178 Inclusive Apps

inclusive Information and Communication Technology (iICT)

2017

Join the Facebook group: “inclusiveICT”
This booklet was developed by students for the topic DSRS4102/DSRS9064 Technological Applications and Disability – Flinders University 2017, Semester 1.

It is presented as is, and represents undergraduate and post-graduate student work.

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inclusive Information and Communication Technology (iICT)

The voyage to discovery is not seeking new landscapes, but in having new eyes.

(Marcel Proust)

Teaching is but an illusion --- only Learning is real

(Carey, 2007)

What is iICT all about?

The topic looks at inclusive Information and Communication Technology (iICT). We look at new and emerging technologies that may be useful to people with a disability. It is not about learning how to use a technology (this is covered in other areas) but how to look at technology with new eyes to see a new use or potential.

"...if not used effectively ICT becomes little more than a glorified typewriter...and an expensive one at that!" (McKinsey, 2009, 17)

It's about Innovation NOT Duplication
**Introduction:**

This is the final project for students in this topic in Semester 1 2017. The reviews are presented with minimal editing, omitting only those apps that did not have direct relevance to the Australian context.

A full index of apps is at the end of this eBook. These apps in this collection are evaluated by students under specific headings:

- UDL
- Curriculum
- Australian National Disability Standards
- SAMR
- Person centred planning
- 21st Century approach to learning and technology (the 5Cs)

**Universal Design for Learning (UDL)**

Universal design for learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn. Watch the video below to get an overview of UDL. (http://www.cast.org/our-work/about-udl.html#.WUDQmGiGNhE)
Curriculum area

The area of learning that the app addresses.

National Disability Standards


There are six revised National Standards that apply to disability service providers. They are:

Rights - The service promotes individual rights to freedom of expression, self-determination and decision-making and actively prevents abuse, harm, neglect and violence.

Participation and Inclusion - The service works with individuals and families, friends and carers to promote opportunities for meaningful participation and active inclusion in society.

Individual Outcomes - Services and supports are assessed, planned, delivered and reviewed to build on individual strengths and enable individuals to reach their goals.

Feedback and Complaints - Regular feedback is sought and used to inform individual and organisation-wide service reviews and improvement.

Service Access - The service manages access, commencement and leaving a service in a transparent, fair and equal and responsive way.

Service Management - The service has effective and accountable service management and leadership to maximise outcomes for individuals.

SAMR

Developed by Dr. Ruben Puentedura, SAMR is a model that supports and enables teachers to design, develop, and infuse digital learning experiences into their lessons. It stands for Substitution, Augmentation, Modification and Redefinition. Each word can be applied to a lesson or activity that incorporates technology, moving from a use that simply replaces existing classroom resources (Substitution) to activities that create new tasks, not possible without technology. (Redefinition)

(From Adam Foster https://www.showbie.com/using-showbie-with-the-samr-model/)
Person centred planning

‘Person centred planning’ may be defined as a way of discovering:
1. How a person wants to live their life and
2. What is required to make that possible.

The overall aim of person centred planning is “good planning leading to positive changes in people’s lives and services” (Ritchie et al, 2003).

21st Century approach to learning and technology (the 5Cs)

The 5Cs

Provide learners with
• the CONNECTIVITY
• to develop a COMMUNITY of learners
• so they can COLLABORATE
• to CREATE new things and ideas and
• provide a place where the resources and products can be CURATED for retrieval at a later date.

http://www.slideshare.net/gjpcarey/redefining-education-5cs-copy
List of apps

**Intellectual Disability**
1. Comprehension Therapy
2. Money Up!
3. Word Sort by Grammaroplois
4. Dragon Dictation
5. First Then Visual Schedule
6. Talk’n Photos
7. iDo Hygiene
8. Next Dollar Up
9. Epic! Unlimited Books for Kids
10. DialSafe Pro
11. iWriteWords
12. Shoe Tying 1-Activity App
13. Community Success
14. AAC Speech Buddy
15. My First AAC
16. Plan it, Do it, Check it off
17. I Get... My Schedules at Home
18. Off We Go
19. Everyday Skills
20. Play 123
21. Math Fact Master
22. Elevate- Brain Training app
23. So Much 2 Say
24. Fourth Grade Learning Games
25. BW Story App
26. CanWork
27. I Get...Going to the Hospital
28. iModeling Boundaries
29. Sequence of Events-Sequencing Cards for Kids
30. Little Speller
31. My Safety Companion
32. Stepping stones daily routine
33. Read Me Stories

**Autism Spectrum Disorder**
1. Proloquo2Go: AAC in your pocket
2. Remories
3. Autism Learning games: Camp discovery
4. Toca store
5. Autismate
6. ASD Tools
7. Talk Tablet- Autism Speech AAC
8. Care for Me
9. Pictello - Talking visual story creator
10. Emotions & Feelings Social Story
11. i create...Social Skills Stories
12. See Touch Learn
13. Settle your Glitter
14. Behaviour World Reward Chart
15. AVAZ
16. A Present For Milo
17. A BuZoo Story
18. AAC Autism Talk Now
19. 1:1 Communicate Easy
20. First-Then Visual Schedule
21. iPrompts- Pro
22. Learn with Rufus
23. Social Skill Builder
24. Fun with Directions
25. Autism Link
26. AutismXpress
27. Social Skills for Autism
28. JABtalk
29. Emergency Chat
30. Video Scheduler
31. Shopstagram
32. Classic Explain Everything
33. News-2-you
34. Choiceworks Calendar

**Vision Impairment**
1. BIG Launcher
2. Read2Go
3. Aipoly vision
4. Amedia Live Reader
5. Amedia NaviRec
6. Tap Tap see
7. KNFB reader
8. Math melodies
9. Look Tel Recogniser
10. Look Tel Money Reader
11. Read me the Weather
12. iMove
13. Text Detective
14. HeyTell
15. RAY App
16. BlindSquare
17. Voice Dream Reader
18. Eye-d pro
19. Google Talkback
20. Soft Braille Keyboard
21. Alarmed Reminders Timers
22. WhatsApp Messenger
23. Auto Ringtone Pro Talking Caller ID Ringtones
24. Talking Scientific Calculator
25. VisionAssist
26. NantMobile Money Reader
27. Ariadne GPS
28. Chime
29. Dragon Dictation
30. Ulexia
31. Learning Ally
32. Voice Brief
33. Be My Eyes
34. Tap-n-See Now
35. Light Detector

Specific Learning Difficulties
1. Explain Everything
2. Sound Note
3. Word Builder
4. Auditory Memory Ride
5. LetterReflex
6. ConversationBuilder
7. Phonics Genius
8. Evernote
9. Learn to Read, Write & Spell
10. Abilipad
11. Noisili
12. Padlet, Post it Plus,
13. Min2Go
14. Prizmo
15. MyScript Calculator
16. Lectio
17. Ghotit Real writer
18. Dexteria
19. Mod Math
20. Photomath - Camera Calculator
21. Voice Dream Reader
22. Easy Spelling Aid
23. Marble Math
24. Articulation Station
25. myHomework student planner

Physical Disabilities
1. Speech Hero AAC
2. SCI-Ex
3. Physiotherapy Exercises
4. Access map
5. Help Talk
   Dial2Do
6. Ability Trip Mobile
7. Physiotherapy Exercise
8. Smart Hub
9. Catch the Cow
10. ProLoQuo2Go
11. Be My Eyes
12. Talk IT
13. HiredUp
14. AXS
15. Toilet Finder
16. iBooks
17. Red Panic Button
18. Commandr
19. IFTTT-If This Then That
20. Wheel Mate
21. Physio Advisor Exercises
22. JABtalk
23. Assistive Touch
24. Dragon Dictation

Hearing Impairment
1. Sound Scouts
2. AUD-1
3. Ear Spy: Super Hearing
4. Phonak Leo
5. Connect by BeWarned
6. Z5 Mobile
7. iMoufe
8. Dragon Dictation
9. WhatsApp
10. TextHear
11. TapTap
12. Sign Instant Message (SIM)
13. Let me Hear Again
14. Subtitles viewer (Sub Pro)
15. Skype
16. My Smart Hands
17. RIDBC Auslan Tutor
18. Ear machine
19. Live Caption
20. Five App
21. Be Warned
22. Braci
23. Transcense/AVA
24. VoxSciences
25. Pedius
26. Eye-Sign
Intellectual Disability
Intellectual Disability

Intellectual Disability (ID) is defined by the World Health Organisation (WHO) as having “a significantly reduced ability to understand new or complex information and to learn and apply new skills” (World Health Organization, 2017). In addition, ID is characterized by low intelligence and associated limitations in adaptive behaviour. People with ID need assistance in various contexts, from diagnosis through adulthood. People with ID have difficulties in the following areas; comprehension of new ideas, life or self-help skills, social skills, communication skills, and learning skills (Carulla, Reed, Vaez-azizi, Cooper, Leal, Bertelli...Saxena, 2011; Department of Health, 2001 as citied in Tuffrey-Wijne and McEnhill, 2008).

<table>
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<tr>
<th>Reviewer</th>
<th>Names of apps</th>
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Introduction

Intellectual Disability (ID) is defined by the World Health Organisation (WHO) as having “a significantly reduced ability to understand new or complex information and to learn and apply new skills” (World Health Organization, 2017). In addition, ID is characterized by low intelligence and associated limitations in adaptive behaviour. People with ID need assistance in various contexts, from diagnosis through adulthood. People with ID have difficulties in the following areas; comprehension of new ideas, life or self-help skills, social skills, communication skills, and learning skills (Carulla, Reed, Vaez-azizi, Cooper, Leal, Bertelli...Saxena, 2011; Department of Health, 2001 as citied in Tuffrey-Wijne and McEnhill, 2008).

People with ID often cannot live independently and are likely to experience less social engagement and fewer opportunities to enjoy network growth (WHO, 2017; Forrester-Jones, Carpenter, Coolen-Schrijner, Cambridge, Tate, Beecham, & Wooff, 2006; Lippold, & Burns, 2009). In order to live as independently as possible, is it essential that they are aware of the formal support services available to assist with personal planning and exploring their environments independently (Wheeler, Mayton, & Carter, 2015).

According to Tuffrey-Wijne and McEnhill (2008), people with ID, whether mild or moderate, will have communication difficulty. This may include difficulties in expressing themselves, limited vocabulary, difficulty understanding what is said, and speech that is difficult for others to understand. It is evident that increased opportunity to communicate choice and direction for their own lives is paramount to maximising positive outcomes (McConkey, & Collins, 2010).

The key to successful skills acquisition for people with ID is to present information in multiple appropriate forms, in a mode of learning best suited to that person (Bunning, Smith, Kennedy, & Greenham, 2011). For example, visual schedules, charts, pictures, and other modifications provide effective alternative representations and give people with ID the opportunity to better understand and implement instructions, tasks, and communication skills (Moody, 2012; Bunning, et al., 2010).

Though static resources are suitable for many people, the development of mobile technology has made person centred choice much easier. A person centred approach promotes the rights, independence, choice, and inclusion of people with ID. It considers aspirations, provide support to achieve goals, and create wider social networks for families (Mansell & Beadle-Brown, 2004).

Mobile technologies also assist people with ID with life and learning skills. This includes toileting, personal care, grocery shopping, going to different places, communication, and social skills (Mansell & Beadle-Brown, 2004). Within classrooms, teachers can use selected applications to enhance learning opportunities for students with ID. Visual and verbal instructions and prompts, often customisable, enable students to independently complete activities and connect their learning to their everyday world (Kennedy & Deshler, 2010; Smith & Okolo, 2010).

The use of technology cannot help people with ID with everything, but a person with ID who uses apps in their mobile technology for self-instruction and support develops self-determination in completing different tasks (Mansell & Beadle-Brown, 2004). The apps presented here aim help people with ID express themselves, augment communication, assist in key areas of understanding, and enhance people’s wellbeing and overall independence.
Reviewer: Kayleigh Brown

Name of app: Comprehension Therapy

Operating System: iOS 5.1.1 or later (compatible with iPhone, iPad and iPod touch, Android 4.0.3 or above)

Location: iTunes Store, Google Play store

Cost: $30.99 AUD

Description: This app is available in five different languages and can be used by children and adults, targeting auditory and reading comprehension of single words. It uses ten categories of nouns ranging from animals and food to objects and places. The user can explore three different modes including; listen, read, and listen and read. It allows the user to set individual goals and automatically varies the difficulty depending on performance. It works by scoring answers and provides hints if the user becomes stuck on something. During the task, the user can review answers, go back and forth or just skip. When a task is complete, a summary of results is produced, which can then be printed and/or e-mailed to anyone (teachers, professionals). It provides the option to add own photos, avoids the use of complex or unknown jargon, and encourages independent use through the simple interface, making it more appealing to all people.

Alignment with the UDL guideline: Comprehension therapy aligns with UDL Guidelines in various ways and provides multiple means of representation and engagement. Providing feedback as to the users as soon as the task is completed guides the user in information processing (standard 3.3) and enables them to visualise words. It also breaks down the information into smaller bits so that the user can develop a deeper understanding of the word and/or picture. It promotes the user to participate in self-regulation and reflection by providing them with timely feedback that supports progression (9.3). It is available in various languages (2.4) allowing it to be more accessible across the world (CAST, 2011).

Curriculum area: This app is made to assist students with English skills, specifically language and comprehension. It would be most effective with early-mid primary school students, although can be used by adults as well. It is useful to build literacy and increase the associations that are made between pictures and words. It essentially provides the user with a functional base to learn more words and develop their ability to communicate with others throughout their life.

How does the app meet the National Disability Standards? This app encourages the user to work with their teacher or another professional to identity strengths and weaknesses and regularly review the results to ensure the user is being supported. If the results are shared with the users’ teacher and/or parents it has the capacity to encourage a partnership that will promote more communication and encourage further participation from the user (Community Services ACT, 2014).

How the app changes pedagogy (SAMR)? This app could be used as an Augmentation tool as it provides functional improvement for students who find it more difficult to understand language and literacy
(Puentendura, 2013). It makes connections between pictures and words and speaks to the user to highlight how the letters are formed into a specific word. The teacher can gather results from the activity in order to determine the level of understanding and use it as a guide for further improvement.

**How the app encourages person centred planning.** Person-centred planning highlights the importance of providing the person with a disability the power to control their participation (Department of Ageing, Disability & Home Care [DADHC], 2009). In this app, the user has the ability to control the difficulty, the mode, the pictures that will be used, and the process during the task. This allows it to be more meaningful and appealing to everyone. The activities are tailored to each individual and the difficulty automatically increases to motivate and challenge the user. The ability to save and share summary reports encourages teachers’ and/or parents’ to be actively involved in the process (DADHC, 2009) and they can use the results from the app as a base to further support and develop the users’ abilities.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app encourages Connectivity (Carey, 2013). The user can import their own photos they may have gathered from outings or of objects, they enjoy. This creates more meaning and allows the user to connect more with the tasks provided. Through the simple interface, the user is also able to easily take control and navigate through the modes and tasks independently.

**Evidence from the literature that the app is capable of the claims made:** Due to its varying levels of ability, Lu (2016) argues that this is a useful app for people of all ages and abilities. It provides global access through the availability of five languages and encourages the user to customise it to better suit their ability (Lu, 2016). This app can be a motivational tool for users as it makes a sound when an incorrect answer is selected prompting the user to try again until they succeed (Autism Association of Western Australia [AAWA], 2013), although it is also argued that the app can become repetitive and sometimes uses more abstract concepts that may be difficult for some users. It is useful to note that there is a “lite” version that users can try to discover if it is suitable for their needs before purchasing (AAWA, 2013).

**General Comments:** This app would be helpful in the classroom and could be used by any student when learning new literacy skills or new nouns. It is a different way to explore words and enhance the ability in understanding various nouns and make real life connections with them using elegant pictures. It would be more beneficial if the teacher could interact with the app by adding words that the students are currently learning in the class.
Reviewer: Kayleigh Brown

Name of app: Money Up!

Operating System: IOS 8.0 or later (compatible with iPhone, iPad and iPod touch)

Location: iTunes Store

Cost: $24.99 AUD

Description:

This app is made in Australia and uses the Next Dollar Up method to teach children with intellectual disabilities how to handle money. Money Up! Is best suited to primary school students, but can still be used by adults especially in real life contexts such as the shopping centre. It has various currencies embedded, including Australian, New Zealand, American and British, making it more accessible to students across the world. It encourages the user to explore money through different games and activities and teaches essential life skills such as identifying each note and coin, how much money a person has and how much is needed to buy certain things. This app encourages independence through the ability to customise the screen and import pictures of objects that they may wish to buy. Having been created in Australia, it is more accessible to Australian users and may be more true to the price of products, especially when it can be used to create a shopping list the user can develop and work out how much they will need in order to pay for it all. It can also be used by teachers, parents or other professionals to view progress reports and work alongside the individual to reach their goals and build their overall independence.

Alignment with the UDL guideline: Money Up! aligns with the UDL guidelines through multiple means of representation and engagement. This app allows the user to explore key concepts in an alternative form (3.3) and enables them to interact with money in a more abstract and clever way. Guideline 7.2 outlines the importance of relevance to each student, this app succeeds in this area as it can be used with various currencies and the user can add specific items of interest to them onto the shopping list (Cast, 2011). Money is everywhere across the world so it is essential that students have the opportunity to develop an understanding of what each note and coin means before they become adults. Aligning with these UDL guidelines the app is a useful support tool that can be used around the world to ensure people with intellectual disabilities are able to live a more independent life.

Curriculum area: This app is a great tool that should be used in Mathematics. It not only identifies all notes and coins in various currencies but also provides students with an interactive way to learn notes and coins while becoming aware of the importance of handling money. It can be used to also learn addition and subtraction with money and develop an understanding of when to give change or how much they should receive back. Money can be a difficult concept to learn but this app takes a concrete concept and allows the user to explore money in creative and engaging way.
How does the app meet the National Disability Standards? Money Up! Provides the user with key independence and encourages them to participate within the community. As per standard 2.4, this app promotes inclusion within the community by providing an essential support to users with ID to effectively handle money in various contexts including shopping centres, or banks. It encourages the user to participate in active decision making (1.3) by identifying items, price and producing the correct amount of money required (Community Services ACT, 2014).

How the app changes pedagogy (SAMR)? Money Up! is an app that would be used for re-definition (Carey, 2013). It requires the user to not only identify notes and coins in each system but encourages them to create shopping lists personal to them which they can take and refer to wherever they are. It allows the user to explore different types of monies and make connections between items and particular notes or coins. Teachers can use this app to enhance their student’s learning in a practical and engaging way. Making connections to the students’ wider contexts allows this app to create a redefinition in maths tasks involving money.

How the app encourages person centred planning. This app gives the user essential life skills that will enable them to be active community participants and feel a sense of inclusion (DADHC 2009). Money Up! places the user and their needs at the centre of the tasks and promotes independence during the activities. Providing opportunities to make connections with the community will enable the user to continue using it when they leave the school environment.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Money up! aligns with Creativity (Carey, 2013). Providing the user with the ability to manipulate the different currency or to create their own shopping list allows them to experiment with the notes and coins available. It encourages the user to explore money in a personal way depending on their wants or needs.

Evidence from the literature that the app is capable of the claims made: With an increase in advocacy, there is in turn a focus on post-school independence and enabling students to live independently and actively interact with the wider community (Cihak & Grim, 2008). Having the ability to work, spend money, save money and create budgets are essential skills required to independently function (Cihak & Grim, 2008) in society. Although it is an essential to learn the importance of handling money, it can be time consuming and may not be perceived a high priority in education (Colyer & Collins, 1996). The Next Dollar Up strategy is used to teach students to pay for items using one more dollar than necessary and it has been successful teaching students with mild to severe intellectual disabilities (Cihak & Grim, 2008). By using the Next Dollar Up method, this app provides key support for students with intellectual disabilities who may take longer to develop an understanding of addition (Cihak & Grim, 2008) and other mathematical functions.

General Comments: This app is a great tool for teachers to utilise when teaching primary aged children about money. It provides them a simple interface which is easily accessible to all, and provides a more interesting and relevant way to explore money as a concept and the importance of using it correctly. This app can also be used throughout a person’s life, giving them support to become more independent and providing them with key confidence to go shopping and exchange money with others.
**Reviewer:** Kayleigh Brown

**Name of app:** Word Sort by Grammaropolis

**Operating System:** iOS 4.0 or later (compatible with iPhone, iPad and iPod touch)

**Location:** iTunes Store

**Cost:** $2.99 AUD

**Description:** Word Sort is a useful tool to use when teaching literacy skills and encourages the user to explore parts of speech in a motivating and engaging way. It is aimed towards primary aged children and enables them to explore the various parts of speech including, nouns, adjectives and verbs in addition to more complex parts such as prepositions, adverbs and conjunctions. Word Sort uses many appealing characters to explain what each part of the speech is before the user participates in an activity where they drag the word into the correct container. It challenges the user as they gain more knowledge with three varying levels of difficulty. It also has the ability to track progress through a scoring page as well as now providing the user with the ability to compete with friends and family, in turn enhancing motivation for some learners.

**Alignment with the UDL guideline:** Word Sort provides the user with multiple means of representation. The app enables the user to explore words and symbols with embedded support (standard 2.1). It provides definitions and examples to the user before they complete a relevant task that connects their knowledge and understanding, while also proving extra support if needed throughout. This app is used to emphasise the critical parts of text and the relationships they have with other words (3.2). Using creative characters enables the user to engage with the program and develop a clearer understanding of essential parts of speech they will experience through their lives (CAST, 2011).

**Curriculum area:** Word Sort would be useful for learning literacy and language. It highlights critical components of speech and provides the user with easy to understand definitions that the teacher can use as a basis for a lesson. It engages the user with creative characters, appealing to children, and allows them to explore components of text at varying levels supporting them at every stage.

**How does the app meet the National Disability Standards?** Literacy skills are essential for community participation (standard 2.3) and can minimise access to various supports (5.5). By tracking progress, Word Sort can provide essential feedback to ensure understanding and knowledge continues to develop (4.4) (Community Services ACT, 2014).

**How the app changes pedagogy (SAMR)?** Word Sort can be used as an Augmentation tool when teaching literacy skills. It provides a different way of interacting with literacy and key opponents of text that may be more engaging for visual and beginning learners. It will assist ID learners to develop an understanding of key components of speech and connections through words. They can progress through the tasks alongside lessons in the classroom and various students can engage with it to create a competitive platform, if appropriate. Word Sort provides users with disabilities a more accessible and functional way to learn key components of language (Puentendura, 2013).
How the app encourages person centred planning. Providing young children with ID with essential literacy skills it gives them more confidence to communicate with their friends (DADHC, 2009 and parents as they venture through their life. Person centred planning tailors support to each individual’s goals (DADHC, 2009), word sort uses creative characters to provide students with basic knowledge before guiding them through set tasks.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Word Sort encourages creativity (Carey, 2013). It inspires writing and gives an opportunity for the user to explore key concepts through the use of visuals and text requiring them to sort through the words and select the appropriate ones. It also encourages the user to manipulate the data by making connections to the characters with specific parts of speech providing a more engaging way to learn about the different types of words commonly used.

Evidence from the literature that the app is capable of the claims made: Developing literacy skills is essential in a child’s development and enables them to communicate and socialise with other, become more independent, and work as they grow older (Raising Children, 2017). Word sorting is a strategy that many teachers use to identify key components of words and how they different in functions (Hoffman, 2015). Hoffman (2015) highlights that word sorting encourages students of all abilities to explore beginning sounds and discover how the English language works. This app provides an opportunity for new words to be analysed and understood in a different way, enabling students with ID to interact with words and discover their functions in speaking and text.

General Comments: Word Sort is a fun and motivating app that teachers or parents could use to enhance their child’s learning. It is easy to use and was made for young children by including fun, interactive characters. Through its engaging interface, children with ID can make connections between the characters and key components of speech, enabling them to develop essential literacy skills they can carry with them throughout their life. It encourages children of all abilities to form an understanding of key functions of words and can give them new ways of understanding and learning concepts that may otherwise be difficult to grasp.
Reviewer: Kayleigh Brown

Name of app: Dragon Dictation

Operating System: iOS 4.0 or later (compatible with iPhone, iPad and iPod touch)

Location: App Store

Cost: Free

Description: Dragon Dictation is a free text-to-speech app that allows users to take notes, send e-mails or SMS and make recordings. It is a flexible program that is useful in many situations such as meetings, sending messages or posting a status to Facebook. It is extremely fast and recognises many different languages (Nuance, 2017). Users can dictate, record other speakers, or use it as a note-taking tool to ensure that everything spoken can be remembered. Dragon Dictation’s software can translate speech to text five times quicker than typing (Nuance, 2017). This gives the user more time to process information, as they can see it at the same time they are listening. These alternatives can be used in various contexts, including home and school. It may allow the user to communicate more efficiently by having their speech turned into text that they can send or save straight away, eliminating the need for typing out a document or response.

Alignment with the UDL guideline: Dragon Dictation aligns with the UDL guidelines through multiple means of representation and expression. It provides a different way to represent audio (standard 1.2), enabling the user with ID to go back and listen to information so they have more time to process and remember the information being spoken. This app allows users to use a different form of communication (5.2) and encourages the user to compose and view words in a way that makes sense to them individually. It can be used in various languages, enabling the user to process information in their native language (2.4), making content more relevant to them (CAST, 2011).

Curriculum area: This app can be used in any part of the curriculum. It allows the user to process information in a different way and encourages them to take notes and develop a clearer understanding of what has been discussed. They are able to save files and export them to other devices, or go back and listen to them later. Dragon Dictation takes the pressure of needing to process all the information off of users with ID and can give them the confidence to communicate in an alternative way.

How does the app meet the National Disability Standards? Dragon Dictation is an app that teachers can use to facilitate and foster the processing of information in a more preferred and effective way (standard 2.3). Choosing an alternative way to process information and communicate is a choice individuals make (3.2) in order to benefit their life, dragon dictation provides individuals with independence to more effectively understand content from lessons and extend on their own thoughts. Communicating is an essential part of life and it is important that people with disabilities are given adequate support tools to succeed in all aspects of their life.
How the app changes pedagogy (SAMR)? Dragon Dictation can be used by teachers through providing a substitution for students with ID and other learning difficulties (Puentendura, 2013). It will enable the student to participate in the task and provide them an alternative that may assist them in processing information and developing a clearer understanding of the content. Providing a substitution for students with disabilities in the classroom enables them to be active participants in tasks and enables them to keep track of content and go back later if needed.

How the app encourages person centred planning. This app facilitates individual choice (DADHC, 2009) providing an alternative way people with disabilities can process information. Every student is diverse and each process information differently than the next. This app aims to support the student through their schooling and future by helping them process spoken words in a visual way and giving them another communication tool they can utilise in various contexts and stages of their life. This tool is not intrusive in any way and using it in classrooms allows teachers to provide different avenues of understanding, thus creating a more inclusive environment that encourages diverse learning needs.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? Dragon dictation places focus on collaboration (Carey, 2013). It tracks spoken words and shows them in written form simultaneously, allowing the user to share ideas and take notes faster and more effectively. It encourages deeper understanding as you can share the file in various forms (email, SMS) and allows users to process information in an alternative way that suits their needs.

Evidence from the literature that the app is capable of the claims made: Dragon Dictation is a useful productivity tool for teachers and students (Nuance, 2017). It is useful when students wish to record a key component of a lesson (e.g., a teacher’s explanation) to review later but may not be accurate in longer conversations (Nuance, 2017). Dictation software has the ability to minimise barriers in communication (MacArthur, Cavalier & Albert, 2004). Students with learning disabilities, including ID, may find writing difficult, but providing a dictation tool provides them with accurate versions of what has been spoken (MacArthur, Cavalier & Albert, 2004). Providing students with disabilities access to tools such as Dragon Dictation gives them key support they may need to effectively learn and process information presented to them in the classroom.

General Comments: Dragon Dictation can be used in many different contexts by people of all ages. It is very simple to use and can take the pressure off by allowing users to process chunks of information at one time. Students can not only use it as a listening and note taking tool, but also to write their thoughts, eliminating the time it might take to type it out. It can give students extra time to comprehend information and allow them to develop a clearer understanding of tasks, explanations, or meetings. This app is a useful tool in assisting users with ID in processing key components of spoken text and can give them more confidence in communicating with others.
Reviewer: Kayleigh Brown

Name of app: First Then Visual Schedule

Operating System: IOS 3.2 or later (compatible with iPhone, iPad and iPod touch), Android 3.0 or above

Location: App Store, Google Play Store

Cost: IOS – $14.99AUD, Android - $5.95AUD

Description: First Then Visual Schedule is used for children with disabilities, such as ID, to provide them with knowledge of upcoming events, changes or tasks that need to be completed and enable them or their carer to create various schedules when required. It is quite customisable and can include pictures, audio and text, making it accessible for a greater amount of people. It has a simple interface and encourages the child or parent to incorporate photos from real life to ensure each schedule is relevant to the child and their needs. Children with ID sometimes struggle with processing information and understanding expectations, this app provides a different representation that is easier to break down and understand so they can view what is expected by them or an event that is going to be occurring. It can be used as a tool to promote positive behaviour within children with ID and minimise the stress they may experience in completing tasks or with various transitions throughout their lives.

Alignment with the UDL guideline: First Then Visual Schedule provides users with multiple means of expression. It enables users to communicate in different modes (standard 5.1). It is a storyboard containing visuals and text, appropriate to the user’s level encouraging them to reach set goals and complete set tasks. Having the ability to import pictures and create various schedules that are relevant to the child and their lives provides multiple means of engagement by optimising relevance and authenticity (7.2) of learning outcomes and personalising schedules to meet the users’ needs.

Curriculum area: First Then Visual Schedule can be used in all aspects of a child’s life. It assists children with ID to break down tasks into smaller components to make it easier to understand. Teachers and parents can use it in various contexts from a task that needs to be completed at school, to what the child needs to do at home. It is about forming a routine and providing key support to children with ID to get through their day. It is a useful tool to use during transitions and provides a guideline for time to be spent on each activity. It could also be used by adults with ID who require support to understand expectations or how to complete specific tasks.

How does the app meet the National Disability Standards? This app aims to facilitate the user’s interests (2.3) and support them through their daily lives independently. First then visual schedule promotes active decision making (1.3) and provides key information in appropriate forms that support the child in relevant contexts. It encourages a collaborative approach to identify needs, goals and strengths (3.1) and can provide support to meet these needs and reach set goals (National Standards for Disability Services, 2013).
How the app changes pedagogy (SAMR)? This app could be used as a tool for substitution as it provides the student with functional improvement for tasks (Puentendura, 2013). It enables the teacher, parent, or carer or user to break down large or complex tasks into smaller steps that the user can view in visuals and text and check them off as they progress. The teacher or parent can use this app to set tasks for a child, or to highlight change that is about to occur. It breaks schedules down to a systematic basis and encourages children with ID to process information at different stages through the task rather than trying to work out a large clump of information at the one time. This is also a useful tool that could be used to guide students with ID through transitions that occur within school e.g. between activities, inside play to outside play, end of the day.

How the app encourages person centred planning. First Then Visual Schedule presents information in a way that is relevant and easy to understand depending on the user. Importing personal photos makes schedules more appropriate and engaging to the user as they can make connections. When used by teachers or parents/carers, they are aiming at guiding and supporting the child through life and daily tasks. The teacher can use this as creative support that the child can feel comfortable using in the classroom, and possibly encourage other students to model for their friend who has an ID.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? First Then Visual Schedule promotes both collaboration and curation (Carey, 2013). Through collaboration, teachers and parents, alongside their child, can focus on specific individualised goals and create schedules that will assist the child. When progress is observed, schedules can be modified or removed and new ones created to ensure that the information presented stays relevant. It enables the user to explore various schedules and keep them in the one place to go back to later, they can order them of importance and store them in a way that they understand.

Evidence from the literature that the app is capable of the claims made: Visual schedules are used to increase independence for children with disabilities (Whatley, Gast & Hammond, 2009). The use of pictures can enhance the functional capabilities of children with ID and assist in building foundational skills (Moody, 2012). Visual schedules are effective support tools that promote social skills, communication and transitional times (Moody, 2012). Apps such as this allow children to generalise skills and make connections of different sequences (Whatley, et al., 2009). Visual schedules assist in building more independent individuals and act as a support through otherwise challenging tasks.

General Comments: This app is useful for people with a range of disabilities. Visuals are easier to understand for some people and enable the user to understand content and make connections with real life contexts (through personal pictures). This app is more suited to young children and useful for parents who are trying to support their child to understand daily tasks, expectations and any upcoming changes that will affect their child. Having the ability to add numerous schedules at one time will allow the user to interact with them when necessary and give them key support throughout their daily lives.
Reviewer: Fiona Fry

Name of app: Talk’n Photos

Operating System: IOS

Location: iTunes

Cost: $2.99AUD

Description: Talk’n Photos is a customised talking photo album. Photos are added to each album from the iPhone/ iPad/ iTouch and the user can then add text and/or a voice recording to each photo. Symbols can be added, and grids can be created with multiple photos and editing features allow the user to rotate, scale and re-sequence photos.

Navigation is simple with the use of arrows to return to album selection. There is the option of locking the editing function to avoid unwanted changes to completed albums.

This application is suitable for children, teenagers and adults.

Alignment with the UDL guideline: Talk’n Photos aligns with the second UDL guideline: multiple means for action and expression. This application allows users to use their photos and verbal recordings to demonstrate learning. An example of this would be arranging photos they had taken of a cooking lesson in sequence to demonstrate their understanding of following the method of a recipe. In addition to this, by recording the user’s voice with these photos, they can express their knowledge of kitchen safety (5.0). This application also aligns with the third UDL guideline; Provide Multiple means of Engagement. Talk’n Photos allows for individualising of content through photos of the user, thus making tasks, both for teaching and for expressing understanding, relevant to the individual (7.2) (CAST, 2011).

Curriculum area: Talk’n Photos can be used across a broad range of curriculum areas by assisting students to communicate and demonstrate their understanding through verbal (voice recording) and visual representations (photos). This app can be particularly useful in developing and building vocabulary and improving literacy. This app can be used to develop sequencing skills in maths and science by ordering photos along with learning to follow directions such as following a photo-sequenced recipe with verbal cues. This app can be used to create a range of ‘how to’ albums to teach or assist learners with independent living skills, such as ‘how to catch a bus’ and ‘how to make an appointment’. Social stories can easily be created using photos of familiar people and environments. This is useful for teaching and developing daily communication and life skills.

How does the app meet the National Disability Standards? Talk’n Photos fits within the National Disability Standard two: Participation and Inclusion (National Standards for Disability Services, 2013). This application allows for PWD to contribute and communicate to the community or their inclusive classroom through sharing of both verbal and visual representations created by the user.

How the app changes pedagogy (SAMR)? Talk’n Photos can enhance teacher pedagogy through Augmentation (Puenteudura, 2013). The use of this application enables the teacher to personalise learning to the user’s interests, engaging the user visually, allowing for creativity along with communication and language development.

How the app encourages person centred planning. Talk’n Photos aligns with person-centeredness as it allows the teacher/carer to support the PWD to create personalised albums, relevant to the
individual’s interests and goals, such as ‘how to’ albums to develop independent living skills (Community Services Act, 2014).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Talk’n photos encourages the categories of Connectivity and Creativity (Carey, 2013). This application allows the user to connect with others by sharing knowledge and understanding with teachers, family and peers through visual and verbal displays. The multiple functions of this app also encourage creativity when making albums by resizing photos, creating grids, changing slants and adding symbols.

**Evidence from the literature that the app is capable of the claims made:** The goal of inclusive education is to ensure students with disabilities are fully participating members and that some of these students are provided with individualised adaptions and accommodations to learn and achieve academic and functional competencies (Janney & Snell, 2006). Douglas et al. (2012) agree that iPads and the plethora of applications available today can play a valuable role within the system of supports for students with IDs. Talk’n Photos can be used to adapt the assessment process for students with ID in many curriculum areas by using the photo, video, or voice recording functions to demonstrate understanding and most importantly, enabling the student to participate with their peers.

Williams et al. (2008) confirm that students with disabilities can have complex communication needs and be provided with a variety of methods to develop their communication. Talk’n Photos is a tool than can provide an alternate communication method whether it be to communicate their understanding through photo or audio assessments or to share a photo album with friends or family.

Individualising and personalising learning content is a key component when differentiating curriculum for students with intellectual disabilities (Westwood & Arnold, 2004). Talk’n Photos provides the opportunity to personalise learning by using the student’s photos, either of themselves, others they know and environments they are familiar with and using these within their learning content such as sequencing, storytelling or ‘how to’ instructional materials.

**General Comments:** Talk’n Photos is a versatile application that could be used in any curriculum area. This one application can connect learning from one content area to another, such as retelling a story through a series of photos and from these photos, creating a sequencing exercise. This application enables a personalised approach when differentiating, using photos familiar to the learner and hence, providing relevance and meaning to the student.
Reviewer: Fiona Fry

Name of app: iDo Hygiene

Operating System: IOS

Location: iTunes

Cost: $9.99AU

Description: iDo Hygiene is an all-inclusive application that enables users independently to learn everyday personal hygiene activities such as cleaning teeth, taking a shower, using a public bathroom and many more. In each unit, there is a video that demonstrates the activity, including step-by-step images and narration for each stage. iDo Hygiene can also create personalised sequences of tasks by using photos and videos taken through the application tool, enhancing learning, creating personal relevance and engaging the user. The board game is a fun feature that enables the user to transfer their understanding of what they have learnt in the units and applying this to other environments. Some examples of this are selecting objects that are a part of a task or choosing a scenario where the door should be shut for privacy. iDo Hygiene is suitable for children and young adults and has proven to be an efficient tool for developing everyday independent living skills for individuals with intellectual disabilities and Autism.

Alignment with the UDL guideline: iDo Hygiene aligns with the first UDL guideline; Multiple means of Representation with the capability to import personalised photos and video to customize tasks, offering ways to customize the display of information (standard 1.1). This application also enables the user to transfer knowledge by offering multiple functions, such as sequencing and quiz activities relating to each task (3.4). This application also aligns with the third UDL guideline; Provide Multiple means for Engagement. iDo Hygiene comprises of multiple task components that can be selected for individual interests and needs (7.1). The options to use personalised photos and videos optimizes individual relevance and value of the task (7.2). The multiple functions of this application, such as watching instructional videos of tasks, importing personalised images, sequencing activities and an interactive game provides variety and challenge for the individual (8.2) (CAST, 2011).

Curriculum area: iDo Hygiene can be used in the curriculum area of Life Skills. The comprehensive instructional videos and linked activities cover a wide range of personal hygiene tasks enabling the user to develop independent life skills. Secondary students and young adults could use this application as they prepare to transition into adulthood and independent living. The inbuilt video instructions are performed by people in their mid-late teens, making it age-appropriate for secondary students.

How does the app meet the National Disability Standards? iDo Hygiene fits within the National Disability Standard principle two: individual outcomes. This application allows for the tailoring of individual needs and promotes the development of independence (National Standards for Disability Services, 2013).
How the app changes pedagogy (SAMR)? iDo Hygiene can enhance teacher pedagogy through Augmentation (Puenteendura, 2013). This application enables the user to connect and transfer their understanding across multiple functions enhancing learning. Examples of this are firstly being able to import personal photos and videos to connect the relevance of the task and secondly the user being able to connect hygiene skills to a range of environments.

How the app encourages person centred planning. iDo Hygiene aligns with person centeredness as it allows organisations, teachers, and carers to provide learning and support tasks that are relevant and personalised to the needs of the user (Community Services Act, 2014).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? iDo Hygiene aligns with the category of community (Carey, 2013). This application encourages the user to learn and develop hygiene skills that are relevant to living within a community.

Evidence from the literature that the app is capable of the claims made: When people with intellectual disabilities have increased control over their lives and their functionality, this increases opportunities for independent living and job options (Wehmeyer & Palmer, 2003). Wehmeyer et al. (2008) state that students with ID will need a range of supports to assist in the development of their individual functioning. Bouck and Joshi (2016) add that there needs to be more attention and practice directed towards providing support to students with ID develop living and independent skills. iDo Hygiene enables students to follow step-by-step instruction across a variety of daily personal hygiene skills, including privacy within the community. This application demonstrates these life skills in video or photo format, and with verbal instruction. As many students with ID struggle with memory retention, having the support of a visual or audio guide to learn and follow will assist them in achieving self-determination (Duttlinger, Ayres, Bevill-Davis & Douglas, 2012). Ayers and Langone (2008) add that from their studies, it is evident that using video formats is an effective method of supporting and teaching students with ID functional living and social skills. Do Hygiene also allows students to integrate personalised photos, upload their own video and to add their own audio. Duttlinger et al. (2012) suggest that giving students with ID opportunities to be involved in planning and preparing strategies to assist with life skills is another element of developing self-determination. Haydon et al. (2012) recommend that iPads should be utilised to provide further practice of learning areas as they have proven to be both engaging and assistive in achieving positive learning outcomes. This application has a game and quizzes directly related to the instructional content providing the student with additional practice and higher order thinking.
Reviewer: Fiona Fry

Name of app: Next Dollar Up

Operating System: IOS, Ipad & IPhone

Location: iTunes

Cost: $5.99AU

Description: Next Dollar Up is a fun and educative game to teach and practice money skills. Using the concept of rounding up to the next whole dollar, this application helps to develop the concept of money values when purchasing items. Next Dollar Up has increasing levels of challenge, ranging from $1 through to $50, using a variety of everyday items to purchase. Next Dollar Up is designed for a diverse range of learners including non-readers. It includes demonstrations along with voice prompts. The design of the pages is simple and consistent to enable users to easily follow the tasks without confusion or distraction. During the game, the user is able to listen to the cashier’s voice prompt and asked to select the dollars needed to pay for the item. Correct answers are rewarded with stars and if incorrectly answering the user is shown a card with the correct answer to enable the user to try again.

Alignment with the UDL guideline: Next Dollar Up aligns with the UDL guideline, multiple means of representation. This application provides options for language, both written and verbal to clarify mathematical operations and symbols, the concept of rounding of whole dollar values (standard 2.1). Next Dollar Up also aligns with the UDL guideline; Provide Multiple means of Engagement. The use of everyday items and familiar monetary language encourages engagement by providing relevance to the users’ everyday life, such as their own participation or observations of purchasing goods in the community (7.2). This application also has increasing levels of difficulty to challenge the user (8.2) (CAST, 2011).

Curriculum area: Next Dollar Up can be utilised within the Maths curriculum for teaching money skills and the concept of rounding up. This application can also be integrated into the Life skills curriculum to develop money management skills when purchasing goods. This application is suitable for primary and secondary students.

How does the app meet the National Disability Standards? Next Dollar Up meets with the National Disability Standard principle of individual outcomes. This application allows for individual development of a life skill, independent money management. The application allows for a diverse range of learners so it can be individualised to the learning needs of the user (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? Next Dollar Up enhances teaching pedagogy through Augmentation. This technology facilitates learning of money skills, using multiple language formats, allowing for diversity in learning styles. The game style format enhances the engagement and learning of the concept, including the function of self-correction and awards.
How the app encourages person centred planning. The use of the Next Dollar Up application identifies that the teacher aims to develop the student’s life skill of managing money which will be valuable as they progress towards independence (Community Services Act, 2014).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Next Dollar Up encourages the teaching of Community (Carey, 2013); in particular, using and managing money within the community. Using real life scenarios regarding purchasing goods encourages understanding and relevance to how all people purchase goods within the community.

Evidence from the literature that the app is capable of the claims made: Understanding money management and having confidence when dealing with money in the community are key components of the Maths curriculum and a valuable life skill for PWD. Next Dollar Up is based on developing money skills and safety strategies when purchasing goods. The functionality of this application is supported by Burgstahler (2003), who states that technology, such as iPad and apps, is helpful in not only developing academic skills of a SWD but also preparing them for their transition to adulthood. Next Dollar Up caters for a range of abilities as it has a number of progressive difficulty levels. This allows students to play the game at a level suitable to their current ability and master concepts progressively; enabling a sense of autonomy which Jalongo (2007) confirms is highly important for learners to feel. Shute, Ventura, Bauer and Zapata-Rivera (2009) state that technology-based games support students with ID across a number of components essential for learning and development. These include direct feedback, catering for current ability but providing challenge and ensuring students are able to relate to the content (agency). Next Dollar Up covers these components with audio feedback for both correct and incorrect answers, it uses everyday items that students will relate with and it caters for a range of cognitive abilities, providing challenge as they progress through the levels of difficulty.

General Comments: Next Dollar Up can be seamlessly integrated into a life skills program with secondary students with ID as an additional learning and practice tool in monetary understanding. Younger students in primary years will also benefit from this application. It can be integrated into the Maths curriculum where all students can benefit and all abilities, including SWD, can use the
Reviewer: Fiona Fry

Name of app: Epic! Unlimited Books for Kids

Operating System: IOS, iPhone and iPad

Location: iTunes

Cost: $10.75AU/month

Description: Epic! is an eBook library for children and teens, offering 15,000 quality books, with new additions weekly, including thousands of audio books with unlimited access. This library service offers both fiction and non-fiction books from leading publishers including award winning titles and series like Goosebumps, The Octonauts, Geographic Kids, Batman and many more. There is a wide variety of styles of books to suit a range of ages and many preferred book formats such as early readers, picture books, comics and junior novels. Each account may have up to 4 individual child profiles and each child will receive recommendations based on their reading level and interest areas encouraging and assisting them with book selection and suitability. Epic! Tracks reading logs and these can be emailed weekly or monthly to teachers, parents, or carers. Epic! Is available in English, Hindi, Japanese, Korean, Simplified Chinese, Spanish and Traditional Chinese.

Alignment with the UDL guideline: Epic! aligns with the UDL guidelines for multiple means of representation and provides multiple means of engagement. This application provides a comprehensive variety of book styles with a wide variety of ‘read to me’ and audio books for all ages (standards 1.2, 1.3). The extensive amount of choice of reading material allows for individual preference, relevance and suitability to their reading ability (7.1, 7.2) (CAST, 2011).

Curriculum area: Epic! can be easily integrated into the English curriculum, especially for reading and literacy programs. There are also options for students to use the non-fiction books in other areas of the curriculum for research and interest. Epic! has reading material appropriate for young children right through to upper secondary students.

How does the app meet the National Disability Standards? Epic! fits within the National Disability Standard of Participation and Inclusion. This application provides extensive choice with both reading material and formats, including audio books and this gives all individuals the opportunity to participate both in reading program and for enjoyment (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? Epic! enhances teaching pedagogy through Substitution (Puentendura, 2013). This application acts a direct substitute for traditional reading material, such as books and audio books on CD. This application does however provide an extensive range of materials to suit reading abilities and personal interests.

How the app encourages person centred planning. Using Epic! within the classroom ensures students with disabilities are included and can participate in the reading programs where relevant and preferred reading material and formats can be selected by the student (Community Services Act, 2014).
What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? Providing students with Epic! as a reading tool, this will encourage collaboration and connectivity between students, teachers, parents and peers as books are discussed and interests are shared (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: The United Nations (2007) insisted that people with disabilities have a right to full and active participation and inclusion in society. Cumming, Strnadova, Knox and Parmenter (2014) also concluded from their study that iPads enabled people with intellectual disabilities greater opportunities to participate within the community. Cumming et al. (2014) revealed that 71% of the general population used their mobile devices to read books. Epic! allows children and adults of all abilities this same opportunity. Within any given classroom, whether it be mainstream, specialised or community based, Epic!’s diverse range of reading material and reading formats enables all children and young adults the opportunity to have access to reading materials suitable to their needs. Due to cognitive deficits experienced by students with ID, the wide selection of audio and ‘read-to-me’ books along with picture and comic style novels allows these students to participate in class during independent reading and share their opinion of their chosen books. These apps support students, not only from an educational perspective, but also as a form of entertainment (Douglas et al., 2012). Due to the mobility of the IPad, people with ID can enjoy reading not only at school but also at home or in the community. The Epic! feature of being able to program the reading levels and preferences of individuals enables users to select the recommended material easily and removes confusion. Janney and Snell (2006) state that some students with cognitive disabilities will require adaptations to their materials that are individualised to their age and abilities.

General Comments: This application is useful when developing literacy, particularly in the reading component, as students are able to choose reading material suitable to their abilities and age levels. Students with ID can participate with their peers in class during independent reading and can use this application at home to extend their literacy and to encourage the enjoyment of reading.
Reviewer: Fiona Fry

Name of app: DialSafe Pro

Operating System: iOS, iPad and iPhone

Location: iTunes

Cost: Free

Description: DialSafe Pro is designed to teach children and young people proper phone usage and safety when using a mobile phone. Through animated lessons, skill building games and practice sessions with a realistic phone simulator, students can learn the important phone usage skills in a safe environment. Lessons involve: Correct buttons to push, How to hang up and redial, Emergency calling, and Storing regularly used numbers. The realistic voice simulator allows student to experience realistic phone messages, with both guided systematic lessons to learn and unguided sessions to evaluate their skill development.

Alignment with the UDL guidelines: DialSafe Pro aligns with all 3 of the UDL Guidelines. Firstly, multiple means of representation – this application highlights the key features of the mobile phone, both visually and with audio, using multiple examples (standard 3.2). DialSafe Pro also guides the user through the process of understanding the features of the mobile phone using visual representation and examples to develop understanding (3.3). This application also provides multiple means for action and expression. The interactive function using a voice simulator enables the user to physically practice real phone-use scenarios, where both verbal and visual stimulants and feedback are used (5.3). DialSafe Pro also provides for multiple means of engagement. Due to the individualised functions of teaching users how to store and retrieve commonly used phone numbers of people in their lives this application offers value and authenticity to the individual (7.2). The included games and skill practice sessions also provides for challenge suitable to the current understanding of the user (8.2).

Curriculum area: DialSafe Pro is suitable for use in a Life Skills program and particularly suitable for primary and secondary students to develop the component of communication skills using a mobile phone. This application is also valuable when teaching and developing safety awareness in the community.

How does the app meet the National Disability Standards? DialSafe Pro meets with the National Disability Standard principle of individual outcomes. This application allows for individual development of a life skill, using a mobile phone to contact others for pleasure, for safety and in cases of emergency. (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? DialSafe Pro enhances teaching pedagogy through Augmentation (Puentendura, 2013). This technology facilitates learning of mobile phone use using both visual and audio instruction and real voice simulation. The skill testing games and interactive practice sessions provides immediate feedback and the individualising of relevant content, such as familiar names and phone numbers gives authenticity and value to the with user.
How the app encourages person centred planning. The use of the DialSafe Pro application identifies that the teacher aims to develop the student’s life skill of developing competence in being able to use a mobile phone to contact family and friends, to develop communication skills, awareness of safety and with regards to who to contact in times of emergencies. This application allows the students to use familiar names and their phone numbers, individualising the learning process to the user (Community Services Act, 2014).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? DialSafe Pro encourages community and connectivity. This application is a teaching and learning tool based around being able to communicate and connect with others in the community by using a mobile phone (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: People with ID will develop greater self-determination skills when provided with opportunities and guided support to independently complete tasks (Duttlinger et al., 2012). Using a mobile phone is valuable skill for students with ID to learn as it enables individuals to communicate and connect with others both socially and in times of need, such as emergencies, this being fundamental as they transition towards independent living. Bouck and Joshi (2016) highlight that legislation included in IDEA (1997) states that students with disabilities will be involved in learning activities that are personalised and address skills applicable to post-school life. These authors also found from their study that that further attention needs to be directed towards offering students with ID activities that will enhance their life skills (Bouck & Joshi, 2016). DialSafe Pro enables students to learn the key components of a mobile phone. Using both visual and verbal guides for learning the key features of operating a phone and the process of communicating via phone to important people in their lives, encourages engagement and positive feelings of autonomy as they learn. Ke (2009) confirms that learning content that is meaningful and relevant to the individual will result in more successful learning outcomes.

General Comments: DialSafe Pro can be easily integrated into a life skills program as a component of developing communication skills using a mobile phone with a range of ages. This application can also be used as a learning tool for understanding safety and recognising danger. The unguided practice sessions and interactivity by the students allows for evaluations of progress to be easily assessed by teachers or carers.
Reviewer: Kunjesh Raj Sharma

Name of app: Shoe Tying 1 - Activity App

Operating System: IOS,

Location: App Crawlr

Cost: $4.99AU

Description: Shoe Tying 1 - Activity App teaches children with intellectual disability to tie shoes with less hassle and effort. Parents or teacher can help the children to tie shoes with the help of this app because all the steps needed to tie shoes are given in the form of diagrams and voice and scripts which help children with intellectual disability to learn the way of tying shoes so later on, they can do this task independently. The steps and videos presented in this app are such that it can be managed by playing and replaying repeatedly until the children master it and perform the required skill independently (AES Apps, 2017)

Alignment with the UDL guideline: Shoe Tying 1 - Activity App aligns with the Principles of Universal Design of Learning Guidelines of providing multiple means of representation (CAST, 2011). It provides multiple means of representation by helping parents teach their children with intellectual disability to tie their shoes through video modelling of step-by-step procedures rather than traditional method, which is less interesting. They can even repeat the process as many times as they wish until they master the whole process with confidence (AES Apps, 2017)

Curriculum area: Shoe Tying 1 - Activity App is suitable in the curriculum of Special Education for the age group of 6 to 10. Not only parents, but also teachers, can teach their students with intellectual disability about the way of tying their shoes. This app will guide students through all the steps needed to tie their shoes through video, diagrams and texts. The students would also learn faster through this app because it is prepared in an interesting and informative manner. Students can see either the full video or individual steps or transition from video to images or transition from images to text and can gain the complete skill of tying shoes (AES Apps, 2017)

How does the app meet the National Disability Standards? Shoe Tying 1 - Activity App meet the National Disability Standard of participation and inclusion (National Standards for Disability Services, 2013). Children with intellectual disabilities can participate with their parents and teachers in the various steps of tying shoes with the help of this app and master the way of tying shoes. This would make children with intellectual disability to tie the laces of their shoes independently, making them more included in the society through by having independence to do things by themselves and avoiding the need of facilitators to do shoe tying task on their behalf (AES Apps, 2017).

How the app changes pedagogy (SAMR)? Shoe Tying 1 - Activity App enhance the teacher’s pedagogy by applying different types and degrees of prompting and systematic teaching to ensure success. There are different types of prompts like physical, verbal, gestural or proximity, they can be applied as various degrees or levels. The amount of prompting is higher when students are taught to cross their shoelaces hand-over-hand, while the prompt is lower by touching or guiding the wrists,
forearm and elbow (AES Apps, 2017) students to tie shoes through this app is a Substitution, where technology acts as a direct tool of substitute with no functional change.

**How the app encourages person centred planning.** Shoe Tying 1 - Activity App encourages personal central planning by putting person at the centre of the activity. This app helps to support people with intellectual disabilities so that they could do their shoe-tying task independently without the need of daily support from others. The task they would learn through this app would remain in their mind for the rest of their lives.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Shoe Tying 1 - Activity App encourages the 21st Century approach to Teaching that is learning through digital games as a pedagogical tool. This app is step-by-step game of tying shoe laces so student with intellectual disability could learn the whole process of tying shoes and later on learn to do the task independently by themselves.

This app also encourages the collaboration of the 5Cs (Carey, 2013), as it helps the students with intellectual disability to learn in collaboration between teachers, parents and computers and later on to master the whole shoe tying process.

**Evidence from the literature that the app is capable of the claims made:** Shoe Tying 1 - Activity App helps parents and teacher to teach the way of tying shoes to their children and students respectively with less frustration and effort. This will also save the amount of time spent teaching this skill to their children and students. The children with intellectual disabilities can learn the way of tying any shoes and the language and skill involved in shoe tying. Thus, young children or low functioning children can benefit from this app by learning the required skill needed to tie shoes (AES Apps, 2017).

**General Comments:** Shoe Tying 1 - Activity App is very useful to developmental educators and teachers to teach way of tying shoes laces to early learners with intellectual disability. Such students have difficulty learning through observation, but with the help of this app they can view the behaviours and remember them through mimicking. Video modelling presented in this app helps students with such disability to learn the task of shoe tying and recalling the learned information for a long time (AES Apps, 2017).
Reviewer: Kunjesh Raj Sharma

Name of app: iWriteWords

Operating System: iOS

Location: iTunes

Cost: $4.49AU

Description: I Write Words App teaches children how to write in a fun manner and playing games. It is useful for children with intellectual disability because this app is fully customized to address fine motor deficiencies and the children can become familiar with the alphabet and numeric system. Thus, children with intellectual disability can effectively practice writing letters and numbers at their own speed and capability. Young children would enjoy learning this handwriting app because it is embedded with cartoon graphics, imaginative sound effects and simple words making them writing full of fun and enjoyment (Educational App Store, Ltd. 2017).

Alignment with the UDL guideline: I Write Words App aligns with the UDL principle and guidelines of providing multiple means of representation; that is, information can be presented to students in different forms (CAST, 2011) as this app teaches to students with intellectual disability or autism how to write letters and numbers with interesting cartoons, graphics and sound effects. Through this app, students with special needs can learn more easily than from the traditional manner of teaching with a textbook and pencil.

Curriculum area: I Write Words App is suitable in the curriculum of Language for the Special Education children of age group 6 to 8. When this app is included in the curriculum, the students with intellectual disability or autism can learn how to write letters and numbers in easier manner and in their own speed. They can learn through this app in much more easier and quicker manner (Educational App Store, Ltd. 2017).

How does the app meet the National Disability Standards? I Write Words App meet the National Disability Standards of “Individual Outcomes” (National Standards for Disability Services, 2013). that is this app is built to provide services and support to individual with intellectual disability or autism. This app is also built to meet the individual strength because each individual can learn to write letters and numbers through this app in their own speed. By doing so, this app helps to meet the individual goal of writing letters and numbers in an easy manner because pictures are included with words and individuals can easily write words by remembering picture of that particular word (Educational App Store, Ltd. 2017).

How the app changes pedagogy (SAMR)? I Write Words App enhances the teachers’ pedagogy by actively involving their students with intellectual disability or autism in writing alphabets and numbers. This app is interactive to teachers because teachers would not simply be teaching alphabet and numbers but would be playing with diagrams and figures associated with the alphabet and numbers which would eventually make students with intellectual disability or autism familiar with basic skills of writing words, spellings and numbers. Write Words App is substitution because the way of teaching how to write the alphabet, numbers and words to students with intellectual disability or
autism is changed from passive way of teaching to more interactive way of teaching through diagrams and pictures.

**How the app encourages person centred planning.** I Write Words App allows teacher to provide person-centred approach by working with students with disability in completely different way (Community Services ACT, 2014) than the traditional way of teaching to write alphabets, words and numbers through pencil and text book. Through this app teachers can teach their students with intellectual disability or autism to recognise letters and number through diagrams and graphs which is very easy for them to learn and understand (Educational App Store, Ltd. 2017).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The 5Cs which the app I Write Words encourage is Curiosity because students with intellectual disability are so much curious to learn alphabets, numbers and words through this interactive apps containing pictures, videos, cartoons and so on.

**Evidence from the literature that the app is capable of the claims made:** The I Write Words App teaches children with intellectual disability a handwriting skill while playing games (Autism Queensland, n.d.) It is a cheap tool to teach one’s children with intellectual disability or autism starting from simple alphabet to full alphabets of small and capital letters (Lambert, 2015). This app is useful in teaching letters for children with learning disabilities.

**General Comments:** I Write Words App is useful to developmental educators and teachers to teach students with intellectual disability the way of writing alphabets, words and number with animations and an interactive game. It helps children to draw letters with the help of animated characters. Each letter and word are also read loud for better understanding and pronunciation (Pressman & Pietrzyk, 2017).
Reviewer: Kunjesh Raj Sharma

Name of app: Community Success

Operating System: IOS

Location: iTunes

Cost: $62.99AU

Description: Community Success App helps children with intellectual disabilities or developmental disabilities do different activities in the community more independently. Different activities in the community include going on public buses, shopping in grocery stores, riding in cars, going to the cinema, waiting in queues, talking with people, asking others for help, crossing the street, etc. This app shows the step-by-step process of the activities. For example, the process for getting in the car would be first, to decide where to sit: either in a front or back seat, second, to open the door carefully, third, to mind hands while closing the door and fourth, sitting properly. The app has real pictures of human rather than cartoons, so people with intellectual disabilities can learn in more real manner. It has also a story telling option which makes the listeners spellbound so they have better knowledge about tasks and know different vocabulary related to tasks. The video feature of this app shows informative videos about the tasks, which helps people with intellectual disabilities grasp the tasks much quicker (Attainment Company, 2017; Attainment Company, 2013)

Alignment with the UDL guideline: Community Success aligns with the first of the UDL principles and guidelines: provide multiple means of representation, as information about different skills needed in day-to-day community activities are provided to people with intellectual or developmental disabilities in different forms of pictures, videos, illustrations and storytelling. Therefore, they can learn in the way which best suited to them, as learners differ in the ways that they perceive and comprehend information that is presented to them (CAST, 2011).

Curriculum area: The Community Success app is suitable for the curriculum of Special Education to teach students with intellectual or developmental disabilities about various community skills so they can adjust in the various tasks of the community like walking, shopping, interacting with others, asking for help, etc. Though the app is suitable for any age of people having such disability, it is most suited to children of the age group four to seven who are in the starting phase of learning community skills and have such disabilities.

How does the app meet the National Disability Standards? Community Success App meets the National Disability standard three: individual outcomes (National Standards for Disability Services, 2013) because the objective of people with intellectual or developmental disabilities being social in community is met with this app. This app helps to teach them different community activities like shopping, travelling, meeting people, ordering food in restaurants in playful manner through different pictures, video and storytelling, and finally, the individual goal of being independent in dealing with community activities are met with this app.

How the app changes pedagogy (SAMR)? Community Success enhances pedagogy by helping young students with intellectual developmental disabilities learn different going out skills and later on being independent with such skills (Attainment Company, 2017). This app is substitution because
it helps to teach community-outgoing tasks to the students with such disability in a different manner such as through pictures, diagrams, videos without any such functional improvement (Schrock, 2017).

**How the app encourages person centred planning.** Community Success allows teachers to provide a person centred approach by focusing on the students with intellectual or developmental disabilities learn about who they are and how their community skill can be enhanced (Community Services ACT, 2014). This app help in enhancing such students’ community skill in a step-by-step and practical manner with the help of video, diagram and storytelling about the different community activities like shopping, walking, interacting, entertaining, etc., (Attainment Company, 2017).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Community Success App encourages Community (Carey, 2013), because it prepares people with intellectual developmental disabilities to communicate effectively about different daily activities skills related to activities in the community. In this app, several skills related to community like travelling on bus, going to the grocery store, and interacting with others can be learned through pictures and videos in easy manner for people with disabilities.

**Evidence from the literature that the app is capable of the claims made:** Community Success helps people with intellectual or developmental disabilities communicate independently in the community and by doing so, people with such disabilities are view with people with possibilities in the community. Even negative feelings of community members towards people with disabilities could be converted to feelings of praise (Stewart & Gissel, 2012).

**General Comments:** Community Success could be useful to developmental educators and teachers because it helps them teach students with intellectual or developmental disabilities basic skills of social interactions like how to speak with storekeepers, how to find things in stores, how to make payments and receive change, etc. This app has 24 different community-based tasks like going to the store, going on public buses or in cars, walking on the street, going to the library etc., presented in and easy to navigate program with videos, photos, stories and vivid illustrations. All these things would improve teacher presentations (Attainment Company, 2013).
Reviewer: Kunjesh Raj Sharma

Name of app: AAC Speech Buddy

Operating System: IOS, Android

Location: https://www.aacspeech.com

Cost: $26.76AU

Description: AAC Speech Buddy uses different voices and pictures so that children with intellectual disabilities or speech problems can communicate properly. This app is extremely useful for children who cannot speak properly, because by using this app they would find a voice. For example, by pressing the button showing pizza, the app would speak, ‘I need pizza’, and the restaurant waiter would understand that user is hungry and needs pizza. So, a person who is speechless or has a speech problems would find a voice with the help of this app. Therefore, children with verbal problems do not have to point to the things they want. They can directly press the button on their mobile or tablet and the app will speak on behalf of them. This app gives much more independence to children to communicate for themselves in society (AAC Speech Buddy, 2011)

Alignment with the UDL guideline: AAC Speech Buddy aligns with the second UDL principles and guidelines, providing multiple means of action and expression. People who have language barriers learn in a very different manner (CAST, 2011). People with intellectual disabilities have language barriers, due to which they cannot communicate properly in different places, so in such situations this app would be very helpful for them to make the listener to hear and understand what they want to say.

Curriculum area: AAC Speech Buddy is suitable in the curriculum of Special Education to help children with intellectual disabilities and speech disorders communicate properly with others in society. Teachers can also create multiple profiles of students in this app and can manage them based on the individual need of each students. The teacher can record the words most frequently used by the particular student in order to facilitate his communication needs. This app is suitable for ages four to seven who are in the starting phase of facing communication difficulty.

How does the app meet the National Disability Standards? AAC Speech Buddy meets the National Disability standards two, participation and Inclusion, because this app enables people with intellectual disabilities and speech disorders to participate in the community through voice as a means of communication. If people with disabilities can interact with the community members through voice it would make their social inclusion in society easier. The intent of this standard is to promote the connection of people with disabilities with their families, friends and chosen communities (National Standards for Disability Services, 2013, p. 13).

How the app changes pedagogy (SAMR)? AAC Speech Buddy App enhances pedagogy by facilitating students with intellectual disabilities and speech disorders in the conversation process. In this app, the teacher can add an infinite number of profiles of students as per their requirements. In each profile, there is a speech set which individuals can choose. An individual who is hungry can select the eating or shopping category, and by pressing the food, for example, the pizza button, the app will say ‘Can I have pizza, please?’ In this way, the teacher can teach his students to be independent by ordering the needed food instead of pointing at the needed food. This app is Substitution
because the things that the individuals voice can now be articulated through this app so there is not any functional change (Educational Technology and Mobile Learning, 2017).

**How the app encourages person centred planning.** AAC Speech Buddy App encourages a person-centered approach by developing the app in such a manner that it focuses on the communication needs of the user, family, friends and teachers. By using this app, the person with an intellectual disability or speech disorder can communicate easily about different activities of life like shopping, walking, navigating, eating, playing, etc., through different pictures and their associated voices. Personal centered planning is learning what it is the person and their family want, and responding by providing the supports needed to achieve the goals and aspirations of the person and their family and friends (Community Services ACT, 2014, p. 10).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** AAC Speech Buddy App encourages Connectivity (Carey, 2013), because it helps to connect the people with intellectual disability and speech disorder to the world. In the absence of such an app, the people would have to use the sign language or point with a finger to get things done. However, this app helps to solve such communication problems and enhances connectivity with rest of the world.

**Evidence from the literature that the app is capable of the claims made:** AAC Speech Buddy App is capable of solving the communication problem of the people with intellectual disability and speech disorder, because by pressing the appropriate icons of the app, it performs the required speaking task on behalf of such people with disability. A clinical framework for comparing and selecting apps will be offered to assist speech language pathologists in answering the popular question ‘What communication apps should we use?’ (Gosnell, Costello, & Shane, 2011).

**General Comments:** AAC Speech Buddy App could be useful to developmental educators and teachers because it is a very user friendly and flexible alternative to students with intellectual disability and speech disorder to communicate in an alternative method. The user can use their own voice or own picture of choice to make the communication with others more effective. This is the only app that helps share user-created, customized, personalized speech sets with others. It is very simple and easy for students to use with a touch of the fingers and easy-to-read text (AAC Speech Buddy, 2011).
**Reviewer:** Jasmin Santiago

**Name of app:** My First AAC

**Operating System:** IOS, Android

**Location:** AppCrawlr

**Cost:** $38.99AU

**Description:** My First AAC is an augmentative and alternative communication app that is specifically designed for young children, from ages two to seven, with delayed speech or severe speech disorders. However, it can also be used with other young children with intellectual disabilities that have speech problems. The app helps young children communicate with family, teachers, peers and other people they encounter in their everyday life. The app has theme icons that include greetings, food, feelings, and others, and users can access over 250 related words and phrases to express frequently used ideas. The icons are presented in colourful and large formats. My First AAC features the child’s voice used in all audio files, can record personal information, and has a customizable screen layout that can be adjusted to be child-friendly and for a choice of gender (Apple Inc., 2017).

**Alignment with the UDL guideline:** My First AAC aligns with Principle III: Provide Multiple Means of Engagement. According to this principle, all learners must be able to communicate effectively within the community of learners. This app provides prompts to individuals with intellectual disabilities to communicate with others and ask for help from their peers and/or teachers. This app also promotes peer interaction to be able to get involved in group work; therefore, it meets checkpoint 8.3: foster collaboration and communication (National Center on Universal Design for Learning, 2012).

**Curriculum area:** The My First AAC can be used in all areas of the curriculum as it is a communication tool. This will help the students with intellectual disability communicate with the teachers, peers, and other school staff. The app can also be used when participating in classroom activities, helping students express their ideas and opinions. Specifically, the app can be used in English language development. According to the Australian curriculum, in English area of the foundation year, students will explore how language is used differently at home and school (ACELA1428), understand the use of vocabulary words (ACELA1437), construct texts, and share feelings and thoughts in texts (ACARA, 2015). With the help of My First AAC, the student with intellectual disability can be able to achieve these objectives.

**How does the app meet the National Disability Standards?** My First AAC meets standard two of the National Disability Standards, which is participation and inclusion. A person with intellectual disability can be assisted by this app to connect to family, friends and communities. This will also assist the person in communicating with others during different activities in the community (National Standards for Disability Services, 2013).
How the app changes pedagogy (SAMR)? My First AAC is an enhancement-augmentation as it improves the function to communicate of the students or function to learn (iPad Bootcamp for Teachers, n.d.).

How the app encourages person centred planning: My First AAC encourages person-centred planning as it supports individuals with intellectual disability to aim for inclusion and community participation. According to ACU National (n.d.), “person centred planning puts the person with disability at the centre of the planning, listens deeply to them...” (p.7). This app was specifically designed for individuals with speech difficulties (AppCrawlr, 2015).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? My First AAC promotes connectivity (Carey, 2013). The app helps individuals with intellectual disabilities to connect when communicating with people in their environment. It helps individuals to communicate with family, peers, teachers and other people they meet in their everyday life.

Evidence from the literature that the app is capable of the claims made: Most individuals with intellectual disabilities, even mild or moderate, will have some difficulty with communication (Cogher, 2005). One of the barriers between the doctor and patient is communication difficulties (Howells, 1986; Barker & Howells, 1990; Beange & Bauman, 1990; Cumella et al, 1992; Minihan et al, 1993; Beange et al. 1995; Beange, 1996; Lennox et al, 1997) and between health professionals (Cumella et al, 1992; Lennox & Chaplin 1995; Lennox & Chaplin, 1996; Lennox et al, 1997). Ziviani et al (2009) conducted another study and the findings are that general practitioners (GPs) were concerned about the communication difficulties of their patients with intellectual disability and this affects their ability to adequately diagnose, manage and inform patients. It was also reported in the same study that individuals with intellectual disability experience frustration when they feel that they could not communicate adequately with the GP. There were several suggestions in Lennox et al (1997) on how to improve the communication between the patient with intellectual disability and doctor. However, the My First AAC will help individuals with intellectual disabilities to communicate with their doctors and health professionals. “The use of pictographic symbols for expressive or receptive communication can be a valuable skill for persons with severe intellectual disability” (Stephenson & Linfoot, 2009, p. 244). In this way, the doctors and health professionals will have better understanding of the patient’s feeling and condition.

General Comments: Some teachers also struggle in understanding the students’ ideas and opinions when is not provided by technology support. My First AAC will benefit both the individuals with intellectual disability and the teacher in understanding each other. When the student is having difficulties to express his/her opinion, with the help of this app, it would be easier for the teacher to understand the student’s ideas and build better relationship.
Reviewer: Jasmin Santiago

Name of app: Plan It, Do It, Check It Off

Operating System: IOS

Location: I Get It!

Cost: $7.99 AU

Description: Plan It, Do it, check It Off can be fully customized by the user. The application has twenty six “to do” activities included with real images to illustrate the task or event. The application allows the user to build step-by-step photo and audio prompt in sequence. All the activities can be customized by importing the user’s own photos, change the title, add custom text and audio or even make own book from scratch. Plan It, Do It, Check It Off is a great application to assist individuals that needs visual supports. One example is when an individual is planning to go to the mall and do some shopping. The person will add to the list “Go to the mall”, add an image if he wants and check it off after going to the mall.

Alignment with the UDL guideline: Plan It, Do It, Check It Off app meets the UDL guideline “Principle I: Provide Multiple Means of Representation”. Because it displays information in a flexible format in digital material that can be customized by changing the title, add custom text and audio and the images; therefore, it meets checkpoint 1.1 Offer ways of customizing the display of information. It also aligns in the same principle, checkpoint 3.3 guide information processing, visualization and manipulation. The app provides prompts to the user and is presented in step by step sequential process (National Center on Universal Design for Learning, 2012).

Curriculum area: Plan It, Do It, Check It Off can be used in all areas of the curriculum. For example, if there is an assignment, things to bring for the next day, project, or exam, in any subjects, or anything to be done for the topic, the teacher or support staff can make a task or event in the application to remind and guide the individual with intellectual disabilities in completing the task or the user can add it to his list if he can. This can also be used in different activities in the school such as for instance, when arriving the classroom, the student will be guided by the app on what are the things to do when he gets to the classroom such as greet the teacher and classmates, place the food in the fridge, place the diary in the diary box, place the bag in the shelf, sit down on your seat.

How does the app meet the National Disability Standards? When no support staff, teacher and family member around to assist the individual with an intellectual disability to complete the task, the individual can refer to the app and it will assist the individual in completing a task. This monitor and addresses potential barriers to access. In this way, the individual with an intellectual disability will practice his independency by remembering to complete a task on his own (National Standards for Disability Services, 2013)

How the app changes pedagogy (SAMR)? Plan It, Do it, Check It Off can be transformation-substitution and augmentation. As what mentioned above, if no one is around to remind the individual with an intellectual disability to accomplish the task, this app can substitute the support staff, family
member or teacher in reminding the individual with the tasks need to be accomplished. However, the app can also use by the support staff, family member and teachers to augment by showing visual images of the tasks (iPad Bootcamp for Teachers, n.d.).

**How the app encourages person centred planning.** The app can be customized depending on the user’s wants and preferably. This gives an opportunity to the user on how the images and titles be presented in the app. The app encourages person centred by enabling individuals with disabilities to have ordinary and meaningful lives in the community just like the other people in the environment. The application create supports to individuals with intellectual disabilities to help them move towards of being more independent (ACU National, n.d.).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Plan It, Do It, Check It Off meets the criteria of creativity (Carey, 2013). Planning tasks and events will be made in a creative way. This will help the user to keep on track on his schedule. The user will be connected to the app that can be used in planning activities independently.

**Evidence from the literature that the app is capable of the claims made:** The Plan It, Do It, Check It Off app lets the person do his interests and makes choices and decisions on what to be done based on his preferences (National Gateway to Self-Determination, n.d.); therefore, it builds self-determination to individuals with an intellectual disability. There is an evidence that individuals with intellectual disability can be more self-determined when provided adequate supports (Wehmeyer et al, 2003). The individual with intellectual disability can make decisions and plan ahead using this app and develop self-determination and have greater quality of life (Nota, Ferrari, Soresi & Wehmeyer, 2007).

**General Comments:** This app would be useful to developmental educators, teachers and support staff in teaching the individuals with intellectual disabilities in taking note of their tasks or events and practice independence in terms of making decisions in planning a task and be able to accomplish a task.
Reviewer: Jasmin Santiago

Name of app: I Get... My Schedules at Home

Operating System: IOS

Location: I Get It

Cost: $7.99AU

Description: The I Get... My Schedules at Home is a visual support app that provides daily routines and is presented in visual images to help individuals in understanding the process. Individuals with an intellectual disability to support them in completing their daily routines can use the app. The app consists seven books: weekday morning, weekday night, weekend morning, weekend night, my favourite (blank book), my photos (blank book) and how do I. The first four books include photos associated with morning and evening routines. The user can also import his/her own photos that can be used in the app. Audio can also be added in the app for auditory support.

Alignment with the UDL guideline: The I Get... My Schedules at Home meets the UDL guideline “Principle I: Provide Multiple Means of Representation”. Because the daily routines are presented with images and audio can be added to provide auditory support to the user to have additional support and therefore, it meets the checkpoint 1.3 Offer alternatives for visual information (National Center on Universal Design for Learning, 2012).

Curriculum area: The I Get... My Schedules at Home app can be used in life skills. This helps the individuals with an intellectual disability to perform their daily routines with less prompt from the support staff, teacher or family member and practice living independently.

How does the app meet the National Disability Standards? The I Get... My Schedules at Home app meets the National Disability Standards. This app promotes participation and inclusion. Every individual has the right to participate in the community and with the help of this app, individuals with an intellectual disability can be able to participate in their chosen community such as family and school. This promotes opportunities for meaningful and active participation in the individuals’ community by doing their own daily routines (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? The I Get... My Schedules at Home is a transformation-substitution because individuals with an intellectual disability are using the app to be able to remind themselves to accomplish the daily routines and do not need support staff, teacher, or family member all the time to remind them in completing their daily routines. The app is also enhancement-modification because it modifies the daily routines by presenting it with images, text and audio to guide individuals with an intellectual disability in completing their daily routines (iPad Bootcamp for Teachers, n.d.).

How the app encourages person centred planning. The I Get... My Schedules at Home is a person-centred approach. It tailors support to the person by organising and accomplishing the daily routines. Without discovering the ways that can tailor support to individuals with an intellectual disability, person centred approach cannot be achieved (ACU National, n.d.).
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The I Get… My Schedules at Home meets the criteria of community and creativity (Carey, 2013). It allows the person to do his daily routines in her environments such as at home and school and it is presented in a creative way.

Evidence from the literature that the app is capable of the claims made: It was found in the literature review done by Mechling (2007) that the use of assistive technology, including mobile technologies (Mechling & Seid, 2011) in completing daily tasks help improves the quality of life of persons with disabilities (Wehmeyer, 1999) and this include individuals with an intellectual disability. By doing daily routines, it helps the individual to develop their life skills. “Life skills are those skills needed to realize a productive daily life” (Ayres, Mechling & Sansosti, 2013, p. 260). Furthermore, pictures as visual support is reported to be the most commonly used for supports (Lancioni, O’Reilley & Oliva, 2001; Mechling, 2007). The app includes images in presenting the routines and according to Hodgdon (1995), visual supports maintain attention, sequence events, increase independent task or organize environments by persons with disabilities and this include individuals with an intellectual disability. Picture prompts are effective in completing different tasks such as daily living and meal preparation (Mechling, 2007).

General Comments: The I Get… My Schedules at Home would be useful for developmental educators, teachers and support staff as a tool in teaching the individuals with intellectual disabilities to be more independent and let the individuals to perform their daily routines by themselves and less or no prompt needed later on. Nonetheless, providing mobile technology to individuals with an intellectual disability can provide a flexible way for educators to build supports from which many students may benefit (Ayres, Mechling & Sansosti, 2013). In this way, the individual with intellectual disability will be able to practice his daily routine with minimal prompt from the teacher or not at all. Whether the technology aims to assist individuals in a specific skill, teachers, support providers, and developmental educators need to be knowledgeable in the technology that will be used for the student.
**Reviewer:** Jasmin Santiago

**Name of app:** Off We Go

**Operating System:** iOS, Android

**Location:** AppCrawlr

**Cost:** $5.35AU

**Description:** Off We Go is a user-friendly app that has a series of books called, “Going to the dentist” and “Going on a plane”, but it needs to be downloaded each and buy each series. Each book tells the story of a particular event or every day activity in a sequence of twelve steps. The app is presented with visual images and words and audio. Each image can be narrated and is presented with description, the user can swipe the text to read the sentence description and tap the words to hear the text and play the audio, and it can even spell out the words. In addition, narration and text is available in Spanish, US and UK English languages. The user can also enjoy the app by colouring the illustrations or images.

**Alignment with the UDL guideline:** The Off We Go app meets the UDL guideline Principle I: Provide Multiple Means of Representation. The app is presented with images and uses text equivalents in the form of captions and therefore, it meets the checkpoint 1.2. It also aligns to “Principle II: Provide Multiple Means of Action and Expression” Guideline 5: Provide options for expression and communication. According to this, learners must develop a variety of fluencies such as visual, audio, reading and others. This means that they need multiple of scaffolds to assist them as they develop and practice independence. The app provides models to demonstrate the step by step to do in an event. Therefore, it meets the checkpoint 5.3 Build fluencies with graduated levels of support for practice and performance (National Center on Universal Design for Learning, 2012).

**Curriculum area:** The Off We Go app is suitable in English specifically in language area, text structure and organisation. According to Australian curriculum (ACARA, 2015), in foundation year level, student will understand that text can be short or long and that stories and informative texts have different purposes (ACELA1430). Also, to understand the concepts of print and screen (ACELA1433) (ACARA, 2015).

**How does the app meet the National Disability Standards?** The Off We Go app meets two standards of the National Disability Standards. It meets standard two that is participation and inclusion. With the help of this app, the individual with an intellectual disability will be more confident to enable their genuine participation and inclusion by going on a plane and to the dentist. The standard emphasises the importance of community participation and having a broader community. The app also meets the standard three that is individual outcomes. The app is flexible and tailored to the needs of the individual and deliver positive outcomes (National Standards for Disability Services, 2013).
How the app changes pedagogy (SAMR)? The Off We Go app aligns enhancement-modification. The app redesigns the structure of attending an event and follow the steps by showing images with description and that also narrates the steps of an event (iPad Bootcamp for Teachers, n.d.).

How the app encourages person centred planning. The Off We Go app is a person centred for individuals with intellectual disabilities as it provides support when the student needs to go on a plane or to the dentist. It tailors support to the individuals with intellectual disabilities at the series of books accommodate the user (ACU National, n.d.).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Off We Go meets the criteria of connectivity and creativity (Carey, 2013). It guides the person on what to do when on the plane and at the dentist and helps the person to be connected in these places. The app is also presented in a creative way by having images presented systematically, with narration, audio, and text and the user can colour the images based on his likes.

Evidence from the literature that the app is capable of the claims made: Off We Go lets the individual with intellectual disabilities to have access to activities (Power, 2013) such as going to the dentist and going on a plane and access to community facilities (McConkey, 2010a). The app assists the individual with an intellectual disability during leisure time such as going to various places by plane. One of the factors why individuals fail to adapt to community is the inability of individuals with an intellectual disability to use their spare time in a personally satisfying manner or to have a leisure time. Having a leisure is just part of social integration and inclusion and it develops the quality of life of individuals with an intellectual disability (Duvdevany & Arar, 2004).

General Comments: This app is another fun tool that can be used by the teachers and developmental educators as an instructional material in the classroom in teaching the students to follow instructions, read texts or spell words. The students will learn more if the information given to them fits in their interest. This is also another straightforward way to teach students about going on a plane and going to the dentist.
Reviewer: Jasmin Santiago

Name of app: Everyday Skills

Operating System: iOS, Android

Location: AbleLink Technologies, Inc.

Cost: $40.22AU

Description: The Everyday Skills app has 40 important skills for living independently and accessing the community. The app includes community skills that features 15 cognitively accessible learning sessions in the community such as barbershops, restaurants, libraries, grocery stores, trips to the zoo and others. The app also includes personal skills that features 10 cognitively accessible learning sessions related to personal skills such as expressions, going out on a date, indoor chores, outdoor chores, visiting the doctor’s office and others. Lastly, the app includes transition and transportation skills that features 15 additional learning topics related to transition and transportation such as riding the school bus, city signs, safety signs, and others. The app includes images and audio explanation.

Alignment with the UDL guideline: The Everyday Skills align with different principles of the UDL. Firstly, it aligns to Principle I: Provide Multiple Means of Representation. The app is presented with images and audio explanation and therefore it meets checkpoint 1.3. Secondly, it also aligns to Principle III: Multiple Means of Engagement. The app mentors the person to communicate with her environment and therefore it meets checkpoint 8.3 Foster collaboration and communication. The app also models different skills by presenting images and this is why it meets checkpoint 9.2 (National Center on Universal Design for Learning, 2012).

Curriculum area: The Everyday Skills app suits the life skills. It assists the user to have a full participation in everyday life and can do things that a person wants.

How does the app meet the National Disability Standards? The Everyday Skills app meets the National Disability Standards. The app promotes participation and inclusion to the person; therefore, it meets the standard two participation and inclusion. It helps the individuals with an intellectual disability to do what other people can do such as go to the restaurant or to the zoo. This app doesn’t only promote participation and inclusion but also develop the self-confidence of the individual to practice different skills and be more exposed in the community. The app also builds strengths on the individuals and enable the person to achieve his goal; therefore, it meets the standard three individual outcomes (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? The Everyday Skills app enhances the teacher’s pedagogy of enhancement. The app is presented with images and audio explanation for better understanding of the skills; therefore, it is a modification. It modifies different skills in a way that is presented in modified way (iPad Bootcamp for Teachers, n.d.).

How the app encourages person centred planning. The Everyday Skills app meets the person-centred approach as it tailors support to individuals to be able to practice the skills. Individuals with an
intellectual disability need support that encourages person centre to meet his needs and supports that will fit the person. This app may not benefit all, depending on the condition of the person, however, it will benefit most individuals with an intellectual disability to encourage them do their skills independently (ACU National, n.d.).

**What area of a 21\textsuperscript{st} Century approach to Teaching/training does the app encourage (5Cs)?** The Everyday Skills app meets the criteria of connectivity and community (Carey, 2013). The app encourages the person to do different activities, whether at home or in the community. It also lets the person experience leisure activities, be involved in the community and provides safety.

**Evidence from the literature that the app is capable of the claims made:** My Everyday Skills assists the person to perform different skills including community skills. This allows the person to be involved in the community such as going to the restaurants, grocery stores and this practice the person’s social inclusion. Social inclusion focuses on two domains; interpersonal relationships and community participation. Being included in the community develops the quality of life of the individuals with intellectual disabilities (Simplican, Leader, Kosciulek & Leahy, 2015) and building interpersonal relationship with other people that a person meets. According to Hall (2010) and Power (2013) in Simplican, Leader, Kosciulek and Leahy (2015), social inclusion involves of being accepted by others as an individual beyond disability, having access to informal and formal supports and being involved in the community, to have a social interaction and participate different activities.

**General Comments:** The Everyday Skills app would be useful for developmental educators and teachers and most especially for special education teacher. I have worked for two years in special education and one of the biggest challenges was finding appropriate instructional materials and technologies to use when teaching. This app could have been helpful and useful when I was teaching different skills to my students.

Some individuals with an intellectual disability may be anxious in performing some skills and so this app can help ease the anxiety of the person and prepare them for what is coming next. The skills included in the app are very relevant and would be very useful in everyday life of the person.
Description: PLAY 123 is an education IOS app for pre-school and kindergarten children from 2-5 years of age, where they can learn geometrical, spatial and logical concepts in a free environment. This app emphasis on the shapes, and their connection with the practical life. and PLAY 123 app is for playing game along with learning mathematics. It helps them to understand the concepts regarding shapes like lines, circles, rectangles, spheres, cubes, cones, etc. This helps them to break the shapes into parts and then again get another shape. After using the app and following its instructions, the children can become masters in these concepts by analysing the shapes in various contexts using the touch screen. PLAY 123 is very easy in its functioning. It is not suggested for adults. It is a great source to learn for the children aged 2 to 5 about the basic concept of mathematics. Colours create the interest of the children in drawing and painting. Children can learn count, add, and subtract the numbers. The children learn to do mathematical reasoning and problem solving with numbers. PLAY123 for iPhone is suitable for the children aged 2-5 years.

Alignment with the UDL guideline: Play 123 provides alignment with first UDL guideline of multiple means of Representation as the children can learn mathematical concepts related to shapes, counting, and can apply them in real life. It also aligns with third UDL guideline that provides multiple means of engagement. Children can fix their objectives through the game, and hence increase the self-determination of the children. This app motivates the kids towards cheerful learning removing boredom, and they learn many skills and strategies. Children can clarify syntax, structure and mathematical concepts (CAST, 2011).

Curriculum area: PLAY 123 is the best app to teach mathematics to the children aged 2-5 years and has the features of audio and visual. It has an important role in improving mathematical skills, working memory and self-awareness. With the enough information, students can interact with the environment. The students have to show their aptitude about shapes and colours before going to the next activity. It enhances interest and participation of the students in curriculum. It also enables the students to control over their motor skills that is necessary in curriculum for assessment. Using touch screen, the app commands the students to draw the shape, if they are not able to do that, then they can’t go to the next step. This app increases reasoning of the students by introducing new questions on each step. So, it can cover the topic of mathematics.

How does the app meet the National Disability Standards? PLAY123 iPhone app can be used for people with intellectual disability. This is an individualized app and helps the teachers to teach the kids who have intellectual disability. This app is very useful for the children between 2-5 years for fun, gaming, and learning mathematical shapes. Kids can learn to recognize colours and differentiate them. Parents have great help from this app to teach children in a better way.
How the app changes pedagogy (SAMR)? This app helps the teachers to infuse the technology into learning for children. It helps in strengthening the curriculum. This is the best way to teach the kids by plying. This removes monotony of the class, and makes the environment interesting and cheerful to learn. This is a transformation (Modification or Redefinition) in teaching-learning process. This app has changed the concept of-learning from traditional way to technological way.

How the app encourages person centred planning. This app can be used for the individual people who have intellectual disability. This app encourages children with intellectual disability to play, to have fun with, to learn different concepts of mathematics, and to engage them in various activities through its usability without the help of anyone. The students get direction himself from the app for next step, and does it independently.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app increases creativity and curation in students (Carey, 2013). It allows them to curate according to their own speed and pace, so that they can be free to act, and can show their talents and creativity. It has the feature to make the students learn from each step, and provides opportunity to the students to show his creativity in each step. In this way, students can curate according to their curriculum.

Evidence from the literature that the app is capable of the claims made: Byers & Hardley have found touch screen apps that can teach mathematics to the children of age 3-8, in iTunes, AppCrawlr and Google Play stores (2013). PLAY 123 app increase students’ interest in mathematics and can be found from AppCrawlr. A huge and wide-ranging collection of the apps of mathematics is progressively applicable to the early mathematics education (Byers & Hadley, 2013). The apps were detected from the app stores and provide the advantage in math, preschool, basic calculations, shapes, geometry and counting (Byers & Hadley, 2013). Byers & Hardley (2013) stated “What sets Play Lab and PLAY 123 apart from the other apps is the centrality of math concepts in education”.

General Comments: PLAY 123 is a huge discovery, which has facilitated the task of educators, teachers, and parents. Through this self-individualised app, children can learn on their own. The educators and teachers have found teaching with apps to be one of the best techniques to teach students, as they encourage the students for better learning which is opposite to the traditional learning in past.
**Reviewer:** Naveena Devi

**Name of app:** Math Fact Master

**Operating System:** IOS

**Location:** iTunes

**Cost:** $0.99AU

**Description:** Math Fact Master is a learning math app. This app is very useful for practicing math. This is perfect for children aged 7-9 years. Families love Math Fact Master because this app provides an alternate for practicing math facts. This as a great app to help children in solving math problems and facts. Through this app children learn addition subtraction, multiplication, and division of numbers. This app helps the children to solve by giving feedback to the children. This describes the math fact and aware the children with new concepts in math. Children can solve simple problems of math with their favourite way learning by playing or gaming. This is one of the best and cheaper flashcard apps helpful in teaching mathematics in flashcard mode. This is a great app for beginners for practicing and experts to evaluate themselves. Additionally, its difficulty level can be increased by changing setting. Math Fact Master is very helpful for teachers and parents as it can email progress report of the children.

**Alignment with the UDL guideline:** Math Fact Master is a wonderful app for the children to create their interest, increase their reasoning, and practice with individual choice and freedom. This provides the option of perception, language, mathematical expressions, symbols, and comprehension. This app provides multiple means of engagement with children’s own interest, providing them options for sustaining effort and persistence, and self-regulation (CAST, 2011).

**Curriculum area:** Math Fact Master is a good app for the children of age 7-9. This app plays an important role in curriculum enhancement as this provides the flexibility and pace to the children to know the mathematical facts and to solve the problems of mathematics in challenging and interesting way. This has broadened the area of thinking math issues and to solve them in interesting way. This app enables the children to think, to calculate and to practice math independently while providing them accurate options for their questions. This app provides them freedom to think and to enhance their reasoning while doing calculations, and assures their progress through their report cards. This will help in increasing literacy.

**How does the app meet the National Disability Standards?** Math Fact Master app is basically the app which meets the needs of individual students. This app meets the needs of the children with intellectual disability. All problems of mathematics are different based on the intellect and reasoning of the children. This makes familiar the children to symbols and notations of mathematics. Individual can learn math according to their mental level using flashcards. The app also gives them hint for answers before they have done mistakes. Its difficulty level can also be increased relative to the standard of the class and the children. Teacher gets help of this app while controlling the students with different needs and different intellects. Hence, this app provides the children individualised education in mathematics.
How the app changes pedagogy (SAMR)? Teachers of teaching mathematics love this app because this app improves the pedagogy of the teacher. Math Fact Master suits the needs of children and curriculum. This app provides the enhancement in teaching mathematics through augmentation, as it provides the technology to act as a direct tool substitute with functional improvement. One can do adjust the apps’ difficulty and challenging level. With the help of this app the teacher feels good to help the students making independent in learning mathematics. This will help the students to handle the situation later on in real life at the time of difficulty.

How the app encourages person centred planning. Math Fact Master app provides the teachers and trainers the opportunity to provide education to the children at different levels. The teacher sets the app to the standards of the students in classroom and even at home. The children can do the homework while using this app as this is self-directed app. According to the guidelines, the teacher can adjust the question series which is evaluated itself by the app. At home, the parents also learn to work with app, and they can monitor the performance of their children with the app. This app has removed the burden of teachers of checking and marking. The teachers have only to assess the students’ performance and set the questions appropriate to the students’ level.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? The app Math Fact Master has connected the students with technology in solving maths problems. The app encourages connectivity of the students (Carey, 2013). Math Fact Master has aided students by converting the paper pen and blackboard method to the app method. So, in 21st century, technology has benefited the education system with its connectivity.

Evidence from the literature that the app is capable of the claims made: The ability to make decisions and numerical concepts are based on mathematical concepts and reasoning (Peter et al., 2007). Peter et al. (2007) found that people working with numbers are more trustworthy and confident to handle the situations. This app increases the ability of the person to handle the situation through reasoning power. Pelton & Pelton (2012) noted that some iPod apps are commendable and have simple flashcards, numeric procedures or mobile textbooks. IOS apps have the capacity to encourage learning in young children at school or at home (Pelton & Pelton, 2012). Math Fact Master app encourages students’ learning through its features.

General Comments: Math Fact Master is an app working with the children who have intellectual disability. This enables the children to work at their own pace and freedom so children can learn mathematical reasoning by its facts and difficulty level. Teachers maintain their balance with the education while providing different maters to different students matching their intellect. The app is very useful for the children to engage them in learning while engaging them in mathematical problem solving. This app really helps children, teachers and parents to increase the children reasoning.
Reviewer: Naveena Devi

Name of app: Elevate- Brain Training App

Operating System: IOS

Location: iTunes

Cost: Free

Description: Elevate- Brain Training app is an app for exercising the brains of children from 7 to 9 years. This app provides the children challenges for different level of strengths of children. This helps the children to remember the things in easy way. Whenever the children are free, this app provides them opportunity to utilise the time in different and better way. This is a great brain food for children to exercise. This app is very useful for the writers and the students to exercise their brain. If the students feel bored or tired, they can play the games in the Elevate- Brain Training app. This provides them opportunity to learn English while playing. Anyone, including the children aged 7-9 years, can use this app for improving their vocabulary. Students can use their time well instead of wasting their time in playing other mindless games. This provides a mixture of games so children can play according to their mental/ intellectual level. Elevate-Brain Training app keeps the mind in shape while playing and exercising brain.

Alignment with the UDL guideline: Elevate- Brain Training app aligns with the guideline of providing multiple means of representation. This app provides option for comprehension and activate the previous knowledge. This app provides option for language by improving vocabulary, syntax and symbols in language. It enables the students to understand the text and improving their pronunciation. It promotes their understanding across language (English). This offers the way of accessing information and offers in both- the auditory information and visual information (CAST, 2011).

Curriculum area: This app helps those who are weak in English vocabulary, to improve their vocabulary in English by providing them multiple means of representation. Children aged 7-9 years and the people who want to improve their basic vocabulary in English can benefit from Elevate- Brain Training app. This app not only used to improve language, but also strengthen the brains of the users by giving them opportunities to play games. This app helps in improving literacy in English, which is an international language, and help in spreading worldwide through this app. Children can show their intellect through just playing game by following its steps.

How does the app meet the National Disability Standards? This app provides the way of expression to the children. Children with intellectual disability can have benefits from the app as it provides pace them to play with their own strategies and pace. They can use the time as best by exercising their brains through this app. Elevate- Brain Training app is very useful for the students/ children with intellectual disability. This app acts according to the age of the children as it goes to next level when they complete the previous step.
How the app changes pedagogy (SAMR)? Elevate-Brain Training app is very important for language teachers, as it increases the interest of the students in language (English) and also increases their reading skills through games. Through the game, the app uses activities to encourage reasoning, thoughts and vocabulary. This reduces the work of teaching English by adopting some strategies and providing an easier and effecting way to teach them. This app is an enhancement in the direction of increasing knowledge in language.

How the app encourages person centred planning. Elevate-Brain Training app focuses on the individual’s need, desires and goals. This provides the children freedom to play according to their own skills, strategies, mental abilities, speed and pace. This app is person-centred app and keeps the brain in shape by regular exercise through gaming. By just playing games, learners can enhance their vocabulary, and fluency in English.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? Elevate-Brain Training app encourages the creativity and curation of the learners (Carey, 2013). the app itself teaches the kids to follow some steps and to show his/her creativity by following the steps and playing the game. The children can curate usable strategies from the app and increase their brain working efficiency. This app enables the users to think about the various aspects of the game and motivates the users to move next to increase their knowledge.

Evidence from the literature that the app is capable of the claims made: Mobile apps motivate the children to learn the alphabet, to pronounce words, and to recall the information in a fun and exciting way (Daud & Abas, 2013). Elevate-Brain Training app teaches the learner in the same context. Students can best use of mobile application to compose text, read and notetaking to increase their efficiency in English (Shapiro & Rich, 1999). Language is very important for the teacher and the learners to enhance vocabulary and spelling, to read, to write and to apply in various fields of education (Moats, 2000). For the students, availability, convenience, and low cost of mobile apps provides opportunities to fit learning into their busy lives outside class (Steel, 2012). Godwin-Jones (2011) stated that using mobile apps for vocabulary practice, quiz delivery, live tutorials, file sharing and to learn language has increased the interest of people to learn language because it is fun. Elevate-Brain Training provides opportunities to the learners for enhancing overall performance in language.

General Comments: Elevate-Brain Training app has decreased but made effective the teaching-learning process through learning by gaming. The development educators and teachers easily can improve focus, speaking abilities, processing speed, memory, math skills and more of the children by bringing the app in use. This app itself will help to improve the learning of the children aged 7-9 years.
Reviewer: Naveena Devi

Name of app: So Much 2 Say

Operating System: IOS

Location: App Crawlr

Cost: $18.99AU

Description: So Much 2 Say is a picture communication app. This app is very usable for students and parents who need a cost effective, fully flexible and customizable communication system. They can use the built-in cameras to make cards for new objects on the spot by selecting a photo from their own library or from 8,000 included images. This app can simply create the cards fast, beginning sentence building with flexible layout options and adding 1 to 12 objects per page. The teacher or the parents can change its arrangement according to the needs of the students. This app meets to the needs of the learners. The students just have to touch the card in order to hear a familiar voice, verbalizing what was entered. As the learner progresses, more cards can be made visible. Once multiple cards are accessed regularly, the concept of categories will be introduced, and learners can move to the next step.

Alignment with the UDL guideline: So Much 2 Say app aligns with the guideline that provides multiple means of actions and expression. This app provides the learners options for executing functions through goal setting, planning and monitoring progress. This app provides the learners opportunities to communicate through the pictures. This app navigates the learners to the next step after a step has completed. The learner can express his/ her interest in the content they want to know about and can express his knowledge as well as get more information by clicking the picture (CAST, 2011).

Curriculum area: So Much 2 Say app has made it easier to know the history of any photo. This app is suitable to summarize the content through its pictures. This strengthens the curriculum through sharing ideas between the learner and the communicative partner. This best suited to geographical or historical subjects as teachers can demonstrate significance through a card game.

How does the app meet the National Disability Standards? This app fills a significant hole in the communication-app landscape for the individuals with significant intellectual disabilities. So Much 2 Say is designed from the ground up to meet that need. Everyone can choose the pictures on their own and can communicate with partners. They are free to know about the pictures they have interest in and can ask their partner about their doubts.

How the app changes pedagogy (SAMR)? The teachers or parents can make changes to app’s configuration as the learner progresses. So Much 2 Say app is developed with two distinct classes in mind- the learner and the administrator. Teacher can use this app as one of the strategies to explain the concept to their learners. This is a new strategy for the parents and teachers to teach students. Just a simple click reveals the story about the picture. This is the transformation and allow the learners to know about the different facts and new information.
How the app encourages person centred planning. So Much 2 Say app is child/individual centred app. The learners can choose the pictures according to their interest and need, and they can get information about that by communicating with their partner. Moreover, learner can discuss his/her doubts with his partner. This is person centred app and teachers can change its design by taking care of individual’s need and speed.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages a communication exchange between the learner and a communicative partner (Carey, 2013). So, this app community and collaboration for the learner and his partner. This gives both the ability to communicate through this app to get information and discuss facts about the picture by associating it to real context.

Evidence from the literature that the app is capable of the claims made: Just click on the picture, and it will reveal all the information about it, not only in written, but also in audio and visual form by explaining all its important details (Wolber, Abelson, Spertus, & Looney, 2011). So Much 2 Say reveals the history and conceptions about the particular image by explaining its origin, and pros and cons, and ignore the unnecessary things (Wolber, Abelson, Spertus, & Looney, 2011). Apps like this help to describe the picture in its context and helps the reader to associate his/her knowledge to picture; it helps them to memorize the facts (Tuve, 1940). This app also helps to increase the memory through the story of related picture.

General Comments: So Much 2 Say app is very beneficial for the teachers as well as the learners. The teacher can use the app to describe the various things or to describe the subject matter. They have not to waste their time on explain the whole summary or content to the children. The learners can click the pictures they want to know about. The educators just have to modify the app’s setting for the level of the students or their interest.
Reviewer: Naveena Devi

Name of app: Fourth Grade Learning Games

Operating System: IOS

Location: iTunes

Cost: Free

Description: The Fourth Grade Learning Games app is used to teach the children while games. This is perfect for students and their parents. The students learn important topics of Mathematics and English. The students learn the topics through 10 educational mini-games. The students learn fractions, spelling, geometry, graphs, division, grammar and more all while they are playing fun and engaging mini-games. They do not even realize that they are learning important 4th grade concepts as they fly spaceships, race cars, and throw darts. In a fractions game, the students have to compare, add, subtract, multiply, and divide the fractions. In geometry, they play games based on the angles and geometry. In graphs, the students read a variety of graphs and use coordinates to plot points. In patterns, they fill in the missing values, and identify the number growth and time increments. To increase efficiency in spelling, they fill the missing vowels to complete the words and spell hundreds of different words. Students learn to use appropriate punctuation and grammar by fixing sentences by dragging the correct punctuation. They learn about homonyms, and to find synonyms and antonyms by identifying the word which is similar or opposite to the words.

Alignment with the UDL guideline: With Fourth Grade Learning Games, students engage themselves in gaming for which they must apply their skills and knowledge. This app provides the students opportunity to show their efforts and persistence. Again, this app provides them option for presentation through visualization, mathematical symbols and notation. It promotes their understanding across the language through enhancing their spelling and grammar. This app motivates the students to learn new concepts of mathematics and language through 10 educational mini-games by creating their interest in them (CAST, 2011).

Curriculum area: Fourth Grade Learning Games is one of the best apps for providing the students education along with the games. This app is for the students of grade four and also suits to the parents as they can teach their children at home with this app. All 10 games are designed using real fourth grade curriculums and are remodelled after United States Common Core State Standards. This app teaches the students mathematical topics- fractions, geometry, division, spelling, graph, grammar and more. So, this strengthens their math and language abilities.

How does the app meet the National Disability Standards? This is an individualized app and measures the efforts done by individual students. This app is very helpful for the students or children with intellectual disabilities, as this accommodates them according speed and pace to play with. Fourth Grade Learning Games is an interesting game app which enhances reasoning, increases memory and makes the students smarter in language. The teacher can change the design of the app for the students who have intellectual disability. This app provides the learners relevant content which has been specified for the students of grade four.
How the app changes pedagogy (SAMR)? This app is valuable for teachers, especially for the language and math teachers. The teacher can teach the content of fractions, geometry, division, graphs, etc., just by guiding the students to play games in Fourth Grade Learning Games app. Moreover, this app also benefits language teachers by providing games based on spelling and grammar. So, this app has increased the teaching strategy of the teacher and made it more interesting and effective.

How the app encourages person centred planning. This app is planned while considering the needs of individuals. Some students can play the games very fast, while others may be slower. But this gives them equal opportunity to go to the next round. All the students have different levels of games according to their intellect. If the students don’t complete the basic level of the game cannot move further. The teacher may guide them through the level sometimes, and then they move to the next round.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The students can show their creativity through Four Grade Learning Games app by playing different levels of games based on new concept (Carey, 2013). The more levels they complete, the more they can show their creativity. This app encourages the students to learn with gaming. Children are free to grasp the information from the app and analyse that for solving the content topic. This app has made it easier to cover whole the content of mathematics in a cheerful way.

Evidence from the literature that the app is capable of the claims made: A fourth grade teacher use the selected app to increase the literacy by helping students to learn content effectively, and support teacher to meet the needs of the students (Hutchison, Beschorner, & Schmidt-Crawford, 2012). Educators have utilized the advances in education and found apps for different content of mathematics, which include mathematical calculation and geometrical expansion through games (Carr, 2012). Apps are an effective way to educate children with technology that has elaborated apps to teach mathematics for fourth grade students in interesting way which helps teacher to encourage pedagogy and the learner by self-regulation (Carr, 2012). Fourth Grade Learning Games app has all these characteristics.

General Comments: Fourth Grade Learning Games app is a useful app for the development educators, teachers, parents, and students of fourth grade. This app is self-regulated app. The teachers just have to monitor the students and help them to understand the level if the student is not able to understand that.
Reviewer: Alexis Maxfield

Name of app: BW Story App

Operating System: IOS, Android and desktop version

Location: iTunes App Store; Google Play App Store

Cost: Free, in-app purchases can be made

Description: The BW Story App provides pictorial storyboards organized by theme illustrating various situations that people may experience, particularly adults. Some stories revolve around physical and mental health situations, sexual health issues, and abuse. Others are geared towards social activities and independent living. This app is rated for ages 17+, because stories are sometimes graphic and explicit. The images do not open with any text, to allow for free interpretation, questioning, and discussion, but there is an option to include a short caption, either while looking through the whole story, or as a list before looking at the illustrations. The free version does not offer full access, but a subscription can be purchased, either for an individual or as an organisation of 25 or more people. The app is also offered in a desktop version or as printed books.

Alignment with the UDL guideline: This app touches a wide range of UDL guidelines. There are several options for perception (checkpoints 1.2-1.3) with images and captions, language and symbolic expression (2.4, 2.5), methods of expression (5.1), and guides appropriate goal setting (6.1). (CAST, 2011).

Curriculum area: While rated 17+, some components are suitable for younger students, addressing social situations such as bullying, staying healthy, and social behaviours. Some stories can be used in physical education to encourage active lifestyles before and after schooling (ACARA, 2015).

How does the app meet the National Disability Standards? This app works towards several of the National Disabilities Standards, including: rights (standard 1), participation and inclusion (2), individual outcomes (3), and service access (5). This app allows freedom of expression, choice and control, participation in social activities and independent activities, collaboration and options for delivery of services, and access to information and transparency of practices in service delivery (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This is transformative, augmenting experiences by providing visual representation in a portable manner (Puentendura, 2013). It can easily be accessed by anyone involved in the care of and planning for people with intellectual disabilities. Basic concepts can be reiterated or built upon with further stories.

How the app encourages person centred planning. This app is portable, for use at home, in a doctor’s appointment, or at school to discuss stories with educators or peers as appropriate. The large number of stories describes individual situations when relevant. Using the app in an appointment or at school can allow the user to seek advice from professionals, as well as from family, to be better informed of the choices they have. This resource applies to any current situations and explores some of the complexities involved in future goals. In addition, the app may reduce some of the burdens felt by carers and service providers in giving them a starting point for explanation and discussion (Community Services ACT, 2014).
What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? This app fits well with Communication and Collaboration (Carey, 2013). It provides a visual representation that can encourage discussion and shared understanding between people with disabilities, educators, carers, and healthcare providers.

Evidence from the literature that the app is capable of the claims made: IEPs and post-school goals should be consistent (Roth & Columna, 2011), but often health and safety issues, are difficult for caregivers to broach. Rushbrooke, Murray, and Townsend (2014) identified several challenges in managing this issue, which include fear and uncertainty, the balance between protector and facilitator roles, and conditional support. While person centred planning and the right of choice are increasingly popular, the line between policy and implementation is not always clear. Many of the caregivers were uncomfortable even broaching the subject for personal or professional reasons (Rushbrooke, et al., 2014). Other research indicates that families of people with intellectual disabilities who support autonomy balance the support with a desire to provide direction and protection (Saaltink, MacKinnon, Owen, & Tardif-Williams, 2012). Freedom and intervention are not necessarily mutually exclusive, but acts of freedom include support and guidance. This is particularly true for people who are underage, and is regulated by conventions and values held by the family, as is common in most familial settings. Many parents feel that personal choices should ultimately be left to their child. However, when the individual is deemed to lack skills such as complex decision-making, discernment, or self-advocacy, the family is more likely to limit autonomy. Issues of physical health and safety are areas where family members consistently dominate decision-making. Saaltink et al. also sought information about strategies and techniques to increase participation and autonomy in decision making. Some of the themes discussed were consistent communication about possible options and outcomes and practicing decision making. It was also suggested that people with intellectual disabilities should have opportunities to make choices from a young age, not only in the home, but also at school (Saaltink, MacKinnon, Owen, & Tardif-Williams, 2012).

General Comments: This app is a reusable, portable reference that can facilitate discussion and improve understanding about day-to-day or unique experiences. The themes addressed are timeless. Educators and family members can use this app to discuss concepts before, during, and after an event, across a wide age range. Even professionals outside of immediate care, such as fitness centre employees, could use this app. The stories can guide conversations that might otherwise be difficult or uncomfortable, or alleviate some of the stress or anxiety parents feel about letting their children with intellectual disabilities participate in activities or social groups (Roth & Columna, 2011). In addition to the app, there are many supporting references to guide caregivers in the use of this product. The materials consist largely of images, and could be used in other languages with minimal translation (though this cannot be altered within the app). These products are not limited to use with people with disabilities, so they may also help an overall organisational culture embrace multiple means of representation.
Reviewer: Alexis Maxfield

Name of app: CanWork

Operating System: iOS (Compatible with iPad & iPhone)

Location: iTunes

Cost: $2AU

Description: CanWork allows users to input multiple employers and details about shifts: times, what to prepare beforehand, and a list of contacts who can be messaged from within the app (job coaches, supervisors, caregivers, colleagues). This app also provides reminder notifications one day, thirty minutes, and ten minutes before a shift starts. While working, the employee can refer to a set of steps for tasks, with photographs.

Alignment with the UDL guideline: This app provides multiple means of representation for visual and auditory information (checkpoints 1.2, 1.3), flexible language options and multimedia illustration (2.4,2.5), guides information processing (3.3), and maximizes transfer (3.4). The app promotes multiple means of expression with different options for communication (5.1), supports planning (6.2), helps manage information and resources (6.3). The app also addresses means of engagement by optimising autonomy and relevance (7.1, 7.2), and fosters communication (8.3) (CAST, 2011).

Curriculum area: The app is rated 4+, but is applicable to any age level that requires assistance remembering schedules, tasks, and sequencing. It can help students develop and meet personal and social capabilities, produce classroom assignments, or practice job skills pre-employment (ACARA, 2015).

How does the app meet the National Disability Standards? This app supports participation and inclusion (standard 2), allowing people with disabilities to explore and develop their interests and form meaningful connections within society (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This is an enhancement, modifying traditional paper schedules in several ways (Puentendura, 2013). This program only augments a traditional schedule in some ways (multiple employers, alarms, and preparation lists). However, the addition of editable task guides with photos and the internal messaging system simplify the entire process and add new dimensions of communication.

How the app encourages person centred planning. The user inputs information for their own workplace(s), specific to that job and employee. The contacts are people best suited to helping with a given job, including coaches and supervisors, so the user can get help easily. The reminder and preparation tools can provide a sense of control over processes and help workers meet immediate and future goals. In addition, the app helps users go a bit beyond training and needing direct assistance and/or constant supervision. These can all contribute to motivation and determination to continue employment and, therefore, a form of social engagement (Community Services ACT, 2014).
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app falls into the Community category, along with Connectivity and Collaboration (Carey, 2013). It helps people with disabilities participate in social workplaces and perform tasks, either alone or with the option to quickly and easily seek help from others.

Evidence from the literature that the app is capable of the claims made: Meaningful employment can be essential to the mental health of people with disabilities. So is the ability to perform independent tasks within the home (Jahoda, Wilson, Stalker, & Cairney, 2010). The concept of job placement is not enough, as it does not automatically equate to using skills gained during education. The process of maintaining employment is much more holistic, balancing competencies, emotions, cognition, behaviour, and social interactions. Such a balance can improve quality of life much more than just finding someone a job. Another major component is the self-perception of autonomy, and the development of a “work personality” that is engaged, productive, and creative (Reiter & Schalock, 2008, p. 16). Task analysis and knowing where to get help play an important role in planning, development of goals, and autonomy (Roth & Columna, 2011). Employment rates of people with intellectual disabilities are improving. However, while training and coaching help develop skills and work performance, they can hinder integration into the social sphere of the workplace, hindering the development of interpersonal skills and generating stigma. The presence of a job coach may also reduce the ability of the worker to develop or maintain independent productivity (Gilson & Carter, 2016).

General Comments: This app could be used in a pre-transition setting within schools to increase student awareness or comprehension of following schedules and systematic instructions. People with a range of severity of intellectual disability could use this app, as the number of steps and the language level are almost entirely customisable. This app may have uses in school or in one’s personal life, not just for work or school, as it is categorised as a “productivity” app in iTunes (iTunes App Store, n.d.). Specifically, it could be adapted to meet other goals, such as workout routines or household chores. A location and tasks could be input and the steps documented. Including activities in more than one area of life can provide consistency and routine. Inputting tasks is easy due to an instructional box that comes up on every page, and the in-app help option and website both provide decent support. While there are a few different fields to navigate, the display is uncluttered. The CanAssist organisation also provides other apps plus customised tools and objects that could complement the app in different work environment. Using this app to outline the tasks but provide an anchor to helpers may give the worker a sense of autonomy, boost confidence and motivation, and let the worker and co-workers initiate interactions.
Reviewer: Alexis Maxfield

Name of app: I Get...Going to the Hospital

Operating System: IOS

Location: iTunes

Cost: $7AU

Description: This app opens into a library of “books”. The basic set describes different aspects of healthcare and explain how to use, create, and share books (via e-mail or Dropbox). Books can be edited many ways: adding personal pages and photographs, changing or adding titles and captions, and hiding or showing books. Pages can be swiped or tapped to turn through the pages. Quite a lot of pages can be added and the user just swipes down or up to scroll. Some of the aspects of healthcare addressed are hospital objects, people, and “Emergency Room”, which contains many pages that can also apply to more general medial processes, such as “Waiting Room” and “X-ray”. When a page has been discussed and understood, the user can tap on the image and a green check mark will appear. This app can also be purchased as part of a larger bundle of “Social Stories”.

Alignment with the UDL guideline: This app meets perception guidelines by letting users customise display items with alternatives for auditory and visual information (checkpoints 1.2, 1.3), clarifies and decodes vocabulary and symbols, can promote understanding across languages with user input, and illustrates concepts with multiple media (2.1, 2.3, 2.4, 2.5). It can help activate or supply background knowledge and highlight relationships (3.1, 3.2). The app also can be tailored to provide authentic, relevant information that can enable more autonomy (7.1, 7.2, 7.3) and augment coping skills (9.2) (CAST, 2011).

Curriculum area: I Get...Going to the Hospital can teach about sequence of events, categorising, and building vocabulary. In terms of personal health and life skills, it can help students understand and communicate about some of the processes they may undergo (ACARA, 2015).

How does the app meet the National Disability Standards? This app promotes the rights (standard 1) and individual outcomes (3) of individuals with disabilities, allowing them to understand processes and have some control over choices in their healthcare and services. It also underscores the fact that care involves several people all working for the benefit of the individual (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This app is transformative, augmenting traditional materials by allowing them to be manipulated in several ways, including editing, hiding or revealing, and language. They are also easily and quickly shared amongst any number of participants (Puentendura, 2013).

How the app encourages person centred planning. This app allows care and medical providers to select images and stories that best explain a unique situation, as well as providing a general idea of what “going to the doctor” means. This app can be customized with specific pictures and stories. Also, the “books” can be printed or mailed to anyone involved in the care of the individual, allowing
family and care professionals to be equally informed about that person’s needs. Being informed will allow the care providers to give better information, helping the person with disabilities to make more informed choices (Community Services ACT, 2014).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app best exemplifies Communication (Carey, 2013), as it helps explain the different processes and promote understanding about situations that can be confusing and/or frightening.

Evidence from the literature that the app is capable of the claims made: People with intellectual disabilities have relatively high rates of comorbid conditions (e.g. seizures, diabetes, respiratory difficulties, etc.), hospitalization, and associated complications (Ailey, Johnson, Fogg, & Friese, 2015; Balogh, Brownell, Ouellette-Kuntz, & Colantonio, 2010). Adults with intellectual disabilities have a greater tendency to a decline in physical condition, premature aging, younger morbidity, and relocation to care centres. Issues include a lack of competence and patient-centred care, and self-reports of medical professionals feeling unprepared to manage the care of people with intellectual disabilities. Some researchers are implementing programs targeted at increasing awareness and considerations of needs specific to the intellectual disability population. Components of these programs include managing behaviour, methods of communication, and how to provide a calming environment (Friese & Ailey, 2015). Additionally, both healthcare providers and patients themselves seem under-informed about the specific needs of people with intellectual disabilities (Gibbons, Owen, & Heller, 2016). Most information given to medical providers comes from agency staff, family, and other medical providers. Some people with intellectual disabilities do not understand definitions of what is considered a medical need or healthy practice. They often perceive being “healthy” as not feeling pain, not needing a doctor, or not taking medicine, versus following a healthy diet and receiving routine care, such as annual dental visits. This can lead to a lack of overall care, even if it is accessible. While some patients report difficulties with and mistreatment from their medical providers, those who had positive experiences emphasised the use of “accessible and understandable communication methods” in addition to access and timely service providers (Gibbons, Owen, & Heller, 2016, p. 100).

General Comments: This app can help educators, parents, and medical providers explain and reiterate the processes of health care with their individual students, children, and patients. Familiarity with tools, people, and procedures might increase awareness and decrease stress levels for all involved. Perhaps a tool like this app that can be shared between care providers and people with intellectual disabilities seeking treatment can reduce some of the discrimination from some care providers. Patients can be better informed and potentially viewed as more capable of making “good” choices for their own health, even if they require more support.
Reviewer: Alexis Maxfield

Name of app: iModeling Boundaries

Operating System: iOS (Compatible with iPad)

Location: iTunes

Cost: $1.50AU

Description: This app helps teach guidelines about kinds of that are safe and acceptable to give or receive. Using this app starts with entering a profile (multiple profiles are allowed). Next, uploaded photos, or general icons of people in the user’s life are added: family members, service providers, friends, new people, etc. Each photo can be dragged into a group, distinguished by a differently-coloured shape and a label indicating the appropriate type of touch (e.g. hand to hand, no touch, personal care). Any group symbols (colour, shape, type of touch) can be edited, and it is easy to add, delete, hide, or reveal groups. Photos can be resorted, hidden, and revealed as needed. Tapping on the icon shows all the people in that group. There is an informational help box within the app.

Alignment with the UDL guideline: This app supports perception guidelines with options for customisation and alternatives for auditory information (1.1, 1.3). Based on the photographs input by the user, this could potentially illustrate the concept of boundaries through multiple means (2.5). The program activates background knowledge, highlights relationships, and helps users chunk information and know when to use certain behaviours (3.1, 3.2, 3.3). Since users can help create and fill categories and understand boundaries, the app can help develop autonomy, and is relevant and authentic to the user (7.1, 7.2) (CAST, 2011).

Curriculum area: This app can help students across a wide age range (being rated 4+) develop social awareness and practice interpersonal skills with their peers. A teacher to work with an individual or with a larger group of students at one time, inserting photographs and information about teachers, principals, or others within the school context (ACARA, 2015) could use this app.

How does the app meet the National Disability Standards? This app promotes participation and inclusion (standard 2), helping users understand the best ways to engage and connect with others in their communities. (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This app is transformative, acting as a substitution (Puentendura, 2013) for real people or printed images and putting them together in one place. Only working on the iPad is a limitation, but this could be used in a classroom or at home.

How the app encourages person centred planning. Everyone included in this app is involved in the user’s life. This app will help the user and his or her community members participate more comfortably and confidently together because it helps the user understand the roles he or she and other people play in social situations (Community Services ACT, 2014).
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages Communication and Community (Carey, 2013). Helping users understand social rules will help them participate and develop relationships in the wider society.

Evidence from the literature that the app is capable of the claims made: An estimated 75% of people with intellectual disabilities demonstrate impaired social functioning, including difficulties in communication, engagement, or facial emotion recognition (O’Handley, Ford, Radley, Helbig, & Kimberly, 2016; Zaja & Rojahan, 2008). The lack of social skills is considered a major factor in adjustment to life after education, leading to a trend in isolation as people with intellectual disabilities age (O’Reilly, Lancioni, Sigafoos, O’Donoghue, Lacey, & Edrisinha, 2004). Typical interventions include video modelling and behavioural skills training to reinforce appropriate or expected participation. Presenting material for social skills training in a classroom setting is possible and can be more resource-efficient than one-on-one work (O’Handley, et al., 2016). Conversely, there is evidence that external modelling and reasoning scaffolds have less effect than internal methods, such as learning to decode stimuli, identify and enact proper strategies, and evaluate choices (O’Reilly, et al, 2004). The maintenance of learned social skills is also very important to the effectiveness of any training (O’Handley, et al., 2016). The ability to participate in social situations transfers across numerous settings (Gilson & Carter, 2016). Participation in group activities is key to happiness and self-worth for many people (Reiter & Schalock, 2008), but some interactions are inhibited by stigma from those who are typically developing, or even from well-meaning family members, described as “benevolent stigma” (Jahoda, Wilson, Stalker, & Cairney, 2010, p. 531). Also, there is evidence that clarified boundaries benefit both parties in an interaction and assist integration into mainstream society. The Dutch government is hoping that if members of local communities feel more comfortable with neighbours from vulnerable populations, they may embrace higher levels of “conviviality” (Bredewold, Tonkens, & Trappenburg, 2016, p. 3375), in which neighbours assist, observe, and engage with one another, rather than leaving interaction to paid professionals and family members (Bredewold, et al., 2016)

General Comments: This app does require attention to setup, but the format is straightforward and input and sorting can be collaborative. The app could help the main user and friends or siblings learn about personal safety and boundaries together, these skills being very important for all people. This app can help reinforce social skills at school with peers, instructors, and administrators, and for educators helping students transition out of school. Familiarity with the app can provide a level of consistency as users age.

Through developing social skills the app can encourage people with disabilities to initiate or respond to social interactions in ways that are comfortable and familiar for everyone. This may reduce some of the stereotyping that occurs towards members of the intellectual disabilities community and encourage future interactions.
Reviewer: Alexis Maxfield

Name of app: Sequence of Events-Sequencing Cards for Kids

Operating System: iOS

Location: iTunes

Cost: $1.50AU

Description: This app opens to a screen with 21 sets of sequence cards. The sequences describe everyday events and activities, such as choosing food, throwing away rubbish, washing the car, and getting ready for school. There are three categories: 3-, 4-, or 5-step sequences. Users can tap on a photo to hear a description of the illustration, and then must drag each photo to the appropriately numbered box. The app does not allow incorrect matches. When a step is correctly added to the sequence, award noises play (or can be turned off). Settings and card sets are limited, but there is a direct link to e-mail for help.

Alignment with the UDL guideline: This app promotes perception by offering visual and auditory information (1.2, 1.3), and highlights ideas and patterns and guides processing (3.2, 3.3). The app has some graduated levels of practice (5.3) (CAST, 2011).

Curriculum area: This app is useful for learning the steps in a process and has graduated levels, which help build general capabilities (ACARA, 2015). Since users must drag images to the correct box, it can assist in the development of simple motor coordination. The target age is 4+.

How does the app meet the National Disability Standards? This app meets individual outcomes (standard 3), because administrators can create and add their own versions of the quiz to tailor the process to a specific user (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This is a substitution, as it could replace flash cards or other physical representations of similar material (Puentendura, 2013). It is also portable and can be used with more than one device.

How the app encourages person centred planning. While this app does leave something to be desired in this context, there is potential to create a framework that helps users understand everyday tasks, such as cleaning up and getting ready, which could help develop some independent behaviours and task completion (Community Services ACT, 2014).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Potentially, this app could encourage Community (Carey, 2013), if players work together and share the game.

Evidence from the literature that the app is capable of the claims made: Intellectually disability may interfere with the ability to perform daily living skills. Breaking activities into smaller steps and providing visual clues can assist skill acquisition, help establish routines, and anticipate activities. Recognizing small achievements in the completion of a process is as important as praising task completion (Government of South Australia, 2013). People with mild intellectual disabilities...
demonstrate problems with motor coordination (accuracy, speed, and reaction time) (Carmeli, Bar-Yossef, Ariav, Levy, & Liebermann, 2007; Latash, 2007). This may be linked to a lack of hand-dominance, or lateralisation, which could prevent the development of coordination. The lack of ability may be attributable to premature aging rather than intellectual disability itself, but there is an argument for early rehabilitation in fundamental abilities (Carmeli, et al. 2007) and for regular practice (Latash, 2007).

**General Comments:** Although the content of this app is limited, the displays are uncluttered and there are very few steps to start playing. There is really no way to lose, as the app doesn’t allow mistakes, so even if users take a longer time to find the correct answer, they should eventually get it. The images are small and simple, so it would be easiest to see on an iPad, but the images convey all the relevant information. Because there are a few different levels of complexity, the user has some choice in the level of difficulty.

The simplicity of the game might make it a handy reference when parents are trying to reiterate the steps in some everyday processes, such as getting ready for school and getting on the bus.
Reviewer: Anne Frith

Name of app: Little Speller

Operating System: IOS

Location: iTunes

Cost: Free

Description: Little Speller is a mobile sight words application suitable for ages 4+. Cue cards are used together with audio to introduce words and letters. The letters are on tiles that, through touch, can be dragged and placed over the appropriate letter to spell the word. When the letter tile is touched, the audio speaks the letter. When the word is correctly spelt, the next scrambled word appears. There are many settings within this application that can be customised to suit the person. Through the settings the sound, word hints, visual hints, letter hints, letter repeat, tile magnet and auto progression can all be enabled or disabled. Word selection can be alphabetical or random. Letter display can be upper or lower case. Word length can be individualised as per the requirements of the user. 3 letter words up to 6 letter words can be chosen. The chosen length of words can be a combination of word length or only such word length. Customisation is possible through the specific selection of word phonology, adding or deletion of these specific sounds. Audio can be recorded to add praise and reinforcement to learning, the child’s own voice or the parents voice may be added to emphasise the individualisation of the application. This application has universal use across ages and specific learning modes. Basic literacy skills can be practised and reinforced by children/ adults who require extra support gaining language skills (Innovative INVESTMENTS Limited, 2014)

Alignment with the UDL guideline: The Little Speller application meets the Universal Design for learning guideline 1. “Provide Multiple means of Representation” because it enables the user to have the opportunity to customise the settings of the application to suit the individual needs of the student aligning with checkpoint 1.1 “Offer ways of customising the display of information” (CAST, 2011).

Curriculum area: The Little Speller application gives the user the ability to form a strong foundation of literacy skills through exposure to letters, words and phonology. Access to the opportunity to read and comprehend is paramount to increasing a person’s expressive and receptive communication skills. The development of these skills decreases the need for external support in this area increasing their communication options and promoting independence through the ability to communicate independently. Furthermore, this independence supports global growth within social networks and options of choice creating a better quality of life for the individual. The app developer suggests that the Little Speller is suitable for children 4 years and over although the basic cue card system may be of benefit to learners of all ages that require support with learning basic language skills such as a person with an Intellectual Disability. The flexible nature of the app to allow the user to customise the application means that support is received in the curriculum area of literacy and language. Highlighted previously is the global effect to the person of increasing communication skills such as receptive and expressive language so this app may also be considered as a contributor to the growth of life skills.
How does the app meet the National Disability Standards? The Little Speller application meets the National Disability Standard 3: “Individual Outcomes” (Department of Social Services, 2013). This app supports the flexibility of learning through the multiple representation of information customised for the individual learner. Using visual and audio representation the student can gain knowledge at the appropriate level. This ensures that the individual has access to the most appropriate information for their need. The app settings support success for the individual by allowing the learner to increase their lexicon by reinforcement and exposure to more difficult phonology as they progress through the app.

How the app changes pedagogy (SAMR)? The Little Speller app is a pedagogy ‘enhancement’ considered as ‘augmentation’ as the application enhances the use of traditional cue cards for audio, visual and text representation (Schrock, 2017). The option of alternative displays may increase engagement in learning for a child who require additional reinforcement during the acquisition of the foundation of language.

How the app encourages person centred planning. A person-centred approach is achieved using The Little Speller application as the flexibility of settings allows for the individual needs of the user to be considered. The use of multiple representations such as audio, visual and text gives the individual incidental reinforcement during learning. The settings allow for easier or a more difficult lexicon to be utilised resulting in individual programs that are manageable for successful learning outcomes.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The Little Speller application may align with both the aspects of ‘creativity’ and ‘curation’ for the 21st Century (Carey, 2013). This occurs as the app is a tool that promotes and enhances language skills represented by an interactive and visually appealing mode of learning for a diverse group of students requiring support to gain basic language knowledge. The lexicon is flexible customising is possible dependant on the needs of the learner. The lexicon is stored electronically therefore resulting in curation for the learner who can retrieve and revisit the stored lexicon for future retrieval reinforcing learning for the individual.

Evidence from the literature that the app is capable of the claims made: The Little Speller application has the capability for the user to customise the settings to include picture, text and audio within the tool (Stone-MacDonald, 2014). Highlighted by Stone-MacDonald (2014) is that the ability to focus on specific skills or concepts within the needs of the student meet the requirement of the child within a person-centred model. Providing literacy support the customised app provides prompts, feedback and reinforcement of learnt skills for people with an Intellectual disability (Stone-MacDonald, 2014). The multiple representation offered by a computerise learning tool has the potential to increase the comprehension and knowledge of a person with a cognitive deficit (Sharmir & Margalit, 2011).

General Comments: This app could be useful for both teachers and developmental educators as a tool for growth within the literacy area. The notion of customisation allows for a person-centred experience for the user because of the multiple representation capability of the app.
Reviewer: Anne Frith

Name of app: My Safety Companion

Operating System: iOS

Location: iTunes

Cost: Free

Description: The Safety Companion is a mobile personal security application designed to allow independence of travel with safety. The ability to contact a support person should the user require assistance is the overarching goal of the system. The application stores the contact number of a nominated person and a phone call or SMS can be sent with a user one touch system. The safety companion records the user’s location and attaches the GPS coordinates to the option of SMS, this can be activated by a simple one touch action. The SMS will send the users location as GPS coordinates also links the location to a map to show the persons actual location this enables the location of the user to be recorded to provide aid should it be required. An alarm sound can also be activated which will attract attention to the user requiring help. An in-app purchase of a flashlight for $1.49 which activates the flash light if the phone is shaken an advantage should the user be on their own in the evening and need the assistance of a torch. This mobile application is a simplified emergency call system particularly beneficial for peace of mind for the user knowing that help can be available should the need arise. This application could be used as a risk minimiser when travel training is completed. The Safety Companion supports independence while providing safety for all ages and cognitive ability within the community. Supporting people with a disability to grow and extend their social networks creating a greater quality of life. The task of calling for help when the user is under duress is simplified thus ensuring contact with support is easy.

Alignment with the UDL guideline: The My Safety Companion application meets the Universal Design for learning guideline 3. “Provide Multiple means of Engagement” because it enables the user to have the opportunity to have increased choice and independence to suit the individual needs of the student aligning with checkpoint 7.1 “Optimise individual choice and autonomy” (CAST, 2011).

Curriculum area: The alignment with the curriculum area for My Safety Companion application would be life skills. The application supports and enhances independence through the invisible yet present support system that can be activated should assistance be required. Growth of networks and diminishment of barriers enjoyed by all ages of people requiring support to travel can be achieved. The global effect within someone’s life may see a lessening of anxiety and fear particularly for the people who may not have previously be given the latitude of choice that so many people in the community enjoy.

How does the app meet the National Disability Standards? My Safety Companion meets National Disability Standard 2. “Participation and Inclusion” (Department of Social Services, 2013). The app aligns with this standard by providing an external support for the person to travel independently knowing that should the need arise there is support available. The individual would have greater access and choice within the community enjoying a greater freedom to choose what and where
they want to go. A more spontaneous lifestyle would become apparent with this flexibility of movement. The app would also assist with reduced anxiety for the user and their stakeholders by knowing that a nominated support can be contacted if assistance is required.

**How the app changes pedagogy (SAMR)?** The application My Safety Companion is considered a pedagogy known as ‘enhancement’ through ‘augmentation’ (Schrock, 2017). The app assists the user with the ability to travel with invisible support thus changing the focus from the need to have external supports to that of independent community engagement.

**How the app encourages person centred planning.** My Safety Companion gives the user the choice to access the community through providing a safety net of invisible support. The barrier of opportunity is highlighted within the lives of people with a disability due to the ongoing costs and availability of external supports and resources. Giving the power of choice and self-determination to the user as a functioning member of society. The app while providing the support also enhances the person’s quality of life through empowerment and engagement supporting richness and depth of life experiences.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app My Safety Companion promotes and supports the independence and community inclusion for a person who requires support to travel unassisted. This aspect aligns within the 21st Century approach of ‘community’ providing an invisible support for the user (Carey, 2013). This ensures that the growth of networks continues and the need for external resources through support is reduced.

**Evidence from the literature that the app is capable of the claims made:** Independent travel for people with an intellectual Disability can often be perceived as dangerous both from a safety aspect as well as the fear of the unknown for a person who has lived their life through the external support network that is often service provision (Dempsey & Nankervis, 2006). The human need for social connectedness through viable networks is restricted for many people within society due to the deemed limitations of their disability (Dempsey & Nankervis, 2006). The My Safety Companion app provides an invisible support with one touch operation. This encourages the growth independence and self-reliance while enabling a physical presence within the community (Dawe, 2006).

**General Comments:** This app would be useful as a independence promotion tool for a person who has just completed travel training. The extra security for the person may provide feelings of elevated self-esteem contributing both to the success of the travel training and growth in personal development.
Reviewer: Anne Frith

Name of app: Stepping Stones Daily Routine

Operating System: IOS

Location: iTunes

Cost: $0.99AU

Description: The mobile application Stepping Stones daily routine provides a visual representation of the user’s daily schedule. Tasks/activities that can be broken down to the required number of steps to suit the individual. The visual steps act as prompts reinforced by script to support the successful outcome of the required task. Audio instruction can also be added to gain clarity to the task providing spoken, written and visual prompts. A visual count down timer can be added to notify the user of the time at which the partial or completed task should be actioned. Customising the application is easy, the ability to download a photo or alternate visual representation can be uploaded via the camera roll or using the photo library. This application also provides the flexibility of using written language only instruction should that be more appropriate for the individual user. An overriding parental lock is available so changes to the routine cannot be made by error.

Alignment with the UDL guideline: The Stepping Stones daily routine application meets the Universal Design for learning guideline 3. “Provide Multiple means of Engagement” because it enables the user to have the opportunity to enjoy increased independence to suit the individual needs of the student aligning with checkpoint 8.1 “Heighten salience of goals and objectives” (CAST, 2011).

Curriculum area: The Stepping Stones daily routine application provides a visual representation using picture prompts the user can follow to complete daily tasks and or activities. The user’s daily routine can be recorded in small steps, each step visually represented to reinforce understanding of what is required to be completed. These steps can also be customised to include script, which will also create incidental learning for the user. The use within the community for this application is diverse. Older people can benefit from assistance with memory issues, early learning can be strengthened and people with Intellectual Disabilities and other cognitive challenges can use the app as a prompt or simply as a predictable path for their day. Predictability of routine decreases anxiety resulting in a more stable and sustainable behavioural pattern for individual.

How does the app meet the National Disability Standards? The mobile application Stepping Stones daily routine aligns with the National Disability Standard 3. “Individual Outcomes” (Department of Social Services, 2013). Stepping Stones daily routine encourages and supports individual partial or full participation in a person’s life by providing easy manageable steps to complete tasks/activities that with a reduced need for external intervention. This greater self-reliance results in confidence and personal growth that will transcend into other aspects of the user’s life. The global increase in the engagement of life for the individual provides greater choice and better quality of life.

How the app changes pedagogy (SAMR)? Stepping Stone daily routine is a pedagogy ‘transformation’ through ‘redefinition’ (Schrock, 2017). Through task analysis, the multiple steps required to
perform a function can be displayed giving the user the prompts required to successfully complete the activity. The ability of the application to provide multiple visual and auditory representation of the task reinforces a stable routine and successful completion of task.

**How the app encourages person centred planning.** The Stepping Stones daily routine is by its very nature person centred. The app is developed by or for the user with their relevant information and required tasks or activities for the day. The persons tasks are broken down to smaller achievable steps which can be personalised by including audio and text with picture/photo detail. The visual representation can be a photo of the required step or a simple picture to provide clarity to the person of what they need to do to complete the task. A timer option can be used to prompt the steps. Multiple modes of display are used within this system that can be customised to suit the needs of the user. These paths can be changed or added to as required to support the successful completion of the task.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)** The Stepping Stones daily routine application supports independence and personal growth by using pre-stored pictures/photos and text that is stored for daily retrieval. These aspects align within the 21st Century approach of both ‘creativity’ and ‘curation’ (Carey, 2013). The app is creative in the modes of display that can be customised to suit the user, creating self-prompting and self-reliance resulting in empowerment for the individual. The created paths are stored for retrieval when required to map the daily requirements for the individual aligning within the criteria for curation.

**Evidence from the literature that the app is capable of the claims made:** A person with an Intellectual Disability has the most positive outcomes globally within all their life domains by providing a predictable and stable routine (Dempsey & Nankervis, 2006). This can create challenges of comprehension and engagement unless the routine is presented in a form which can be understood by the individual (Dempsey & Nankervis, 2006). The transition between meaningful and necessary tasks may challenge some individuals, the use of video prompting has been of use in this area but requires accessibility and portability of the required equipment (Kellems, Grigal, Unger, Simmons, Bauder, & Williams, 2015). The inclusion of a portable device that can be used as a personal prompt with relevant and a versatile user-friendly display has become for many people the avenue of choice (Chmillar & Anton, 2015). Using assistive technology, a greater skill base may be achieved for the user optimising engagement and self-determination within their own world (Beyer, Meek, Kilsby & Perry, 2008)

**General Comments:** This app would be useful for a developmental educator as a tool to promote independence and skill acquisition for a person requiring support for their daily needs.
Reviewer: Anne Frith

Name of app: Read Me Stories

Operating System: IOS, Android

Location: iTunes, Google Play Store

Cost: Free to download app – in app purchases $2.99 a bundle

Description: Read Me Stories is a mobile application designed to assist children with the development of early language and reading skills. This app promises the user will through exposure to books and language extend their core reading skills and encourage a love of reading. Sample books are provided at the initial download of the app that is free. Further storybooks can be bought as in app purchases as book bundles for $2.99, 140 books are currently available which can then be stored in the story library. The text is highlighted as you read the story and interactive touch of the illustration allows for further story development extending knowledge and exposure to new concepts. The Read Me Stories app has the flexibility to begin with the alphabet introducing the user to phonics and pronunciation with a lexicon of over 1000 words. Included is the option for the user to touch the screen and have audio sound out both the letters and words reinforcing the foundations of word and sentence structure. The developer suggests the appropriate age range for this app is 5 years of age and under but this app could enrich and develop literacy and language skills for children with an Intellectual Disability as an early learning intervention tool.

Alignment with the UDL guideline: The Read Me Stories application meets the Universal Design for learning guideline 1. “Provide Multiple means of Representation” because it enables the user to learn basic language skills developing a solid literacy foundation aligning with checkpoint 2.2 “Clarify syntax and structure” (CAST, 2011).

Curriculum area: The Read Me Stories application is aimed at the 5 years and under age group as suggested by the app developer. This application is a useful tool than can be used in the curriculum area of literacy and language specifically within early intervention education for children with Intellectual Disabilities. Even though the reading support that this system uses has a global application within the diverse age ranges of a person with cognition challenges the subject matter would be deemed inappropriate for preteens, adolescence and adults.

How does the app meet the National Disability Standards? The Read Me Stories application meets the criteria of National Disability Standard 3: “Individual Outcomes” (Department of Social Services, 2013). Read Me Stories app provides the opportunity for the user to access a language learning tool at their appropriate cognitive level. The application allows access for children to learn to read and have access to books at the appropriate level. Developing and adding to the user’s lexicon assists with comprehension a prerequisite for language development and expansion.

How the app changes pedagogy (SAMR)? The Read Me Stories app is a pedagogy ‘enhancement’ in the form of ‘augmentation’ (Schrock, 2017). The app meets these criteria by substituting a physical
book with an e-book, providing audio and visual reinforcement for the development of early language skills.

**How the app encourages person centred planning.** The Read Me Stories application is an interactive tool that assists the learner to gain skills around the early learning of language. The app allows the student to participate at their required level promoting the notion of person-centred application. Participation of the learner within the activity is flexible providing exposure to words, meanings and concepts in multiple representations by picture form, audio and written text. Providing many opportunities for reinforcement during reading. The interactive nature of the system may encourage engagement for the students who want and need more than a paper book. Repetition is also a valid consequence of the e books and as there is the ability to engage within the books at a deeper level by touch for the user. This may enhance the experience of the user while reading, further supporting participation and engagement. There are 140 book titles available with a diverse range of topics and interests to engage the reader.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Read Me Stories application is a library of books that can be accessed and read with or without external supports depending on the needs of the user. The app aligns with the 21st Century approach of ‘creativity’ as an e-book is an interactive tool that encourages engagement and provides exposure to students in early learning education (Carey, 2013). The interactivity of the app engages and extends on the background knowledge of the student while reinforcing language development.

**Evidence from the literature that the app is capable of the claims made:** Literacy and language development can assist with engagement and participation for children with an Intellectual Disability using an iPad (Stone-MacDonald, 2014). Use of an app may provide access to a greater level of language comprehension by multiple representations of customised display options (Stone-MacDonald, 2014). The Opportunity to reinforce learning is offered by the exposure to an interactive literacy app affords confidence through feedback provided within this tool (Stone-MacDonald, 2014).

**General Comments:** This app would be useful for a Developmental Educator to use to introduce or expand a person’s language and literacy skill. This in turn would enhance communication for the individual.
Conclusion and Recommendations

People with intellectual disabilities have less ability to process, understand, and apply new information and skills. This limits their ability to learn, communicate, participate in society, and live as independently as others (World Health Organization, 2017). However, in addition to traditional family and social support structures, many improvements have been made in everyday technologies that are useful for those with intellectual disabilities.

People with intellectual disabilities have been making use of advanced technological devices to integrate into society and access amenities for some time (Hallgren et al., 2011). According to Ostlund (1995), “Technological development today offers great possibilities in simplification and increased efficiency in daily activities for example by the use of computers, mobile devices, remote controls and cash dispensers” (as cited in Hallgren et al., 2011). The essential thing is to design impressive systems of access and assistance which people can take advantage of from those devices (Carey et al., 2005; Hayes & Martin, 2007; Stock et al., 2008, as cited in Hallgren et al., 2011).

People operate such systems from home without depending on anyone just by using different apps on their computers and mobile phones. According to Ventola (2014), “Apps are software programs that have been developed to run on a computer or mobile device to accomplish a specific purpose”. In this paper, 35 apps have been described for people with intellectual disabilities, including children, adolescents, and adults, as well as their employers, carers, and teachers to meet a variety of needs. These apps encompass many different areas of learning (sequencing, brain exercises, auditory and reading comprehension, and mathematics), communication (learning language, improving communication skills, and translating speech to text), and life skills (using money, travel safety, scheduling, and healthcare).

The apps are available from the iTunes App Store, App Crawlr, Google Play, and Google Apps, and users benefit from the ease of shopping and downloading directly from internet markets (Ventola, 2014). These apps are available at different prices: some are free whereas some are costly. Many of the free or low-cost apps can be upgraded later, as users prefer (Ventola, 2014).

When choosing apps for people with intellectual disabilities and for their support teams, certain factors were taken into consideration. Many of the apps here were chosen because they have simple formats and displays and utilize visual and verbal prompts, allowing users to manipulate and navigate through the program with minimal help, increasing autonomy and self-confidence. Others provide a platform for practicing social and life skills repeatedly in a rewarding and entertaining manner that should encourage users to participate more in decision making and social activities. Several of the apps build communication skills, both for people with disabilities, and for those who live and work with them. Most of the apps can be used over several stages of development, to either start very young learners off strong, or to help older learners in new ways.

Apps are the media for capability for people with disabilities (Shibataet al., 2017). Hopefully, these apps help meet the needs of people with intellectual disabilities and users find a variety of ways to use them beyond the suggestions given here.
References


Feschuk, S (2013). Glass explorers' doesn't sound nerdy at all: soon we shall technically make eye contact while actually browsing. Maclean’s, 126(19-20), 89.


Howells, G. (1986). Are the medical needs of mentally handicapped adults are being met? *Journal of the Royal College of General Practitioners.*


Useful Links

AAC Speech Buddy:
https://www.youtube.com/watch?v=e5TTxYQjsWg
https://www.youtube.com/watch?v=sQtv6J8aE44

Brain Power & Google Glass: https://www.youtube.com/watch?v=gFNLQ6p9Uvs

BW Story App homepage: https://booksbeyondwords.co.uk/story-app/
Free version for desktop: http://app.booksbeyondwords.co.uk/


Elevate- Brain Training app:
http://download.cnet.com/Elevate-Brain-Training/3000-20415_4-76152725.html

Four Grade Training Games app:

Free Medical Journals: http://freemedicaljournals.com/


I Get...Going to the Hospital homepage: igetitapps.com

iModeling Boundaries tutorial: https://www.youtube.com/watch?v=fmp2-PV1Dx0


PLAY 123 app: http://download.cnet.com/PLAY123-for-iPhone/3000-20415_4-75681505.html


So Much 2 Say app: http://appcrawlr.com/ipad/so-much-2-say-picture-communication

Tactus Therapy website: http://tactustherapy.com/apps/

Word Sort Homepage: https://grammaropolis.com/word-sort.php

http://autismapps.org.au
Website listing range of apps that are suitable for use with individuals with ASD
https://www.autismspeaks.org/autism-apps
Website containing large list of apps that are suitable for use with ASD including links to research supporting the app.

http://www.udlcenter.org
Detailed outlines of each of the principles and checkpoints of the UDL guidelines, complete with teaching examples

Expert advice for teaching students with ASD

Detailed ideas for teaching students with ASD including classroom design and links to ask a professional

http://www.autismpluggedin.com/category/free-apps
Lots of free apps that are designed for children with Autism Spectrum Disorder. There are lists for using certain apps for certain skills development (math / English / cause and effect / etc)

http://igetitapps.com/
Educational Applications for iPhone, iPad, and iPod Touch for People with Additional Learning Needs

http://www.aacandautism.com/
A website where you can find options of AAC devices that people with ASD can use as an alternative form of communication.
Autism Spectrum Disorder
Autism Spectrum Disorder (ASD)

ASD is used to describe a pervasive developmental disorder involving disturbances in cognition, interpersonal communication, social interactions and behaviour (obsessional, ritualistic, stereotyped and rigid behaviours).

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<td>Nikita Jaensch</td>
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<td>8. Care for Me</td>
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<td>Fatema Sitabkhan</td>
<td>9. Pictello - Talking visual story creator</td>
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<td>Viet Truong Nguyen</td>
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<td>18. AAC Autism Talk Now</td>
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Introduction

Withey (2017) reports that autism spectrum disorder (ASD) has been identified as the “third most prevalent [form of] disability” (Withey, 2017, p.250) in young children in the United States of America. The nature of having an ASD diagnosis means that the affected individual experiences difficulties around creating interpersonal relationships with known and unknown people alike, demonstrating behavioural challenges, and engaging in “repetitive, stereotypical” behaviour patterns (Withey, 2017, p.250). While there are many different forms of intervention that are available for support to this population, there is strong evidence to support the effective use of technology in developing “social emotional skills” (Withey, 2017, p. 251).

Autism spectrum disorder (ASD) is a “neurodevelopmental disorder” (Lubas, Mitchell, and De Leo, 2014, p.1) that typically affects individuals in their early childhood (Lubas et al, 2014). The characteristics of ASD varies from individual to individual and can present with complex needs for those who are diagnosed with it (Lubas et al, 2014).

While there are numerous methods of intervention to support the person with an ASD diagnosis, AAC apps were invented to provide this population with more convenient and cost-effective means of compensating or overcoming their communication-based difficulties (Lubas et al, 2014).

Allen, Hartley, and Cain (2016) report that “… 80% of children with ASD aged 5 years and younger … are non-verbal (Bondy and Frost, 1994)”, with “30% being minimally-verbal at 9-years (Anderson et al., 2007)”. This is a concerning statistic that puts a question mark on the future of these children, who struggle with developing their skills in an educational and social medium and affect their ability to communicate effectively with their peers and people in the society (Allen et al, 2016). Since introducing technological devices such as smartphones, tablets, and computers that can integrate apps as compensatory strategies, researchers have gone far and wide to explore how these devices can provide as an important source of communication in alternative ways, particularly starting off by focusing on the appealing features of the devices themselves, such as ease of portability, size, text-to-speech output (Allen et al, 2016). The target population with disabilities, particularly with ASD, tend to have difficulties around expressive language, social cues, sensory processing issues, and interpersonal relationships (Roth, 2013). With that, there’s been a stark increase in the use of technology to aid people with disabilities through these situations by providing them with an alternative way to communicate with each other (Roth, 2013). Technology has been found to give users with a new sense of perspective, through the use of visual and audible aids, in addition to structuring out tasks and content in a less overwhelming manner (Roth, 2013). While this development of using technology as an alternative tool of communication is fairly new, research has begun in its emerging stages and discussions are only getting stronger in these fields of education and disabilities (Roth, 2013).

The purpose of this document is to provide readers with an insight into the world of apps that are specifically designed for people with autism spectrum disorder. Predominantly, the apps discussed below pertain to the iOS platform, but increasingly software developers are working to produce applications for the Android platform.
Reviewer: Erin Lever

Name of app: Proloquo2go: AAC in your pocket

Operating System: IOS, Android

Location: iTunes App store

Cost: $399.99

Description: Proloquo2go is a multilingual Augmented and Alternative communication (AAC) app that uses symbols to help users of all levels communicate. The symbols used in the program stem from research into communication methods for people with Autism and a range of other disabilities. The program can be customised to include pictures of the individual completing activities and organised to best suit the user. For example, parents and teachers can group and colour code activities or words that are used most frequently. Proloquo2go utilises voice to text technology with a variety of accents and languages available and has been designed to be easily paired with ongoing speech pathology or occupational therapy programs.

Alignment with the UDL guideline: Proloquo2go aligns with multiple aspects of the UDL guidelines, it fits into Guideline I - providing multiple means of representation; checkpoints 2.1, 2.2, 2.3, 2.4 and 2.5, under language, expressions and symbols (CAST, 2014). Secondly, it also fits into Guideline II - Provide multiple means of action and expression; checkpoints 5.1 and 5.2, under expression and communication (CAST, 2014).

Curriculum area: Proloquo2go fits into the area of life skills as it is primarily used to develop an individual’s communication skills, a vital part of day to day life.

How does the app meet the National Disability Standards? Proloquo2go can be individualised and differentiated in a variety of ways, thus meeting the National Disability Standards. Firstly, the app can be programmed across different vocabulary levels with in app purchases available of other existing language development programs, making it accessible to beginner and more advanced communicators. In terms of accessibility, there is also a choice of 23 different grid sizes, so that information presented is not overwhelming for individuals of a lower level yet still provides options for those that are more advanced communicators. The app is easily individualised to meet the needs of the individual, with over 20,000 symbols that can be used, the option to insert pictures of the user completing activities, their surroundings and people around them. The use of partner apps alongside Proloquo2go, such as Vocapriority, means that symbols can be ordered in priority and frequency of use.

How the app changes pedagogy (SAMR)? Proloquo2go fits into the transformation hemisphere of the SAMR model. The app, which is augmentative in its nature, being a form of AAC, allows users to transform their level and style of communication.

How the app encourages person centred planning. Proloquo2go fits easily into a person-centred approach as it allows the individual to communicate with others around them. This allows the teacher or trainer not only gain an understanding of how the individual is able to complete tasks
and learning activities, but also gain insights into how the student is feeling and what they want. It promotes an increased level of social interactions, which is important in developing social skills in individuals with autism. By utilising the elements of the app that are able to be individualised, teachers can ensure that vocabulary is at the appropriate level, whilst still developing the user’s language skills.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Proloquo2go encourages several of the 5cs of a 21st century approach to education, either directly or indirectly. The app allows the user to gain easier access to the things they like, as they are able to communicate what it is that they want. This opens up the opportunity for individuals to perform activities with others, linking to the components of community, collaboration and connectivity. The app allows students to communicate how they feel and what they know, thus linking closely with components of creativity, and of course with collaboration. The app inspires collaboration with others as in its nature, communication is a collaborative activity.

**Evidence from the literature that the app is capable of the claims made:** Proloquo2go has been investigated across a range of educational literature, mainly investigating claims that the app can greatly assist individuals in developing communication and social skills. Kreck (2015), highlights that it is the interactive nature and variety of vocal features of Proloquo2go that make it effective in enhancing communication of those with ASD. The app draws on a number of strengths that have been identified in individuals with ASD, including visual spatial processing (Allen, Hartley & Cain, 2016). The most effective modes of intervention for children with ASD need to be individualised to best suit the learning (Allen, Hartley & Cain, 2016). Proloquo2go is able to be modified to meet not only the vocabulary needs of an individual, but also their visual stimuli need and linguistic requirements.

**General Comments:** One downfall of Proloquo2go has been highlighted in the literacy, that for students of lower ability, the app can be difficult to navigate if students cannot recall groupings of objects (McEwan, 2016). For example, if students cannot remember if the symbol for ‘tired’ comes under bedroom, activities, or personal needs, they may become frustrated when attempting to locate the correct symbol for tired. This app could prove very useful for teachers, particularly when used in conjunction with other programs and interventions. By developing a student’s communication skills, we can provide students with more independence and thus a greater quality of life.
Reviewer: Erin Lever

Name of app: Remories

Operating System: IOS, Android

Location: Google Play Store, iTunes App Store

Cost: Free

Description: Remories provides an instant support system for individuals who may struggle to complete tasks or interact with others. They can record their past experiences and good memories in the form of a text, photo or video that can be revisited the next time a similar situation arises. The app can be synced up with other calendars and emails to provide automatic prompts. Similarly, prompts can also be set to automatically remind the user of past successes, for example, last week’s positive experience grocery shopping can be paired with the reminder for grocery shopping this week. Remories allows users to set goals and see a visual representation of how they are working towards this goal. All aspects of the app can be shared with other users to promote a community of support, while a news feed can also be accessed to see friends’ stories and successes.

Alignment with the UDL guideline: Remories links to several of the UDL guidelines, in particular guideline 5: Provide options for expression and communication, checkpoint 5.2 and 5.3 (CAST, 2014). The app also meets all of the checkpoints under guideline 6: Provide options for executive functions through its ability to help students set and track goals, manage information and processes and allow for strategy development. The app also aligns with guideline 8: provide options for sustaining effort and persistence, checkpoint 8.1 which centres around goal setting. Finally, the app also works in line with guideline 9: provide options for self-regulation, checkpoints 9.1, 9.2 and 9.3 (CAST, 2014).

Curriculum area: Remories assists students in developing their life skills, organisation, self-motivation and memory recall.

How does the app meet the National Disability Standards? Remories works in line with National Disability Standards as it allows individuals to achieve a greater level of independence and thus an improved quality of life. Users can individualize the app to suit their own needs through the medium used to record their memories and experiences - text, photos or videos. The app can be linked to an individual's schedule, calendars, email and synced across multiple devices. Remories however, does not allow for a great deal of differentiation as it targets users that have an average literacy level to access all facilities within the app.

How the app changes pedagogy (SAMR)? The app fits into the Enhancement section of the SAMR model, becoming a redefinition of a student diary.

How the app encourages person centred planning. Remories targets person centred planning at its core, with goal setting, self-regulation and personal reaffirmation central areas of the app. The goal setting aspect of the app, which can be aligned with the individual’s schedule, encourages all students to strive and achieve, no matter what their goals may be. The recall premise of the app
can be used to encourage students to reflect and recall previous successes, assisting individuals in overcoming struggles they may face in both their everyday and academic lives.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** Remories links primarily to the idea of Curation when discussed in terms of the 5cs of a 21st Century approach to education. It allows users to sort and store information that they deem important in a way that suits them. This allows for reflection and goal setting to help an individual succeed.

**Evidence from the literature that the app is capable of the claims made:** Digital recording of one’s life, such as that used through Remories has been shown not only to increase the degree of control that individuals have over their own lives, but that that ability to revisit digital memories in the future can assist in developing the ability to plan for one’s future (Beyer, Meek, Kilsby & Perry, 2008). Digitally recorded photos, videos, memories, experiences and feelings such as those in Remories, can provide valuable prompts for individuals with ASD who may struggle with recall abilities or processing difficulties. (den Brok & Sterkenberg, 2015). Programs such as Remories also assist in providing a support network for people with ASD, which can assist in developing individuals’ social skills (Raghavendra, Grace, Newman, Wood & Connell, 2013).

**General Comments:** Remories is an app that could be easily utilized in the classroom to assist in developing self-regulated learners. Individuals can seek help from their own past experiences in an easy to access, individualised way, without necessarily requiring the help of others, which also assists individuals to develop greater levels of independence. As the app can be used easily across all experiences and areas of life, students may begin to see links between experiences in and out of school and thus overcome ongoing challenges more easily.
**Reviewer:** Erin Lever

**Name of app:** Autism Learning games: Camp discovery

**Operating System:** IOS, Android

**Location:** Google Play Store, iTunes App Store

**Cost:** Free

**Description:** Camp Discovery is an app designed specifically for children with Autism. It combines a range of educational activities and games for children to learn about colours, numbers, emotions, shapes, locations and more with easily customisable levels. Users are first asked to select their preference for rewards when correct answers are given to increase sensory engagement. The app minimises incorrect responses to student answers using visual prompts such as making the correct answer larger. These prompts gradually disappear as students make more correct answers. Once users have progressed through 3 rounds, they are rewarded with mini games to maintain motivation. Parents or teachers are easily able to track progress and identify areas that may require more assistance.

**Alignment with the UDL guideline:** Camp discovery particularly targets Guideline III of the UDL guideline - providing options for sustaining effort and persistence, specifically checkpoints 8.1, 8.2 and 8.4 (CAST, 2014). This is done mainly through the option of allowing students to choose their preferred type of feedback, minimising negative feedback that the student receives and the use of mini games to maintain motivation.

**Curriculum area:** The Camp Discovery app targets the life skills area of the curriculum, as not only are students learning to recognise a range of numbers and objects but are also developing the ability to self-regulate their learning.

**How does the app meet the National Disability Standards?** Camp discovery is particularly advantageous for individuals living with ASD as it targets the individual’s sensory preferences. In being able to choose their preferred method of reward, such as calming leaves falling or explosive stars everywhere, students are more likely to be engaged and motivated for longer periods of time. Difficulty levels can be easily customised, allowing further individualisation of the app for users. Camp discovery also provides differentiation for individuals throughout each activity, with correct answers being made visually larger, or options reduced if the student requires some prompting. This level of prompting is gradually taken away as students make more correct choices.

**How the app changes pedagogy (SAMR)?** Camp discovery fits into the transformation section of the SAMR model. It acts as a substitution for traditional learning methods such as pen and paper or flash cards. The app can also be a substitution for a teacher in some instances, in that students are still being rewarded, receiving feedback and being given prompts.

**How the app encourages person centred planning.** Camp discovery has been designed around a person-centred approach, with a clear focus on the different sensory needs of different individuals with ASD. Students can easily change their reward preferences as their individual preferences change.
The app can be easily customised to suit the current and predicted level of the child, providing them with work that is adequately challenging yet still allows for progress.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Camp Discovery app primarily encourages the areas of connectivity and creativity. The app encourages internal motivation in students, by providing them with access to something that is preferable to them and through the use of the mini games, this in turns provides students with more freedom to connect and interact with things that they may like. Similarly, through providing students with knowledge surrounding letters, numbers, emotions, objects etc, the app broadens a child’s knowledge base, allowing them to create with more and more elements.

**Evidence from the literature that the app is capable of the claims made:** Individuals with ASD have been shown to have extreme or ritualised responses to various sensory stimuli. These can result in an strong preference towards, or aversion against particular sounds, images, tactile sensations, tastes and light patterns (Kanakri, Shepley, Varni & Tassinary, 2017). Kanakri, Shepley, Varni and Tassinary (2017) outline that over-responsivity, or aversion to sensory input can trigger emotional responses and disruptive behaviours. Camp discovery aims to minimise this emotional response by allowing children with ASD to choose the stimuli that they find preferential. Little, Ausderau, Sideris, Baranel (2015) have also highlighted that by reducing sensory input that children may be aversive to, they are more likely to learn and take new information on board. This research also found that individuals with ASD prefer sensory input to be expected and predictable. Camp Discovery, operates in line with these findings, as if students are able to choose the sensory input that they are receiving it is not only preferable but also becomes expected. The camp discovery app allows students to access an in app mini game upon the completion of three tasks. This aims to increase student motivation through providing a reward, sensory stimulus and a “brain break”. Grant and Crossen (2014) outline that through providing students with ASD access to preferable rewards, such as computer games can not only increase motivation towards educational tasks, but also significantly decrease problem behaviours as students are not becoming overwhelmed with the task.

**General Comments:** The camp discovery app could be highly useful to teachers and parents alike, particularly for younger children with ASD. It can be used in conjunction with classroom activities and provides students with ASD an environment to learn crucial skills in an environment free from the pressures of navigating social interactions. The app can be used to develop numeracy, literacy and social skills in students with ASD.
**Reviewer:** Erin Lever

**Name of app:** Toca Store

**Operating System:** IOS

**Location:** iTunes App Store

**Cost:** $4.99

**Description:** Toca Store is a shop based game that allows users set up their own stores. Users can either use the app collaboratively, playing either the role of the shopkeeper or the customer, or fulfil both roles. Users must select which items to sell and how much to sell them for, before than inviting friends or customers to buy their products. The user interface is simple to use and can be modified to suit the visual preferences of the individual. The game operates under the premise that there are no rules and that children can create their own world.

**Alignment with the UDL guideline:** Toca Store aligns predominantly with Guideline 7 of the UDL guidelines - Providing options for recruiting interest (CAST, 2014). Within this guideline, it fits into checkpoint 7.1, 7.2, 7.3 as it provides individual choice and autonomy, optimises relevance with real-life situations and minimises threats and distractions as children can play the game together without needing to navigate social interactions.

**Curriculum area:** Toca Store teaches students important life skills including decision making, counting and collaboration.

**How does the app meet the National Disability Standards?** Toca Store allows students to choose and design their own stores. By making decisions that allow them to personalise the store, the app is allowing for individualisation. Furthermore, by not having any specific rules that children must follow to complete the activity, the app can be easily differentiated for different ability levels.

**How the app changes pedagogy (SAMR)?** Toca store fits into the enhancement category of the SAMR model, in particular as a redefinition. That is, that students could play a similar game without the app, yet the app enables children to redefine how they play the game of ‘shop’. This redefinition can be helpful for individuals with autism who may struggle to interact with their peers in typical social setting surrounding a game of ‘shop’. redefinition - same game different context.

**How the app encourages person centred planning.** Toca Store can be used as a part of person centred planning approach in that it can be used as a part of a student reward or work station in investigating number, money or decision-making skills. The app encourages students to make their own decisions, while also presenting them the ability to practice every day occurrences, such as going to the supermarket, in a safe and controlled environment.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Toca Store encourages students to develop both collaboration and creativity. For example, students are able to work with a peer to play a game, without necessarily requiring developed social or interpersonal...
skills. Students are encouraged to be creative in their store by choosing what items they would like, how much to sell them for and how they want the game to work.

**Evidence from the literature that the app is capable of the claims made:** Toca Store aims to develop the social and creative skills of individuals through encouraging collaboration with others and allowing users to create their own rules and stores. Boyd et al (2015), have found that multiplayer games, particularly those utilising touchscreen technologies have been shown to increase sociability and communication among players. This then translates to improved social skills within the classroom environment. Toca Store aims to increase real-life experiences and relevancy of learning through letting students play in a setting that mimics that of real life. This prepares students not only for different environments, but the type of interactions they may have within these. Furthermore, teaching student’s real-life scenarios, such as the need to pay for items, prepares them for post-school life and helps develop active members of the community (Test, Smith & Carter, 2014).

**General Comments:** Toca Store, whilst it cannot be used as a large part of learning, could be easily integrated by teachers into reward time or workstations for student ASD. It could also be highly beneficial in encouraging interpersonal communication between students, especially those that may struggle to interact with peers.
Reviewer: Erin Lever

Name of app: Autismate

Operating System: IOS

Location: App store

Cost: $150

Description: Autismate is a augmented and alternative communication (AAC) app that assists users who have difficulties with verbal communication. It uses pictures and symbols to help users communicate their thoughts to others. The app can be fully customised to individuals and progresses with the changing needs of the individual. Autismate allows users to take a picture of their surrounds to create scenes. They are then able to tag “hotspots” which, when tapped open a menu that allows them to see words or common phrases used in that “hotspot”. Videos and pictures can be easily added to different scenes to further assist users in their communication. The app also incorporates the use of visual schedules, which show, using pictures, an individual's tasks to complete or plans for the day in chronological order.

Alignment with the UDL guideline: Autismate aligns primarily with guideline 5 - providing options for expression and communication. From this guideline, the app meets checkpoints 5.1, 5.2 and 5.3 (CAST, 2014). It uses multimedia for communication, uses multiple tools for construction and composition purposes and builds fluencies with gradual progressions, as the user requires it.

Curriculum area: Autismate targets the life skills area of the curriculum through teaching student’s communication and organisation skills.

How does the app meet the National Disability Standards? Autismate allows for a high level of both differentiation and individuality. The app can be used with preloaded word banks, or fully customised to show the individual's environments and words they would commonly use in these settings. Similarly, the level of difficulty of words that can be accessed by individuals can be amended to meet their skill level. The app progresses with the individual as their ability progresses to encourage further skill development. Users are also able to individualise the task organiser and daily schedule elements of the app, using pictures, videos and notes to remind them of tasks.

How the app changes pedagogy (SAMR)? Autismate fits into the Transformation hemisphere of the SAMR model as its Augmentative in its nature. The app transforms the communication options that are available to the individual with ASD.

How the app encourages person centred planning. Autismate can be easily used alongside speech therapy programs, as it uses many symbols similar to those used in therapy sessions. This means, that therapy and learning plans can be easily integrated, making for a highly person-centred approach. As the app allows users to include their own scenes and commonly used words, it can be used to target particular areas of need and progress at their own speed.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? In considering a 21st Century approach to learning, the Autismate app encourages collaboration with others through developing an individual’s communication skills. By empowering them with a way to express their thoughts and ideas, it also encourages creativity. Finally, by again providing an avenue for communication encourages community in individuals with ASD, as they are able to connect with others in fields or activities that they may have a particular interest in.

Evidence from the literature that the app is capable of the claims made: Autismate claims to improve the communication of individuals with ASD with symbols and a fully customizable, user-friendly interface. Alzrayer, Banda and Koul (2014) found that programs such as Autismate were moderately to highly effective in improving communication in individuals with ASD particularly as users were able to learn to use the program quickly and symbols were clear and highly iconic. Autismate is highly customizable to user preferences, allowing them to include information from and about their own settings and can be adjusted to suit skill levels. This integration of user preference has been shown to increase not only communication levels in people with ASD, but also decrease problem behaviours and accelerate learning (Boon, 2016). Through combining the use of visual schedules with an AAC app, Autismate aims to simultaneously develop an individual’s levels of communication and valuable life skills. The use of visual schedules, such as those in Autismate has been shown to be advantageous in developing independence, interpersonal skills and task engagement in students with ASD (Hume, Wong, Plavnik & Schultz, 2014). These skills in turn, aid in the development of communication skills of children with ASD.

General Comments: Teachers could easily use this app to guide students’ speech and communication development in the classroom. Visual schedules can be used as a part of the app to assist students in developing organisational skills and understanding what is required of them for various tasks. By customizing the app, individuals can use the app to move seamlessly between communicating at home and in the school environment. Finally, the app can easily be used in collaboration with intervention or therapy programs, making it highly valuable to both students and teachers alike.
Reviewer: Rajuna Singh

Name of app: ASD Tools

Operating System: IOS

Location: iTunes App Store

Cost: $5.99

Description: The app ‘ASD Tools’ is designed for those who have communication difficulties. The app helps users to complete the task by breaking it down into smaller pieces and achievable modes. After completing a task children would get a reward that motivates them to learn more. This app has been used by parents, therapists and teachers all over the world to enable children with ASD as well as children with communication difficulties. The popularity of ASD tools is growing due to its flexibility of functions according to the need of the child. ASD Tools has four different tools, first and then - which includes a Visual schedule, choice board, diary; breaking task down, timer, and rewards. The app gives children the ability to understand the process of stepwise work, visual schedule to understand daily work schedule; and getting rewards helps to increase the feeling of joy which builds confidence to learn more (Apple iTunes, 2016).

Alignment with the UDL guideline: ASD Tools has four main tools that align with UDL guideline II: Provide Multiple Means of Action and Expression, which explains about expression, communication and working stepwise to do tasks. This meets with checkpoint 5.3: build fluencies with graduated levels of support for practice and performance. The rewards component of the app also aligns with the UDL guideline III: provide multiple means of Engagement as it utilises the benefit of reward as a motivational factor. Therefore, ASD Tools also meets checkpoint 7.3: minimize threats and distractions (CAST, 2014).

Curriculum area: ASD Tools has tools as first and then, timer and visual schedule so it gives students understanding about steps, ranks and limits allowing the app to meet area of curriculum of Mathematics. Moreover, after completing a task, users would get a reward, which helps them to understand the concept of doing right which also meets area of curriculum of social skill development.

How the app meet the National Disability Standards? ASD Tools is designed with various features that fits individualisation. This app helps an individual to express through his or her participation so this app has met the National Disability Standards.

How the app changes pedagogy (SAMR)? The app ASD Tools can be used in substitution of flashcards or pictures into touchscreen so it can be classified as substitution using the SAMR model that is defined as enhancement of learning. The children are learning the same things, which they used to learn through flashcards or images, but as the pedagogy has adapted the technology, this is substituted through technology. It helps children to understand learning through doing in order to improve ability of child, with the use of technology as a part of pedagogy.
How the app encourages person centred planning. The app ASD Tools has a person-centred approach because it helps children with disability to break down the tasks into smaller pieces that they can accomplish by themselves. It also helps them to learn by doing to improve their ability and to achieve goals. Through this app, a teacher or trainer can enhance ability of children with autism to develop understanding about stepwise work and prioritising tasks.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? ASD Tools fits a 21st Century approach to teaching by encouraging connectivity and curation. The teaching approach fits connectivity because they are learning tools such as breaking down tasks into small pieces and accomplishing it stepwise. This working stepwise activity helps individual to accomplish any task by their self, which means working independently. The app also covers curation. There is a library for images and own photos which can be collected and used for learning according to the need and interest of the child.

Evidence from the literature that the app is capable of the claims made: Roxby (2012) found that Veronica, who has been diagnosed as being on the Autism Spectrum, could understand that she would get a reward of music box after collecting five tokens while playing on tablet. Children with autism have difficulties in identifying facial expressions so when they accomplish tasks they cannot understand our smile and appreciation (Roxby, 2012).

General Comments: Technology and multimedia play a vital role in today’s education. As children with ASD have difficulties to communicating as well as difficulties understanding a reward such as teacher’s facial expression, the use of ASD Tools would be helpful for educators and teachers to initiate connection of feelings through technology. Moreover, it would be beneficial to assist in understanding the feelings of children with ASD with communication difficulties.
**Reviewer:** Rajuna Singh

**Name of app:** Talk Tablet – Autism Speech AAC

**Operating System:** iOS, Android

**Location:** Play Store

**Cost:** $104.99

**Description:** The app is developed for people with different kinds of disabilities who are facing difficulties in communication. Talk Tablet – Autism Speech AAC is a type of Augmentative and Alternative Communication (AAC) which enhances communication ability of people with autism, developmental delay, Down Syndrome, stroke and other communication difficulties. The features of the app are very useful and include; speak through pressing buttons; on screen keyboard with word prediction; and many symbols that can be a voice for people with different types of communication difficulties. There are many features that can be customised to fit the individual, such as grid size, colour and word prediction or pictures to express selves. Additionally, it has natural sounding voice with multiple languages and can record audio too. The app can be password protected to stop unwanted changes that could be made by others (Google Play, 2017).

**Alignment with the UDL guideline:** Talk Tablet – Autism Speech AAC is especially designed as an alternative way of communication. This app meets the UDL guideline I: provide multiple means of representation. The app has various features including multiple voices, multiple languages, text, symbols, pictures, and recording of voice for effective alternate ways of communication. These features meet with checkpoint 2.1: clarify vocabulary and symbols, checkpoint 2.4: promote understanding across languages and checkpoint 2.5: illustrate through multimedia (CAST, 2011).

**Curriculum area:** This app is especially designed for communication so it helps overall area of curriculum but as a medium for understanding and expressing.

**How does the app meet the National Disability Standards?** Talk Tablet – Autism Speech AAC meets the National Disability Standards because it gives freedom of expression to people with ASD as well as those who have other communication difficulties. The design of the app includes; speak by touching button, onscreen keyboard and over 30,000 Symbolstix symbols enables an individual to make their own choice to express their feelings. This facilitates them to communicate independently in a non-discriminatory way.

**How the app changes pedagogy (SAMR)?** The app Talk Tablet – Autism Speech AAC can be used both as a Substitution and Augmentation in the SAMR model. it can be used as a substitution because instead of using flashcards or communication boards, teachers can now use a touchscreen symbols or pictures to teach. This app has a variety features and use of word prediction, which helps people with autism, developmental delay, Down Syndrome, and Stroke to type and spell correctly. This part of the app can be classified as augmentation in the SAMR model because it helps an individual to learn word formation and spelling by using word prediction. This app changes pedagogy of
teaching from use of flashcards and pictures to adapting modern technology that make it easier to learn for people with communication difficulties.

**How the app encourages person centred planning.** The design of an app Talk Tablet – Autism Speech AAC is not only designed for people with ASD but also useful for other kinds of disabilities who may be facing communication difficulties. It has different types of features that can be tailored according to need of the individual. Talk Tablet – Autism Speech AAC is person centred app in that, according to the ability of individual, they can choose the language they prefer, and the different approach to communication such as communicate with text to speech, using symbols, pictures and so on.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app, Talk Tablet – Autism Speech AAC encourages four areas of 21st Century approach to teaching, connectivity, creativity, community and curation. It covers the area of ‘connectivity’ because it helps an individual to communicate independently through several ways such as text to speech and use of symbolstix. The app also covers other areas such as creativity and community. creativity in the sense that, users would be able to improve their writing through word prediction, presenting feelings by using images or symbols. The area of community because they can share vocabularies from one Talk Tablet – Autism Speech AAC to another. Talk Tablet – Autism Speech AAC has feature that allows choosing and creating of own vocabularies and a backup and restore feature that covers the area of curation of 21st Century teaching and training approaches.

**Evidence from the literature that the app is capable of the claims made:** Children with autism spectrum disorder have benefited from using apps on a tablet. There are differences in performance, participation and engagement of children with ASD in tasks using an app compared to without using app. In the study, children with ASD speak more, have more verbal exchanges, and physically participated more too. The use of Talk Tablet – Autism Speech AAC also enhances the ability of individuals if they use it continuously. Children with communication difficulties and ASD can benefit by using the app as the voice for them via text to speech, symbols, images or whatever communication method they choose. As children are interested in technology, portable multimedia tablets can be used to stimulate and to develop academic and communication skills of children with ASD (Hourcade, Williams, Miller, Huebner, & Liang, 2013; Lorah, Parnell, Whitby, & Hantula, 2015).

**General Comments:** Use of app ‘Talk Tablet – Autism Speech AAC’ for children with communication difficulties would be better way to open the door of expression through technology and would be helpful for them to communicate independently. Even though there are significance of using apps, due to many features, it seems hard to use by children with learning difficulties or children with ASD. It is wondering how people with learning difficulties would be able to learn complexity of the app with many features. It is a good to have many features but nothing is a good if it is more than needed.
Reviewer: Rajuna Singh  App 8

Name of app: Care for me

Operating System: IOS

Location: iTunes App Store

Cost: $1.49

Description: The app Care for me can be used by a person with either an intellectual disability or physical disability. Additionally, carers also benefit from the app because of its features of recording of text, photo, and video for those are routine workers. Care for Me provides clear instructions for caring for person with a disability through text, photos and videos. There is a calendar too, which helps to show daily caring services. This app can be updated as required and password protected. All the routine and instructions for caring work, can be saved in iCloud (Apple iTunes, 2016).

Alignment with the UDL guideline: The Care for Me app meet the UDL guideline II: provide multiple means of action and expression, as it illustrates information about daily activities in different ways. It helps people with learning disabilities to retain the information and meets checkpoint 6.3: facilitate managing information and resources. Additionally, it also helps the person with a disability to save the activities as pictures or video, using multimedia to communicate or express to the carer, or memorise the task. This meets checkpoint 5.1 Use multimedia for communication (cast, 2014).

Curriculum area: This app meets curriculum area in a broader level of life skill. It is more focused about caring of day to day life activity for people with a disability.

How does the app meet the National Disability Standards? Care for me app can collect the information about day to day caring life of people with a disability. This app can support an individual to gather the information and communicate with the carer. Additionally, Care for me app meets the National Disability Standards to collaborate need of person with disability with their career based on choice and the decision of the person with a disability.

How the app changes pedagogy (SAMR)? This app, is designed for the day-to-day care schedule and allows for clear communication to carers who may be unsure about the timing and method needed for supporting and caring for people with disabilities. The illustration of day-to-day life through multimedia is quite an advanced way to explore the need of people with disabilities. The use of this app can be very helpful for those with communication difficulties, and would not be able to express their day to day need of care and time schedule properly without the use of multimedia. Use of multimedia is the modification of the way of communication, so the app is a modification in the SAMR model. The teacher can adapt this app, Care for me, as a part of pedagogy which would be helpful for children with disability to express their very regular and basic needs independently and can be highly beneficial in critical situations.
How the app encourages person centred planning. Care for me app encourages person centred planning because in this app a person with disability can store their daily care work in different forms based on their strength and capabilities. For instance, day-to-day care planning and time schedule with text, in picture format or with videos. This can be updated if needed.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app Care for me meets the connectivity and curation areas of a 21st Century approach to teaching and training. The Care for me app has features such as storing data as text, images or videos of the activity and time schedules. These can be used by the individual as well as by the carer. Through the app, an individual has control and can independently communicate their day-to-day needs. Moreover, the app helps children with disability by learning by doing by following the schedules and activities provided in app, which helps them to be independent and encourage them, covering the area of connectivity in a 21st Century teaching approach. The app also stores and updates the caring timetable and access to the instruction via image, videos and text. It is a collection of essential things that has been categorically managed so curation is another area of 21st Century approach to teaching that the app covers.

Evidence from the literature that the app is capable of the claims made: In proper communication, it is important to transfer the message from speaker to listener. Children with communication difficulties and autism cannot express their need and feeling properly to their carers (Volden, 2017). The App Care for me has features that allow caring instructions and timetables to be saved as text, image or video. This app can be very helpful to explain about the needs of the individual to get the help. An Individual who has difficulties communicating or children with autism can communicate and are able to transfer the message of daily need to the carer when the regular caring person is not with them. Additionally, they can also follow the instruction in app to care for themselves.

General Comments: The app can be used as a medium of communication for children who have communication difficulties. The app would be helpful for developmental educators and teachers as instead of repeatedly giving an instruction and teaching, they can facilitate to learn by themselves via following the app for day-to-day life activities and it would be helpful for them to be more independent.
Reviewer: Rajuna Singh

Name of app: Pictello – Talking visual story creator

Operating System: IOS

Location: iTunes App Store

Cost: $30.99

Description: Pictello – Talking visual story creator app is for telling stories. This app helps to create a social story or make a slideshow with pictures or visual schedules for children with autism. Pictello tells stories by video, photos as well as highlighted text to speech. This app helps children to enhance their literacy skills of reading, writing with text to speech by highlighted word and enhanced spelling using word prediction and speech. By creating stories, children’s social skills of the child are developed. In Pictello it is possible to add your own photos with different activities and then can create your own story. There is an option to make short videos with recording of own voice too. Created story can be shared to with other Pictello users, and it is possible to share stories, videos through non-Pictello user by Pdf, printing the document and Dropbox. There are multiple languages available to tell a story so language also can be chosen (Apple iTunes, 2016).

Alignment with the UDL guideline: The app Pictello – Talking visual story creator, is a visual storytelling app which uses own photos, videos and recordings. It helps students to be creative, for planning and to think strategically while making and presenting stories. The app, which helps a user to create a story meets checkpoint 6.2: support planning and strategy development summary which is in the UDL guideline II: provide multiple means of action and expression (CAST, 2011).

Curriculum area: This app helps students to be creative and strategic thinkers by creating stories. Social stories are significant for social skill development. Additionally, this app also assists the student to develop literacy skills by using text to speech, highlighted word and word prediction.

How does the app meet the National Disability Standards? Pictello – Talking visual story creator app helps people with disabilities to develop creativity by creating social stories using pictures and photos of their own life events. It promotes social skill development and helps them connect with the community, friends and increase participation in social activity that meets the National Disability Standards. There are multiple languages, which is significant for adapting to the individual to fit their needs.

How the app changes pedagogy (SAMR)? Pictello – Talking visual story creator is a new voice for children with communication difficulties. This app can break the traditional way of storytelling by use of voice only. Pictello – Talking visual story creator can be a voice for people with disabilities and those who are not able to explore their creative thoughts and imaginative stories that they feel and exist in their mind. This app helps teachers to support students with communication difficulties to express their stories. This expression would be also helpful to overcome their level of stress. This app has many features such as text to speech, adding pictures and video, sharing stories with
friends which enhances their knowledge, therefore Pictello – Talking visual story creator can be classified as Redefinition in the SAMR model.

**How the app encourages person centred planning.** The app meets personal centred planning because the app Pictello – Talking visual story creator is about telling and creating stories but there are various methods to do it. For instance, stories can be shared with pictures only; text with word prediction and speech to text can be used; video can be included or recording of voice. It depends on the kind of disabilities what would be fitted to them to explore their creativity independently. The varieties of features of Pictello – Talking visual story creator that helps individual to adapt it in several ways based on the conditions of their disabilities.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** Pictello – Talking visual story creator covers the area of creativity from a 21st Century teaching and training approach. This is because the feature of the app is to create a story with images and with own photos, there is also the possibility to add recording of voice, make short video and share it with friends.

**Evidence from the literature that the app is capable of the claims made:** The purpose of Pictello – Talking visual story creator app is to create and tell stories using photos of an individual’s events, travels, and experiences or symbols. Hourcade, Bullock-Rest, and Hansen (2012), show that the activity of storytelling using tablet helps to develop social skills of children with and without autism spectrum disorder. During the activity, they explore their interest and show great interest in participation (Hourcade, Bullock-Rest, & Hansen, 2012).

**General Comments:** Storytelling activities are a part of education that teachers and educators have been using to teach about social skills to children with or without disability. Use of the app Pictello – Talking visual story creator adds technology as a part of pedagogy through which those who have communication difficulties or autism also can express their imagination and feelings. Use of technology would be useful in the teaching pedagogy. However, there is always pros and cons of anything that only can be evaluated by the person who has an experience in the situation or classroom environment.
Reviewer: Rajuna Singh

Name of app: Emotions & Feelings Social Story

Operating System: IOS

Location: iTunes App Store

Cost: $4.49

Description: The app Emotions & Feelings Social Story has pictures with different emotions and feelings of a people over an entire day. The app also has an activity of different times, with pictures including emotion and feelings at that time. There are social stories that demonstrate various kinds of people feeling differently in different situations; why a person feels that way and when. It also shows what are some causes behind their feelings and emotions. This app has nine buttons that illustrates nine types of emotions and feelings via stories. This app is very useful for students with autism spectrum disorder who have difficulties in identifying people’s emotions and feelings as well as good for children with communication delays and special needs (Apple iTunes, 2014).

Alignment with the UDL guideline: The app is focused on identifying emotion and facial expressions which are difficult to identify for students with autism spectrum disorder. This feature of the app meest checkpoint 9.3 of the UDL guideline III: provide multiple means of engagement’.

Curriculum area: Emotions & Feelings Social Story is about understanding emotions, feelings, and facial expressions which is aligned with social skill development of curriculum area. This app is made for age group of 5 years and under.

How does the app meet the National Disability Standards? Most children with autism spectrum disorder struggle with lack of understanding about the feelings and emotions in their surroundings. The app Emotions & Feelings Social Story helps children with autism spectrum disorder through a story to understand various kinds of feelings that people experience in different situations. Understanding the feelings and emotions of others, helps to develop social skills which enhances social participation in the community for people with autism spectrum disorder.

How the app changes pedagogy (SAMR)? The app Emotions & Feelings Social Story can be classified as a Substitution in the SAMR model because it is a substitute method in pedagogy. Instead of showing pictures, the app uses a tablet for storytelling to educate children of various kinds of feelings and emotions that people feel in different situations. Use of technology as a part of education helps them to listen to story with picture as well as practice nine types of feelings and emotions by touching buttons and listening to sounds. This app is particularly beneficial for children with autism spectrum disorder who have difficulties in identifying feelings and emotions from facial expressions.

How the app encourages person centred planning. Emotions & Feelings Social Story can be used for children with autism spectrum disorder, or communication or social skill delay. The app’s menu can be used by reading the story or going into the page with Emotions and feelings that describes nine
different emotions by pressing each button. The app can be used as needed by the individual, encouraging teacher or trainer to provide personal centred approach for teaching.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Connectivity, community, collaboration, creativity and curation (5Cs) are areas of 21st Century’s teaching and training approaches. However, the app Emotions & Feelings Social Story covers the area of connectivity only. This is because the app helps to children with autism spectrum disorder to encourage and learn for social skill development through using this app. This app gives visual support to see the emotions, expressions and feelings of other people’s experiences throughout the day through social stories.

**Evidence from the literature that the app is capable of the claims made:** Children with autism have difficulties in expressing their feelings, social interactions and communication difficulties. Due to lack of understanding about facial expressions and emotions, it is problematic for children with autism to reciprocate as a part of social interaction. An individual with autism performs pragmatic dysfunction poorly, this impacts negatively in the relationship with peers (Tartaro & Cassell, 2008; Volden, 2017). Emotions & Feelings Social Story app is helpful for children with autism to understand the relationship between facial expressions, their feelings and the situation. The app illustrates emotions and feeling through visual support and social stories. The children with ASD were more involved in and liked collaborating storytelling using technology. When using the technology, children would show those expression on their faces, such as twisting mouth to change emotion of cartoon images (Hourcade, Bullock-Rest, & Hansen, 2012).

**General Comments:** Repeated activity with nine buttons with different feelings and emotions as visual support would be useful for developmental educators and teachers to education children with autism. Additionally, social stories with scenarios would be also helpful to describe more about feelings and emotions of the people through the app rather than flashcards or traditional pedagogy. However, there is still a big question of, is using an app to teach about the emotions and feeling are sufficient to children with autism?
Reviewer: Nikita Jaensch

Name of app: i create...Social Skills Stories

Operating System: IOS

Location: iTunes App Store

Cost: $7.99, or available as a bundle with 3 other apps for $17.99

Description: This app has been designed as a platform with which to create social storybooks, with the ability to import personal photos, text and audio. Perfect for students with a range of social difficulties, this book allows unlimited pages, which can be created to explore ideas that are new and challenging, or everyday routines, such as morning routines within a classroom (I Get It Apps, 2017). Not only can this app be used to inform, but it can also be used as a prompt to encourage and support conversation, through the creation of examples, possible questions and conversation starters. To support the flexibility of the app, it has been designed for multiple users, and provides the option for a checklist function within the books.

Alignment with the UDL guideline: If used according to the intention for creation, i create can be aligned with several of the UDL guidelines, however it is primarily aligned with Principle 1: Provide options for perception and Principle 9: Provide options for self-regulation. As this app is specifically designed to provide information in the form of an interactive book, it offers an alternative to auditory information (Guideline 1.2) through images and symbols, as well as being an alternative for visual information (Guideline 1.3) as audio files can be included on the pages. It has also been designed specifically for the creation of social stories, which can promote expectations and beliefs that optimise motivation (Guideline 9.1), facilitate personal coping skills and strategies (9.2) and provide a platform that can be used as a guide for self-assessment and reflection (Guideline 9.3).

Curriculum area: This application could be used with people of all ages, in a variety of settings, as the books are customisable to assist with their use. Although it has been designed specifically for assisting social skills, the flexibility of the content within the books allows for a variety of applications, including personal schedules, social stories, and representation of work.

How does the app meet the National Disability Standards? The purpose of this app is to create learning tools that can assist with developing relationships and social skills. Standard two of the National Standards for Disability Services refers to the promotion of connections between people with disabilities and their families, friends and chosen communities. This application assists with this connection, as it aims to build the relationship strategies that are required for these connections to occur.

How the app changes pedagogy (SAMR)? i Create acts as a modification tool (Enhancement). Although the basis of the task would be the same as what could be created without the use of technology, this app allows for audio cues, images and checklists to be included in a text that may not have otherwise had these functions.
How the app encourages person centred planning. According to the Productivity Commission, person-centred approaches should be designed to maximise an individual’s ability to take control of their lives. The aim of social stories is to develop skills and understandings that assist in developing relationships, and working as part of a community. Through teaching these skills, an individual becomes increasingly independent in their ability to work effectively as part of a community.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Essentially, this app has been designed to encourage creativity, as it provides a platform to create storybooks using a variety of different text, image and audio tools. Using the books created however, this app also encourages the building of communities, and can support this is books are created within the app regarding these communities.

Evidence from the literature that the app is capable of the claims made: Findings identified in Social Stories™ to improve social skills in children with autism spectrum disorder (2010) highlight the significant positive benefits of social stories, due to story comprehension, the ability to identify and understand emotions, social and communication skills, and strategies to control aggressive behaviour. This app allows for these concepts to be explored in detail through the production, and retelling of stories that relate to an individual’s life. If the stories are created in a manner that effectively engages with these concepts mentioned above, the app should assist in the development of social skills and understandings.

General Comments: Create...Social Skills Stories has been created to assist with the development of social skills stories, providing the ability to create books using a variety of text, audio and visual cues. It has been designed to allow multiple users, enabling it to be an effective tool for settings in which several users may benefit from its use, such as in a classroom setting. The ability to personalise the elements within the book allows for a greater personalisation for the intended audience, and the added checklist function provides an opportunity to use the app for a greater purpose. This is a fantastic tool to assist people with behavioural, social, communication and emotional understanding difficulties.
Reviewer: Nikita Jaensch

Name of app: See. Touch. Learn

Operating System: IOS

Location: iTunes App Store

Cost: Free. Add-ons are available at an additional cost.

Description: See. Touch. Learn acts as a substitution tool for flash cards, relating to a wide variety of different topics. With a large variety of pre-designed packs of cards, and the opportunity to create your own cards (this function requires an add-on at $7.99), this tool enables an individual to independently test themselves, through a game like format. These cards are collated into lessons, and can be specifically designed to relate to specific content areas or students. By providing the opportunity to include the use of text, images and audio cues to the cards, they can be further tailored towards an individual’s needs.

Alignment with the UDL guideline: This application adheres to Principle I: Provide Multiple Means of Representation. This app has been specifically designed to present information in a new way (Checkpoint 1.1), and in doing this, it is presenting information in a variety of different ways to support a variety of auditory and visual methods (Checkpoints 1.2 and 1.3).

Curriculum area: Due to the many possibilities of content within the lessons, this application can be applied to a variety of different curriculum areas. Although majority of the cards have been created to relate to an educational setting (e.g. shapes, colours, finding something odd, numbers, letters and words), other packs, such as the emotions pack, or the community members pack, can act as a tool for developing social skills and understandings. Furthermore, an individual’s ability to create their own packs allows for the cards to be developed to incorporate a variety of different curriculum areas. As the ideas within the pre-designed lessons are quite basic, as it stands (as a free app) it is best suited for a younger audience, however, if the customising add-on is bought, it could target a much larger audience.

How does the app meet the National Disability Standards? When this app is used appropriately, the opportunity is presented for an individual to (possibly) choose their lessons and content within, providing an opportunity for independence in their learning. By enabling the user to test themselves using the exercises provided, it also provides an opportunity for independent learning, as the student doesn’t require another person to present the information. This could prove useful for students who struggle with social interactions, as the game-like structure of the app could be less intimidating that working with another person. As the lessons can be customised, the creators could differentiate and individualise the learning for individuals.

How the app changes pedagogy (SAMR)? See. Touch. Learn most predominantly acts as a substitution tool (Transformation). For instance, the photos used within the app could also be used if the cards were presented in a physical manner, and the voice recording is another way of presenting the information that might be shared between the learner and an educator.
How the app encourages person centred planning. This app assists in encouraging a person-centred approach as the lessons can be purposefully created and chosen according to the individual using the application. This can be differentiated according to readiness levels (Tomlinson, 2014), interest (Sousa, & Tomlinson, 2011) or other needs that require support, such as social skills.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This application encourages creativity and curation of lesson cards. Not only can it act as a platform with which lesson cards can be created, it also acts as a portable curation of lessons, that can be carried easily, allowing greater access.

Evidence from the literature that the app is capable of the claims made: According to Simulation and Serious Games for Education, there are 4 criteria that determine the successfullness of educational gaming; the content, and game, must be fascinating and engaging, it must be easy to use, be accessible through a technology that is easily accessed, and must concern concepts that are part of everyday life (2017). See. Touch. Learn can adhere to these criteria as the content should be individualised according to the students, providing an engaging activity, and is easily accessed within the app. Moreover, iPads are becoming increasingly popular within a variety of settings, influencing a growing culture of understanding how to use the device, that is, it is a familiar platform. The concepts explored within this application are relevant to many aspects of everyday life, and should be tailored to specifically relate to the individual user’s needs.

General Comments: This app has the potential to be an incredibly effective interactive way to practice concepts, especially within the classroom setting, such as spelling words, emotions and social skills. Although the application is free, there is the possibility to purchase add-ons that either provide further pre-designed lessons, or the ability to customise lesson cards. Aside from this free version, there are two other versions available that are similar, but have a few different functions not found in this version. The ability to incorporate images, text and audio cues to the cards allows this application to cater for a large range of needs and requirements, and can be customised according to individual needs.
Reviewer: Nikita Jaensch

Name of app: Settle Your Glitter

Operating System: iOS, Android

Location: iTunes App Store and Google Play Store

Cost: Free

**Description:** Settle Your Glitter has been created to assist with calming, deep breathing strategies. Through the visual use of a glitter ball, this app aims to be visually appealing and calming, whilst supporting deep breathing through a small pufferfish animation. Specifically targeting mad, sad, silly and worried emotions, the user is asked to identify the severity of their emotions, and the glitterball is adjusted accordingly. According to the developers, the glitter can represent the difficulties that we face in life, and through calm deep breathing exercises, we are able to allow the difficulties in our lives to settle, even though, just like the glitter, they don’t disappear completely.

**Alignment with the UDL guideline:** According to the description identified in checkpoint 9.2 of Principle III: Providing Multiple Means of Engagement of the UDL Guidelines, learners need understand their emotions and can react appropriately to these emotions. This app acts to support this by providing a strategy to assist with calming one down. This is done through visual representation of glitter settling and the modelling of deep breathing.

**Curriculum area:** Depending on the characteristics of an individual with autism spectrum disorder, this app has the potential to be used for all ages; however the simplistic design is most appropriate for younger users. Its focus is on self-calming strategies, however, these are also transferable to social settings, and may provide a strategy to help keep the user, and the people around them, safe.

**How does the app meet the National Disability Standards?** Visual stimulation, such as that identified in this app, can be a successful resource for engaging, and calming down people who are hyperactive, or unable to control their emotions. Standard 3.1 of the National Standards for Disability Services identifies the need for services to assist with identifying an individual’s strengths, needs and life goals. An app such as Settle Your Glitter can be an effective service in identifying and supporting a person’s emotional needs. Supports such as Settle Your Glitter can help develop positive behaviour strategies that can be introduced into life outside of the app, and can be beneficial in social contexts where people with autism spectrum disorder may feel uncomfortable.

**How the app changes pedagogy (SAMR)?** Similar to a physical version of a glitterball, Settle Your Glitter has been designed to emulate the pattern of glitter falling through water. Unlike physical versions of this tool, the app has some functions that are not available through the independent use of other glitter tools. This app has been designed with a moving animation of a pufferfish. The role of the pufferfish is to help identify the emotion that is being felt by the user, and to assist in the deep breathing exercise as the glitter is settling. Due to this, the app acts as an augmentation, because it allows independent use of the app, with the added function of a breathing model, that may not be available in physical examples of this strategy.
**How the app encourages person centred planning.** When first opening the application, the user is asked to identify their emotion, choosing from either mad, sad, silly or worried. They are then asked to select a severity of emotion, either not at all, a little bit, very or extremely. The next step is to shake the device, so that the glitter swirls within the ball, and so the breathing exercise begins. As these are the only steps within the app, the procedure is based on the user’s emotions, and nothing else. This means that the experience for the individual user is extremely personal, and as there are no other distractions within the app, the sole purpose is to focus on the individual’s emotions and breathing. This strategy can then be taken into other contexts, and can assist with a person becoming independent in this calming strategy.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?**  This application acts as a tool of connectivity as it provides a connection to a calming tool whenever there is access to a device. Although it does not provide connectivity to other information, it does provide the ability for the user to access this service wherever they are.

**Evidence from the literature that the app is capable of the claims made:** People with autism spectrum disorder can often find it difficult to engage in social interaction. When overwhelmed by his or her emotions, talking to another person may not be the best strategy to overcome this difficult time. Settle Your Glitter is fantastic for supporting situations like this as no human interaction is required for the app to begin. Students with autism spectrum disorder often enjoy watching videos (Self-Regulation Intervention and Strategies, 2014), and in the same way that this removes the face-to-face social interaction, the pufferfish animation takes the role of another’s support in the breathing exercise.

**General Comments:** Settle Your Glitter is a simple, easy to use app that assists its users in calming down through visual aids. The animated pufferfish acts as a guide for deep breathing, while the glitter is distracting to the eye, and acts as a timer. Although this app is based on the identification of emotions, there isn’t any information within the app on those emotions, so it may be difficult to use appropriately if those emotions aren’t understood correctly. Nonetheless, this app is a fantastic app to begin developing a calming, deep breathing strategy.
**Reviewer:** Nikita Jaensch App 14

**Name of app:** Behaviour World Reward Chart: Class & Chore Tracker

**Operating System:** IOS

**Location:** iTunes App Store

**Cost:** $4.49

**Description:** Reward charts can be an incredibly valuable tool for managing behaviour, and encouraging participation within a classroom. Behaviour World Reward Chart: Class & Chore Tracker is an interactive version of a rewards chart, that is designed to encourage users to develop positive behaviour habits. An in-built timer has been created, that reminds the user to consider their behaviours, and encourages them to continue working to earn rewards. This app allows multiple users, and provides a platform for individuals to create their own avatar within the app. This avatar’s aim is to collect coins, used to identify the steps towards a goal, but this can only be completed through the achievement of specific behaviours that have been previously negotiated. Although this app assists in identifying the goals, e.g. staying in my seat, you cannot specifically reward for individual goals without creating multiple reward “charts”. The number of coins collected is customisable, as are the expectations and reward possibilities, meaning that it can be individually tailored to suit the user. Not only has this app been designed to cater to an individual, it has also been designed with a class feature, where the reward chart acts as a reward chart for the entire class.

**Alignment with the UDL guideline:** As the purpose of this app is to guide the user to achieving a goal, it aligns with Principle III of the UDL guideline, as Guideline 8, Checkpoint 8.1 identifies that goals should be represented in a variety of ways. This application allows for the goals to be identified in a game-like fashion, which can be personalised for an individual.

**Curriculum area:** Building on personal development, the goals within this app can relate to a large variety of concepts, such as staying in one’s chair (behavioural), completing work (academic) or saying hello to someone (Social). It can also act as a guide with which to teach consequences, as once a coin has been gained, it can also easily be lost if the user acts in a manner that is not acceptable to the agreement made. By breaking down habits into small steps, this app can act as a guide to facilitate the development of life skills. The simplistic game-like design of this app is best suited to younger users.

**How does the app meet the National Disability Standards?** Behaviour World Reward Chart acts as a guide through which goals are achieved, meaning that it plays a role in encouraging the active participation of users. When these goals are negotiated between the user and an appropriate other, such as teacher, or carer, the individual can gain independence in their goals, especially if they are able to play a role in identifying the possible rewards. As Standard One identifies the right of an individual to choose, and have the right to control their life, the collaboration involved with the use of this app allows for this autonomy to exist, within the limitations of the context (for example, the student can’t simply choose not to work, and gain coins for that).
How the app changes pedagogy (SAMR)? The interactive game-like structure of this reward chart does not change the purpose of a traditional reward chart; however, it does allow for a variety of charts to be curated in one place. Due to the animations, it is much more engaging than a traditional reward chart, and it is possible that this would lead to a greater desire to achieve, as the nature of the chart implies a challenge. Because it is not necessarily changing the concept of a reward chart, this app is an augmentation tool, as the task has not changed, but additional functions are included that aren’t present in a traditional chart.

How the app encourages person centred planning. As this app is designed for individual, or class, goal achievement, it is a person-centred application. Through the support of surrounding peers and support networks, individuals should use this app to facilitate the achievement of goals. This means that the experience of using the app is specifically designed for the individual user.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The use of this app in a classroom setting could foster the development of a greater community, through the establishment of shared goals. Not only does the app reward the user for achieving their goals, it also fosters the communication between school and home, as when rewards are reached, it is possible to get a reward certificate sent home. This not only builds a connection between the people, but it is able to reinforce the connection between behaviours and home and school.

Evidence from the literature that the app is capable of the claims made: Some people with autism spectrum disorder can struggle with the concept of motivation, and how motivation plays a role in one’s life (Demurie, Roeyers, Baeyens, & Sonuga-Barke, 2012), as well as with the concept of consequences and rewards (Demurie, Roeyers, Baeyens, & Sonuga-Barke, 2012). Due to this possible lack in understanding, challenges, or games can often provide an effective tool for teaching motivation (e.g. we want to get all the coins!), as well as the concept of consequences and rewards (e.g. if you can sit in your seat without making loud noises, you can get a coin. If you cannot do this, you will lose a coin). The nature of this app allows for these interactions to take place, and to encourage the user to achieve their best.

General Comments: This app has been creatively designed to be not only engaging, but visually appealing. The challenge presented within the chart to gain coins is an engaging tool for facilitating the achievement of goals, and the ability to personalise the character, background, number of coins, expected goal, and rewards means that it is able to be personalised to individual users.
Reviewer: Nikita Jaensch

Name of app: Avaz AAC App for Autism

Operating System: iOS and Android

Location: iTunes App Store and Google Play Store

Cost: Free one month trial, then optional payment methods.

Pro Version $97.99 (Google Play)

Description: Avaz AAC App for Autism is an award-winning app that provides an alternative mode of communication for people who cannot effectively communicate. Designed through a collaboration with several schools and students, Avaz provides over 15,000 different symbols (through payment) to develop and improve effective communication. Not only does this app have 4 built-in voices, but it also allows some customisation, including photographs and voice recordings. Aside from the pre-designed symbols there is also a keyboard which can be used to write words, which can then be read aloud, allowing for further development of communication skills.

Alignment with the UDL guideline: Depending on the intent for using this app, it aligns with several UDL principles. Aligning with Principle II: Providing Multiple means of Action and Expression, this app specifically relates to Guideline 5, as it allows users to communicate through a different form of media. Although apps like this are generally only used for students with communication difficulties, it can also be used by individuals that don’t struggle with communication, but would prefer to express themselves through a different media. This means that it also aligns with Principle I: Provide Multiple Means of Representation, as information that would normally be presented orally can be presented through written text or symbols. Moreover, Principle III: Provide Multiple Means of Engagement aligns with this app as it provides an opportunity for students, especially those who otherwise would not be able to communicate, to have an independent voice, and provide some autonomy and independence to their work (Guideline 7).

Curriculum area: This application can be used in a variety of settings, as communication is a crucial part of everyday life. Even though this app could help in an educational setting, the reason that it helps is due to its ability to provide a tool for communication. Providing the ability to communicate means that users can build social skills, engaging in a wider community, and developing life skills. Depending on the communication and literacy skills of the individual, this app could prove useful any age group, however it has been designed quite simplistically, so would best suit school-aged students.

How does the app meet the National Disability Standards? The ability to communicate is important, and when an app such as Avaz provides the opportunity to communicate, it encourages and supports the fundamental rights of all people to have the right to choose aspects of their life, and to give them the freedom of expression (Standard 1). This concept is also identified in Standard 2 of the National Standards for Disability Services as it encourages and supports the role(s) of people with
a disability within society, and promotes and supports their inclusion and participation in the wider community.

**How the app changes pedagogy (SAMR)?** If used for the intended purpose of providing a tool to communicate with for someone who otherwise can’t communicate, or struggles to communicate (Augmentative and Alternative Communication in the Early Childhood Years, 2007), this tool acts as a redefining tool, enhancing a user’s ability to participate in their life. If a user is not able to communicate without the use of such tool, the action of communication has been transformed to enable participation.

**How the app encourages person centred planning.** Without a voice, people are not able to direct aspects of their own life. Their ability to communicate emotions, interests, personality and ideas relies upon their ability to communicate. An app such as Avaz allows for this form of communication, meaning that aspects of life can be tailored according to information provided by the individual. This ensures that the individual is at the centre of the design, planning, delivery and review of their lives, and aspects within.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The ability to communicate is crucial in the development of a community, and collaboration. With the ability to discuss ideas, form friendships based upon personal interests, and to communicate with others around them, this app is a catalyst for social growth, and independence. This aligns with the Community and Collaboration aims identified in the 5Cs.

**Evidence from the literature that the app is capable of the claims made:** According to Teresa A. Cardon the most effective form of AAC for students with autism spectrum disorder is one that uses the support of visual aids (2016), such as those available in Avaz. It has also been identified that tools such as Avaz, that provide assistive communication strategies, are increasingly showing the potential to benefit people with autism spectrum disorder, from a variety of ages and levels of severity.

**General Comments:** The easily accessible design of this app, and simple functionality allows it to be an extremely effective communication tool. Created with graded vocabulary, adjustable settings, such as size of images, caption size, images and audio, this application has been specifically designed to facilitate communication in children with speech disabilities and difficulties. Interactive communication is crucial to including people, such as those who otherwise would not be able to communicate, in communities, and is a brilliant support for developing language skills and strategies.
Reviewer: Fatema Sitakhan

Name of app: A Present for Milo

Operating System: IOS

Location: iTunes App Store

Cost: $4.49

Description: Described as “a digital storybook” (Apple Inc., 2017), A Present For Milo is an app that is designed for young children who are in the emerging stages of reading development. It is an interactive app that engages children through its animations and sound effects to teach them the basics of “vocabulary and sound-out words” (Apple Inc., 2017). The storybook is also accompanied by playful narration and sound effects (Apple Inc., 2017).

Alignment with the UDL guideline: As CAST (2011) outlines the UDL guidelines, this app represents aspects of the UDL Guideline III - providing multiple means of engagement, whereby the features of the app allows users to heighten the user’s sense of achieving goals and objectives to tell a story using expressive language and vocabulary, which develops in the process (8.1), along with fostering collaboration between the parent / teacher / carer and the child (8.3).

Curriculum area: Young children in their pre-reading stages of development, nonverbal children, and children with autism spectrum disorder would benefit from using this app. The curriculum areas covered may include social skills, reading, vocabulary, letter sounds, and word association (Autism Speaks, 2017).

How does the app meet the National Disability Standards? Following the standard of participation and inclusion as per the National Disability Standards (Australian Government, 2013, p. 13), A Present for Milo encourages users to participate in a digital medium as an individual or in collaboration with a family member or carer. The app encourages the development of skills that are fundamental towards the development of the individual for functional participation in society. This app also follows the standard of service access (Australian Government, 2013, p. 19), whereby users can access the app on their iOS operating device at any time, by paying a one-off fee for the app, which is available at a reasonable cost. Given how the app has a range of functionalities that can apply to a diverse population with and without disabilities and has a ‘review’ section on the App Store as well as their website. Users can identify and address any issues that may arise during the use of the app, which can help resolve any barriers towards their skill development on educational and social levels.

How the app changes pedagogy (SAMR)? Enhancement - by augmenting the ways in which children learn pre-reading skills and develop on their abilities to engage with educational content with the aim of functionally improving on their storytelling and vocabulary skills (Schrock, 2014).

How the app encourages person centred planning. Seeing how technology is becoming a tool that people of all ages are heavily reliant on, the app encourages young minds with learning / communication difficulties to engage in alternative ways to enhance their skill development around language and
comprehension (Ruckus Learning, 2017). It incorporates several ways of encouraging the child to participate in the educational endeavour that is fun and enjoyable. It helps the user feel invested in the storytelling process, whilst simultaneously learning the basics that help them achieve the storyline.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Collaboration between the user and their parent / caregiver to share ideas and connectivity between the elements of the story and the user’s ability to decode those elements (Carey, 2013).

**Evidence from the literature that the app is capable of the claims made:** While there is limited evidence available on this app, there was a study conducted by Williams, Wright, Callaghan, & Coughlan (2002) that explored the differences between book-based training and computer-based training in developing the reading skills in children with autism spectrum disorder (ASD). Given the nature of this diagnosis, children with ASD have been found to show better progress from learning in a 1:1 setting, rather than in a group setting (Williams et al, 2002). “Computer-assisted instruction” (Williams et al, 2002) has seen a significant rise in its popularity within the field of special education and while there is a level of scepticism around its usage and benefits, the consensus revolves around having the knowledge and skill of balancing the use of technology with other forms of educational training techniques (Williams et al, 2002). Similar to *A Present With Milo*, this study used a technologically capable “book” on a computer device, which replicated the sound effects and featured voice-overs of characters from a storybook (Williams et al, 2002). Participants could integrate voices, sounds, and texts to involve themselves into the story (Williams et al, 2002). Results from Williams et al’s (2002) study indicated that the participants were more engaged with the computer-based ‘storybook’ (30.5 hours of reading), compared to the physical book (8.5 hours). Moreover, the participants produced “twice the number of words” (Williams et al, 2002, p. 80) using the computer. While the sample size of this study was small, participants engaged in communication using gestures more during the computer condition (41 times), compared to the book-based instruction (1 time) (Williams et al, 2002). There were limitations to this study, especially around the need for teacher-participant training and the understanding of the tasks themselves. However, this pilot study by Williams et al (2002) is a preliminary step towards further research in this field.

**General Comments:** Developmental educators and teachers can use *A Present For Milo* as a means of engaging children to learn in a fun, creative, and interactive manner. The educational component of the app can contribute further towards the development of skills in children with learning/intellectual disabilities, as well as children who have been diagnosed with autism spectrum disorder.
Reviewer: Fatema Sitabkhan

Name of app: A BuZoo Story

Operating System: Android

Location: Google Play Store

Cost: $15.72

Description: *A BuZoo Story* is a touch-screen free app that invites the user to use the camera functionality on their device to direct the zoo animals into doing tasks, using hand gestures (Shailah Interactive, 2014). While it is “touch-screen free” (Shailah Interactive, 2014), this functionality can be enabled in the settings section of the app (Shailah Interactive, 2014). The app has been designed to compensate for those with shaky or unstable hands (Shailah Interactive, 2014). This ensures maximum interaction with a wide variety of individuals with and without disabilities. The app developers pride themselves in taking steps towards promoting “inclusive learning and better self-directed communication” (Shailah Interactive, 2014).

Alignment with the UDL guideline: As CAST (2014) outlines the UDL guidelines, this app primarily represents aspects of the UDL Guideline II - providing multiple means of action and expression, whereby users can utilize different ways of interacting with the app, in terms of their responses and navigation (4.1), as well as optimize tools and forms of assistive technologies (4.2).

Curriculum area: Drawing on the information offered by Shailah Interactive (2014) and Autism Speaks (2017), any child over the age of 3, anyone who is nonverbal or requires assistance. The app aims to improve skills and knowledge in the areas of recognizing animals, spelling, information gathering. It also promotes, physical activity, communication, functional skills, social skills, and language would be viable participants to benefit from this app. The target audience also includes those with autism spectrum disorder, Aspergers, or Cerebral Palsy (Autism Speaks, 2017).

How does the app meet the National Disability Standards? A BuZoo Story reflects the principles of encouraging participation and inclusion, in addition to providing service access to participants who may not can use touch screen devices or touch screen-based apps (Australian Government, 2013). People with disabilities in general would highly benefit from using this app, which not only accommodates for the limitations that people may experience from their diagnoses, but also provide them with a means of receiving a form of education, in terms of sound identification, sound-word association, vocabulary development, interaction with a realistic interface, and encouraging a sense of motivation to achieve the “goals and objectives” (Australian Government, 2013, p. 13) of this app, which is to direct the zoo animals in the right location. In terms of service access, A BuZoo Story invites people with disabilities who may have shaky or unstable hands to provide “input” (Australian Government, 2013, p. 20) to attempt the tasks of the app. If people who use this app can utilize the touch screen functionality, then there are settings available within the app to reflect this, which coincides with the Australian Government’s (2013, p. 20) point around providing “alternative access” to the app.
How the app changes pedagogy (SAMR)? Enhancement - in the form of augmenting the way in which users can treat their physical disability/ies as secondary and be able to engage with an app that adds value to their educational skill development (Schrock, 2014).

How the app encourages person centred planning. This app provides the individual with a physical disability with the ability to interact with an app that compensates for their disability and allows them to engage in an educational environment using alternative methods of interaction.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Connectivity - achieving a sense of independence and autonomy through engagement in an educational and leisurely environment, community - where people with and without disabilities can collectively achieve goals and objectives of this app, which boasts of an all-inclusive method of educating individuals across the board (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: While there is no evidence available on the app itself, there is a study by Wang, Zhai, and Canny (2003), who explored the use of Tiny Motion, which is a similar app to A BuZoo Story and incorporates the participants’ hand movements through the camera. The results of this study indicated that there was a high level of reliability of the app to capture the hand movements of the participants, so much so that it can even encourage the participant to ‘write’ their sentences onto the app.

General Comments: This app is currently available on Google Play and developments are being undertaken to have it available on the iTunes App Store, and Leap, soon (Shailah Interactive, 2014). Developmental educators and teachers can use A BuZoo Story as a means of engaging children to learn in a fun, creative, and interactive manner. The educational component of the app can contribute further towards the development of skills in children with learning/intellectual disabilities, as well as children who have been diagnosed with autism spectrum disorder.
Reviewer: Fatema Sitabkhan

Name of app: AAC Autism Talk Now

Operating System: Android

Location: Google Play Store

Cost: $2.77

Description: *AAC Autism Talk Now* is a form of alternative and augmentative communication that provides children and adults with communication difficulties an alternative means of addressing their ideas and having their basic needs met (Google, 2017). Aimed to be a learning accessory, its features include pictures, which “speak out loud” upon clicking on it, thereby encouraging the user to speak and use their language out loud as well (Google, 2017). It also provides the users with options to incorporate gestures and emotion as furthering their ways of effectively communicating with each other (Google, 2017).

Alignment with the UDL guideline: As Cast (2014) outlines the UDL guidelines, this app represents aspects of the UDL Guideline I - providing multiple means of representation, whereby users can clarify vocabulary and symbols (2.1), in addition to illustrating the educational content through multiple media (2.5). It also follows the aspects of the UDL guideline II - providing multiple means of activity and expression, where users can be treated to various ways of responding and navigating through the app to ‘voice’ their needs (4.1), along with optimizing access to forms of assistive technology (4.2). This app also demonstrates aspects of UDL guideline III - providing multiple means of engagement, where the user’s choice and autonomy is optimized (7.1).

Curriculum area: Primarily aimed at teaching the user ways to be able to communicate basic needs, such as “I Want To…”, emotions, play, and verbal output. Particularly aimed at children and adults who are nonverbal, as well as those with a diagnosis of autism spectrum disorder (Google, 2017).

How does the app meet the National Disability Standards? *AAC Autism Talk Now* primarily follows the NDS concepts around service access, whereby users are provided with the opportunity to access information through various methods within the app (Australian Government, 2013).

How the app changes pedagogy (SAMR)? Transformation by redefining the ways in which the users can participate in society and in an educational setting (Schrock, 2014). Children with ASD or special needs can use this app as an alternative and augmentative form of communication (Autism Speaks, 2017). There are visual and audible cues for the users to be able to effectively represent their thoughts and feelings and the app can be modified to suit the user’s needs from a communication aspect.

How the app encourages person centred planning. The user can type out their words to communicate with their peers and/or family members and/or their caregivers, without the need to use verbal output. The app is an AAC device that incorporates many ways in which the user can communicate - using pictures, sounds, and text-to-speech functionality.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Connectivity - allowing users to be independent in their ability to communicate with each other, using alternative ways (visual and audible cues) (Carey, 2013). They also have the control to use text-to-speech and original words that can be typed into the app for output and communication purposes.

Evidence from the literature that the app is capable of the claims made: While there is no specific evidence available on the app itself, there are studies that have been conducted around the use of AAC devices among the population of children and adults with disabilities. Talkington, McLaughlin, Derby, and Clark (2013) focused on evaluating the effectiveness of using an AAC device - Flip n Talk - for enabling functional communication in a five-year-old child with developmental delay and suspected autism. Results from Talkington et al’s (2013) study indicated that there was an improvement in the child’s ability to communicate their needs of requiring assistance and maintaining a level of attention during tasks. Like AAC Autism Talk Now functions, Flip n Talk also encouraged the participant to have an increased ability to participate in social situations with teachers and peers effectively (Talkington et al, 2013). Similarly, a study by Brady, Thiemann-Bourque, Fleming, and Matthews (2013) researched the language development in 93 nonverbal children (some with ASD diagnosis, others with Down Syndrome diagnosis) using AAC devices. While some of the AAC devices were not necessarily technology-based, the concept around the use of AAC devices has been shown to enable functional communication and vocabulary development within this target population, in conjunction with their adult caregivers and/or parents (Brady et al, 2013). The development in the child’s vocabulary is dependent on the amount that the AAC device has in store - the more vocabulary storage on the AAC device, the more the development in the child’s mental library of vocabulary identification and understanding (Brady et al, 2013).

General Comments: It sounds like a versatile tool that can enable communication with children who have difficulty addressing their thoughts or appropriately highlighting their emotions in social scenarios.
Reviewer: Fatema Sitabkhan

Name of app: 1:1 Communicate Easy - Autism App on iPad

Operating System: IOS

Location: iTunes App Store

Cost: Free

Description: Communicate Easy is an iPad app that has been designed for people with language / learning difficulties to communicate more effectively and efficiently (Pluja Apps Limited, 2015). The target audience primarily includes children with autism spectrum disorder, Aspergers, ADD, and ADHD, FG Syndrome as well as non-verbal children (Pluja Apps Limited, 2015). The app provides the user with options of using visual prompts, cards that have pictures, sound, and video features that allows the user to develop skills around choices, schedules, and stories (Apple Inc, 2017).

Alignment with the UDL guideline: As CAST (2014) outlines the UDL guidelines, this app primarily represents aspects of the UDL Guideline I - providing multiple means of representation, whereby users are provided with options of perception (UDL guideline 1.1), but also have means of encouraging comprehension (UDL guideline 3.1).

Curriculum area: Anyone who is nonverbal, or has communication difficulties, or is diagnosed with autism spectrum disorder, or has special needs who falls in the age bracket of 4+ is welcome to use this app in a functional manner (Autism Speaks, 2017). It covers the areas of communication and language, in addition to providing strategies around complex behaviour (Autism Speaks, 2017).

How does the app meet the National Disability Standards? 1:1 Communicate Easy is an app that satisfies the Rights, Service Access and Participation and Inclusion components of the NDS. In terms of rights and service access, this app provides the user with a level of “dignity and respect” (1.1) (Australian Government, 2013, p. 12) by appreciating the limitations that may be caused by their disability and provide ways of allowing these users to freely express themselves using alternative means (1.5 and 5.2). It also allows staff members and users to better communicate with each other (2.3) using visual and audio-based prompts within the app (Australian Government, 2013).

How the app changes pedagogy (SAMR)? 1:1 Communicate Easy aims to follow the rules around transformation, by modifying and redefining the ways in which children with special needs can better interact in society with their peers and people around them (Schrock, 2014). The use of visual schedules allows the target population to attempt tasks (routinely and new) in a more sequential and methodological manner (Schrock, 2014). The app can also be customized by using personal photographs and familiar sounds.

How the app encourages person centred planning. Through the level of customization and editing that users can apply to make the app their primary and effective tool of communication. It also allows individuals to attempt seemingly overwhelming tasks by breaking it down too little and manageable steps that can allow the user (target population) and their parents / caregivers to connect and collaborate to create meaningful content that can add value to their educational knowledge.
What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? Connectivity - to encourage a sense of independence and control over the achievement of goals on a routinely basis (Carey, 2013). Creativity - to create new ways of approaching tasks using the many features available on the app, such as visual schedules, designated folders, and audio/visual content from a personal perspective (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: Dwayne Lewis, who developed this app, decided to introduce it on the iPad due to its reported benefits of being an educational tool for the target population (Parades, 2013). It has been reported that this app is most downloaded in the United States of America, with New Zealand taking second place (Parades, 2013). This app adds to the technological universe that is becoming a beneficial tool in aiding with communication difficulties, particularly among children with complex communication and intellectual needs (Parades, 2013).

General Comments: This app can be extremely useful as an alternative and augmentative form of communication for children with complex communication needs. Using technology to engage this population is crucial in providing them with an all-inclusive and accessible pathway in participating in our society.
**Reviewer:** Viet Truong Nguyen

**Name of app:** First-Then Visual Schedule

**Operating System:** IOS, Android

**Location:** iTunes App Store and Google Play Store

**Cost:** $14.99

**Description:** First-Then Visual Schedule is designed as an easy-to-use tool for developing multisensory schedules for children with complex communication needs, intellectual disability, and autism spectrum disorder (ASD). The application is aiming at increasing independence and reducing anxiety during transitions through different activities by providing structural visual and auditory schedules. It consists of five format choices presenting the schedule to children so they can independently follow their progress, demonstrate outcomes once they finish a step, and start the following one.

Using visual and/or auditory cues, First-Then Visual Schedule provides positive behaviour support for daily events (e.g. morning routines, learning tasks, therapy schedules) or necessary steps for completing a specific activity (e.g. using the toilet, changing dresses, cleaning up the room).

**Alignment with the UDL guideline:** First-Then Visual Schedule can provide children with learning specialised needs including ASD with multiple a means of engagement. The use of this application is aligning with Guideline 7 - Provide options for recruiting interest. Checkpoint 7.3 - Minimize threats and distractions asserts that reducing potential stresses and distractions in the learning environment is one of the essentials to create a safe setting for learners.

Referencing to the implications offered in the guideline, First-Then Visual Schedule seems worthy to provide calendars/schedules, visible timers, cues. This tool increases the predictability of daily activities and transitions. It can be used to organise class routines. The application provides alerts and previews that can engage learners in anticipating and preparing for changes in novel steps, activities, and events. First-Then Visual Schedule can deliver both visual and auditory signals. This meets the requirement of various level of sensory stimulation presented in the guideline.

**Curriculum area:** First-Then Visual Schedule is an excellent application for creating visual and auditory tool developing cognitive skills for diverse children. Especially, the simple and multisensory interface of the app can be really valued for children with ASD, intellectual disabilities, anxiety or attention problems, and who are living with language, hearing, or information processing difficulties.

**How does the app meet the National Disability Standards?** First-Then Visual Schedule demonstrates its active role in encouraging individuality for the users. One of the rights of people with disability stated in the National Disability Standards is that they must be provided with information in a way appropriate for them. The application allows parent(s)/carer(s), even educators or specialists to add various image into the schedule. This is appropriate to typical characteristics of children with ASD. First-Then Visual Schedule directly addresses to the involvement in visual stimulus of children.
with autism. Moreover, every child with specialised needs is unique and different. Parents/carers know well what objects can attract their child’s attention and interest. Depending on that, they can choose the most efficient pictures and images to add into the schedule.

**How the app changes pedagogy (SAMR)?** It is clear to see that First-Then Visual Schedule can be used as an efficient tool for enhancing the use of the SAMR model by teachers in classrooms. For example, at the level substitution, First-Then Visual Schedule is used for timing the length of work by setting up appropriate images on the iPad screens instead of a clock or watch, such that, there is no functional change in teaching and learning but the application. First-Then Visual Schedule in teaching practice makes the learners with specialised needs like such as autism understand concepts of time easier compared to the use of traditional tool like clocks or watches.

**How the app encourages person centred planning.** First-Then Visual Schedule should be used as an effective tool that allows teachers to apply a person-centred approach for their pedagogical practice. One of the core principles of person-centred approaches is to provide a person with information he or she needs in the ways he or she wants. Classroom teachers can use First-Then Visual Schedule to help a child with ASD to manage time and the process of work by providing him or her appropriate information based on visual stimulus. Through this way, the child feels comfortable to receive information in a favourable way. Furthermore, the child also systematically gets familiar with the changes and reach novel events without stresses.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** First-Then Visual Schedule is worthy in encouraging collaboration. Teachers or specialists can use the application to develop ability of joint attention in the child by engaging him or her in choosing images, setting steps, and planning the process. The app is also a great place where parents and specialists share information and collaborate in helping the child reach goals.

**Evidence from the literature that the app is capable of the claims made:** Experimental investigations have reported a significantly inefficient ability of making joint attention and paying attention to the process of work in children with ASD (Leekam, López & Moore, 2000). On the other hand, other previous research has also pointed out that children with autism have unique needs for visual support (Dettmer, Simpson, Myles & Ganz, 2000). According to these researchers, the visual support enables the children to fit with their environments, predict planned events, realize expectations that others place on them, and anticipate changes. Such that, First-Then Visual Schedule can meet the needs of these children in managing the process of work and preparing well for transitions.

**General Comments:** In general, I highly appreciate the application of First-Then Visual Schedule for children with ASD. I think this is a great tool that parents/carers; teachers, and specialists can use to enhance ability of attention and joint attention in the children. This application is also significantly contributing to reducing stressfulness for these individuals when they transit a new step or novel event.
Reviewer: Viet Truong Nguyen

Name of app: iPrompts Pro

Operating System: IOS

Location: iTunes App Store

Cost: Au$159.99 (Pro Version) $79.99 (Standard Version)

Description: iPrompts is designed to provide visual prompts for children with intellectual disabilities and challenging behaviours, including autism spectrum disorder. The app contributes to the transitioning from one activity to the next, understanding of coming events, making choices, and focusing on the task. The application consists of four main functioning features.

Parents/carers use pictures to create and present sequences of activities as guides. The schedules may have systematic pictures, or first-this-then-that pictures. The users can also edit captions for each image and select images from iPrompts library, the users’ photos, or the internet. A Visual Countdown Timer shows an image that parent(s)/carer(s) choose along with a graphical countdown timer. It can be set to any duration and displays how much time a current activity has left or how long until the next pictured activity begins. Parents/carers can offer choices between images, empowering their children who are unable to vocalize their preferences. The users can rotate horizontally the Choice Prompt and Picture Schedule features to enlarge and orient images as required to support visual needs. The “starter” library consists of hundreds of useful pictures categorised across diverse domains. Users can also supply additional categories and digital images. From the Library search feature, users can find and save images from the internet for permanent use. Pictures can be easily duplicated, deleted, and added captions.

Alignment with the UDL guideline: In terms of the UDL guideline, iPrompts is highly valued in providing multiple means of engagement. This application aligns with the Guideline 7 - Provide options for recruiting interest. Checkpoint 7.3 – “Minimize threats and distractions” suggests that reducing potential stresses and distractions in the learning process is one of the vital demands to provide a safe learning environment for learners. Teachers can use iPrompts as a great tool to provide calendars, schedules, visible timers and cues, supporting the predictability of daily activities and transitions. It can also be used to organise class routines. The application engages learners in anticipating and preparing for changes in novel steps, activities, and events.

Curriculum area: iPrompts is appropriate to teach language, communication and living skills for children with disabilities including autism spectrum disorder, Down syndrome, Fragile X syndrome, speech difficulty, and attention deficit disorder (ADD/ADHD). iPrompts can be also applied effectively for typical pre-verbal toddlers. iPrompts allows the creation of picture-based promptings which are relevant to traits of receiving and processing information in these children.

How does the app meet the National Disability Standards? The National Disability Standards states that people with disability have the right to access information in the ways appropriate to them. The picture-based promptings provided by iPrompts is suitable for abilities of children with complex
communication needs, being aware of abstract concepts like the time, paying attention to the process of tasks, and transferring to a new activity or a novel event. The application allows parent(s)/carer(s), special educators and therapists to add various image into the schedule.

**How the app changes pedagogy (SAMR)?** As an augmentative and alternative communication system. Traditionally, teachers use verbal promptings and a clock to support a child with autism to pay attention to the process of tasks or transitioning to a novel event in classroom. by using iPrompts, the child can engage with the picture-based promptings appearing on the screen such that no functional change occurs in the process of teaching and learning but iPrompts provides a new accessibility appropriate to requirements of the child.

**How the app encourages person centred planning.** In relation to person-centred planning in teaching practice, iPrompts is a tool that allows teachers to apply a person-centred approach for their work. One of the core principles of person-centred approaches is to provide a person with information he or she needs in the ways he or she wants. Classroom teachers can use iPrompts to help a student with autism spectrum disorder to learn about time and the process of work, by providing appropriate information based on visual stimulus. Through this, the child feels comfortable to receive information in a favourable way and slowly becomes familiar with the changes, reaching novel events without stress.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** iPrompts can be used to encourage creativity and collaboration. The application is a portable, flexible, and easy-to-use tool that can be used creatively to support people with autism by choosing suitable pictures or adding meaningful captions. Moreover, iPrompts also allows the users to share provisions related to the child so that family, school staff, and specialists have accurate information and collaborate effectively in supporting the child to reach goals.

**Evidence from the literature that the app is capable of the claims made:** Su iPrompts has been viewed as one of the best augmentative and alternative communication interventions improving language, communication, and social skills in children with autism (Aziz, Abdullah, Adnan, & Mazalan, 2014; Windman, 2012). Its greatest effects on the development of children with language and communication disability have been demonstrated by research-based evidence.

**General Comments:** Based on user feedback and peer-reviewed research iPrompts is a tool that parents, teachers and therapists could use in supporting children with autism to develop their language, communication, and social skills.
Reviewer: Viet Truong Nguyen

Name of app: Learn with Rufus: Emotions

Operating System: IOS, Android

Location: iTunes App Store and Google Play Store

Cost: $7.99 (iTunes) $5.29 (Google Play)

Description: Learn with Rufus was designed to provide children with fun learning games to understand how facial expressions reveal people’s feelings. By playing the games, step-by-step children will identify facial expressions that correspond to feelings and emotions including happy, sad, angry, afraid, disgusted, and surprised. Learn with Rufus is ordered into three parts including a learning phase and two separate games (Find it and Name it):

Learning: Before the game starts, a preview of facial expressions will be shown to the child for learning.

Find It: A number of specific facial expressions are shown; the child is directed to select a suitable emotional or feeling description corresponding to each image.

Name It: A single facial expression is shown, the child will be required to name the emotion or feeling.

Depends on the child’s ability, Learn with Rufus allows supporters to customize the level of difficulties including easy, medium, hard, and expert to match the child’s level.

Alignment with the UDL guideline: Learn With Rufus provides a great facility to learn social skills for children with developmental disabilities including autism spectrum disorder. This completely aligns with the Universal Design for Learning (UDL) guidelines. The principle - “Provide multiple means of representation” in the UDL standards states that learners are different in the ways of perceiving and comprehending information. There will be no a unique means of representation best for all learners and providing appropriate options is essential. Learn with Rufus facilitates the learning process by providing visual stimulus in several levels. This is suitable for abilities and the traits of information processing in children with autism and other developmental disabilities.

Curriculum area: Learn with Rufus can be viewed as a relevant strategy used to teach social skills, language, and communication for children with autism spectrum disorder. The application also benefits to a wide range of children who are early diagnosed with a developmental disability or learning difficulty.

Meet the National Disability Standards: Learn with Rufus meets the National Disability Standards, particularly the standard of individual outcomes. Learn with Rufus supports the child to make choices about what he or she wants to do. By providing visual features, the app ensures a suitable way through which children with complex communication needs like those with autism perceive and understand information. Furthermore, especially focussing on helping the children identify facial expressions is a reasonable point of the app because most of these children seem insufficient in this skill. Learn with Rufus works toward individual goals.
How does the app meet the National Disability Standards? Learn with Rufus meets the National Disability Standards, particularly the standard of individual outcomes. Learn with Rufus supports the child to make choices about what he or she wants to do. By providing visual features, the app ensures a suitable way through which children with complex communication needs like those with autism perceive and understand information.

How the app changes pedagogy (SAMR)? In relation to the influence of Learn with Rufus on the pedagogy at schools, the app significantly changes the pedagogical practice of teachers. This is really an effective tool supports teachers to apply the Substitution Augmentation Modification Redefinition model into the classrooms. For example, before using the app on an iPad, a teacher might use a set of pictures, papers, and pencils to teach a child with autism to learn about facial expressions. Whereas, the use of Learn with Rufus on an iPad also enables the teacher to do the same work with no function change.

How the app encourages person centred planning. Classroom teachers can use Learn with Rufus as an efficient tool to provide a person-centred approach when they work with children with autism. The application is highly customisable to meet the needs for diverse skills, ability levels, and learning styles of each individual learner. Furthermore, the additional features included in the app also allows teachers to adjust the levels of difficulty matching ability of a child or select options appropriate to the real situation of each learner.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Learn with Rufus focusses on teaching language and social interaction skills. This app encourages the “collaboration” and “community” requirement of 21st century education. All 21st century learners are expected to have sufficient abilities to collaborate and participate actively in their community. Learn with Rufus significantly contributes to the preparation process for students with special needs to become active learners of the 21st century education.

Evidence from the literature that the app is capable of the claims made: Children with autism spectrum disorder typically show a poor performance when being asked to identify four basic emotions including happy, sad, angry, and surprised (Gross, 2004). Moreover, Children with autism tend to be involved in visual stimulus (Landry & Bryson, 2004). Therefore, that Learn with Rufus uses picture-based approaches to teach these kids to perceive and comprehend the meanings of facial expressions is a great teaching strategy.

General Comments: Language and social interaction skills are developmental areas that children with special educational needs like those with autism require a special support. Learn with Rufus is a learning game appropriate to these children’s ability and learning style. Parents and teachers can consider to the use of this app to improve their children’s basic language and communication skills.
Reviewer: Viet Truong Nguyen App 24

Name of app: Social Skill Builder: My School Day

Operating System: IOS

Location: iTunes App Store

Cost: $14.99

Description: Social Skill Builder was designed as a learning game improving interaction skills for children, particularly those with complex language and communication needs. The full version app offers 19 modules accompanying various sequences of videos and questions. Children play the game by answering multiple choice questions associated with the videos they view. These video scenarios present real interactions in schools and community settings. Within these settings, the users demonstrate common social interaction skills when they interact with their peers.

The application provides a wide range of functions and abilities. At Level 1, children are offered key social vocabulary. At Level 2, they respond to the multiple-choice questions. At Level 3, they identify contextual cues. And at Level 4, they create a novel awareness of social interaction based on the real situation. The My Community and School Rules included in the app is an additional level that allows children to compare, contrast and anticipate what others are possibly thinking, feeling, and going to say or do next.

Alignment with the UDL guideline: By attracting children’s involvement in playing games, Social Skill Builder offers an option for engaging diverse learners in learning. This utility aligns with the principle III of the Universal Design for Learning – Provide multiple means of engagement. Social Skill Builder can be viewed as a great tool to sustain effort and persistence for its users, particularly individuals diagnosed with autism. Through the form of playing a game, the application engages the learners in the learning process by a natural and interesting way. This is useful for children who are living with challenging behaviours. Aiming at providing developmental opportunity for children with special education needs, Social Skill Builder is a valued tool of universal design for learning.

Curriculum area: All modules of Social Skill Builder contain interactive video associated with key social thinking, language and behaviour related to daily social situations. It should be a great resource for teaching social skills to children with autism spectrum disorder. The application is also capable of benefiting to individuals with language and communication disability including Asperger Syndrome, traumatic Brain Injury, Down’s Syndrome, attentive deficit disorder, and other Learning difficulties in a diversity of ages from primary to high school.

How does the app meet the National Disability Standards? In general, Social Skill Builder meets the National Disability Standards, particularly the standard 3 - Individual Outcomes. Social Skill Builder supports individuals to access learning in the way suitable for them. By providing visual features, the game enables the learners with complex language and communication needs like those with autism perceive and comprehend basic abilities to perform social interaction. Furthermore, focussing on teaching social skills is a valued point of the app because most of individuals with
autism perform insufficiently these skills. Although as a product for commerce, Social Skill Builder works towards the goals of individuals with disability, therefore, it is also relevant to the National standards for disability services.

**How the app changes pedagogy (SAMR)?** With regard to the use of Social Skill Builder at mainstream schools, the application significantly impacts the pedagogical practice of teachers. The iPads included Social Skill Builder should be the first option for teachers to apply the Substitution Augmentation Modification Redefinition (SAMR) model into the classrooms. For example, before using the app on an iPad, teachers might teach key social vocabulary while students might respond to the multiple-choice questions on papers or white boards. Whereas, the use of Social Skill Builder on an iPad enables the teacher to do the same work in a facilitated and efficient way with no function change.

**How the app encourages person centred planning.** Classroom teachers can use Social Skill Builder as an efficient tool to provide a person-centred approach when they work with children with autism. The application is highly customisable to meet the needs for diverse skills, ability levels, and learning styles of each learner. Furthermore, the additional features included in the app also allows teachers to adjust the levels of difficulty matching ability of a child or select options appropriate to the real situation of each learner.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** One of the fundamental purposes of the 21st century education is that all its learners must be able to communicate and collaborate effectively within their community. This seems so easy for some, but remains a hard challenge for a diversity of learners like those with autism. Social Skill Builder offers a system of key social vocabulary, typical manners of social interaction, videos presenting real communication situations through which children can learn various social skills. As a high-tech assistive technology focussing on improving social interaction skill for individuals with complex language and communication needs, Social Skill Builder can be viewed as a marked contribution to the development of 21st century education.

**Evidence from the literature that the app is capable of the claims made:** Deficiency in language, communication and other social skills is a typical impairment of individuals who are diagnosed autism spectrum disorder (Kuder, 2013). Social Skill Builder is specially designed as an educational tool to help teach appropriate social skills for children and adults with developmental disabilities including intellectual disability, Autism, Asperger's Syndrome, Down's Syndrome, Cerebral Palsy, and Spina Bifida (Farmer, 2014).

**General Comments:** From the personal angle of view, I have an appreciation to the Social Skill Builder games regarding teaching social skills for individuals diagnosed with autism. Every learner is different and the educational needs and abilities of each is unique. There is, of course, nothing to meet all demands. I think, however, parents and teachers of individuals diagnosed with a developmental disability should try the app. Perhaps, it may bring a great change.
Reviewer: Viet Truong Nguyen

Name of app: Fun With Directions

Operating System: IOS

Location: iTunes App Store

Cost: $24.99

Description: As a perfect speech-therapy app, Fun with Directions is designed to provide a fun and engaging way to enhance abilities of listening, following directions, colours, spatial concepts, auditory memory and auditory processing. The app attracts the learner’s attention to verbal or written instructions regarding to colours, spatial concepts, and word meanings. It consists of ten concepts including give, touch, open, close, top, middle, bottom, push, colour, and erase. The instructions are organised from simple level (e.g., “Touch the cat”) to levels that are more complex (e.g., “With your orange crayon, colour the large one that is a furry pet and likes to chase mice”).

Alignment with the UDL guideline: The Fun with Directions game engages players in an interesting activity of learning. This utility can be used as a great tool to support learners with educational needs, particularly individuals diagnosed with autism. Therefore, the app aligns with the principle III of the Universal Design for Learning – Provide multiple means of engagement. Through the form of playing a game, the application engages the learners in the learning process by a natural and interesting way. This is useful for children who are living with challenging behaviours. Aiming at providing developmental opportunity for children with special education needs, Social Skill Builder is a valued tool of universal design for learning.

Curriculum area: Fun with Directions is a learning tool especially designed for helping learners have auditory memory and processing problems. The app focuses on developing language and communication skill. Through playing the interesting games, children practice basic language skills, particularly responding to verbal and written directions. The application also provides the users with several basic concepts such as open, close, bottom, colour, middle, touch, and give. Fun with Directions can be used as a supplemental activity to help teachers determine where a child may be struggling and monitor the student’s progress.

How does the app meet the National Disability Standards? Insufficient ability in following directions is a big barrier preventing individuals with autism from having successful communication. Fun with Directions provides these persons with opportunity to learn and practice the key concepts and verbal and written directions under an interesting way of learning – playing games. The application allows teachers or caregivers to create individualised settings suitable for each learner regarding to text sizes, time limitation, degree of difficulty, and access capabilities. These options ensure that each learner has opportunity to succeed in the set activity and will be intense in the next level of the learning process. Such that, the app can meet the standard 3 – Individual outcomes of the National standards of disability services.
How the app changes pedagogy (SAMR)? In relation to the application of SAMR model in general classrooms, Fun with Directions can play the role as a substitutional tool in teaching language and basic concepts for students with autism. With Fun with Directions games on an iPad, the students can access the learning contents easily. They learn new concepts and practice responding to verbal or written directions efficiently on the device instead of face-to-face meetings or paper and pencils. The app also assists a child to learn or practise skills independently in various settings, homes, and schools.

How the app encourages person centred planning. Fun with Directions can be used as an efficient tool to promote a person-centred approach in the educational setting. The application is highly customisable to be suitable for ability levels and learning styles of each learner. The application offers a range of options from simple one stage instructions to more complex multiple stage directions. This enables children with diverse abilities to be engaged in the learning process in the ways appropriate to them. Moreover, focussing on providing basic concepts and manners of social response for children with developmental disability like ASD, the app centres the person’s needs and ability.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? One of the fundamental purposes of the 21st century education is that all its learners must be able to communicate and collaborate effectively within their community. Deficiency in language and social interaction skills has been viewed as a big challenge for individuals with autism. Fun with Directions offers a range of basic concepts and options for the learners to practice responding to verbal or written directions, which may be useful for them when they take part in real social interactions. As a high-tech assistive technology focussing on improving language and communication for individuals with special education needs, Fun with Directions is really a significant contribution to the development of 21st century education.

Evidence from the literature that the app is capable of the claims made: The development of technology allows portable, interactive systems, widely used tools such as computers and tablets to be used commonly to support individuals with autism spectrum disorder in many homes, classrooms and workplaces. Research-based evidence has indicated that the use of visual supports can be beneficial to the learning process of learners with complex language and communication needs like ASD (Autism Association of Western Australia [AAWA], 2013). Technology has been viewed as an effective learning tool for individuals with ASD, particularly in the development of expressive communication skills (Rogers & Rogers, 2013), supporting transitions (Schreibman, Whalen & Stahmer, 2000) and the development of academic skills (Burton, Anderson, Prater & Dyches, 2013).

General Comments: As an assistive technology designed for learners with special educational needs, parents and teachers can choose these games for their children to play and learn over time. By playing the games, children have chance to learn the basic concepts and practice listening to and reading directions that are the fundamental elements of social interaction skills. This is particularly important for individuals who are living with developmental issues, particularly those diagnosed with ASD.
Reviewer: Lucy Bye

Name of app: Autism Link

Operating System: IOS, Android

Location: Google Play Store and iTunes App Store

Cost: Free

Description: Autism Link aims to connect people with autism spectrum disorder to possible service providers. A map pinpoints provider types and where they are located to allow for a simple and user-friendly interaction to access the supports required.

The Autism Link application has a 5-star rating and positive reviews regarding the services available all in one place. The services are broken into domains such as occupational therapy, speech therapy, psychology, early intervention, education, respite and support groups. The services can assist both the client and parents/caregivers to access and compare possible options for the best supports available.

Alignment with the UDL guideline: Autism Link falls follows guideline III Provide multiple means for engagement through 8.3 foster collaboration and community. Autism Link places a strong emphasis on utilizing community supports and collaboration between families and service providers.

Curriculum area: The curriculum area that Autism Link could be utilized in is based mainly around social integration and awareness. The application is targeted at users over the age of 15 or parents and guardians of people with Autism seeking formal supports. The layout of the application makes it accessible for people to find their support area required and any contacts that could be of benefit, pictures are clearly visible and simple English is used throughout.

How does the app meet the National Disability Standards? Autism Link meets the National Disability Standards of service access and individual outcomes by offering individualized choices to people to enable them to reach their goals. Offering different support options on the application gives greater individualised choices to users regarding the type and quality of formal supports.

How the app changes pedagogy (SAMR)? Autism Link acts as a substitute (enhancement) as there are books, pamphlets and professionals who can provide the same information to clients. The major difference is the ease of access to information within the Autism Link application, all information is conveniently located on a mobile device which can be viewed anywhere at any time.

How the app encourages person centred planning. Autism Link promotes person centeredness by ensuring that their application is accessible to all users by utilizing clean and simple language and incorporating pictures where possible to offer a visual cue along with the written. The support requirements offered on the application can be individualised and sorted into specific categories, for example, a parent of a teenager with autism looking for a case manager, the app has an option to put categories such as early intervention or prenatal care towards the bottom of the page if it is
not going to be used. By allowing personalisation of the application, it promotes person centeredness and accessibility.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Autism Link promotes the collaboration approach to teaching and training by allowing the user and service providers to share and view information and ideas related to their area of interest or support required. The collaboration approach allows the user to log on at any time and find up to date information related to their search of services.

**Evidence from the literature that the app is capable of the claims made:** There is limited academic research on the application Autism Link due to it being a relatively new application. In 2012 there was an estimated 115,400 Australia’s living with Autism, this number had increased a dramatic 79% since 2009 (abs.gov.au, 2011). For this reason, more applications targeting Autism are now available. Autism Link has a perfect five-star rating on the Play Store as of July 2017, this along with the comments and reviews left on the site suggest that the application is appreciated and used across Australia. The comments present a common theme of the ease of accessing organisations and supports in one application, one user stated, “all the hard work done for me and right at my fingertips” (Play Store, 2016).

**General Comments:** Autism Link is a great resource for people with autism and parents/guardians, depending on the user’s age. The application includes separate areas of support outlined within a specific region that can be refined or altered throughout the search. The customisable home screen allows users to place headings of importance closer to the top of the screen while moving other heading further down out of sight. Overall, this application has a 5-star rating on the Play Store with positive reviews from current users, Autism Link should be downloaded by people over the age of 18 or parents and guardians of children.
Reviewer: Lucy Bye

Name of app: AutismXpress

Operating System: Android

Location: Play Store

Cost: Free – Option to upgrade to pro version for $2.19

Description: AutismXpress Encourages the emotional development and regulation for people with Autism, the application assists users to recognise and express their emotions clearly. This application could help a person with Autism in all domains of their life; personal, social and employment to clearly recognise and express their emotions.

Alignment with the UDL guideline: AutismXpress aligns with multiple UDL guidelines, the prominent areas are Guideline III. Provide multiple means for engagement and 9.2 facilitate personal coping skills and strategies. AutismXpress also falls into 9.1 promote expectations and beliefs that optimize motivation as the application has a focus on self-reflections and how best to deal with distractions.

Curriculum area: Autism Xpress is aimed at school aged children with a focus on the development of social skills. The application has a friendly and simple interface and is aimed at younger users by including two games to practice social skills in a fun and engaging manner. This application could be used at home, in the community or integrated into lesson plans within schools.

How does the app meet the National Disability Standards? AutismXpress meets the National Disability Standard of participation and inclusion through the encouragement of social awareness and development. The application promotes opportunities for growth and development in an engaging and interactive way.

How the app changes pedagogy (SAMR)? AutismXpress falls into the augmentation section of enhancement when referring to SAMR, there are similar social skills programs and lessons available but having the AutismXpress application increases functionality of the same task. This is achieved by splitting the lesson into smaller activities and the ability to access the information when alone or in a public place.

How the app encourages person centred planning. AutismXpress promotes person centred learning by having clear and accessible language throughout the application, there are also pictures incorporated to provide visual representations of words or phrases for the user. There are age specific activities to complete which promotes person centred design, this ensures that the lessons and activities being carried out can be related to skills and development for that particular age group. The lessons and tasks that are provided on the AutismXpress application can be broken into smaller activities to promote them being completed individually with a minimal amount of assistance.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? AutismXpress follows the creativity and curation approach to teaching and training when referring to the 5 C’s. Creativity allows the user to view and present the information provided within the application in new and creative ways. The lesson plans and descriptions are stored on the application and can be located and viewed once the activity is completed as a reminder that follows the curation approach.

Evidence from the literature that the app is capable of the claims made: The claims made by the application states that AutismXpress is an application that aims to assist users improve their social skills in all areas of their life through technology in the form of an application. Researchers in the last decade have published multiple studies reporting on the use and effectiveness of teaching people through technology. A study conducted in 2006 concluded that students with and without Autism learnt more quickly and effectively by computer-presented information than teacher presented (Stromer et al., 2006).

General Comments: AutismXpress aims to improve the social skills and cues of teenagers with autism, the application could have benefit within a school environment or also at home as a practice activity set for homework. The bright and interactive application allows people to have fun while they are learning through games and activities of interest to the user. This application would be of benefit for people aged between 12-17 years old who want/need to improve their interactions and social skills.
Reviewer: Lucy Bye

Name of app: Social Skills for Autism

Operating System: IOS, Android

Location: iTunes App Store and Google Play Store

Cost: Free

Description: Social Skills for Autism is aimed at teenagers who live with autism spectrum disorder and Asperger's to improve their social skills. The application consists of individual lesson plans aimed at developing communication and social skills. Lessons include; conversation skills, listening skills, manners, staying on topic and asking and answering questions. The Social skills for Autism application has been used since its development in 2010 and has shown promising results.

Recently, Kloog 2 - Return to Zugopolis, was created which is the second app in the Social Skills for Autism series. The follow-on application continues the journey of the main character with updated lessons and challenges for users to practice, this application is free and available on both the Play Store and iTunes.

Alignment with the UDL guideline: Social Skills for Autism is included in guideline III. provide multiple means for engagement through 9.2 facilitate personal coping skills and strategies. The application uses a reward system for motivation once an activity is completed, for this reason, the application also fits into guideline 9.1 promote expectations and beliefs that optimize motivation.

Curriculum area: Social Skills for Autism promotes a friendly and accessible interface which allows teenagers with Autism easy and independent navigation within the application. Utilising the social skill lessons could be beneficial when working with teenagers who are technology driven to engage and reward with something that still has a background educational framework.

How does the app meet the National Disability Standards? Social Skills for Autism promotes the National Disability Standard of participation and inclusion by encouraging the development of social skills to assist people to participate effectively within their community. The application targets teenagers and because of the interactive games, it promotes inclusion of other people to facilitate some of the activities and help develop social interactions.

How the app changes pedagogy (SAMR)? Social Skills for Autism is part of the substitution area within the enhancement category, there are multiple other applications focussing on similar areas of improvement for people with Autism, for this reason Social Skills for Autism is new technology and updated lessons replacing older technology such as flash cards, applications and written lesson plans.

How the app encourages person centred planning. Social Skills for Autism encourages the use of person centred learning by having customisable options and lessons within the application. When the application is first downloaded there is a prompt screen asking for details such as name and age, this is then stored and included when completing activities making it a more personal experience.
for users. Social Skills for Autism has a lot of reading throughout the application which may require some assistance from a support person. When supporting the reading component, the idea is to facilitate the reading but give the user the opportunity to answer the questions before proceeding to the next screen.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Social Skills for Autism promotes the creativity and connectivity approach to teaching and training through giving users the option to work independently on tasks and set lessons on the application. Social Skills for Autism works on a rewards strategy when a task has been completed, this gives motivation to continue and finish set lessons. The information is presented in a creative way and give the option for users to answer creatively on the quiz questions before finishing each section and moving on.

**Evidence from the literature that the app is capable of the claims made:** Social Skills for Autism claims to provide users with lessons surrounding social skills and the importance of skills such as listening skills, communication skills, eye contact and manners. Research suggests that people with autism often display difficulty understanding and implementing social skills such as understanding personal space, maintaining eye contact and engaging in conversations (Kroeger et al., 2006; Matson et al., 2007). An application such as Social Skills for Autism has a sole purpose to promote and improve social skills for people with Autism that is a lacking area that often needs development according to research provided.

**General Comments:** Social Skills for Autism promotes the development and practice of social skills for people with Autism, the application boasts an interactive, bright and fun interface with personalisation options along the way. The lesson topics are based around the age of the user but also changes when a skill has been achieved. The feedback from the first application was positive enough for the developers to release a second follow on application, which is also available for download. This application could be used within a school environment either individually or as a small class.
Reviewer: Lucy Bye

Name of app: JABtalk

Operating System: Android

Location: Play Store

Cost: Free

Description: JABtalk is a communication application with the aim of promoting effective communication between individuals as effectively and affordably as possible. There are voice options to personalise the application and ensure age appropriateness.

JABtalk is of benefit to children with Autism to promote their communication skills and independence. As the application can change the speaking voices, age appropriateness can be ensured, for example, if the application is being used by a young Australian boy, the voice can be adjusted accordingly. This application is of use for adults and children with Autism but can also benefit people who have had a stroke, toddlers in pre-speech communication and professionals.

Alignment with the UDL guideline: Jabtalk links to multiple areas of the UDL guidelines, specifically guideline II - Provide multiple means for action and expression and 1.5 Provide options for expression and communication. Jabtalk provides the option of utilizing other forms of communication and expressions through text and voice commands. This is an essential guideline to emphasise due to the importance of accessible communication for all individuals.

Curriculum area: Multiple age groups can utilize Jabtalk as it has individualized settings depending on who is using the application. The application can be used in all areas of life, including school, social interactions and work. JABtalk can be used by children, teenagers and adults although the recommended age group to be using JABtalk is years three and over.

How does the app meet the National Disability Standards? Jabtalk meets the disability standards of rights and participation and inclusion. The application gives people access to freedom of expression, speech and the ability to have control over decisions affecting their lives. Jabtalk gives a voice to people who use nonverbal communication in a predominantly verbal society which allows people to become valued members of communities.

How the app changes pedagogy (SAMR)? Jabtalk follows the guideline around redefinition in the transformation section of SAMR, this application both modifies and redefines communication and interaction for people who communicate using nonverbal language such as people living with disabilities. Application like Jabtalk give the opportunity for people to communicate with others virtually anywhere in the world, an idea once only dreamed about.

How the app encourages person centred planning. Jab talk promotes person centeredness by providing a customisable voice for the user, for example, if a 10-year-old Australian boy was using the application, there is the option to find a voice that suits the user. The application uses clear and clean images and words throughout and there is a tutorial section offering support if required.
Using simple and customisable language provides the opportunity for more people to access the application and feel comfortable with the language included.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Jab talk encourages the curation approach to teaching and training by giving users options to store pre-written messages within the application for future use of reference. The application promotes users having the ability to have the option along with personalised messages to also have the option to write messages and phrases in real time to communicate with people.

Evidence from the literature that the app is capable of the claims made: JABtalk has been downloaded 50,000 times and has received a four-star rating on the Play Store for Android devices, approximately 66% of reviewers of the application were satisfied with the program (Google Play Store, 2016). Ismaili (2016) stated that the remainder of unsatisfied users reported their main concerns consisted of installation problems and failing to understand the concept of the application. It was noted within the report that although the application is free to download, it does not take away from the fact that it is an effective and well used communication tool.

General Comments: Overall, Jabtalk is an effective communication application for people with Autism who struggle with verbal communication. Jabtalk gives users a voice to interact and engage within the school setting, work settings and larger community. The ease of use ensures accessibility for users of all ages and the design layout and personalisation of voices ensure age appropriateness. This application is an effective and cost-efficient communication application for people with autism.
Reviewer: Lucy Bye

Name of app: Emergency Chat

Operating System: IOS, Android

Location: Google Play Store and iTunes App Store

Cost: Free

Description: Emergency Chat was created to be used in any situation where speech is impossible but communication is necessary. A person can write a simple paragraph at any time that saves onto the application detailing their situation, the device can then be passed to someone else to explain their situation and gain the assistance required. This is a highly rated application with a total score of 4.6 out of 5 stars. This application could be vital for a variety of different people. People with Autism may experience severe and common anxiety attacks from sensory overloads, with this application they could easily pass their pre-written message to an onlooker or community member to explain their situation and what they require to overcome it. This application could also be beneficial for people who have a hearing impairment, have asthma, anxiety, depression, schizophrenia, medical problems etc. This application will allow people to help get the assistance required through communication other than verbal speech.

Alignment with the UDL guideline: Emergency Chat falls into guideline II: Provide multiple means for action and expression, 5.1 use multiple media for communication, 1.9 provide options for self-regulation and 9.2 facilitate personal coping skills and strategies. Emergency Chat utilizes not only the individual using the application but also the wider community when someone is in distress.

Curriculum area: Emergency Chat targets anyone who has difficulty with verbal communication in times of stress, such as anxiety attacks, asthma attacks or sensory overloads just to name a few. The application can be used in many different settings including schools, community events, workplaces etc. The purpose of the application is to be used in any situation where speech is impossible but communication is necessary.

How does the app meet the National Disability Standards? Emergency Chat promotes participation and inclusion within the community, this application gives individuals the opportunity to speak up when they are in distress and require assistance. It is a human right to be safe from harm and abuse, emergency chat allows people who use alternate methods of communication to have the opportunity to express if they are feeling unsafe or experiencing harm. Emergency chat gives people the chance to make decisions related to their health and lifestyle which they may not have had if application such as emergency chat was not available, for these reasons, Emergency chat meets multiple disability standards and should be promoted as a good option for people to have readily available.

How the app changes pedagogy (SAMR)? Emergency Chat falls into the category of redefinition and transformation, this application has redefined the way people can communicate their needs, wants and thoughts in stressful situations. People who use this application are now able to express their
thoughts in a safe and accessible way to get the assistance required, a task that was difficult without this technology as using a pen and paper to communicate is not always available or accessible.

**How the app encourages person centred planning.** Emergency chat provides person centred use by having a settings page with options to customise the layout, text size and saved messages depending on the user’s preferences. Having the option to pre-write a message allows users to feel confident in knowing exactly what message they are providing to a communication partner. The chat section of the application includes bold and clear writing for both people who are communicating to access easily.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Emergency chat encourages the curation approach to teaching and training for their application. Users of the application can store, categorize and collect data when it is required at any time of the day or night. Having the ability makes it available for use when it is required and encourages accessibility to all users.

**Evidence from the literature that the app is capable of the claims made:** Emergency chat is a relatively new application that is yet to have any published research articles completed. From the reviews that were collated the occurring points that are highlighted include the simplicity of use of the application and the change it has had on people’s everyday lives. One user commented that her long-term partner has Autism and “goes into non-verbal meltdowns” where he cannot communicate with her, having this application allows the user to communicate effectively with her partner throughout the entirety of the episode (Play Store, 2017). Overall, this application has a 4.6-star rating and has constant updates to improve through user feedback provided on the Play Store.

**General Comments:** Overall, Emergency Chat provides a vital application for people both with and without Autism to provide a voice when verbal communication is not possible. The frequent updates and improved settings by the developer allows users to feel understood and heard leading to a high star rating with positive reviews.

The simple layout of the applications design allows accessibility for users who are struggling with possible sensory overloads or anxiety attacks. Allowing users to insert personalised pre-written messages creates clear instructions for the person receiving the message and clear expectations for the person using the application. This application is strongly recommended for people to have installed on their device.
Name of app: Video Scheduler
Operating System: IOS
Location: iTunes App Store
Cost: $17.99

Description: Video Scheduler is a scheduling app, which combines different mediums such as photos, text, videos and audio recordings can be added to a scheduled activity. The created schedule can be shared with others. There are features such as orientation locks, which can prevent the user from being distracted by the sensory stimulation. Passcode functions exist as a prevention method from individuals skipping scheduled activities to complete only the most desirable ones. Scheduled activities can be marked as completed as an individual goes about their day.

Alignment with the UDL guideline: Video scheduler aligns with principles 2.5 and 5.1 of the UDL guidelines. It illustrates a person’s schedule using multiple media including audio recording, videos, photos and text (CAST, 2014). Principal 5.1 is about using multiple media for communication (CAST, 2014) which this app performs through the ability to share the schedule with other people. A person can communicate their schedule with other people or align their schedules. Parents could also be aware of what their child’s scheduled activities are as well as the child being able to make use of their schedule.

Curriculum area: Personal or Social outcomes can be achieved with this app. The app could assist with planning social activities, helping an individual achieve personal goals and assist the people around them to help make these outcomes occur. The individual and those who support them could schedule activities and task to aid in having social activities and with personal organisation as well as understanding activities with the possible instructions or representation of the task within the app. The app would be suitable for school aged children all to way to adults to assist with the creation of the daily schedule.

How does the app meet the National Disability Standards? The app encourages individuality for a person because a schedule is individual. It is different for each person; based on their likes and dislikes. Each person may have different goals or personal outcomes that they may want to achieve and scheduling in activities, which can focus on these outcomes would be different for each. The instructions or other information added into the scheduled item could consider each person’s individual preferences, knowledge and abilities. The different media forms that are possible for people to use allow for people to understand the information in the best format. Different people may respond better to different stimuli.

How the app changes pedagogy (SAMR)? The app could be considered a modification to an already existing task such as scheduling. It enhances what a schedule can do; the app creates the ability for instructions to be added, visual and auditory stimulation allowing for the concept to be presented in more than one format in a sharable manor.
How the app encourages person centred planning. The schedule created would focus on the person. A schedule can consider likes and dislikes as well as preferred times of day for an activity. A schedule is an individualised person way of keeping track of activities.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Communication is encouraged by the app. The schedule can be used for the individual to communicate with themselves as well as with others. The schedule can be shared. For a younger individual, a parent could create the schedule to communicate with teachers or support workers. It is a way of expressing information and remembering the scheduled tasks. The different media formats can communicate how to do the activity or give more detail.

Evidence from the literature that the app is capable of the claims made: Bereznak, Ayres, Mechling and Alexander (2012) found that using video prompt, individuals with autism could gain more independence. The number of steps the individuals could complete on their own with using instructional videos and self-prompts with using technology increased. An app like Video Scheduler could be the right type of prompt to help someone with autism gain greater independence and learn new skills. Functional, social and behavioural skills can be gained (Bereznak et al., 2012). Handheld technology also blends in, in a social circumstance. Many people in the community will have a mobile phone or tablet and therefore, it is socially acceptable.

General Comments: The video scheduler could be helpful to developmental educators and teachers to learn a child’s set routine or to implement changes into the schedule. For someone new working with an individual with autism, learning their schedule would be very useful as changes in the schedule could have undesirable outcomes such as the onset of an emotional response. A change to a routine could be slowly introduced with something like the video scheduler app. Instructions could also be inputted into the app to help with learning a new skill or task, which may be added into the schedule. This could slowly be inputted into the routine and become part of the daily, weekly or monthly routine so that the change is not unexpected. The individual would be able to have information through multiple media and have the schedule to have information about their schedule. The ability to stop a person from skipping scheduled activities could also help keep a person on task and motivate them to complete an activity to get to the desired one.
Reviewer: Julie Bettac

Name of app: Shopstagram

Operating System: IOS

Location: iTunes App Store

Cost: Free

Description: Shopstagram is an app that takes the task of creating a grocery list and transforms it by allowing individuals in input images of regularly purchased food item into the app. To add the item to the list, the user simply needs to press the image and if multiple of the same item are needed the user needs to press the image as many times as the quantity they desire. A badge of the quantity of the desired item will appear in the upper corner of the image within the shopping list. Prices can be inputted into the app, which allows the user to know how much money to bring on their shopping trip. The app will categorise the shopping list by what store each item can be purchased at if the user configures what stores they regularly shop at and what they by where. When shopping, once each item is found the user can simply tap the item on their list to tick it off.

Alignment with the UDL guideline: The app aligns with UDL guideline 3.3 (CAST, 2014). It allows the information to be presented in a way it can be processed easily through visualization of the objects on the list. A person can manipulate the app to allow for it to show the different number of items, the store that the item can be bought from and it even inputs the typical price of an item. It is providing a different means for representation than the traditional format for a person to view a common everyday life type task.

Curriculum area: The app Shopstagram can be categorised into the life skills curriculum area. It aids an individual to complete basic day-to-day tasks such as creating a shopping list and helping make grocery shopping easier. The app would be suitable for anyone who is a young adult to adult, to assist with their everyday tasks.

How does the app meet the National Disability Standards? The app encourages people to be able to do typical everyday tasks in a new way by using images instead of writing. A task has more than one way to be completed and different individuals complete the same task in different ways. Individuals can personalise their shopping list with their food preferences and preferred shops. People can complete the task in their own way and get the same result: groceries.

How the app changes pedagogy (SAMR)? The app is a transformation. It takes the task of creating a grocery list, which is commonly done with a pen and paper and replaces that with an electronic version of the same task, substituting words with a visual representation of the items through pictures. The app still has the same function as a typical grocery list, it just allows the process to be performed in a different manor than writing it out by hand.

How the app encourages person centred planning. The app allows a person-centred approach because it is individualized to each person who use the app. Each person can individualise the photos for within the app as to show exactly what he or she need to buy, brand and all. The stores each person
shops at can be inputted into the app as well making it personalised. It is person-centred throughout the entire concept because a person would not add items to their list, which they do not like.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app encourages creativity. It takes an already existing life task such as creating a grocery list and reimagines the task by using images. The representation of information in a different manner could allow for sensory information and make the task seem simpler. There is the bonus of the app being able to help an individual budget and know how much money they may need to bring with them on a shopping trip.

**Evidence from the literature that the app is capable of the claims made:** People with Autism have an enhanced perception and sensory interest (Little, Auserau, Sideris & Baranek, 2015) Shopstagram presents information in a sensory manner using images and voicing. “Nonvocal methods of communication” (Charlop-Christy, Carpenter, LeBlanc, & Kellet, 2004), can be used for individuals to express themselves. The app uses images instead of speech or text to create a shopping list allowing for the communication of what they would like.

**General Comments:** Shopstagram could be a particularly helpful app for developmental educators. It can allow an individual to express their wants, likes and dislikes even if they are nonverbal. The app could allow people to have greater independence in their life by being able to create the shopping list themselves. The list could allow for greater personal choice and autonomy within a person’s life. The images could allow a person with autism to find the information to be more accessible.
Reviewer: Julie Bettac

Name of app: Classic Explain Everything

Operating System: IOS

Location: iTunes App Store

Cost: $10.99

Description: Classic explain everything is an interactive app for presenting information. It uses multiple different media formats allowing for many different types stimuli to keep individuals interested. The app is compatible with most file types, has the ability to be imported/exported to share with others and can use many different export destinations including Evernote, Dropbox and OneDrive and others. A simple interface can be used to make the app less overwhelming to users. There is an iBook manual for all uses of the app allowing for those supporting an individual with autism to best understand all the features within the app and create the best learning experience. It is interactive and can be engaging. Video, images, text, highlighting, voice recording and drawing are some of the aspects that can be curated and combined into one space to create an interactive learning experience.

Alignment with the UDL guideline: The app allows for educators to provide options for perception. It gives multiple means for representation covering principles 1.1, 1.2, 1.3 and provides options for representation with principles 3.2 and 3.3(CAST, 2014). Relationships between concepts can be visualised and highlighted to better direct the learning experience when presenting is done with classic explain everything. The information is presented not only visually but also with auditory information being possible. The app could allow for the way information is presented to be adapted. Adjustments to the curriculum could be made and presented in a way in which the individual could better comprehend the material.

Curriculum area: Classic explain everything is suitable for education purposes to represent information in a more sensory format. With the option for audio, and multiple visual aspects and ways to focus the app may allow for greater understanding of the student. The material could become more accessible. The app could be useful for individuals who are from late primary school to adult.

How does the app meet the National Disability Standards? The app allows for multiple different representations of the same concept and in interactive to keep the focus on an individual. It understands that students learn better when a concept is presented in more than one way. It allows for the information to be appealing and keep the focus of someone. The app allows the user to personalise it and it can be used in an inclusive manner so that everyone can have a better understanding of the concepts being presented.

How the app changes pedagogy (SAMR)? Classic explain everything is a substitution to other forms of presentation of information. There are more possible media forms, which can be used than a classic whiteboard in a classroom. More different sensory information could be gained and the app is still inclusive to other students in a learning situation.
How the app encourages person centred planning. The app allows for a person centred approach because a simplified version of the information being presented can be given to different student for different needs. It operates with different file types making it accessible to people. Different file types could work in conjunction with different software, making the information easier to utilise.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Classic Explain Everything focuses on the curation of information. It allows individuals to take the whiteboard like app and use multiple forms of media to annotate information live time or save projects. In teaching it is another form of presenting the material. Not only an individual with autism but also the other students within the classroom or learning situation can do the information presented in a format that could be understood.

Evidence from the literature that the app is capable of the claims made: Sasson & Touchstone (2013) report that individuals with autism have increased attention to visual stimuli that are not social stimuli. Modifying and enhancing visual supports can lead to greater independence in children with autism (Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011). Photographs, line drawings, words, static, dynamic and interactive visual supports can make learning easier for children with autism (Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011). All these elements are possible with the Classic Explain Everything app. This could allow for better comprehension of the information presented to the child. The information being presented in multiple ways would still be accessible to other students as well. “Teachers use visual supports primarily to enhance comprehension of language, prepare for environmental changes and assist with the completion of a specific task” (Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011).

General Comments: The app could be a great way for parents, support workers or teachers to present information to an individual with autism on the different platform. It allows for more sensory stimulation or the presentation of information in a new way. The combination of multiple media sources could allow for greater understanding of the sources. The multiple uses of the app go as far as the creativity of the user. It is a platform to represent information and has the possibility for information to be easier to understand if used correctly.
Review: Julie Bettac

Name of app: News-2-you

Operating System: iOS

Location: iTunes AppStore

Cost: Free

Description: News-2-you is an app that is designed for beginner readers and individuals with disabilities. The weekly newspaper is available in four different reading levels depending on the individual’s skill level. The information is presented through multiple different ways such as short symbol-supported articles, recipes, puzzles and games presented in a stimulating manner. The information is available in a text-to-speech format. Progress can be tracked. The app can be used in a group format but for each person is will consider differing reading levels, type of voice and other individualised settings put into place. The app itself is free but each edition of the news is a cost of $1.99 or an annual subscription for the cost of $54.99.

Alignment with the UDL guideline: The app uses the following principles from the UDL guidelines: 1.1 and 1.2 (CAST, 2014). The paper allows for multiple means of representation. It allows for both audio and visual representation of the material using the text to speech feature in the app and the symbol-supported articles. Principal 2.3 (CAST, 2014)is also present as the text is represented through symbols as well as the option to be voiced making it easier to decode what is occurring within the article.

Curriculum area: The curriculum area in which the app falls is in the sector of education. It allows individuals to learn about what is happening around them in the world in an accessible format so that comprehension can be achieved. The combination of different ways the information can be represented allows for people to be aware of the social situations happening around them. The app tracks progress allowing for skills to be learned and achieved. A person could also potentially get to a higher level and continue to learn and increase their abilities. The app would be suitable for school aged students to adults potentially. I content may appear childish for an adult but for an adult with autism it is a newspaper that is accessible. It has multiple sensory stimulations, which could allow them to keep up with what is happening around them.

How does the app meet the National Disability Standards? The app recognises that there are different abilities for people to access information and presents it in different formats to allow for individual differences. There is also the fact that the app can be tailored for each person with the settings and difficulties. The accent of the text to speech can even be changed based on preference or location.

How the app changes pedagogy (SAMR)? News-2-you is a modification of the news. It is the same general information that could be found in any newspaper but it is presented in a way a person with autism could understand with different stimulations to keep them focused and learn.
How the app encourages person centred planning. Each person may like to read about different items in the newspaper and have different interests; they could read about their preferred interests. The person could also learn at their own pace and slowly increase their level of comprehension.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs): The app encourages connectivity. The user can connect to other learners through the app while still having the personalised settings. Connectivity with the surrounding community is also created through being up to date with current events.

Evidence from the literature that the app is capable of the claims made: The same default symbols, “SymbolStixs, which includes over 8,000 colour vector-based line drawings used for Proloquo2Go” (Sennott & Bowker, 2009). are used in News-2-you allowing for easier comprehension and communication (Sennott & Bowker, 2009). Best practice for individuals with Autism includes “symbols, visual supports, voice output, and inclusion” (Sennott & Bowker, 2009). These four factors are all used within News-2-you. The first three features listed are included in the app and inclusion is made possible when multiple people can use the app at different levels but gain the same general knowledge. Children who are minimally verbal can still be engaged in shared reading activities if they are adapted (Mucchetti, 2013). The comprehension of students with adapted reading activities more than doubled as a result (Mucchetti, 2013)

General Comments: Developmental educators and teachers could have a way in which someone with autism could be up to date with current events, access this information; this could better connect them to their community. It is a learning experience. Within a classroom a child with autism could be in their social studies class and still learn about the same current event as the others just in a different format. It could promote inclusion in the classroom. The child can gain information such as what days they have school and what days they do not. The calendar could allow for the child to have more independence within their life. They can be informed of what is happening in their own life and learn the abstract concept of time. The app could allow for the individual to better understand what they are reading and be in a more inclusive environment with their peers with their adapted reading.
Reviewer: Julie Bettac

Name of app: Choiceworks Calendar

Operating System: IOS

Location: iTunes App Store

Cost: $6.99

Description: Choiceworks calendar is an app, which is designed not only for the child but also for the caregiver. It is an image-based calendar, allowing the child to learn what is happening by organising their lives. It gives structure and has a time focus presented through images. The app has the capability to have a countdown, speak the daily schedule out-loud, timer, marking holidays automatically. There is a preloaded library but people could also personalise the calendar by incorporating their own images. The calendar is printable and sharable. Recurring events can be added in easily.

Alignment with the UDL guideline: The UDL guidelines the app is aligned with include: 1.1, 1.2, and 1.3 (CAST, 2014). These all provide different options for the perception of information. The information can be both visual and audio with the ability to customise the images used in the calendar. The multiple different types of stimulus can make the calendar more accessible to the child as well as be helpful to all the supports involved in their life.

Curriculum area: The curriculum area the app fits into in life skills. It is a basic plan of the month, week or day. It allows all people to know what is happening in the child’s life while still being understandable to the child. Organising with multiple different support could become clearer through sharing of information. Choiceworks calendar is suitable for young children and their caregivers.

How does the app meet the National Disability Standards? The app encourages the individuality of children and their families by giving options for what format the information is presented and how best it can be understood by each party. Personalised photos can be inputted to allow for better comprehension. The calendar has a focus on the child with autism and their ability to understand the calendar as well as all the other people within their life.

How the app changes pedagogy (SAMR)? Transformation is used by the app by taking an already existing task and changing it. The calendar adds more sensory information making it more accessible to someone with autism. Instead of having a typical calendar, Choicework calendar is more visual and has the option of voicing. It takes the concept, uses the same elements of the original, and transforms the idea to be more inclusive with the simple augmentation. There is a slight functional improvement but the outcome is the same. With the changes, the information becomes more accessible.

How the app encourages person centred planning. The approach of the app is person centred by taking the child into account when creating the schedule. Instead of simply being told what is going to happen that day, the calendar allows the child to learn of their activities. Their day is shown to them in a way in which they can comprehend and have better knowledge of what their days will
look like. Something like a break in routine because of a public holiday may not be as big of a shock to a child with autism because they would have seen that it was coming up and been able to better prepare themselves for it.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Using choice work calendar encourages communication. The calendar can be shared electronically, transformed into PDF or printed. This allows for communication between different groups of people such as parents, caregivers, support workers, therapists and teachers. The communication could encourage cooperation and discussion between all parties involved in a child’s life.

**Evidence from the literature that the app is capable of the claims made:** People with autism like routine and do not like to stray away from what is normal, engagement in repetitive behaviours occurs (Matherne, 2010). Choiceworks Calendar allows for the representation of the schedule and allows for it to be depicted. Any changes in this routine can be anticipated. Individuals with autism often struggle with sensory stimulus (Pfeiffer, Koenig, Kinnealey, Sheppard, & Henderson, 2011). The Choiceworks calendar allows for there to be multiple different forms of stimuli to allow the child to be able to comprehend what is happening. The use of visual schedules can allow children to better anticipate events and increase their independence (Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011).

**General Comments:** Choiceworks calendar would be great for everyone involved in the life of a child with autism. It is conducive to communication between all the people in the child’s life as well as for the child to learn and understand what is happening in their day-to-day life. The inclusion of the child is particularly good as oftentimes everyone makes the schedule and such for the child but do not present it to them in a way in which they can comprehend. It can allow for clarity between all people involved in the life of a person with autism. The parents, teachers, the support workers, educational aids, therapists and the child would all have the same information about the child’s life and their routine. The communication between all parties could lead to less misunderstandings and greater clarity. With multiple people being involved in the life and necessary changes to routine such as school holidays then everyone knows what is occurring in the child’s life. Communication can cause less confusion.
Conclusion and Recommendations

The purpose of this document is to provide a curation of applications that have been designed to help individuals who may be living with autism spectrum disorder, or be caring for someone with ASD. This document aims to provide readers with a snapshot of options available in the form of applications that people with ASD can utilize to target various aspects of their life. This includes but is not limited to attention, concentration, communication, verbal output, language comprehension and/or expression, social and problem-solving skills.

While technology and apps are a recent development in our society, and the research around their effectiveness as forms of compensatory strategies are still in the preliminary stages, it is safe to say that these forms of resources are crucial for people with disabilities to be able to live an improved quality of life (Picard, 2009). There are many benefits to using app based technologies in the classroom, and to assist individuals with a disability in day-to-day life that have been brought to the forefront during the compilation of this document. Boon (2016) highlights that apps which allow for a greater deal of customisation to meet individual needs of its users, are more effective in their design. This links closely with the National Disability Standards, which requires individualisation and differentiation for individuals with special needs (Department of Social Services, 2013). In regard to common findings across the apps explored, visual supports have been shown to be very useful for individuals with ASD and have been linked to increased development of prosocial skills, such as independence, communication, interpersonal skills and task engagement (Hume, Wong, Plavnik & Schultz, 2014). Furthermore, apps that integrate multiple aspects of life skills, such as Pictello or Remories, and draw on AAC features such as visual representations of words have been shown to be highly effective in developing both independence and communication in individuals with ASD (Alzrayer, Banda and Koul, 2014). A key aspect of ASD is that individuals often lack interpersonal skills. Many of the apps explored in the document are multi-user apps, which have been shown to be highly beneficial in developing both social and communication skills for individuals with ASD as there is less pressure to successfully navigate social situations as the use of virtual environments remove face to face anxieties that individuals with ASD may experience (Test, Smith & Carter, 2014).

To effectively implement an app into teaching or therapy programs, it is imperative that individuals are first taught how to use and navigate it. This means, that educators, parents and carers first know and understand how to use the apps themselves. Secondly, applications need to be chosen based purely upon the needs of the children or individual in question. Parents and teachers need to carefully consider a student’s strengths, weaknesses, preferences and ability levels before an app can be utilised effectively.
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http://dx.doi.org/10.1007/s10803-006-0207-x


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Useful Links

http://autismapps.org.au
Website listing range of apps that are suitable for use with individuals with ASD

https://www.autismspeaks.org/autism-apps
Website containing large list of apps that are suitable for use with ASD including links to research supporting the app.

http://www.udlcenter.org
Detailed outlines of each of the principles and checkpoints of the UDL guidelines, complete with teaching examples

Expert advice for teaching students with ASD

Detailed ideas for teaching students with ASD including classroom design and links to ask a professional

http://www.autismpluggedin.com/category/free-apps
Lots of free apps that are designed for children with Autism Spectrum Disorder. There are lists for using certain apps for certain skills development (math / English / cause and effect / etc)

http://igetitapps.com/
Educational Applications for iPhone, iPad, and iPod Touch for People with Additional Learning Needs

http://www.aacandautism.com/
A website where you can find options of AAC devices that people with ASD can use as an alternative form of communication.
Vision Impairment
Vision Impairment

Disability group: Vision Impairment: Encompasses blindness and vision impairment (not corrected by glasses or contact lenses), which can cause severe restrictions in communication, and in the ability to participate in community life.

<table>
<thead>
<tr>
<th>Name</th>
<th>Names of apps</th>
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| Susanna Harris                     | 1. BIG Launcher  
|                                    | 2. Read2Go  
|                                    | 3. Aipoly vision  
|                                    | 4. Amedia Live Reader  
|                                    | 5. Amedia NaviRec  |
| Madanarathi Madan Gopal           | 6. Tap Tap see  
|                                    | 7. KNFB reader  
|                                    | 8. Math melodies  
|                                    | 9. Look Tel Recogniser  
|                                    | 10. Look Tel Money Reader  |
| Dharshinie Vimalanathan           | 11. Read me the Weather  
|                                    | 12. iMove  
|                                    | 13. Text Detective  
|                                    | 14. HeyTell  
|                                    | 15. RAY App  |
| Thi Thanh Nga (Nga) Nguyen        | 16. BlindSquare  
|                                    | 17. Voice Dream Reader  
|                                    | 18. Eye-d pro  
|                                    | 19. Google Talkback  
|                                    | 20. Soft Braille Keyboard  |
| Andrew Short                      | 21. Alarmed Reminders Timers  
|                                    | 22. WhatsApp Messenger  
|                                    | 23. Auto Ringtone Pro Talking Caller ID Ringtones  
|                                    | 24. Talking Scientific Calculator  
|                                    | 25. VisionAssist  |
| Camila Amestica                   | 26. NantMobile Money Reader  
|                                    | 27. Ariadne GPS  
|                                    | 28. Chime  
|                                    | 29. Dragon Dictation  
|                                    | 30. Ulexia  |
| Tshering Wangdi                   | 31. Learning Ally  
|                                    | 32. Voice Brief  
|                                    | 33. Be My Eyes  
|                                    | 34. Tap-n-See Now  
|                                    | 35. Light Detector  |
The table below summarises the functions for each reviewed app, for ease of reference.

<table>
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<tr>
<th>Apps</th>
<th>Functions</th>
<th>Mobility</th>
<th>Device Access</th>
<th>E-text Access</th>
<th>Recognizer (objects, color, text, label,...)</th>
<th>Printed-Text Access</th>
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Introduction

With the recent developments in Information and Communication Technology (ICT), valuable opportunities have paved the way for individuals with vision impairment to become active participants of society. Many are engaging meaningfully and to a certain extent, performing independently in daily activities across all settings using state of the art technology (Csapó, Wersényi, Nagy, & Stockman, 2015).

With the advent in mobile technology, an individual’s self-determination skills are enhanced which improves their quality of life (Adam & Tatnall, 2017). Therefore, the use of mobile applications shows great potential in enabling its users with vision impairment to be integrated into the community by providing equal participation and expanding their opportunities for social inclusion (Kim, Han, Park & Park, 2016).

Therefore, the aim of this eBook is to provide information about the various trending mobile applications that are commercially available on the Android and iOS platforms. Through the effective support of Optical Character Recognition (OCR) technology in some of the applications, individuals with vision impairment can acquire lifelong skills to perform personal, educational and vocational tasks that were previously considered challenging and hard to achieve.

The applications that have been reviewed in the eBook include GPS applications to support independent navigation, various text-to-speech applications that support independent access of written information, and descriptive applications that assist individuals to identify objects and items in their surroundings. In addition, we will demonstrate how the use of these applications have the potential to enhance the independence and quality of life for individuals with vision impairment with a focus on students of all ages across educational settings.

Therefore, we hope that through the reviews shared in the eBook, students are offered an alternative and effective means to engage functionally in school and life activities that to a certain extent can bring normalcy to their lives.
Reviewer: Susanna Harris

Name of app: BIG Launcher

Operating System: Android

Location: Google Play

Cost: $11.99* A free demo version is available

Description: BIG Launcher is a simplified user interface for Android phones. It features include a simplified home screen, simplified functionality, extra-large icons, extra-large fonts and full screen notifications. It provides quick access to commonly used features such as date and time, phone, camera, photos, and email. It does not feature its own audio program, but it operates well with Talkback, to enable use by people with significant vision impairment. There are high contrast colour scheme options and three different font sizes to choose from. It is designed for older people, young children, and people with low vision. There is a free demo to trial the app before purchasing, to test its suitability. It is worth noting that it is not able to upsize or alter any third-party apps, it merely provides a more accessible interface for phone usage. To further enhance its accessibility, it is available in 35 different languages.

Alignment with the UDL guideline: As this app is an interface, it has the potential to address all three areas of the UDL guidelines, as this app opens opportunities for students who may not have otherwise been able to fully access smartphone technology. Using smartphone technology, students are provided with multiple means for accessing information via apps or the internet, which meets UDL Guideline I “Multiple Means of Representation”. Students are also able to actively navigate and express information using apps or the internet, which meets UDL Guidelines II “Multiple Means of Action and Expression”. Further, using apps or the internet students are exposed to a wider variety of personal motivators, assert more personal choice, which meets UDL Guideline III “Multiple Means of Engagement”.

Curriculum area: This interface supports independent life skills for people of all ages who benefit from its visual and functional simplicity. It is particularly useful for young children, students with learning disabilities, students with fine motor challenges, and students with vision impairments. It could support students of any age in any academic area that uses ICT technology.

How does the app meet the National Disability Standards? This app addresses the first three National Disability Standards: Rights, Participation and Inclusion, and Individual Outcomes. By enabling a broader audience to have independent access of smartphone technology, it supports the Rights for people to have self-determination and freedom of expression (Standard 1). It also supports people’s Participation and Inclusion through enabling greater connectivity with friends, family, and communities (Standard 2). Additionally, it provides options for individualisation to enable people to meet Individual Outcomes (Standard 3).

How the app changes pedagogy (SAMR)? As this app is an alternative interface, it is by definition a Substitution. However because of its potential to allow access to students who may not have
otherwise been able to use smartphone technology, it could become Transformational in the education of these students.

**How the app encourages person centred planning.** This app encourages person-centred planning as it is highly adaptable to the requirements of the user, including multiple high-contrast colour schemes, three different font sizes, and its compatibility with Talkback. It is also able to be trialled by the user before purchasing, to ensure its suitability. This allows the student control and choice in whether the app is appropriate and agreeable to them. It also has the potential to enhance partnerships and independent life skills, when the student is able to independently use smartphone technology.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app is mainly about enabling Connectivity and Community, as the student is able to independently make phone calls and send and receive SMS messages. It has the potential to also enable access to other programs and apps that would address the other 4 C’s, but that is not its primary function.

**Evidence from the literature that the app is capable of the claims made:** People with vision impairment have been found to be less likely to access ICT, including computers, smartphones, apps, and the internet (Frances & Siu, 2015). Similarly, as Wandke, Sengiel and Sonksen found (2012), the design of smartphone interfaces is needlessly complex for use by broader audiences, and should take a user-centred approach to design that is more universally accessible. This app overcomes these challenges by providing a user interface that is purpose built for greater accessibility for a universal audience, enabling greater access for people with vision impairments to independently use ICT.

**General Comments:** This app has the potential to be revolutionary both inside the classroom and in real life settings, as it enables independent access to smartphone technology to a broader audience, including people with vision impairments. This app helps overcome the visual barriers associated with accessing smartphone and tablet technology by providing a simple interface, large icons, and compatibility with Voiceover (Rempel, 2013). It simplicity and flexibility makes smartphone technology accessible for older people, young children, people with vision impairments or blindness, people with fine motor challenges, and people with learning disabilities.
Reviewer: Susanna Harris

Name of app: Read2Go

Operating System: iOS

Location: iTunes

Cost: $30.99

Description: Read2Go is an ebook reader that is compatible with Bookshare and other DAISY books. The user can choose between a male or female voice that reads books aloud. Text can also be displayed in braille (connected via Bluetooth). There are options for large fonts (up to font size 70), and different colour options for text, background, and highlighting. Navigation functions are compatible with VoiceOver to provide text-to-speech, so it is accessible for people with complete blindness.

Alignment with the UDL guideline: This app follows UDL Guideline I “Multiple Means of Representation” by providing a variety of options for accessing ebooks. It meets UDL Checkpoint 1.3 “Offer alternatives for visual information” by making ebooks accessible by audio. It also meets UDL Checkpoint 1.1 “Offer ways of customizing the display of information” by providing options for varying the visual input, including different font sizes, colours, and braille.

Curriculum area: This app supports the independent life skill of receptive communication, as students can more easily and independently access ebooks. In academics, this app directly supports younger students with and without vision impairment to develop early literacy skills. It is also useful for students with vision impairment of all ages to access a wide variety of textbooks across all subject areas.

How does the app meet the National Disability Standards? The ability to more independently access texts supports a person’s Rights to self-determination, and choice and control (Standard 1). Its provision of multiple means of representation also enables enhanced responsiveness to diversity (Standard 3).

How the app changes pedagogy (SAMR)? This app provides students with vision impairment easy and independent access to a broad range of texts, which enhances and encourages their education and leisure opportunities. The software could be incorporated for the whole classroom so that each student can choose the most suitable combination of font size, colour contrast, and audio options, to allow for flexible and personalised access to text. While this is merely an Augmentation using the SAMR model (a direct substitution of textbooks, with functional improvement), it has the potential to encourage more independent reading by more students, which enhances both the quantity and quality of learning.

How the app encourages person centred planning. In line with the principles of the NSW Community Partnership Program, this app can be completely navigated by the user (using VoiceOver) to individually tailor the most appropriate audio and visual settings. As such, it encourages person-centred planning because it is led by the user, is highly individualised and flexible, and supports
independence and life skills. Importantly, this app is able to be navigated independently by students with vision impairment using VoiceOver, which enhances student independence.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app allows for greater and easier Connectivity to texts through ebooks. This enhanced Connectivity can indirectly support Community and Collaboration, as people with vision impairment will more easily be able to join group discussions and projects related to the texts in ways that would be impossible without easy access to the texts.

**Evidence from the literature that the app is capable of the claims made:** Enabling independent access to the curriculum is at the crux of providing accessible education to students with vision impairment (Frances & Siu, 2015). Despite the advances of modern technology, curricular material is predominantly provided in visual text (Frances & Siu, 2015). Using this app, students with a range of vision impairments, including low vision and blindness, are able to customise visual and audio outputs of ebooks in order to independently access texts. This technology supersedes more dated text-to-speech programs that have been found to have ongoing issues with software compatibility, volume control and inflexibility (Nees & Berry, 2013). Nees and Berry (2013) also found that using older text-to-speech programs, there was ongoing difficulty matching appropriate software to individual users, depending on individual vision ability, perceived social acceptability of assistive technology, and teachers reporting feeling unprepared to deliver assistive technology. These challenges are overcome using this app, as the use of tablets in the classroom has become socially normalised, and there is individual flexibility built into this software. As one 15-year-old user quotes, “With Read2Go I can download a book and start reading it in seconds. I don’t stick out in class because people are familiar with iPads.” (Lee, 2017.)

**General Comments:** Using Bookshare or other DAISY books, students are able to use Read2Go to access a range of texts using a variety of visual and audio outputs on their iPad. It is individually customisable and easy to use, enhancing its accessibility to a broad audience of students. It overcomes the challenges of more dated technology through its flexibility and general social acceptability. By making texts accessible in a greater variety of ways, this app meets the principles of Universal Design and provides collateral benefits for sighted learners, such as students with dyslexia or young children learning to read (Nees & Berry, 2013). Therefore, it is a very useful app to be made available for the whole classroom, without stigmatising students with vision impairment.
Reviewer: Susanna Harris

Name of app: Aipoly Vision

Operating System: iOS and Android

Location: iTunes and Google Play

Cost: Free* (free version recognises 1000 items, upgraded $4.99US pm)

Description: Aipoly vision is a colour and object recogniser. It is designed to support people with vision impairment to better understand their surroundings. By pointing your phone at your surroundings, the app will continuously identify objects and colours, without needing to snap pictures and without needing an internet connection. It runs continuously while using the program. It is programmed to recognise objects, colours, text, currency, plants, animals, and food, including brand labels. It is compatible with VoiceOver. It was designed for iOS but has recently been released for Android as well. It is also available in English, Italian, Spanish, French, German, Japanese, and Arabic, enhancing its broader accessibility.

Alignment with the UDL guideline: This app follows UDL Guideline I “Multiple Means of Representation” by providing both text and audio (with VoiceOver) to assist with the recognition of objects and surroundings. This aligns with UDL Checkpoint 1.3 “Offer alternatives for visual information”.

Curriculum area: This app supports independent life skills, as students can more easily, independently locate, and identify specific items, colours, currencies, brand labels, plants, animals, and much more. It is useful for students of all ages, both within and outside the school and classroom.

How does the app meet the National Disability Standards? The ability to more independently identify surroundings supports a person’s Rights to self-determination, and choice and control (Standard 1). Its provision of multiple means of representation also enables enhanced responsiveness to diversity (Standard 3).

How the app changes pedagogy (SAMR)? This app is about enabling more independence to locate and identify items, reducing the need for ongoing support and enhancing personal self-efficacy and self-determination. Therefore, it does not directly affect pedagogical approaches for the whole classroom, but drastically changes the capacity of individual students to independently participate in all classroom activities by Substituting inaccessible visual input for more accessible text and audio input.

How the app encourages person centred planning. In line with the principles of the NSW Community Partnership Program, this app supports the development and maintenance of everyday life skills and increased independence, both within and outside the classroom. It is used by the student, whenever the student deems necessary, and therefore is person-lead and person-centred.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? By making visual information more accessible, this app allows for greater understanding, interaction, and Connectivity to immediate surroundings. It is worth noting, however, that as the emphasis is on
independence, it serves to lesson reliance on others. This could in fact reduce the superficial connectivity and community that is created from such reliance.

Evidence from the literature that the app is capable of the claims made: This app is very significant in supporting independent life skills, which has been found to be at the crux of enabling quality of life for people with vision impairment (Frances & Siu, 2015). One of the apps creators, Marita Cheng, reports that in the idea for the app came after asking 88 people with vision impairment about what is their greatest frustration. She found that the greatest frustration they reported was that they needed to continually ask what things are (Cuthbertson, 2016). Therefore, this app was specifically designed to help overcome this difficulty. To clarify, some people with vision impairment state that identifying objects is not an issue for them if they are able to touch it (Cuthbertson, 2016). However, in situations where this is not possible, such as identifying distant landmarks, images in a picture, or labels on a product, this app is able to tell them what it is seeing. Previously, people with vision impairment had to rely on apps such as Be My Eyes that use video calling to volunteers to help them identify objects and labels (Cuthbertson, 2016). However using Aipoly Vision, people are able to independently and privately identify things in live time, without needing an internet connection.

General Comments: This app is ideal to support students to be able to quickly and independently locate and identify items around the classroom, printed images, distant landmarks, labels, colours, currencies, and much more. It has also been growing in popularity among people learning English (Cuthbertson, 2016), so could hold potential for students who are learning English in school as well. People who are colour-blind, for example, to identify the colour of the sky to see weather changes or sunsets (Cuthbertson, 2016), have also used it. Therefore this app holds exciting potential for teachers of all students across multiple curriculum areas as well as on excursions, and is not only beneficial for students with vision impairments. It is no wonder this app recently won The Best of Innovation Award at CES2017 (Rego, 2017).
Reviewer: Susanna Harris

Name of app: Amedia Live Reader

Operating System: iOS

Location: iTunes

Cost: $46.99

Description: Amedia Live Reader scans live images using a camera and reads aloud the text in real time. It is specifically designed for people with vision impairment to be able to access texts in their surroundings, such as labels and signage. It is also able to take still pictures, by holding the device flat, to enable reading of a full page of text. For most text, it recommends holding the camera at 20-30cm. For larger signage, 2-3 meters is recommended. It uses the same Optical Character Recognition (OCR) technology that powers the popular KNFB Reader, with the primary difference that Amedia Live Reader can read text in live time (Wallis, 2016). It is able to read English, Chinese (Simplified), Chinese (Traditional), Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Norwegian (Bokmål), Polish, Portuguese, Romanian, Slovak, Spanish, Swedish and Turkish. There is a beeping and vibrating function to assist the user to focus the camera on texts. It is compatible with VoiceOver and is designed to be used with VoiceOver turned on.

Alignment with the UDL guideline: This app follows UDL Guideline I “Multiple Means of Representation” by making a range of visual texts available through audio. This aligns with UDL Checkpoint 1.3 “Offer alternatives for visual information”.

Curriculum area: This app supports the independent life skill of receptive communication by making visual texts in the user’s surroundings accessible through audio input. This is useful for students with vision impairment of all ages across all academic curriculum areas.

How does the app meet the National Disability Standards? By enabling independent access of a range of texts, this app supports a person’s rights to self-determination, and choice and control (Standard One), and the ability to connect and feel included within a chosen community (Standard Two).

How the app changes pedagogy (SAMR)? This app provides students with vision impairment the ability to access a range of visual texts through audio input, which can assist the student’s independent participation in the classroom. It does not directly impact pedagogical approaches for the whole classroom, but serves to improve the capacity of individual students to independently participate in classroom activities by Substituting the need for a personal assistant with technological audio support.

How the app encourages person centred planning. In line with the principles of the NSW Community Partnership Program, this app supports the development and maintenance of everyday life skills and increased independence, both within and outside the classroom. It is used by the student, whenever the student deems necessary, and therefore is person-lead and person-centred.
What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? This app allows for more independent Connectivity with the user’s surroundings. This can indirectly support greater Community, as the inaccessibility of visual text can serve as an ongoing barrier to meaningful community engagement. However, as with other independence-promoting apps, this could diminish the superficial sense of community that is created by dependence on others.

Evidence from the literature that the app is capable of the claims made: Access to printed text has been found to be a major barrier in both educational contexts and general quality of life for people with vision impairments (Frances & Sui, 2015). This app is specifically designed to address this barrier by enabling the user to independently access printed text in live time, without relying on others. In line with the recommendations in Frances and Siu for effective technological adaptations for students with vision impairment (2015), this app considers the needs of a universal audience by ensuring it is able to be used and navigated by people with a range of vision impairments. It incorporates features such as a beeping and vibrating function to help the user focus the camera. Frances and Siu also advocate for as much independence as possible, as this has been found to increase self-efficacy and personal satisfaction (2015). Therefore, this app is preferable to similar apps that require dependence on video calling volunteers to read information for the user.

General Comments: This app supports greater independence by the user to access live texts in immediate surroundings, reducing reliance on others. It is specifically designed for people with vision impairments and has great potential as an educational tool in providing assistive technology for students with vision impairment. It encourages bidirectional engagement with a broader range of ICT by providing means for both input (user taking photos) and output (app audio reading of live texts). This has significance both in educational contexts, for example, a student being able to independently read posters, signage and labels. Its primary purpose is for accessing live texts rather than full textbooks, as this would become quite tedious through the use of a camera. For accessing full textbooks, other apps such as Read2Go are more suitable as they are designed specifically for that purpose.
Reviewer: Susanna Harris
Name of app: Amedia NaviRec
Operating System: iOS
Location: iTunes
Cost: Free

Description: Amedia NaviRec is a combined voice recorder and GPS, specifically designed for people with vision impairments. Audio instructions can be recorded for specific locations and replayed when the user is at those locations, to assist with independent travel and navigation. In this way, customised verbal guidance can be recreated for the duration of travel to the user’s destination. It is able to store up to 100 different routes. It has three modes: Record, Replay, and Guidance. Record Mode is used while a sighted user is traveling the chosen route, while making an audio recording of specific instructions. Replay Mode simply plays back the audio recording. Guidance Mode is used to support the user with vision impairment to navigate independently by replaying the audio recording in coordination with current location. It is available in both English and Japanese. By combining the simple functionality of audio recording and GPS technology, it is able to be provided for free, enhancing its accessibility to broad audiences.

Alignment with the UDL guideline: This app follows UDL Guideline I “Multiple Means of Representation” by providing audio guidance to assist with independent navigation. This aligns with UDL Checkpoint 1.3 “Offer alternatives for visual information”.

Curriculum area: This app supports the independent life skill of safe travel and navigation, reducing dependence on the availability of a synchronous sighted guide. This is useful for older primary, secondary, and university students to support independent navigation both within and outside the school.

How does the app meet the National Disability Standards? By allowing for more safe and independent navigation, this app supports a person’s rights to self-determination, and choice and control (Standard One), and the ability to connect and feel included within a chosen community (Standard Two).

How the app changes pedagogy (SAMR)? This app provides students with vision impairment audio instructions for independent navigation, which can assist the student to find their way around the school independently. It does not directly impact pedagogical approaches for the whole classroom, but drastically changes the capacity of individual students to independently participate in school activities by Substituting the need for a personal guide with recorded audio instructions that are programmed in conjunction with GPS location.

How the app encourages person centred planning. This app is not strictly led by the user, at it requires a seeing guide to first record the audio guidance while navigating the chosen route. Therefore it does not open doors for the person with vision impairment to independently explore new destinations. However, it does support safe and independent travel along predetermined routes, reducing
reliance on a personal guide. In line with the NSW Community Partnership Program, this encourages person-centred planning because it supports independence and life-skills.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app allows for more independent Connectivity within the user’s chosen Community, by enabling independent navigation to destinations. This encourages people with vision impairment to physically attend and be more involved in their communities without relying on the synchronous availability of a personal guide.

**Evidence from the literature that the app is capable of the claims made:** Ong, Zhang and Nee (2013) identified quality of life, including independent navigation, to be a critical global concern. They point out that while walking aids such as walking canes have made significant improvements, they are insufficient because of their short sensing range. Similarly, Frances and Siu identify independent navigation as a key area of the life skills curriculum for students with vision impairment (2015). They recommend GPS technology in conjunction with other walking aides, such as a cane, to support independent navigation in both familiar and unfamiliar environments. This is one example of a GPS app that is specifically designed to support navigation for people with vision impairment, along with the use of a walking cane for safety reasons.

**General Comments:** This app depends on a sighted user to initially program determined routes and simultaneously record auditory navigation advice. This is a limitation to individual independence because the person with vision impairment is not supported to navigate programmed routes, and they rely on someone else to initially set it up. Therefore, it is useful for supporting navigation through chosen and planned journeys, but does not encourage the freedom associated with independent exploration. In educational contexts, it can be used to support a new student to find their way between classes, and to and from school. It has the benefit of being highly individualised to both the user and the environment, as the person setting it up is able to record any navigation advice or information that would be helpful for that specific user in that specific location. Therefore, it is similar to having a sighted guide traveling with the user, but it removes the need for the physical and synchronous presence of a sighted guide.
Reviewer: Madanarathi Madan Gopal

Name of app: Tap Tap See

Operating System: IOS, Android

Location: Apple store & Google Play store

Cost: Free

Description: Tap Tap See is a mobile camera application which incorporates object recognition functionality that is catered to support individuals with blindness and visual impairment. The device’s camera is used to capture everyday objects and items. Double tapping the screen to capture an item can do this. In addition, the user is prompted with a sound when the camera is aligned correctly to take a picture. The Voiceover or talkback features of the device supports by identifying the object aloud to the user. It gives added details and information about the object such as the colour and brand of an item captured by the camera. This allows users with vision impairment to be familiar with an object or item that they encounter in their daily lives.

Alignment with the UDL guideline: The application meets the UDL guideline 1 “Provides Multiple Means of Representation” because it provides an individual with vision impairment with the ability to access information through an alternative means of learning which meets checkpoint 1.3 "Offer alternatives for visual information". The information presented through an auditory feedback allows the user the opportunity to learn and process information better. For example, the application equips the user with vision impairment the ability to identify the different types of food on a menu in the restaurant or the different types of milk in a supermarket.

Furthermore, it increases the user’s ability to gather information independently and subsequently increase their capacity to use the information to develop their choice making skills. The application allows the users to be engaged in their learning which meets UDL guideline 3 “Provide Multiple Means of Engagement” and aligns with checkpoint 7.1 “Optimize individual choice and autonomy”.

Curriculum area: Students with vision impairment can benefit from a literacy-rich environment. According to Luckner, Bruce and Ferrell (2016), the education of students with vision impairment should aim to ensure that they have access to quality information that can support their understanding and provide them with a means to learn about things around them. Therefore, the application gives students the opportunity to interact with their environment. It is an effective medium that can assist students with vision impairment to acquire language skills and expand their vocabulary by helping them to identify everyday items through a voice feedback description. In addition, it increases their opportunities to develop choice making skills which is a crucial skill in communication. The application is suitable for students from primary to high school level.

How does the app meet the National Disability Standards? The application aligns with Standard 3 on Individual outcomes of the National Standards for Disability Services (2013) which promotes that individuals with disabilities should have access to an educational service that recognises their unique learning needs. Individualised instruction that will support the learner’s strengths to achieve
positive learning outcomes is encouraged. The application allows for an individualised way of learning and promotes the user to be an active participant by taking responsibility of his or her own learning through an accessible instructional approach which taps on the individual’s strengths.

**How the app changes pedagogy (SAMR)?** The application is an augmentation to the traditional way of acquiring information solely from visual content or display. The spoken description of the application allows the user with vision impairment to access and comprehend information tailoring to their strengths. This augments the user’s capability and improves their ability to self-manage their daily tasks.

**How the app encourages person centred planning?** The application provides a sense of empowerment and fosters independent skills for individuals with vision impairment by taking into consideration their learning needs. In this way, they are encouraged to learn at their own pace and improve their decision-making skills. The scaffolded approach by the application allows them to increase their understanding and improve their communication skills. It gives them a sense of autonomy in being able to access learning and make informed decisions based on what they have gathered and processed rather than having someone else to influence their decision.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The application aligns with ‘Connectivity’ from the 5Cs. It provides an individual with a visual impairment access to a new way of learning about everyday items and enhances their opportunities of participating actively by shifting the ownership of learning to the individual.

**Evidence from the literature that the app is capable of the claims made:** The application shows great promise in addressing the challenges an individual with vision impairment faces in a myriad of daily living activities both at home and in the community. Many individuals with vision impairment have minimal choice making skills that limits their active participation in daily living skills (Hammel, Magasi, Whiteneck, Bogner, & Rodriguez, 2008).

The use of an application such as ‘Tap Tap See’ enables the user to learn and be familiarised with the items and objects around the environment. This can expand the user’s opportunity to engage and participate actively in choice making skills. The application equips them with skills to perform personal tasks that were otherwise difficult to achieve and helps boosts their self-esteem (Adam & Tatnall, 2017). In addition, it creates a sense of autonomy and independence to the user by reducing their reliance on others to guide their learning. This has a positive impact to the quality of life for a user with vision impairment (Kim, Han, Park & Park, 2016). Therefore, the application ‘Tap Tap See’ is a useful tool for users with vision impairment to conveniently access information.

**General Comments:** The application is an effective tool in supporting students with vision impairment by allowing them to approach learning through active and interactive participation. It promotes their independent learning by enabling them to access information without the need to be dependent on others. For example, a student will be able to use the application to identify the materials he or she might want to use for an art lesson or be able to understand the content of a photograph that is posted on social media. It has the potential to enhance the user’s engagement in functioning effectively in daily activities.
Reviewer: Madanarathi Madan Gopal

Name of app: Math Melodies

Operating System: IOS

Location: Apple store

Cost: Free

Description: MathMelodies is a fun and interactive educational game accessible to all children specifically targeting children with vision impairment. The application incorporates the use of images, sounds and lovely music. It is an easy way to learn math through a combination of a video game, a tale and a math workbook. Math exercises are compiled into six chapters with 12 types of exercises which are done in progressive levels. Upon completion of each level, the child will receive a piece of melody as a reward. The melodies accumulated will form a song upon completion of the game. Children can access the game by exploring the tablet interface with their fingers which will generate an audio feedback. In addition, there is a narrative context which supports the children throughout the learning process. It is the first application which allows children with vision impairment to engage in a game alongside with their peers. The application is only available for use on the Apple iPad.

Alignment with the UDL guideline: The application meets UDL guideline 1 “Provides Multiple Means of Representation” which supports an individual with vision impairment to use digital information through the use of varied representations such as narrative and audio effects to enhance learning which meets checkpoint 3.3 “Information processing”. The application adopts a cognitive strategy in teaching numeracy concepts by tasking children to navigate through a math problem. In this way, the children are guided through the information processing of the content through a scaffolded approach.

Curriculum area: For many young children with vision impairment, understanding and acquiring numeracy concepts can be challenging as most numeracy lessons are usually visual in nature. Using the MathMelodies application can help children to enhance and improve their independence in working out basic numeracy skills such as counting and sequencing as well as participate in their own learning. MathMelodies enables the student to accomplish numeracy tasks progressively through a process of instruction, direction and feedback (Hudson, Zambone & Brickhouse, 2016). Students can interact meaningfully with the numeracy curriculum and demonstrate their learning. Therefore, MathMelodies is an extension of the concrete approach to learning numeracy for children with vision impairment. The application is suitable for children from five to eight years of age.

How does the app meet the National Disability Standards? The application aligns with Standard 2 on participation and inclusion of the National Standards for Disability Services (2013) which promotes for individuals with disabilities the right to access and participate in an inclusive environment with their peers. MathMelodies provides children with vision impairment the opportunity to be engaged actively in an educational game together with their peers and enhances social inclusion.
How the app changes pedagogy (SAMR)? MathMelodies is a modification to the traditional way of using concrete items to teach. It offers the child with vision impairment to access and comprehend numeracy activities by appealing to their auditory and tactile senses through a process of experiential learning. The use of motivating sounds acts as a prompter in supporting the child through a system of progressive learning. In this way, it reduces the instructional support of the teacher who can take on the role of a facilitator. Moreover, it allows the child to demonstrate their learning of the targeted numeracy skills through active participation of their own and directing learning at their own pace. This increases the child’s capability to self-manage and access problem-solving opportunities afforded through the app’s inbuilt instructions.

How the app encourages person centred planning. MathMelodies is an application that aligns to the learning characteristics of children with vision impairment. It addresses the fundamental importance of equal access and participation to digital games for these children. The game builds on touch and audio based interactions, which provide the child with the opportunity to interact meaningfully in a numeracy curriculum. Thus, it is designed to provide accessibility to young users with vision impairment and tailored to their abilities and preferences.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? MathMelodies aligns with ‘Connectivity’ from the 5Cs as it empowers young children with vision impairment the ability to self-manage their learning confidently and competently using an interactive game. In addition, the ability to access learning through a digital game that can be played by children with and without vision impairment is a valuable supplement to learning together in the classroom through an integrated approach. Therefore, the application encourages social engagement and aligns with ‘Community’ from the 5Cs.

Evidence from the literature that the app is capable of the claims made: With the pervasiveness of digital games in education, students with a disability should have the opportunity to have equal access to participate in digital games. For children with a vision impairment, the features such as the audio prompts integrated in the MathMelodies application is useful in providing them with a scaffolded approach to problem solving and self-managing their learning (Main, O’Rourke, Morris, & Dunjey, 2016). In addition, students are active learners who prefer learning concepts through a proactive and collaborative approach that can generate rich learning experiences (Bekebrede, Warmelink, & Mayer, 2011). This facilitates positive social engagement and collaboration amongst the children with and without vision impairment to learn effectively together.

General Comments: MathMelodies is an effective educational tool for both parents and educators in teaching young children basic numeracy through a digital platform. It is a developmentally appropriate application that is both enriching and enjoyable for children with vision impairment to learn about concepts. However, the child should have adequate time to explore the screen with his or her finger to understand the game. The child’s interest and determination is heightened with the game’s narratives and cool sound effects. The interactive elements of the game appeals to the child’s way of learning and allows the child to guide his or her learning with less dependence on others. Importantly, the game allows its young users with vision impairment to overcome isolation by enabling them with an educational tool that provides them with equal engagement and accessibility to learning (Istenic, Starcic & Bagon, 2014).
**Reviewer:** Madanarathi Madan Gopal

**Name of app:** KNFB Reader

**Operating System:** IOS, Android

**Location:** Apple store & Google Play store

**Cost:** $159.99

**Description:** The KNFB reader is an application that provides individuals with vision impairment an efficient way to access print materials. It has the ability to capture and save printed texts to a device easily with the support of the viewfinder and tilt assist features. The texts are automatically detected by the application. Examples of printed texts include documents, menus, and PDFs and JPEG files. It is also embedded with a high quality speech to text and Optical Character Recognition (OCR) technology for precision. The application has multiple features to support reading. It has the ability to scan and read multiple pages of a document or brochures at a time. It reads lengthy texts aloud by using the Google Talkback. In addition, the application has flexible options to offer to its users such as synchronised text highlighting, adjusting the font type, size or colour or background colour. It allows the user to follow what is being read aloud on the screen with a cursor moving across the text and able to navigate a text by line, sentence, word or character easily. It is an effective solution to the challenges of reading faced by individuals with vision impairment and provides a quick and convenient means for them to understand printed information using high quality speech output.

**Alignment with the UDL guideline:** The application meets UDL guideline II “Provides Multiple Means of Action and expression” by removing barriers to learning and enabling individuals with a visual impairment to access printed texts effectively. The application provides them with options in navigating printed materials using user-friendly and customized assistive technological tools which meets checkpoint 4.2 "Optimise access to tools and assistive technologies”.

**Curriculum area:** For many students with vision impairment, accessing common reading materials and texts can be challenging and demanding. Luckner, Bruce, and Ferrell (2016) highlighted that students with a vision impairment need to be provided with an alternative access to print that will allow them the opportunity to gain quality information. KNFB reader has the potential to provide an alternative modality to accessing print for users. It assists its users to acquire reading and comprehension skills in the literacy curriculum. It is suitable for students from primary to university levels.

**How does the app meet the National Disability Standards?** The application aligns with Standard 3 on Individual outcomes of the National Standards for Disability Services (2013) whereby individuals with disabilities are entitled to an equal access and participation to an inclusive community. For individuals with vision impairment, KNFB reader is an excellent tool which provides them with the ability to read printed material independently. It enables students to access educational content, resources and curriculum materials to support their learning thereby increasing their opportunities to participate in an inclusive education alongside their sighted peers.
How the app changes pedagogy (SAMR)? The application can be considered as a modification as it empowers an individual with vision impairment to acquire reading content conveniently that was previously challenging and impossible. The accessible features of the application significantly enhance the user’s comprehension and increase their independence in reading printed texts without a need to depend on a sighted person to read out the content. In addition, the application has the potential to remove the barriers to learning and increases the individual’s capability to seek and manipulate printed information confidently.

How the app encourages person centred planning. KNFB reader is specifically catered for individuals with vision impairment who face difficulties in reading content and information. The application is equipped with various options or settings which allow users with vision impairment with the ability to control and manage content through an alternative approach some of which includes adapting the font type and size, background colour or the use of synchronised highlighting. Therefore, users with vision impairment can tap on the application’s varied accessibility features which are designed purposefully to help them select the most appropriate options to support their reading of printed material. Moreover, the ability to exercise autonomy to daily tasks such as reading brochures and labels can increase the self-determination skills of the users with vision impairment.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? KNFB reader is an innovative application which connects individuals with vision impairment to the world of print. The ability to access paperless documents and materials using the KNFB reader allows those with a vision impairment to participate and engage in literacy activities that are commonly accessible by all. In addition, the application’s ability to help the users to acquire precision in literacy skills increases the individual’s autonomy to exercise control in their learning and improve their functional reading skills. Thus, it increases their chances to perform tasks in their everyday lives and encourages their active participation in the community. Therefore, the application aligns with ‘Connectivity’ and ‘Community’ from the 5CS.

Evidence from the literature that the app is capable of the claims made: The use of the KNFB application is a promising strategy to improve the educational outcomes of an individual with vision impairment. It maximises their abilities to acquire reading content efficiently. In this way, it improves their self-identity and self-esteem in overcoming the challenges of seeking information independently (Soderstrom & Ytterhus, 2010). Moreover, the accessibility features of the applications such as text navigation and high-quality text to speech features can enhance comprehension skills and reduce gaps in learning. This can expand an individual’s educational opportunities in accessing curriculum conveniently and increase their equal participation in an inclusive educational environment (Mishra & Kiran, 2016). Therefore, it is evident that the effective use of the KNFB reader can increase the self-determination skills of an individual with vision impairment as well as support their community participation by enabling them to a new level of engagement in their everyday lives (Adam & Tatnall, 2017).

General Comments: The implementation of KNFB application in the classroom is an effective tool for educators teaching students with vision impairment. The application provides an ease of access to literacy information through its precise and accurate accessibility features. Students can access learning or curriculum materials easily using the assistive tools in the application increasing independence in literacy skills and increases their meaningful participation in their environment.
**Reviewer:** Madanarathi Madan Gopal

**Name of app:** Look Tel Money Reader

**Operating System:** IOS

**Location:** Apple store

**Cost:** Free

**Description:** The Look Tel Money Reader is a simple and easy to use application that identifies currency and speaks aloud the denomination accurately using the VoiceOver feature. It caters for users with a visual impairment to have the convenience to identify, count and sort bills. The use of the application fosters the user’s independence and confidence in managing basic monetary transactions. It captures the bill in any angle and delivers quick information about the denomination. The application includes a feature that displays the denomination of the bill captured on the device using high contrast numerals. This is useful for those with limited vision. The application is easily accessible without the need of an internet connection.

**Alignment with the UDL guideline:** The application meets UDL guideline I “Provide Multiple Means of Representation” by capturing useful information in an easy and convenient way. The application provides individuals with vision impairment the flexibility and ability to identify and recognise dollar bills denomination, which meets checkpoint 2.3 “Decode text, notation and symbols”.

**Curriculum area:** Given that much of the language about numeracy relies on visual reference, learning about the concepts of money can be challenging for students with vision impairment. For example, concepts such as identifying denominations of a dollar bill require some cognitive processing when visualisation is not possible. LookTel Money Reader is a useful tool that can help facilitate a student’s access to identify and use money bills accurately. The application is a useful instructional strategy in the teaching of functional numeracy skills in the life-skills curriculum. It has the potential to support differentiated instruction, promote inclusion and support teachers in a creative learning environment (Istenic Starcic, & Bagon, 2014). It is suitable for students from primary to university level.

**How does the app meet the National Disability Standards?** The application aligns with Standard 2 on Individual outcomes of the National Standards for Disability Services (2013) that allows access and participation to individuals with a disability to engage functionally in the wider community. For individuals with vision impairment, the LookTel Money Reader application enables them with the opportunity to handle basic monetary transactions safely and independently in the community.

**How the app changes pedagogy (SAMR)?** The application can be considered as an augmentation as it empowers an individual with vision impairment to engage meaningfully in the daily activity of shopping and paying for things. The application is an efficient way of discriminating and understanding money bills easily. This reduces the need for users who usually feel the texture and surface of a bill or fold them into separate shapes and sizes in order to identify the denomination.
Therefore, the application provides convenience for the user by making it easier for them to recognise bills both instantly and accurately.

**How the app encourages person centred planning.** Learning skills such as managing and organising money is an important requisite for an independent functioning in the community for individuals with vision impairment. The LookTel Money Reader is a useful application that can enable its user to engage in functional activities that involves the use of money bills. The application is tailored to support the user to choose, count or identify the correct denomination of bills for a monetary transaction. Therefore, it puts the user in control of the environment and increases their responsibility and level of self-determination to handle their money without relying on others for help.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** LookTel Money Reader provides individuals with vision impairment opportunities for choice, skill development and independence in regular activities. The advent of the application has created significant possibilities and options for them to access monetary information and participate in functional activities such as making a purchase at the store. It allows them to take advantage of the same opportunities for success as other sighted individuals and equips them to be enabled individuals. Therefore, the application aligns with ‘Connectivity’ and ‘Community’ from the 5Cs.

**Evidence from the literature that the app is capable of the claims made:** The use of the LookTel Money Reader technology allows individuals with vision impairment to be more engaged and motivated to manage basic finances. They learn to be more self-reliant and responsible in the management of their personal task such as going to a café and handling a monetary transaction on their own. This has the potential to increase their self-esteem and self-determination skills as they are able to participate in meaningful interactions which improves their quality of life (Ayres, Mechling, & Sansosti, 2013). Furthermore, the flexibility of the application provides valuable ways for individuals with vision impairment to develop their self-instruction and self-management skills in their community, thereby creating a positive inclusive experience for them (Bhowmick & Hazarika, 2017). The ability to keep up with what others are doing such as participating in a monetary transaction enriches their life by valuing them as an integral part of the community.

**General Comments:** LookTel Money Reader is an effective tool in teaching students with vision impairment an innovative way of identifying money bills using assistive technology. Teachers can incorporate the use of this application on a mobile or tablet device that can accompany the students on field trips to the shops to participate in basic monetary transactions in an authentic environment. Students can learn and apply money-handling skills through the support of the application which helps them to identify the bills correctly and ensure that the right change is returned to them during a monetary transaction at a shop. This can improve their ability to handle and sort money bills confidently and independently.
Reviewer: Madanarathi Madan Gopal

Name of app: Look Tel Recogniser

Operating System: IOS

Location: Apple store

Cost: $AU14.99

Description: LookTel Recogniser is designed for users with a visual impairment to recognise objects and items instantly through camera based barcode scans. The application incorporates the use of recognition functionality in identifying objects both reliably and accurately. It does not require the need of an internet connection and can be easily accessible by the users in any location. The application has a barcode scanner that can provide additional information about the item and is able to record an audio label for the item scanned. Users can store the images of the objects captured into a database which needs to be set up prior to recognising the items. When the application is used to identify an object, it will easily be recognised by the database and a pre-recorded audio message will recognise the item. In addition, the Recogniser backs-up the images for easy retrieval when a device is lost or replaced.

Alignment with the UDL guideline: The application meets UDL guideline I “Provide Multiple Means of Representation” by providing information that is perceptible and functional to the individual with vision impairment. The application allows the user to customise the content presented using audio which meets checkpoint 1.1 “Offer ways of customizing the display of information”. In addition, the application aligns with UDL guideline III “Provide Multiple Means of Engagement” which gives its users the ability to access information by allowing them to make individual choices which meets checkpoint 7.1 “Individual Choice and Autonomy”. Users are able to choose the items and objects that are of importance to them in their daily functioning and use their device to store and access the information conveniently.

Curriculum area: The LookTel Recogniser application focuses on recognising and reading items that helps users to interpret and understand the item captured. It can support in the development of linguistic competence and the development of knowledge. This can enable students with vision impairment to use the concept of language to appreciate and value the things around them through the application’s audio feature. A useful and pragmatic assistive tool, it can be used to implement to support the functional literacy curriculum for students with vision impairment where they can learn about the things around them through the application’s audio description. LookTel Recogniser is an alternative means that can support in the development of literacy that is a requisite skill for range of life skills activities in the community (Mulloy, Gevarter, Hopkins, Sutherland, & Ramdoss, 2014). The provision and instruction of alternative reading tools can support the teacher to deliver effective literacy lesson for students with vision impairment. The application is suitable for students from upper primary to high school.

How does the app meet the National Disability Standards? The application aligns with Standard 3 on Individual outcomes of the National Standards for Disability Services (2013) which promotes for the
active engagement and participation in daily activities that are easily accessible by others. The unique features of the application allow its users to be more proactive in their daily environment in using technology for problem solving and decision making. It fosters individual choices and interactive engagement for the users in understanding the thing and items around them through the use of the LookTel Recogniser.

**How the app changes pedagogy (SAMR)?** The application can be considered as an augmentation as it enables an individual with vision impairment to identify a variety of objects around the environment effectively. In addition, the items can be easily named with the user’s voice. This is convenient to the users as it will reduce the time and effort needed in identifying items through the use of tactile cues or having others to name the item. The application empowers the users to gain accessibility to things or items readily at their fingertips which can have a meaningful impact in their everyday lives.

**How the app encourages person centred planning.** Individuals with vision impairment are supported by the LookTel Recogniser towards making their own individual choices of creating their own personalised database of everyday objects and things that they may need or use in their daily lives. The application provides them with an individualised support of labelling their personal items, which they can access easily, while at home or in the community. It encourages independence and shifts ownership of daily tasks such as identifying groceries or medication to the individuals that reduces their need to be dependent on others.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** LookTel Recogniser encourages ‘Connectivity’ from the 5Cs. The application is designed to provide users with a vision impairment to acquire independent living skills by enabling them to self-manage their tasks. In addition, it also aligns with “Creativity” as it allows the users to create a library of their own to store the information they have captured for easy retrieval. The application enhances by allowing the user to include audible labels to their collections.

**Evidence from the literature that the app is capable of the claims made:** Individuals with vision impairment face many challenges and barriers in acquiring information about their environment. With the advent of technology and applications such as the LookTel Recogniser, these challenges have been addressed effectively and many users with vision impairment have been enabled and equipped with assistive technology that can support and encourage their independent functioning at home and in the wider community (Csapó, Wersényi, Nagy, & Stockman, 2015). For individual needs with vision impairment, accessibility and autonomy are fundamental needs. Therefore, the use of technological applications such as the LookTel Recogniser conveys information generated by the assistive technology to the users directly, a key to improving self-confidence. In addition, the ability to gain authentic information about one’s environment independently empowers them with self-autonomy skills, which is essential in leading a meaningful and independent life (Andò, Lombardo & Marletta, 2015).

**General Comments:** LookTel Recogniser can help the users with visual impairment with the ability to learn about things and items around their environment. Its main task is to help its users to acquire awareness. Students can self-manage their classroom tasks with the support of the recognition technology.
Reviewer: Dharshinie Vimalanathan

Name of app: Read Me the Weather

Operating System: IOS

Location: App Store

Cost: $4.99

Description: Read Me the Weather was developed to assist people with vision impairment or blindness to check weather forecast. It is integrated with Apple’s Voice over Technology that enables spoken descriptions to be read out clearly and concisely. To be able to use the app, all users need to do is navigate their fingers through opening the app and hear the weather and temperature for today, tomorrow or even for the next few days.

Alignment with the UDL guideline: This app is aligned with Principle I of the UDL guideline indicating multiple means of representations further aligning with checkpoint 1.3 which offers alternatives for visual information. This app is designed for both users with and without vision impairment. As mentioned the app is integrated with Apple’s VoiceOver Technology that enables the information to be read out as an alternative mean for visual information. Furthermore, for people without vision impairment who do not use voice over, they do not need to worry as it comes with a built-in voice synthesis enabling users to open the app and just listen about the weather.

Curriculum area: Based on the Australian Curriculum, this app can be incorporated in the Science curriculum area from Foundation Year to Year 2 or Year 3. During these ages students learn about the different types of weather and temperature and this app would enable students with vision impairment to be on par with other students in a mainstream classroom.

How does the app meet the National Disability Standards? This app meets two out of the six main National Disability Standards (a) Rights and (b) Participation and Inclusion. Read Me the Weather allows students to feel included in social aspects. As this app seems to align with the Science Curriculum Area, it allows students who are in mainstream classrooms to join in with class peers and discussion with the app being installed in an iPad or Iphone. Furthermore, individuals in social gatherings are able to feel included in conversations leading up to weather forecasts.

How the app changes pedagogy (SAMR)? The app changes pedagogy in two ways, which are substitution and augmentation. The app is a substitution of looking out the window and predicting what the weather would be like for the day. It is also Augmentation on the other hand because the app has a built in voice over technology for non-sighted users and for sighted users it has a built-in voice synthesis.

How the app encourages person centred planning. The app allows a teacher/trainer to provide a person centred approach by allowing the student to contribute in classroom discussions by simply explaining about the weather using the app. With this, teachers/trainers can promote further classroom discussions and enable the student to feel included.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages Connectivity and Community. Read me the weather allows students and individuals to connect with other individuals creating a community of learners. Students will be able to connect with one another and have classroom discussions between themselves based on what the app produces. Individuals with vision impairment would be able to fit in and join into the conversations thus allowing for connectivity with other children as well as it creates a community of learners.

Evidence from the literature that the app is capable of the claims made: To date, there has been limited research conducted on individuals and their preferences on apps, and even more so for individuals with vision impairment. However, researchers Bryant, Wilde and Smart (2015) conducted a study on what kind of weather apps would individuals prefer on smartphones. Although the research does not directly link to individuals with visual impairment, it definitely generated a buzz of what people in general prefer. The study revealed that weather apps were found to be a lot easier to navigate around and due to the text-to-speech elements people preferred to download the app and listen to it. The Read Me The Weather App would be a preferred app for individuals with vision impairment due to the convenience of its text to speech feature.

General Comments: Educators and teachers are able to incorporate this app into their lesson plan to enhance their learning lessons. As this app is not only confined to individuals with vision impairment, teachers and educators who are in mainstream classrooms and have students with vision impairment are able to stick to the same curriculum but substitute the material. This saves more time as well as resources for teachers by not having to create a different plan for the student with visual impairment. Furthermore, this will allow the student to have a sense of belonging together with his/her peers.
Reviewer: Dharshinie Vimalanathan

Name of app: Text Detective

Operating System: IOS, Android

Location: App Store and Google Play

Cost: Free

Description: Text Detective is a free app for individuals with vision impairment or blindness. It has a built-in Optical Character Recognition (OCR). The basic function is that this app allows text to be read out based on what the mobile camera device captures or has scanned. Menus, catalogues, medication description, mail and all other kinds of printed items could be read out to the individual by just placing the camera above these items. Text detective allows text to be edited, copied and pasted into documents as well as emails and other apps. The scanned text is stored in the history of the phone for future reference. It works best on texts, which have good lighting, and with a distance of the length of someone’s forearm. It does not require an internet connection that means it can be used on airplane mode as well. Users can use this app on a go.

Alignment with the UDL guideline: The UDL guideline that applies to this app is Principle I, which indicates that the technology has multiple means of representation. Several checkpoints under principle I applies to this app: Checkpoint 1.3,” Offer alternatives for visual information”, Checkpoint 2.3, “Supporting decoding text, mathematical notation, and symbols”, and Checkpoint 2.5, “Illustrate through multiple media”. The features in this app align with these checkpoints in a way that it is fit for students with visual impairment and will help them be independent.

Curriculum area: Based on the Australian Curriculum, the curriculum area that can incorporate the teaching of Text Detective would be Information and Communication Technology. This app would require lessons on navigation and understanding details about how to go about the use of the app that can be incorporated into daily use.

How does the app meet the National Disability Standards? This app is aligned with four out of six main disability standards: Rights, Participation, Inclusion, and Individual Outcomes. Firstly, it has been developed promoting individual rights allowing them to feel a sense of belonging avoiding negative stereotyping. The app allows for inclusion and participation as individuals with vision impairment no longer will have to feel left out in social gatherings or class participation if they are students. Furthermore, the features of the app such as editing, copying and pasting into documents or emails support the growth of individuals with an impairment allowing them to grow independently as an individual. This aligns with the individual outcomes of the disability standard.

How the app changes pedagogy (SAMR)? Text Detective changed pedagogy in two ways, which are modification and redefinition. Instead of having to manually edit documents, copying, pasting etc. the app has been modified to the needs of individuals with vision impairment allowing them to function similarly to sighted individuals. This app is a total redefinition to the disability community.
such that without the growing world of technology text detective would not have been able to be
developed, which allows people with vision impairment to be included in the community.

**How the app encourages person centred planning.** The Text Detective app allows teachers/trainers to
provide a person-centred approach for individuals with vision impairment by including Ipads or
Iphone’s in curriculums that would enable them to scan the materials given out in class. This would
allow students to be part of classroom discussions that include decision-making, questioning and
different forms or learning outcomes that they can reach for.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app
relates to Curation, Connectivity and Community. Text Detective encourages individuals to connect
to each other which can then evolve into a community of learners. Due to the nature of the app,
individuals with this app are able to contribute to more discussions based on the ability of them
being able to scan what they see and not having to wait for it to be translated by someone. This
app also encourages curation as it allows documents to be stored for future reference.

**Evidence from the literature that the app is capable of the claims made:** Text Detective has a built-in
technology known as Optical Character Recognition (OCR) helping users with vision impairment or
even learning difficulties (i.e. dyslexia) to convert text or any printed documents or labels that has
been image captured. This captured image enables editing and searchable data for these
individuals to understand the content of a certain item. The OCR technology has been around for
decades but only evolved across time and, with the combination of VoiceOver, it helps individuals
mainly with vision impairment or even learning difficulties understand what is around them
(Ramiah, Leong & Jayabalan, 2015). Due to the inability of individuals with vision impairment
to perform visual tasks instantly, Neto and Fonseca (2014) conducted a project called “Camera
Reading for Blind People” in which the main objective was researching the best way possible for
users with visual impairment to be able to “read text” similarly to sighted users based on mobile
applications. Their project revealed that applications with the OCR technology together with text
to speech synthesis (TTS) allows users with vision impairment to be more independent and less
reliant on having someone translate text they come across during social outings. Similar to TTS,
Text Detective has built in Apple’s VoiceOver technology for users with vision impairment.

**General Comments:** This app is useful to developmental educators and teachers in a way that teachers
can incorporate this in lesson plans helping students reach their desired goal. This app not only
assists students with visual impairment but it is also a great app for students with learning and
reading difficulties like dyslexia. This app will help teachers help students with various learning
disabilities be on par with students who do not have a disability. Therefore, teachers are able to
save time and resources preparing extra materials and instead use that extra time to help students
understand what has been read out to them.

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Reviewer: Dharshinie Vimalanathan

Name of app: iMove

Operating System: IOS

Location: App Store

Cost: Free

Description: iMove is a GPS system that enables individuals with vision impairment to understand or know their surroundings. The iMove app allows the individual with visual impairment to navigate around independently. With the fully accessible VoiceOver function, this app simply states the address directly where one is positioned and states key locations (e.g. police stations, schools, grocery stores) around the individual. For the app to function, the user first needs to speak the address of where one desires to go, and the app will note the address every time the desired location gets closer. iMove allows messages to be customized, as the user desires. For instance if you do not want all locations to be mentioned through the journey, you are able to custom the message based on what distance you want to be navigated from.

Alignment with the UDL guideline: This app aligns with Principle II- Provide Multiple Means of Action and Representation. Further, it aligns with Checkpoint 4.1, “Vary the methods for response and navigation”, and Checkpoint 4.2, “Optimise access to tools and assistive technologies”. iMove was designed to allow individuals with visual impairment to gain a sense of independence by being able to navigate themselves when going places.

Curriculum area: This app would suit Geography and ICT curriculum areas. This app is ideal for individuals of all ages. It can be incorporated in ICT classes which will help the individual to learn more about how to go about using the app. It would also be an ideal app to help students understand geographical areas taught in Geography lessons based on the key locations that are pointed out by the app before reaching the desired location. During class trips, students with vision impairment are able to understand landmarks similarly to sighted students based on what the app states.

How does the app meet the National Disability Standards? This app aligns with the standards of Individual Outcomes and Participation and Inclusion. This app allows students and individuals with visual impairment to feel a sense of independence and allows them to grow as an individual without having to be dependent on other individuals. This meets the third National Disability Standards of Individual Outcomes. Furthermore, this app meets the participation and inclusion disability standard allowing individuals to be part of a social excursions and social networks. As the app features key locations and landmarks, this allows individuals with vision impairment to give their input of navigating someone to their desired location simply because of their ability to know based on the apps landmarks.

How the app changes pedagogy (SAMR)? iMove is a substitution to normal map reading or asking people how to get around. It is an enhancement of which technology is getting greater by the day. Furthermore, the app changes pedagogy in an augmented way due to the multiple features added
to it. Initially, navigation apps only had VoiceOver, in which one still has to look and see where they are going. However, with its feature of the app locating every key location heading towards the actual navigated place, individuals with vision impairment would need to be less reliant on other sighted users.

**How the app encourages person centred planning.** This app allows teachers/ trainers to provide a person-centred approach as teachers are able to ask for specific details heading towards a certain location. It gives individuals with vision impairment an opportunity to contribute to class discussions due to the apps features that promote specificity of locations.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The iMove app encourages four areas of the 5Cs. Firstly, it encourages connectivity with other individuals who are not visually impaired. This leads to a community of learners as it encourages individuals with vision impairment to join in and provide their input on discussion leading up to specific locations. Adding to this would-be collaboration between individuals with vision impairment who are able to share their insights of the app and provide them with unlimited opportunities when it comes to navigation. As this app is not only confined to, one language (i.e. English) users can have international collaborations that they could share their insights.

**Evidence from the literature that the app is capable of the claims made:** Being able to navigate oneself from place to place is a pivotal factor in everyone’s lives. Individuals without a disability sometimes lose their way navigating around and even more so for individuals with a disability. Several navigation apps have been developed through the years and have only progressed on its features based on how technology has progressed (Giudice & Legge, 2008). While there is no direct research supporting the iMove app, a study done by researcher Chen-Fu Liao (2014) demonstrates how smartphones have developed navigation apps that have become an extra hand for individuals with vision impairment in work zones. Fu Liao (2014) stated that individuals with vision impairment are constantly being faced with barriers of having to move around independently due to their restriction of being independent. The study did a survey on 10 individuals with vision impairment and found that most of them had felt blessed to be in the age of technology that enables the inbuilt GPS to help them around. It was indicated as feedback that they hoped that with technology, the apps will improve and allow even more independence for them. The iMove app provides the kind of independence that is being sought.

**General Comments:** When planning curriculums, teachers and educators are able to incorporate this app into their lesson plans which will not only be a fun way for students to learn but some students are able to understand when they move around and navigate themselves physically. Incorporating this app in lesson plans will allow teachers to reach their goal of teaching students about navigation.
**Reviewer:** Dharshinie Vimalanathan

**Name of app:** HeyTell

**Operating System:** IOS, Android

**Location:** App store and Google play

**Cost:** Free

**Description:** HeyTell is a combination of two platforms: voice messenger and walkie-talkie. This app allows instant conversation with just a press of a single button to family and friends who have touch screen phones. This app does not require the recipient to have the application installed. The app does require an internet connection to function. This app is ideal not only for individuals with vision impairment but also for individuals with a learning disability (i.e. dyslexia) as it will help get messages across without having to think about sentence construction. Furthermore, this app has 3 levels of privacy settings indicating how an individual would like to be contacted by other people. The three privacy settings are low, medium and high. All three differ in the way people can HeyTell a person.

**Alignment with the UDL guideline:** This app aligns with Principle II – “Provide Multiple Means of Action and Expression”, Guideline 5 – “Provide options for expression and communication”, and Checkpoint 5.2- “Use multiple tools of construction and composition”. It enables individuals with a disability to express and communicate the exact same way as individuals without a disability. These guidelines fit the main app's feature that is allowing individuals to communicate with others without having to type it out.

**Curriculum area:** This app will be best introduced and used in the ICT curriculum. In this way, students are able to understand how to use the app and furthermore would be up to date if there are any new features or any other app similar to this helping them to communicate with others. ICT classes would ensure they are up to date with their technology skills allowing further sense of independence in the technology world as they grow.

**How does the app meet the National Disability Standards?** This app supports an individual’s Rights, Participation and Inclusion. This app promotes rights to individuals for freedom to express what they desire, whom they choose to communicate with and most importantly allowing individuals with a disability to feel safe. Due to the ability to communicate through multiple means of social networking sites, HeyTell meets the National Disability Standards for participation and inclusion. This app allows for engagement within society and allows individuals with a disability to feel part of the community and able to contribute in a meaningful way.

**How the app changes pedagogy (SAMR)?** HeyTell changes pedagogy in two ways, which are substitution and augmentation. These two pedagogies are a transformation towards the communication world whereby normal texting and letter writing has been substituted which just a voice note. The augmentation of this app is the many features that make this app a whole lot easier and better for individuals with visual impairment. These features not only help individuals with visual impairment
but also individuals with a learning disability, such as dyslexia, to get their messages across without having to worry about constructing sentences.

**How the app encourages person centred planning?** This app allows teachers/trainers to provide a person-centred planning by teaching them how this app can improve one’s way of living. Social skills can be taught using this app in classrooms that will teach students to appropriate way of communication. This app will allow teacher and trainers to assist in a quality way of living.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app encourages three out of the 5Cs: Connectivity, Community and Collaboration. It allows individuals with vision impairment to feel a sense of connectivity with the world beyond those who are visually impaired. This allows for a greater variety of community learners that include people with and without vision impairment. This app will encourage collaboration between different communities of people as this app directly links to multiple social media sites.

**Evidence from the literature that the app is capable of the claims made:** Researchers Csapo, Nagy and Stockman (2015) conducted a survey on assistive devices and technologies and found that as technology progresses, apps are being developed that are greatly assisting not only individuals with vision impairment but also individuals with learning difficulties. Having apps to help with communication is a pivotal factor in everyday life. The research found that with technology advancing every day, the text-to-speech feature enables individuals with vision impairment to feel a sense of belonging and part of a community. Having no direct research on the HeyTell app, this research is an indication that the development of this app leads to better quality of life for individuals with visual impairment by allowing them to communicate more effectively.

**General Comments:** This app is ideal for developmental educators and teachers to teach students to live a better quality of life. This app will be able to teach students the difference a message sounds when it is texted and actually voicing it. Much of the time, messages get lost in translation when it is texted rather than actually saying it, which can lead to miscommunication. Thus, educators and teachers are able to incorporate this app into social skills teaching individuals the best way of expressive communication.
**Reviewer:** Dharshinie Vimalanathan

Name of app: RAY App

Operating System: Android

Location: Google Play Store

Cost: Free

**Description:** The RAY app is the new smartphone navigation system only available to Android that was inspired through keypad usability. What the RAY app does is that it navigates its menu or icon system based on the users touch on the screen regardless of wherever they touch on the screen. This app was designed specifically to fit individuals with a visual impairment. Furthermore, this app is voice operated which allow users to say the name of the person they want to call or say the name of the person they want to send a text message. This app provides further independence to users with vision impairment.

**Alignment with the UDL guideline:** This app aligns with Principle 1, “Provide multiple means of representation”, Checkpoint 1.1 “Offer ways of customizing the display of information” and Checkpoint 1.3 “Offer alternatives for visual information”. The main feature of the app which is the whole display of the app aligns with this guideline. From having to navigate yourself through your own phone apps, RAY app has been designed for the app to navigate by the touch of the user.

**Curriculum area:** The curriculum area that best fits this app would be information and communication technology. Students would need to know and learn how to function the app and more so if there are constant updates on the app. Having this app incorporated in this curriculum area would keep the students updated on the functions.

**How does the app meet the National Disability Standards?** This app meets two of the six National Disability Standards, which are individual outcomes and participation and inclusion. Following these standards, this app allows for higher levels of independence and less reliance on others. As the icons on the app rearrange themselves based on a touch of a finger, it allows for faster response on all levels of communication.

**How the app changes pedagogy (SAMR)?** This app is a total transformation of modern day technology. It changes pedagogy in two ways, which are modification and redefinition. The outlook of the app has been modified to fit the needs of individuals with visual impairment and it is redefined based on the advancement that technology has made. This is one of the first apps to have the icons on a touch screen be moved around based on touch.

**How the app encourages person centred planning.** This app allows teachers to provide a person centred approach by asking them how this app has improved their lifestyle, in order to understand what difference the app has brought into their life and how it has made significant impacts on their daily routine. With this approach students would be able to feel like they are being heard and their feedback about input like these apps are important.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app encourages Connectivity, Community, Collaboration and Creativity. The app encourages connectivity such that it allows individuals with vision impairment to manoeuvre around the app as easily as a sighted user. This creates a connection within social networks that leads to a community of learners. This app allows for collaboration whereby inputs about the app can be shared around with other individuals. Moreover, the app itself allows for easy collaboration using social media websites. Furthermore, the app brings out creativity by encouraging new ways to store documents and position the icons.

Evidence from the literature that the app is capable of the claims made: Although there is no direct literature to support the claims made on RAY app besides people’s reviews, researchers Rodriguez-Sanchez, Moreno-Alvarez, Martin, Borromeo and Hernandez-Tamames (2014) indicated that with smartphones, individuals with vision impairment find it difficult to navigate. Often, they spend more time figuring out where is the app that they want, which leads to frustration. The research study included eighteen individuals with vision impairment using the Wayfinder app, which incorporates the RAY app; This research indicated that the subjects showed significant results of being able to navigate themselves without any help. In line with the RAY app, if individuals were able to be happy with the Wayfinder, the RAY app would definitely be a “ray of sunshine” allowing them to feel more independent with its features specifically designed for individuals with vision impairment.

General Comments: This app can be useful to developmental educators such that it can be incorporated into classrooms allowing students with impairments to use any function of the device faster, which will allow them to be on par with the whole classroom. For instance, if in a geography class an individual would require the weather app, the speed of them touching the screen for the app to appear would be a lot faster than having to interrupt someone during the class.
**Reviewer:** Thi Thanh Nga Nguyen

**Name of app:** BlindSquare

**Operating System:** IOS

**Location:** Apple iTunes store

**Cost:** $AU 53.68

**Description:** BlindSquare is a navigation app that helps individuals with visual impairment (VI) both outdoors and indoors. It is an integration of Foursquare data and Apple’s VoiceOver technology. It is considered a mash up of speech synthesis, crowdsourced data and GPS technology. BlindSquare informs people where they are, where they are going by reading street name, surrounding location and address via virtual map through sound.

People with visual impairment can use the application whenever they need. If the person with blindness does not know the place that she/he is in, BlindSquare will help her/him to draw a map about the area through describing the whole information of streets, services around her/him and even crossings. For example, the app will help you to find the nearest library or the most popular café within a 200-meter radius. Once you choose and track your destination, you will be announced the distance, directed while you are moving and always notified when you reach it. Moreover, BlindSquare can help you to figure the old position that you marked it by this app before.

**Alignment with the UDL guideline:** This app aligns with the UDL guideline II “Provide Multiple Means for Action and Expression” in checkpoint 1.4 “Provide options for physical action”. As the objective that section 1.4.2 mentions that “Optimize access to tools and assistive technologies”, the app helps to reduce physical barriers of individuals with visual impairment in full participation in the community activities. This assistive technology ensures that people with visual impairment can physically access all lesson by using effective assistive technology tools.

**Curriculum area:** This app is appropriate to be used in moving orientation teaching for every individual with visual impairment in all of ages. It should be introduced for the students as soon as possible. As a result, their confidence and independence are consolidated early over time that is likely to impact their ability of learning and including.

**How does the app meet the National Disability Standards?** BlindSquare meets the National Disability Standards in Standard 2 “Participation and inclusion” because the app supports people with visual impairment to reduce physical barriers to take part in the community. An independent travel is big landmark of their life and is the foundation for them to be included in the community. Indeed, the most difficulty of people with visual impairment is moving due to not see. However, Blindsquare helps them move confidently that increase their self-efficacy in social inclusion.

**How the app changes pedagogy (SAMR)?** The app would be a redefinition of teachers in teaching moving orientation lesson. It is a transformation from an old teaching method to completely new one. Traditionally, teachers teach students with visual impairment moving orientation through a stick and their guiding speech. After that, the students have to practise and apply the lesson with the
stick but only in familiar places where they used to be there. However, BlindSquare app has changed completely the tool, the way as well as the space for practice. In fact, students do not need any person to guide and navigate them where to go and remind them some impediments forward when using the application. They are likely to use the app easily after the lesson and may independent travel without others’ assistance and even in strange areas.

**How the app encourages person centred planning.** The app facilitates teachers to provide a person-centred approach for students. In fact, the app is built basing on the needs and ability of people with visual impairment. Specially, the app supports the valued contribution of the people to their community. When people may contribute a lot to the society when they have an independent live rather than when they have to rely on others. Clearly, the app expresses a listen, an action that boost the people to achieve what they want in their life.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app encourages a 21st Century approach to Teaching/training is Community. To elaborate, the people with visual impairment may have full participation in community due to being able to travel independently. They can feel belonging to the community where they can move around easily.

**Evidence from the literature that the app is capable of the claims made:** Assistive technology is necessary in enhancing the quality of life of people with visual impairment (Lancioni, 2014). It brings confidence and dependence to them by various supports in which navigation is an important one. However, traditional assistive devices for assistance navigation may exist certain disadvantages. For example, the wide cane has the limited sensing range while obstacle detection devices can recognize the conditions of the streets with higher sensing range to inform the people with VI the potential dangers in advance (Ong, Zhang, & Nee, 2013). BlindSquare is a modern assistive technology that is useful for the people both indoor and outdoor. Although there are some concern about the awareness of people with VI of their surroundings, Csapó, Wersényi, Nagy, and Stockman (2015) assert that designing navigational aids for people with VI is must in no way detract this kind of awareness through natural channels. Otherwise, Puentedura (2006) suggests substitution and augmentative in the SAMR model is considered as ways to enhance learning tasks while modification and redefinition are for transformation. BlindSquare is an app that expresses the highest level of SAMR model that is redefinition. To elaborate, transformational learning activities will go beyond substitution activities that just merely utilizing a mobile device instead of a traditional tool (Romrell, Kidder, & Wood, 2014).

**General Comments:** This is a good tool for teacher or trainer who wants to teach students with vision loss in traveling and moving orientation. It changes completely what and how the teacher should teach the students and the students would be very excited to receive the lesson.
**Reviewer:** Thi Thanh Nga Nguyen App 17

**Name of app:** Voice Dream Reader

**Operating System:** IOS, Android

**Location:** iTunes, Google Play

**Cost:** $AU 20.12 (IOS) and $AU 19.15 (Android)

**Description:** Voice Dream Reader is an app that helps people with a visual impairment. It is an accessible reading tool for tablet and mobile devices. It can be tailored for different reading styles that are suitable to different needs. People with VI will benefit from hearing materials read in a favourite voice. This app supports reading DRM-free EPUB, PDF and DAISY eBooks and more. You can load files from the apps like OneDrive, Box and DropBox or directly from your devices.

**Alignment with the UDL guideline:** This app meets the UDL guideline I “Provide Multiple Means of Representation”. It provides tools that ensure all students have equality in accessing to information by supplying non-visual alternatives. Hence, the app meets checkpoint 1.3 “Offer alternatives for visual information”.

**Curriculum area:** Teacher can use this app to teach the students in diverse areas. For example, reading subject for student from primary schools to high school. Otherwise, students can use this app to support them in tertiary education as well as in daily activities such as read articles, emails or any document.

**How does the app meet the National Disability Standards?** In the National Disability Standards, the app meets the Standard 3: “Individual Outcomes”. Through the app Voice Dream Reader, people with VI have opportunities to assess diverse resources that assist them in building and achieving their life goals based on their needs and strengths.

**How the app changes pedagogy (SAMR)?** The app could be considered a substitution in SAMR model. Instead of reading by eyes to understand the information, this app helps people with vision loss read by their ears and can complete the task similarly the original ones.

**How the app encourages person centred planning.** With this app, people with vision impairment can be self-confident in their learning and life.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** A 21st Century approach that this app encourages people with vision impairment is connectivity. It is useful for them to access social media and share what they are concerning. A community connection would be easy for them when use Voice Dream Reader.

**Evidence from the literature that the app is capable of the claims made:** Hersh (2010) demonstrates the benefits of assistive technology in increasing and improving the functional capabilities for students with vision impairment. He suggests screen reader displays the visual output of the device screen to the user in Braille or in synthesised speech. Voice Dream Reader has become a well-known
assistive technology in community (Carr, 2013). Carr (2013) found that the app helped people with a vision impairment to read independently and do some tests that require reading without relying on others reading the document to them. The purpose of this app is to allow people with VI access to and control over a technology device (Hersh, 2010) that applying a person-centred approach to make sure the needs and strengths of the users are considered. Moreover, Voice Dream Reader and a mobile device are necessary for the students with vision impairment in learning activities. Hockly (2013) states that the learning activities can be designed with a mobile device in a simplest level that can substitute for a traditional tool. Specially, teachers can make a substitution with the app and some learning activities that may not be designed without a mobile device and the app.

**General Comments:** Voice Dream Reader is recommended for educators and parents of students with VI to teach them in learning activities and in their daily life. It is not only helpful for students with VI, it is also useful for students with dyslexia or deficit disorders or even the college students who are busy and want to save time by hearing it on their way.
Reviewer: Thi Thanh Nga Nguyen

Name of app: Eye-d pro

Operating System: Android

Location: Google play

Cost: $AU 5.48

Description: Eye-D Pro helps people with visual impairment in the aware of location with “Where am I”, exploration and navigation of the nearby places of interest with “Travel Mode” and “Around Me”, evaluation of surroundings with “See Objects”. Besides that, Eye-D Pro also has ability to read text and share images. This app is a true companion for the people because it is a complete solution for them in most of daily assistance needs.

Alignment with the UDL guideline: This app meets the UDL guideline II “Provide Multiple Means for Action and Expression”. It aims to reduce barrier in interaction with instructional materials, technologies and physical manipulatives for people with visual impairment by providing alternative means. So, it aligns with checkpoint 4.1 “Vary the methods for response and navigation”.

Curriculum area: Teachers could use the app for students in living skill program. When teachers teach the students applying technology to support their life, Eye-D Pro is a combined app that can assist students with visual impairment in a range of functions. Furthermore, the app could be used flexibly by the students in every daily activity including learning (read articles), moving or recognizing something around them.

How does the app meet the National Disability Standards? The app meets the Standard Two: Participation and Inclusion of the National Disability Standards because this app supports people with VI to have ability of inclusion and contribution in the community with valued participation.

How the app changes pedagogy (SAMR)? The app is a tool of transformation that allows a task redefinition in teaching. To elaborate, educators can use the app in teaching students with VI determining the position and surroundings. These students can implement the learning activities as a new task by supporting of the app functions (Where am I, Travel mode, Around me and See objects). Traditional ways like touching some things, recognizing familiar places are very hard for people with VI due to the limitation of experience. This app makes the tasks become easy and broaden the scope of practice from experienced places to completely strange areas. Obviously, with the Eye-D-Pro, the students do not need to have any experience about the explored places but they can be confident to discover any place they want.

How the app encourages person centred planning? The app supports the trainers in a person-centred approach. It is designed based on the strengths, needs and interest of people with VI. The trainers can use the app to lead them to achieve their goals. Once people with VI use Eye-D Pro competently, they can completely own their goals and active in community participation. For example, people with VI can go anywhere they like but do not need other’s assistance. They also can share some images to others as they like.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages people with VI in two 21st Century approach to teaching including community and connectivity. In fact, it is visible when they have the app to assist, they can participate in communities easily. For example, they can travel to a strange restaurant for an appointment. They can read the menu and order some dishes themselves. Moreover, connectivity is another benefit of the app. People with VI can connect with their friends and share interesting things through the app.

Evidence from the literature that the app is capable of the claims made: New technologies has supported people with disability in different manners. In particular, technology based accessibility has made a significant change for the people in their lives (Bühler, 2016). Community and connectivity for people with visual impairment is evidence when using the application Eye-D-Pro. Besides that, assistive technology has enabled people with visual impairment to have better participation in the school, leisure and work (Gitlow, 2012). Indeed, Eye-D-Pro changes the life of the people by creating opportunity for full participation. It broke the most concrete barrier that is viewing everything. Although this app is not the people’s eyes, it can help them by seeing and talking what the people want to see.

Moreover, this is an app with range of functions but suitable to the needs of students with VI. It helps the students apply personal centred approach with choosing what they like when using the app on a mobile device. Actually, an educator, when looking across the classroom, can see the students’ personalities via their choices in what type of mobile device, which function of app they want to use and how to use it (Romrell et al., 2014).

General Comments: Teachers can use this useful app for their student’s due to its wide range of functions. Thousands of people on have used Eye-D Pro over the world, to assist people with vision impairment become independent.
Reviewer: Thi Thanh Nga Nguyen

Name of app: Soft Braille Keyboard

Operating System: Android

Location: Google Play

Cost: Free

Description: Soft Braille Keyboard is an app that can be used in any application on Android devices where there is a keyboard to enter text. The app is supported with two keyboard layouts (conventional horizontal layout and vertical layout) that are suitable for large screens like tablets and small screens like phones. You can use the standard Braille fingers and gestures to read and manipulate the content input in both modes. Moreover, both keyboard layouts supply additional configuration for users to configure their perfect style. The keyboard has some more functions such as voice dictation, word count, spell checking, auto-capitalisation, text manipulation and more. Current languages that are fully supported are English, Italian, Chinese, Spanish, Vietnamese, Russian, Slovak, Polish, Czech and Portuguese.

Alignment with the UDL guideline: The app meets the UDL guideline II “Provide Multiple Means for Action and Expression”. It provides the users an alternative keyboard so that they can manipulate their work in their way. This app meets the checkpoint 4.2 “Optimize access to tools and assistive technologies”.

Curriculum area: This app can be used for students from primary level in various areas. The app supports students with visual impairment in manipulating input text instead of typing on the normal keyboard. Therefore, it will help the students from primary school who start learning writing and reading to adulthood in any field such as writing, maths, etc. for primary students as well as doing assignments for tertiary students and daily working for adults. In fact, Soft Braille Keyboard benefits students in using the technology devices independently as the sighted people.

How does the app meet the National Disability Standards? This app meets the standard 3: “Individual Out comes” because it supports people with visual impairment to achieve their goals themselves. Indeed, it is difficult for the students who cannot use the keyboard like sighted people without alternative keyboard. It means the devices become meaningless with the students and that is restrictive capability of the students in expressing their ability and in achieving their objectives.

How the app changes pedagogy (SAMR)? The app could be considered a substitute for using an original keyboard to manipulate the input texts. Therefore, it would be classified as “Substitution”.

How the app encourages person centred planning. The app creates opportunities for teachers in using person centred approach. To elaborate, the app was created basing on the needs of people with vision difficulties, created to support the people in choosing what they want to do, how they implement their plan to achieve the goals.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages all 5Cs in the 21st Century approach. When students with visual impairment are able to use the technology devices, they are more confident in participate in the community activities through social media. They can show the connectivity through sharing ideas with friends and relatives, the collaboration through exchanging their opinions and solutions in an online meeting. With the app, the people have opportunities for the creativity in their work as well as develop the curation ability. Overall, the app encourages the 5Cs approach for users.

Evidence from the literature that the app is capable of the claims made: People with VI have many obstacles in typing the original keyboard that is essential for using mobile community and connectivity (Bhagyesh, Sushant, & Tanmay, 2016). Therefore, Romrell et al. (2014) assert that educators should focus on how the app improve students’ learning. Substitution is the lowest level of SAMR model but helps the teachers create optimal learning experience for the students by using an application on mobile devices (Romrell et al., 2014). However, to use mobile connectivity and communication, typing is essential. People with visual impairment face difficulties in this manipulation and there is few technology assisting input text recently (Bhagyesh et al., 2016). For the people with visual impairment, therefore, eyes-free text entry is an urgent need for going beyond academics when using technology devices (Frey, Southern, & Romero, 2011). The app likes Soft Braille Keyboard improves the solutions by overcoming the lack of continuity and the disadvantages of fixed areas in input process (Bhagyesh et al., 2016). Soft Braille Keyboard can help the students have chance to implement the tasks in different way with others. This allows people with VI express their ability of solving the task easily.

General Comments: This useful tool received many positive feedbacks from users. Educators can download and guide their students using in the educational activities. It is quite easy to use for students with visually impairment because it uses Braille that is familiar to them.
Reviewer: Thi Thanh Nga Nguyen
Name of app: Google Talkback
Operating System: Android
Location: Google play
Cost: Free

Description: TalkBack is an app that helps people with visual impairment to interact with the devices. This app adds vibration, audible, and spoken feedback to the device. TalkBack was pre-installed on Android devices when they were sold and through Google Play, it is updated with new features and improvements routinely. You can explore what is on your device’s screen via Talkback. When you act on any element, TalkBack will tell you what you have touched. You use a double tap to act on the element or move to next ones without triggering anything.

Alignment with the UDL guideline: The app aligns with the UDL guideline I: “Provide multiple means of representation”. Information accessibility is different in each individual. People cannot learn if they are imperceptible the information. Although visual information is very useful, not all people can absorb this kind of information. Therefore, it is important to make sure that all learners have equality in accessing information by providing non-visual alternatives. This app reduces barriers for people with visual impairment by providing another option for perception through hearing instead of vision. It is matched with the checkpoint 1.3 of UDL guidelines that is “Offer alternatives for visual information”.

Curriculum area: Because this app helps people with viewing difficulties what they are doing on the device, it can be used in every area in their life whenever they use an Android device. Indeed, every area benefits from the app since nowadays there are many technology tools using Android applied for learning. For example, they can use this app in studying subjects, social skills and many daily activities that are supported by Android devices. Therefore, TalkBack should be use for everyone in every age that needs alternatives for visual information.

How does the app meet the National Disability Standards? The app encourages people with visual impairment to achieve their goals by assisting them in the information processing. It meets the standard 3 of the National disability standards that is Individual Outcomes. When the people have right to choose their goals, the app is a useful tool for them to figure out the goals they want and the way to reach the goals. TalkBack will help the people to determine who they are, what they want to obtain and how they do that. TalkBack is a bridge between the people and the huge information from the world that the people are difficult to absorb them as the sighted people. Once accessing information easily, they become open-minded and have trend to develop themselves.

How the app changes pedagogy (SAMR)? Google TalkBack is a tool that teachers can use in the modification for students with visual impairment in classroom when they have special needs. The app helps the students have ability to access the lesson as well as interact with all visual information that the educators want to convey. It would be classified as augmentation level that there are
functional changes in learning and teaching. The students receive and process information on
screen of devices through the app instead of manipulating on the papers and waiting for helps from
the teachers or the peers. For example, the teacher can give the students some maths lessons
through computer games in lieu of on the paper using Braille. The computer games will give the
students opportunities to practise again if they do wrong work. Therefore, this app enhances the
teachers in using technology to support the students to reach their goals.

How the app encourages person-centred planning. TalkBack allow the teacher to apply person-centred
approach due to it was created based on the need of people with visual impairment. The app gives
students opportunities to develop their strengths. In fact, TalkBack facilitates the teachers to give
students chances to determine what they want their life to be like, what they want to change and
how they change something. Indeed, the students will be more independent and confident in
making choices as they like because they can use the device easily to serve their life.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app
encourages the whole 5Cs including community, connectivity, collaboration, creativity and
curation. When students can use the devices to access information, they can actively participate in
the community. Moreover, they can connect to the favourite activities and become more
independent and controlled in working and entertainment. Otherwise, the app not only creates
opportunities for users to share ideas and information (collaboration), but also is the foundation of
the users’ creativity. From these, the users are motivated to curate their gathered information.

Evidence from the literature that the app is capable of the claims made: Csapó et al. (2015) state that
besides tactile feedback solutions, assistive technology with auditory feedback has increasingly
been utilized for people with VI. It is demonstrated that both frequency and temporal-based
resolution of the auditory sense is high in comparison with the resolution of somatosensory
receptors (Csapó et al., 2015)

Assistive technology including various applications is well ensconced in the life of individual with VI
(Lancioni, 2014). With the widespread development of technology, the availability of devices with
fidelity audio enhances the possibility of accessing curriculum and ensures fair assessment in
education for people with visual impairment (Nees & Berry, 2013). Audio has become popular in
technology devices. The Google TalkBack is one of such apps that offers features designed for
people with visual impairment to make the device more accessible ("Sprint and LG Electronics USA;
GRAPHIC LG Optimus F3 from Sprint Boasts Advanced Accessibility and Unmatched Affordability,”
2013).

General Comments: TalkBack is a useful application that supports people with vision impairment to
interact with and enjoy their mobile devices. It is an accessibility service that brings benefits and
opportunities for individuals with VI to have a truly social inclusion.
Reviewer: Andrew Short

Name of app: Alarmed Reminders Timers

Operating System: IOS

Location: App store

Cost: Free

Description: Most alarms make a sound when one needs to get up, or need to take medicine for example. So this app may not be designed just for people with a vision impairment but sounds better than the general time app on the iPad, which does not have a voice function. There are wake alarms, count down timers and a nagging feature. One in app purchase can allow users to be able to access the feature of fall asleep with music.

Alignment with the UDL guideline: The UDL guideline that applies here is 2: Provide Multiple Means of Engagement, because of self-regulation. Checkpoint 7.1 Optimize individual choice and autonomy. The idea of providing choice needs to have a reason behind it. This reason needs to be to create more independence, and to develop a self of something being done.

Curriculum area: This is would be ideal for high school students. -One key curriculum area could be “home economics” or daily living classes- classes where people learn skills for living. It can be used in bus training classes as this app is useful as one can learn to get to the bus on time. Also, orientation and mobility classes could train students using this app. This app could also be used for getting to classes or appointments on time. Because this app is about living independently, occupational therapists would probably want to use this app in therapy sessions as well.

How does the app meet the National Disability Standards? The major disability standard that is used here is standard three individual outcomes. This is because this app helps students with a vision impairment get more done on time, therefore they will be able to meet more outcomes and be more independent and do more things on time without help. According to this standard meeting outcomes is important and so is the ability to choose more things individually instead of waiting on a nurse or carer. People with vision impairment can will have a wider choice if they can do more things by themselves.

How the app changes pedagogy (SAMR)? Modification as in this app will make the task easier because the of learning how to get things done more independently as the app will be on the student’s mobile device. Will it also be redefinition as it might change the way that student with a vision impairment are taught as the student will not need to have as much prompting. Augmentation comes into play a bit but not as much because it is a partial substitute for the instructor, the person may still need their carers reminding them from time to time as everybody does. It is modification as in this app would replace the standard clock app on the ipad.

How the app encourages person centred planning. This app will help with person centred planning because the person with the vision impairment will be able to use a program to directly tailor their own needs and get to classes on time by themselves. Their app can be very different to the app of
the person sitting next to them. The student will be able to decide what places they want to get or things to on time without needing a support worker.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Community is definitely the C that this app will encourage. The app can create a very real sense of community because people with vision impairment can access the community better. It will be easier to get out and do things at home at time. The app can be a gateway to the community. Meeting friends on time will be easier and being on time to vital to learning social skills, therefore, new friendship can be formed. When friend visit more time can be spent socializing.

**Evidence from the literature that the app is capable of the claims made:** Kondoju et al (2015) found that people with vision impairments do use the internet, and that this app does help to keep them organised. They note that one use to remember that most people with vision impairments can see a little. Melonis (2012) in a review of apps notes that this app is user friendly and popular among people with a vision impairment on their IPad. Friedman (2011) in a Macworld review adds that the app can sync with the iPad in built calendar. Also, it can include human voices. Could this be good for people needing a voice reminder? McGrath (2011) states that one thing that occupational therapists need to assess in working with clients with vision impairment is their ability to set timers this is in relation to meal preparation. Mowerson (2002) in speaking about the importance of people with vision impairments to take medicine on time, states that using audible are a helpful tool in ensuring that people take medicine on time, such devices can be set either by the person themselves or a family member.

**General Comments:** This certainly does appear to a useful app for teaching student with vision impairments independence in traveling and daily living skills. This may also help to remind people of what needs to be done when in a natural way if they hear a voice. During training student would be able to learn independently as they can all use their apps to go different places, and complete tasks most people do not need help.
Reviewer: Andrew Short

Name of app: WhatsApp Messenger

Operating System: iOS and Android

Location: App store and Google Play Store

Cost: free

Description: WhatsApp messenger is a communication app, which is like skype and FaceTime. It is a way to call anybody anywhere in the world provided they have the same app regardless if both users do not have the same mobile device. Basically, one calls the other person using the app and using video call. It allows international calling without long distance fees. The website also states that there is security so that only you and the person you are talking to is aware of the communication. It also features the ability to send messages.

Alignment with the UDL guideline: The UDL guideline that applies here is 2: Provide Multiple Means of Action and Expression, because of the ability for self-expression. Checkpoint 5.1 Provide options for expression and communication, different people need different tools for their communication, and therefore teachers need to provide different tools from which to choose.

Curriculum area: This would probably be good for upper primary and high school students learning to develop social skills. There are quite several different areas that the app that could be used in teaching. In English classes, this could be used to develop communication skills. In social skills, training it could be used to learn how to communicate with people. However, it might also be used in community access lessons level, to learn how to call a friend to arrange with meet them, bus training, or to be used to call someone if they get lost.

How does the app meet the National Disability Standards? The major disability standard that is used here is participation and inclusion. This is because this app helps students with a vision impairment to communicate more; therefore, they will be able to have more interaction in the community and amongst friends. Because the app is on their phone, they will have more control on whom and how they interact with. Communication may also become more frequent and instant. In accordance with this standard, for full inclusion to happen there is need for more choice.

How the app changes pedagogy (SAMR)? Modification as in this app will make the task easier because of the learning how to communicate more independently as the app will be on the student’s mobile device. There is both bulletin board style chat and audio on the same app. However, this app may not replace the telephone. It is also redefinition as it might change the way that student with a vision impairment communicate as the student can use their device as everybody else can. Augmentation comes into, as this app is better than skype and other like apps and programs.

How the app encourages person centred planning. This app is certainly going to help with person centred planning because the person with the vision impairment will be able to use a program to communicate with friends and family independently. This app is an example of social media that
greatly improves social skills. The student will be able to decide what places they want meet at or what topics they want to talk to each other about.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** Community is the C that this app will encourage. The app is going to create a very real sense of community because people with vision impairment will be able to better socialize in the community and build community. It will be easier for users to be heard and express themselves. The app can be a gateway to the community. Meeting and making friends will be easier and communication is vital to learning social skills, therefore, new friendship can be formed and old ones from school kept.

**Evidence from the literature that the app is capable of the claims made:** according to Market Watch (2014), Facebook now owns WhatsApp. Wu’s (2016) article discusses a Facebook mobile app. Wu says that people with a vision impairment access Facebook much the same as everybody else but do not post photos as much as it is harder. However, Facebook’s mobile app is improving this. Now people with a vision impairment can post photos without help. A review of WhatsApp by the Royal National Institute of Blind People (RNIB) in England, found that WhatsApp stands out as a great choice; it has the important feature of voice calling. One person living in London commented that she could not be without it. Wang et al (2014) write about the need for people with vision impairments to be about to have a way to communicate to download a bus timetable and a way to be able to communicate with the bus driver before they pull it, in order to alert their special needs. The model provided in the report is a heavy module, therefore it would be good for link it for an app like WhatsApp. Funahashi (2011) did a study that also confirm the need and benefit of apps for people with visual disabilities to better communicate, in this study people used headphones to hear voices directing them to a LED light display where they could download certain information.

**General Comments:** This certainly does appear to a useful app for teaching student with vision impairments communication and social skills. This may also help this is also good as if they have trouble reading something on the board, the caller can read it to them. In public, it will appears natural because everybody is communicating with his or her mobile device.
Reviewer: Andrew Short

Name of app: auto ringtone pro talking caller id ringtones

Operating System: iOS

Location: App store

Cost: $8.00

Description: This is a text to speech caller ID app. What you type in to this app will say back to you. According to the iTunes description About.com sees it as the best ring tone app. One can make their own ring tone with either voice or sound effect. This app can do ring tones for text messages, reminders, emailing, calendar as well as your alarm, voice email and tweets. You can set up an individual ring tone for every caller, so that you know who is calling you. You can tell it to tell you when to take your medicine.

Alignment with the UDL guideline: The UDL guideline that applies here is 2: Provide Multiple Means of action and expression, because of the ability for communication and expression. Under this is subsection guideline 6 Provide options for expression and communication. The goal here is to create equality in terms of the ability to learn communication. Checkpoints 5:1-2 mostly 1, teaching the ability to communicate in different forms of media is important.

Curriculum area: This app is designed for high school students and would be great in a communication or living skills or maybe even an English class. It would help students with a vision impairment to be independent in communication. This in important in teaching social skills and the ability is conduct business and many other areas of life where using a phone is important.

How does the app meet the National Disability Standards? The major disability standard that is used here is standard two, Participation and inclusion. This is because this app helps students with a vision impairment to become more independent in conducting their own affairs. If they can use this app hey may be in a better position to be taught how to do other aspects of business. Better communication is the key to creating inclusion.

How the app changes pedagogy (SAMR)? Modification as in this app will make the task easier because the of learning how to communicate more independently as the app will be on the student’s mobile device, and it will be easier to identify who is calling. Also, this app may replace the need for a telephone. There are people who do not have a home telephone and just use mobiles. Augmentation comes into play as this app will improve the ability of a person with vision impairment to use their phone far beyond using a phone without the app.

How the app encourages person centred planning. This app is certainly going to help with person centred planning because the person with the vision impairment will be able to communicate more independently outside classroom, having the right app. They will also be able to communication with more of their own expression and will have more choice over when, who are how they communicate, thus giving greater access over other areas of their lives. This app can create more independence in other tasks like taking medicine or going to appointments on time.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This is community as in students with a vision impairment will be able to communicate more naturally with other people, which will build more community by closing the gap between people with a vision impairment and the rest of the community. It is also curation as students with a visual impairment can be involved in collecting and archiving information what will might be better apps for everybody. The whole community might be impacted.

Evidence from the literature that the app is capable of the claims made: There is no evidence about the app, but about the benefits of Caller ID for people with vision impairment. A statement by Telstra in Australia stating that they would introduce a voice caller ID ability that people with a vision impairment could use.

From 2003 a specific phones for people with vision difficulties spoke the caller Id. Duffy (2017) suggests that this should create more confidence in deciding which phone calls to take. Duffy (2017) in discussion discussed that this kind of technology is important so that two of the most common problems experienced by people with a vision impairment, dialling the wrong number and not dialling the number in time, could be reduced.

General Comments: This would be a very useful app for people with a vision impairment because the need for carers would maybe lessen if the client were able to conduct their own business, make, and keep their own business connections. The ability to do so has a very big impact on a person confidence and ability to live in the real world like normal.
Reviewer: Andrew Short

Name of app: Talking Scientific Calculator

Operating System: IOS

Location: App store

Cost: $8.00

Description: This app is designed for members of the vision impairment community. Talking scientific calculator is an IOS app for maths. According to Adam Croser, who is the inventor, this calculator has a voice that can speak to you. Not only can it do basic functions like adding and subtractions but it can also do my complex functions needed in a high school classroom. If you move your finger, the calculator will speak the numbers on the screen or the button you want to press. It also has braille display.

Alignment with the UDL guideline: The UDL guideline that applies here is 1: Provide Multiple Means of representation, because of the ability for understanding concepts and critical ideas. Under this is subsection guideline 2 Checkpoints 2.1-3 mostly 3, support decoding text, mathematical notation, and symbols. This speaks about equal access to the ability to learn maths, which is what this app is specifically designed for.

Curriculum area: This app is designed for high school students and would be great in a maths class. It would help students with a vision impairment to be independent. It would however be a mistake to think that maths class and homework are the only uses. It would also be good in some science classes and community access to use in the supermarket for calculating how much shopping costs.

How does the app meet the National Disability Standards? The major disability standard that is used here is standard three, Individual outcomes. This is because this app helps students with a vision impairment to become more independent in the classroom. They can meet outcomes and perform better at maths and hopefully get better grades. They might be able to perform faster as well. So they can set better goals when they have better tools. Being equipped with better tools means progress can be reviewed better.

How the app changes pedagogy (SAMR)? Modification as in this app will make the task easier because of the learning how to communicate more independently as the app will be on the student’s mobile device. Having the app on a mobile device means one less thing to carry around regarding of ability factors. Also, this app may replace the scientific calculators. Augmentation comes into play as this app will improve the ability of a person with vision impairment to use the calculator far beyond using a traditional non-voice calculator. Is it redefinition as it will change how students with vision impairment do maths and open new possibilities?

How the app encourages person centred planning. This app is certainly going to help with person centred planning because the person with the vision impairment will be able to perform more independently in the classroom, having the right calculator, they will more on par with other students. In the classroom, the students with vision impairment will have tools that work for them.
This app which is an example of independent living will greatly improve academic skills. In the classroom, all students can access the right information themselves.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app encourages cooperation and collaboration by students with a vision impairment who are able to share data with other people.

**Evidence from the literature that the app is capable of the claims made:** Pace Bulter (2013) in reviewing this app writes that one cannot only have it speak to you but you can also speak to it as well. This review is a bit different to the creator’s discussion, as this review for about apps for young children with a vision disability. The vision support team of the NSW Government Education Department in a review of different calculators for students with vision difficulties writes on Croser’s willingness to take student feedback on board in improving his app. Their described the app as optimum. Embry-Riddle Aeronautical University (2013) states that this app is loved the world over right across the school age range. One should be careful here as Alajarmeh (2014) argues that the problem to overcome in teaching maths to students who are visually impaired is not technology to calculate the answers to the questions, but teaching them how to understand the mathematical concepts.

**General Comments:** This certainly does appear to be a useful app for teaching student with vision in maths classes. The ability to do maths of the calculator is important for many different areas of life. This will also open up a wide range of different post school study options at university and TAFE, thus breaking down many barriers in the workforce.
Reviewer: Andrew Short

Name of app: Vision Assist

Operating System: IOS, Android

Location: App Store, Google Play Store

Cost: $6.00

Description: This app is for a person with vision impairment to use their mobile app instead of needing a magnifying glass. According to the iTunes store this app is better than an ordinary magnifying glass. It is for several conditions including low vision colour blindness and cataracts. The iPhone flash will also assist in a dark room. Among the features are the ability to read in low light, read medicine bottles, scan lists and can you read the newspaper better, Crosswords and using the phone book are easier.

Alignment with the UDL guideline: The UDL guideline that applies here is 1. Provide Multiple Means of representation, in this case perception. Guideline 1: provide options for perception. The comments here that are providing students with learning material is no good if they cannot process it. However, this case is a little different as it is not about using the other senses but enhancing the ability to use the sense of sight.

Curriculum area: It is a bit difficult to see how blindfold games and developing senses other than sight and maybe be are the only curriculum areas where this would not be in a benefit. This app can be useful right across the board. But the areas of most benefit would probably be English and social science where a lot of reading is involved.

How does the app meet the National Disability Standards? The major disability standard that is used here is standard two: Participation and inclusion. This is because this app helps students with vision impairment read and understand things more quickly with less help. Therefore, there may be an increase in participation and be included in more things in the community if they can follow along more. This app can help more with reading body language. According to this standard genuine inclusion is important and so is the ability to choose what one wants to study and understand. This will also create more independence in the supermarket. People with vision impairment can participate more if this app helps them to study more.

How the app changes pedagogy (SAMR)? Modification as in this app will make the task easier because of the learning how to get around will be done more independently as the app will be on the student’s mobile device. Augmentation is the main aspect here is students may not need a magnifying glass apart from this app. If the app is more powerful, they might be a bit ahead in science class.

How the app encourages person centred planning. This app is certainly going to help with person centred planning because the person with the vision impairment will be able to read what they need to when they need to. The student will have able to have more study options. They may be able to learn the same thing as their peers the same way.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Community is that this app will encourage. The app is going to create a very real sense of community because people with vision impairment can be more involved in study and debate. This can also lead to different projects and tasks.

Evidence from the literature that the app is capable of the claims made: There is indeed good evidence from the literature that this app will be useful. Korzeniowski (2001) wrote about a new device that was a hand-held magnifier that he hoped would enable people with blindness to read more easily. This device had a light but was very big to carry.

McGrath (2011) an occupational therapist says that it is important that people with vision impairments have a good portable hand held magnifying glass that can magnify to different levels and a light is also helpful. The good thing is that this app can be both in one. Willings (n.d.) says that with this app you can connect it to a computer if you need to make what you are reading even bigger. Gerritsen (2017) in reviewing different magnifying tools assert that different tools are aimed at different tasks. If this is the case, this app could be an all in one solution.

General Comments: This app could be useful is a person with vision impairment in helping activities of daily living such as reading a book or the back of a packet in the supermarket. The ability to see clearer in reading would open wide a wealth of learning. It would not stand out too much because there are sighted people who use the torch. This app may also be useful for the general community.
**Reviewer:** Camila Amestica

**Name of app:** NantMobile Money Reader

**Operating System:** IOS

**Location:** App Store

**Cost:** Free

**Description:** The app allows the user to identify bills in many currencies if having trouble distinguishing them. Simply point the camera to the bill and it will announce it via Voiceover. Available in not only many languages but many currencies as well, so it is able to be used around the world. There is no need to hold the phone still as it will read the money instantly.

**Alignment with the UDL guideline:** This app aligns with the UDL guidelines Number 2: Provide options for language, mathematical expressions, and symbols, as well as Number 4: Provide options for physical action. Under the Representation Guideline Number 2, this app provides a tool to allow the user to decode money and have the currency voiced back to them on their device. This allows clarity in the cash currency and due to it working with various currencies it promotes understanding across languages as well. Under Action and Expression, provide options for physical action this app allows the user to receive a response from their device at any given time and location and does not limit them to needing another person to identify their currency. This app also uses representation: provide options for perception because it allows alternatives for visual information. Traditionally people with a visual impairment would use the sense of touch or asking someone to identify bills however this app allows the user to simply scan the bill and have it identified by voiceover within seconds.

**Curriculum area:** This app is suitable for anyone who is handling any currency. It is ideal for people with visual impairments of any age as it is easy to use and uses voice over to notify the app is still open. This would be good for students or anyone who is trying to learn money, traveling or just for everyday use as a support tool.

**How does the app meet the National Disability Standards?** This app allows individuals to be more independent as they are able to use it at any time or location. It can adapt to many currencies and allows the user to use it when they need it.

**How the app changes pedagogy (SAMR)?** NantMobile Money Reader would fall under Enhancement, specifically substitution. Because the app does not change the currency value it simply identifies and voices it aloud, this app would not create any functional change for the user. It simply substitutes the need of having to get someone else to identify the currency for the user. It allows them to use this app as a simple tool.

**How the app encourages person centred planning.** This app encourages the user to be independent and can utilise this app very easily at their convenience. The teacher/trainer can use this app to help identify multiple currencies as well as help the individual assert their independence when alone. If the user’s goal is to be able to go out independently but has troubles identifying currency which
causes difficulties when paying, this app can help support workers and teachers to help prepare the user for real world situations. The user can create personal goals and this app can help if money reading is a problem for the person with a disability.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages Connectivity as it encourages the user to take control and be independent in a one-time task or in everyday tasks. Because this app can allow the user to identify currency independently, it can create connectivity not just for themselves but also in the form of Community. Someone with a visual impairment may usually depend on someone to identify notes or use touch, however this app can allow individuals to be able to be independent and, if in an environment with peers, they will not need to depend on anyone.

Evidence from the literature that the app is capable of the claims made: A study on Object recognition conducted specifically on identifying currency bills highlighted the challenge often associated with recognition devices was price. The NantMobile Money Reader is free for users to download and use. “As few portable systems can recognize currency bills-often with mixed results and for a high price tag-, we have selected the issue of currency bill recognition for the implementation of a new function to our device” (Parlour, Dramas, Macé, & Jouffrais, 2009 p227). Although they did not utilize NantMobile Money Reader, they created a similar app with near identical features. The findings were that there was 100% accuracy as well as participants found that using the device was faster than the traditional method of identifying bills by touch. The researchers recommend this system to be integrated into mobile phones, something NantMobile Money Reader already achieves.

General Comments: This app is credited for its speed and ability to identify many currencies within seconds. Current developments are being made so it can identify plastic bills.
Reviewer: Camila Amestica

Name of app: Ariadne GPS

Operating System: IOS

Location: App Store

Cost: $8.49

Description: This app allows the user to not only access GPS maps but to be able to interact with the environment around them. It is completely accessible as it can fully use the Voiceover function, allowing everything to be spoken aloud. It has features such as vibration when crossing streets, announcing bus and train stops and is available in many languages. It rotates to your orientation and has features of notifying you when the bus and train is coming as well as vibrate when you are at a road crossing.

Alignment with the UDL guideline: This app’s features cause it to fall under Action and Expression specifically under 4. Provide options for physical action. The app is intended to be a GPS type app and that creates the ability to change the current way of navigation of a map into a verbal one. Ariadne GPA by Giovanni Ciaffoni implements many current assistive technologies all together which is why this app provides a new form of expression.

Curriculum area: This app is intended for people with the need of navigation who may have challenges with visual maps. This GPS app features opportunities to be able to help teach individuals how to navigate and access communities more easily. It can be encouraged for users to use this in any many different ways from everyday activities in a familiar place to being able to access a new area.

How does the app meet the National Disability Standards? Ariadne GPS by Giovanni Ciaffoni encourages individuality as allows the ability for the users to travel independently without any assistance from others. Because of its independent orientated features, it gives users the ability to travel and navigate by themselves creating an independent capability they may not have otherwise. It promotes participation and community access.

How the app changes pedagogy (SAMR)? This app falls under Enhancement. Specifically, Augmentation as it is a tool that provides a substitute for other previous tools such as support staff and guide dogs. This provides an enhancement as it orientates for you and notifies you of bus and trains arriving. The verbal announcements are a functional improvement for those with visual impairments as it gives the opportunity of having access to the community at the convenience of the individual.

How the app encourages person centred planning. This app can encourage teachers and trainers to teach the user to be able to access the community and areas around them independently. The user can decide how they choose to use the app as well as what areas of the featured app benefits them most. Each user can use is differently which is how teachers and trainers to allow for individuality.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?  This app allows for connectivity, community and creativity. It encourages connectivity by allowing the user to independently do daily activities such as enter the community around them. In the sense of Community it promotes inclusion and community access so it is allows people to be together. It inspires creativity due to its innovative way to relay data that has been previously displayed and gives a new outlet to be expressed in. It takes previous visual data into an accessible method.

Evidence from the literature that the app is capable of the claims made: This app is the use of audio-based navigation which has been tested to be a successful tool to help individuals with visual impairments. Tested research by Jaime Sanchez covers the idea about orientation being a feature needed in tools for individuals with visual impairments. “Blind users orient themselves in space by using straight angles, which does not allow them to develop a full representation of the real environment.” (Sánchez, 2009, p402.) Jaime Sanchez tested audio-based navigation technology similar features to Ariadne GPS by Giovannni Ciaffoni. “Applications were evaluated that seek to support the navigation of blind users in real environments such as a neighbourhood, public bus transportation, the Metro network and the school or a closed building.” (Sánchez, 2009, p409). The only challenge found by users had to adjust to the new device, the creators of this app intended for this app to be easily used. This app was widely enjoyed by the users in Sanchez study and the accessibility of this app at a very inexpensive price allows for the user to have better accessibility to this tool.

General Comments: This app can be created with the pursuits to teach people community integration to be more accessible or can be used in new situations when in a new area and need the guidance of GPS. This app gives a variety of features without the expensive price tag along with it.
Reviewer: Camila Amestica

Name of app: Chime

Operating System: IOS

Location: App Store

Cost: Free

Description: Chime allows for notifications of times to be set. Similar to old clock towers ringing every few hours, this app is created to help anyone who is forgetful or unable to see a watch. These notifications can be set as frequent as you want or periodically.

Alignment with the UDL guideline: This app would fall under Representation 1. Provide options for perception. The app offers an alternative for visual information as either it will verbally announce the time periodically or whenever it has been set to announce. It is customizable to the user’s needs and can be adjusted to what capacity it wants to be used at.

Curriculum area: This app can be a very useful tool for individuals with visual impairments and anyone who needs reminders. For people who have troubles with vision and may find it challenging to read the time, this app allows for independence and the ability to check their time with a simple alarm announcement. These alarms could also be set up to remind people of different tasks and appointments or just announcing the time casually.

How does the app meet the National Disability Standards? The feature of customisable chimes at the user’s convenience allows for independence and individualism for the user. Having the ability to select how often the alarms will go off announcing the time are all adjustable by the user and allows them to take the app’s ability into their own hands. It is customisable to the user.

How the app changes pedagogy (SAMR)? Chime acts as an Enhancement of augmentation because it substitutes as a clock but it has the functional improvement of setting alarms and going off at different patterns set by the user. This improvement can sometimes be offered by other apps however it does not provide the feature of voice announcement with each chime. This is ideal for individuals with visual impairments as they are able to amend the app to their routine and need of the tool, while allowing them to create this notification section as well.

How the app encourages person centred planning. This app can completely be customised to the user and their routines. Teachers/Trainers and Support workers can help set up this app to the convenience of the user and what they need the most. It can be as simple as touching opening the app and it speaks the time to having set alarms to go off at different times. It does not have to be a generic app that is set on a standard pattern. It can be adjusted to whatever is needed of the app by the user, creating a person-centred approach.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? This app allows for Connectivity with the ease of control and independence it gives. Users can use this app to enhance and help their daily tasks and routines by not having to struggle or depend on reading
a clock or having someone mention the time. This allows for individuals to each set their own pattern and can connect to different activities with independently and at their own control.

**Evidence from the literature that the app is capable of the claims made:** The benefit of this app is the versatility it has to truly make it individualised and personalised for every user. Having it accessible on a mobile device creates it easily available for use. “The versatility of the tablets and the available apps that incorporate other low vision capabilities will allow these patients to complete a larger breadth of vocational tasks or recreational activities of daily living” (Irvine, Zemke, Pusateri, Gerlach, Chun, & Jay, 2014).

There has been significant evidence to show that individuals with visual impairments prefer using touch technology with voiceover (Leporini, Buzzi, & Buzzi, 2012). This app allows for the use of receiving notifications via voiceover announcement so there is no need to physically go to the app to check the time. It can provide helpful as a simple reminder in everyday tasks.

**General Comments:** Chime can be adapted to the individual’s preferences with sound and frequency.
Reviewer: Camila Amestica

Name of app: Dragon Dictation

Operating System: IOS

Location: App Store

Cost: Free

Description: Dragon Dictation is one of the best apps on iTunes for dictation. It recognises many voices and can be used as a note taking app or longer options such as emails, tweets, documents. This app will not just scribe what is being said but also takes commands such as updating social media and editing.

Alignment with the UDL guideline: This app falls under action and expression under 5. Provide options for expression and communication. This app allows the user to dictate not only voices to notes but it also allows a multiple app communication by allowing the user to take commands to social media. Giving the ability to not only post on other social media but also to edit creates a larger use than traditional note taking. The option of how the user wants to express their way of communication is put in the user’s hands.

Curriculum area: This app is ideal for anyone with a visual impairment or has trouble with typing. Due to it working solely on voice recognition it can not only scribe notes for students but as well allow them to connect with popular social media outlets. In a professional context, this app can be used just for notes and emails or can be used in connecting to others via social media simply with voice commands.

How does the app meet the National Disability Standards? The user can customise this app to what they would like to use the features for. It can be used for note taking purposes, email or for social media use and dictation. It allows for individuality of people as they can select their use of the app as well as allowing them independence of utilizing the app without having to have someone to scribe or utilize another app, their voice solely will be used for this app.

How the app changes pedagogy (SAMR)? This app comes under transformation, specifically modification. It has taken the past dictation apps and use to a new level by allowing to not only dictate notes but to also dictate emails and tweets. You do not need to open the separate apps to do individual tasks; simply using your voice will command the app via the user’s voice. This new design has changed the original task to a new purpose and it has created a new improvement and allows for more tools to be accessed by the user. It does not just connect to notes and email but to social media, which is a huge connection outlet to other people.

How the app encourages person centred planning. By being commanded by the voice of the user, this app is creating individuality. Each user can decide what use they would like to utilise in the app’s many features. This app can be used for simple dictation purposes or can provide a more individual connecting aspect of social media. If a teacher/trainer is trying help the user get a larger connection
with others their age, this app can help assist with using voice commands to send off messages and emails.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** This app utilizes Connectivity, Community and Collaboration. It uses connectivity by its ability to allow users to connect to work and leisure easily with dictation. Users can be independent in their dictation and the app will post for them without the need of other support.

It uses Community because of its connection to social media, email and other tasks where it allows the user to do tasks everyone participates. For example, it can allow students to relate together through notes or via social media and email; it can bring a community of people with similar tasks together.

It uses collaboration because it encourages the sharing of ideas, particularly with social media and email but as well with the dictation portion. It allows there to be an easier connection with others, with the possibility of helping maintain networking opportunities.

**Evidence from the literature that the app is capable of the claims made:** Dragon Dictation allows the users to use their voice that is a great alternative for individuals who may have difficulty with touch screens. “We found that blind people used speech more often and input longer messages than sighted people” (Azenkot & Lee, 2013). This app utilises the ability to dictate email and tweet, and email dictation has been shown to have benefits for users. “Voice based architecture helps blind people to access email with no difficulty. The proposed system entirely focuses on the benefit of the blind in making use of advanced technology for their growth and improvement.” (Hari Priya, Karthigasree & Revathi, 2015).

**General Comments:** This app is versatile in its uses and can be used for solely note taking, email or other combinations of uses.
Reviewer: Camila Amestica

Name of app: Ulexia

Operating System: IOS

Location: App Store

Cost: $6.99

Description: Ulexia was created for individuals with dyslexia or visual impairments as it gives you the ability to scan any printed document and have it read back to you through Voiceover. Features include being able to adjust the font, colour overlays as well as the ability to save the documents to your phone for later use. Simply scan the document with your camera and the app will calibrate the entire document.

Alignment with the UDL guideline: This app correlates to the UDL guideline of Representation 2. Provide options for language, mathematical expressions, and symbols as well as Action and Expression 4. Provide options for physical action. Ulexia supports the decoding of the text as well as illustrates through another form of media audio compared to the previous visual form. It optimises the document content to another form of media and with the other features it allows to be created into an adaptive technology.

Curriculum area: Ulexia is a great app for anyone with a visual impairment who needs to read any printed document. The options of having it magnify, change font and background colour layout as well as having the app transfer to voiceover creates a great tool to access the printed words in another form. This app would be most useful if the user was trying to get access to older texts that are not yet converted online or into audiobooks.

How does the app meet the National Disability Standards? This app encourages individuality and independence as it allows the user to access texts and files without needing someone to help access the text or hoping it has been created accessible. It enables having access to any document as well as being able to independently access text to make it easier in whatever form the user needs.

How the app changes pedagogy (SAMR)? Ulexia falls under Transformation specifically under redefinition as it is a tool that can redefine the previous tasks. This app is not simply an app that just converts the printed document to voiceover but it creates the opportunity to access previously impossible opportunities. If the user wanted to access a document that was old and is not accessible yet via braille, audiobook or any other form, this app would allow access to the text and being able to listen to it and to save it into a format that best suits the users. Ancient and old texts can become accessible with the simple touch of the app, previously something that may not be able to be done independently by the user.

How the app encourages person centred planning. This app would encourage teachers and trainers to allow the users to access information they would like to, not just what is accessible to them. It allows the user to have individual choice and planning what is best for them. There will no longer be a limited access of texts or documents, as it can create a individualised selection to be working
with. Teachers and trainers will not be limited on their selections in options to support, allowing for there to be a large support on person centred goals and using anything that is available.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Ulexia encourages mostly Creativity and Curation because of what the app offers. It is creative as it manipulates the data in text into a new format; audio or with a new colour text background. It creates a channel of curation because it allows the user the ability to store the scanned text for later use and this could be distributed for others. The concept of the app curates previously inaccessible text into something that can easily be accessed by the user.

**Evidence from the literature that the app is capable of the claims made:** There may be other devices that can do what Ulexia does, however this app is unique as it is not very expensive and is able to work on a smartphone. The app is easy to access and can be life changing to previous technology that was created but hard to access. “There are many devices which offer people with vision impairment access to print. The trouble is that these devices are not widely available, and ways in which they can be made more available in a tangle of conflicting interests.” (Whitehouse, 2008, pg.120) For those who cannot access this technology easily it allows a fair opportunity for anyone with an IPhone to use it easily. Access to equipment for the diversity of formats--such as DAISY books, digital audio, downloadable text and audio, electronic braille, and electronic texts--is unequal (Mates, 2004).

There are currently many old textbooks that are not accessible for individuals with visual impairments or those who suffer with print text. "Experts estimate that only 5 percent of the world’s publishing output in English is ever made accessible in alternate formats for people who cannot use print (Canadian Library Association Working Group, 2005). This app will help create individuals decide what they want to access versus just what is available.

**General Comments:** This app can be used by teachers to transcribe the material to make it accessible for all students prior to classes or can be used by any individual who requires support in reading printed text.
Reviewer: Tshering Wangdi

Name of app: Learning Ally Audio

Operating System: IOS

Location: App store

Cost: Free Trial ($119 per year for subscription)

**Description:** Learning Ally Audio is an app, which reads books for you. It goes along with a subscription package of books for children. It is designed to help children with visual impairment and dyslexia to read. You must have a membership using a web-browser before downloading the books. The text and background colours can be adjusted according to the preference of the children. The read pages can be highlighted and the pace of reading can also be adjusted to the individual’s need.

**Alignment with the UDL guideline:** The way learners perceive and comprehend information differs with individuals. This app ensures that textbooks and other learning information are made accessible to individuals with vision impairment making it easily perceptible. It also provides adjustments in providing information as the user can adjust the speed of the reading or change the colours and highlight the read parts. Thus, the UDL principle in line to it is Principle 1, the provision of multiple representation. It also aligns to Checkpoint 1.3, “Offer alternatives for visual information” and Checkpoint 1.1 “Offer ways of customizing the display of information”.

**Curriculum area:** It helps children to develop fluency skills in reading strand. Children can access and download books of all levels including their textbooks. It also enhances English language in general. If the complete set of textbooks that are currently implemented in the schools come in the subscribed package, learning ally would mean the digitalizing of the curriculum making it accessible to different learners.

**How does the app meet the National Disability Standards?** In line with the National Disability Standards, this app supports every student’s Rights and Participation and Inclusion. This app enables the realization of the objective of providing the children with disabilities with the right to education and opportunity to training on the same basis as students without disabilities. The teaching and learning materials are adapted and made appropriate to the needs of the learners. It also enables all students to participate equally according to their individual capacity in learning by making the materials in an accessible format.

**How the app changes pedagogy (SAMR)?** This app is a substitution of learning materials to the children with visual impairment. It transforms the learning process adjusting the materials according to the need and the capacity of different learners. It can increase the speed of the textual lesson delivery with higher efficiency when the students come having either read or heard their texts in audio. The special education teachers need not design lessons with reading aids if the apps have the materials uploaded within.

**How the app encourages person centred planning.** The app eases the task of teachers in teaching children how to read and pronounce correctly. The app would help the language teachers as the
children can make the app read for them at their own pace making adjustment. The children could listen the audio books for repeated times until the make sure of its proper learning. The children are made independent learners irrespective of their impairments once the teachers align their instructions with the audio books.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app mostly encourages the connectivity aspect of the 21st century approach to teaching. It requires the children to create their membership to certain web-browser before subscribing and downloading books. Children also get access to a huge number of books in audio form.

**Evidence from the literature that the app is capable of the claims made:** Wong M.E. and Tan S.S.K claims that technology not only transforms the means of interaction but it is also gradually becoming popular in the education field. They say that the mobile learners typically access the learning materials in small and manageable formats. The availability of reading through this app across a number of books not only transforms the learning style but it can also be popular in assisting the users with visual impairment.

**General Comments:** Learning Ally Audio offers a large library of audio books. It helps students with disabilities, including vision impairment and dyslexia. While a lot of learning materials including the textbooks across different grades are available for subscription, parents must closely monitor children while doing so.
Description: This app acts as a talking assistant. It frees the person from literally looking at the phone to access mail, news, weather report, and much more. All you need to do is select which information you would like the Voice Brief to read for you. It uses voices as ‘reporter’ and ‘announcer’ with the former reading the headlines and the latter, the entire content you want it to read. It can read even Twitter and Facebook posts for you at your own pace.

Alignment with the UDL guideline: It aligns to the UDL guideline Principle I of multiple means of representation, and Checkpoint 1.3 “Offer alternatives for visual information”. Voice Brief makes the information in the device more perceptible to users with visual impairment. It provides them the information through the modality of hearing. It also aligns to Principle II of multiple means of action and representation, and Checkpoint 4.1 “Vary the methods for response and navigation”. It makes the navigation and interaction of information more accessible to people with vision impairment and expresses the information in voice for those who struggle with reading.

Curriculum area: This app can certainly apply to any age group, as it targets every person with visual impairment. It enhances the Universal Design for Learning and the realization of its objectives by making curriculum accessible to the students with visual impairment providing them a digital version of the information, as all information is read aloud. This app can also help the students in reading strand.

How does the app meet the National Disability Standards? In line with the National Disability Standards, this app supports every student’s Rights and Participation and Inclusion. If the teacher adapts the lesson in a digital version readable through this app, it could make the curriculum accessible to the students with visual impairment and those struggling with reading. It means the teaching strategies and delivery meet the needs and capacities of the learners.

How the app changes pedagogy (SAMR)? This app substitutes the need for human readers for children with visual impairment. Thus, the teachers can modify and redesign their lesson in digital versions to suit the needs of these students while at the same time reducing their instructional workload related to such disabilities. This can also enhance the interaction of the teachers and students in a redefined manner using mail and other electronic forms of information exchange.

How the app encourages person centred planning. This app reduces the dependency of people with vision impairment on other individuals in reading. These students no longer need to rely on others to read their text or mail. The re-examining of their own tasks upon completion can also be done independently. All it requires is the teachers to adapt their lesson into a version compatible with the app.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app Voice Brief is more inclined towards connectivity. This app supports multitasking. With the help of this app, one can pop into another app on the device with Voice Brief continuously reading in the
background. It also reads from every feature available in the device once selected, making a huge opening to the social media world for people with vision impairment.

**Evidence from the literature that the app is capable of the claims made:** Doughty K. (2011) is of the view that smart phones and apps support a range of vulnerable groups, including people with disabilities. He asserts that the services should extend to make the users independent from home to the outside environment.

**General Comments:** Voice Brief is a great app that establishes a talking device in your device to read for you. It would be highly effective for teachers of students with vision impairment and those struggling with reading. It also helps save time as it can read for you while you pursue other tasks simultaneously.
**Reviewer:** Tshering Wangdi

**Name of app:** Be My Eyes

**Operating System:** IOS

**Location:** App Store

**Cost:** Free

**Description:** This app helps people with visual impairments to see with the help of a sighted volunteer and the video camera for tasks that necessarily need normal vision. The person with vision impairment can show through his/her video camera and have the image or text described by the sighted volunteer. It makes the life of the person with vision impairment easier by providing the opportunity for volunteers to help them.

**Alignment with the UDL guideline:** This app aligns with UDL Principle II by providing multiple means of engagement. It helps individuals with coping and engaging with the environment. People with vision impairment are challenged on a daily basis by new environments, which calls for engaging with others. This engagement helps them cope well and to self-regulate their life, which aligns with UDL Checkpoint 9.2 “Develop personal coping skills and strategies”.

**Curriculum area:** The various aspects of life skills like problem-solving, interpersonal relationship and coping with stress are some areas of curriculum for which the app is suited. The confrontation of new and challenging environments for students with visual impairment can be distressing and would call for collaboration with sighted people to solve it. This app may apply to students in high school and beyond when they happen to lead independent lives.

**How does the app meet the National Disability Standards?** This app allows students to exercise their rights to education with the help of sighted people. This is a huge step towards accessing the services and facilities to participate in education by children with visual impairment. The responsibility of the educators is to implement activities using such apps as a part of the curriculum.

**How the app changes pedagogy (SAMR)?** The app is a transformation to the teacher’s pedagogy. Students with visual impairment can borrow the vision from sighted peers to substitute their own in the process of either following instructions or undertaking tasks.

**How the app encourages person centred planning.** The use of this app would allow the person with visual impairment to resolve his problems and carry on with his scheduled activities without any disruption. For example, a considerable amount of time that could be spent in searching some lost items would be possible within a few seconds for people with vision impairment. The ‘problem partner’ can be blocked and prevented from returning by both user and the helper.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Connectivity, community and collaboration are mostly encouraged by the app. It keeps a wide range of people from across the world being connected as ‘user’ and ‘helper’. This is a huge community of people from across the globe as the apps’ users expand to collaborate in their efforts to either benefit from...
it or to render help. The app would alert the person and in absence of response within 10 minutes moves on to other helpers in queue.

Evidence from the literature that the app is capable of the claims made: With the advancement of technology, travel and navigational aids including audio displays are integrated into mobile devices. Caspo (2015) is of the view that such apps are user friendly and dynamically interactive and that it gives hope to rehabilitate users with visual impairment.

General Comments: Though there are many apps today to assist people with visual impairment, there are times when we necessarily need eyeballs for vision. Developmental educators and teachers need such apps in their effort to deliver learning activities for students with vision impairments.
Reviewer: Tshering Wangdi

Name of app: Tap-n-See Now

Operating System: IOS and Android

Location: App store

Cost: $AU2.99

Description: On opening, a picture of an animal is seen bouncing on the screen. Once you tap on the screen, it will move towards the finger. If you tap on it, the movement stops and it grows to fill the entire screen and disappear with rewarding sounds. The image of the animal is in mono colour and so is the background. There are provisions to change the colours from the setting. Therefore, it is designed to examine to which colour the child responds the most. The child can also track the moving object and the sound on the screen.

Alignment with the UDL guideline: It provides multiple means of representation of the image with varied background. This would make visual information perceptible to different learners according to their needs. It also makes the visual representation accessible with modifications in colours. Therefore, it aligns with UDL Principle I and Checkpoint 1.1 “Offer ways of customizing the display of information”.

Curriculum area: It may apply to children between 3 to 5 years of age when they are tested for their developmental growth. It is suitable for early learners in childcare centres who are tending to show signs of visual impairments. It can help assess to which colours the child respond best and how accurate they are in tracking movements at early age.

How does the app meet the National Disability Standards? This app helps the children to track moving objects or recognize colours. The app enables vision in a simple, undistracted and appropriate environment as it possesses only mono colours for the image and the background respectively. The provision for change in the colour and the audio provides an alternative activity with equivalent experience within the context of its overall aim.

How the app changes pedagogy (SAMR)? This app is an enhancement tool for teacher’s pedagogy. It helps early childcare teachers in modifying their assessment tools to examine the neuro developmental growth in children. The teachers may at times use it as an all new tool or lead to the redefinition and creation of new assessment tools for cortical visual impairment.

How the app encourages person centred planning. The app provides a non-cluttered and simple environment free of distractions for the child to respond to. The teacher only needs to change the colour and the audio from the setting to vary and examine the response. It has a person-centred approach inbuilt.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? It enhances creativity. This app can be used as a model tool for disability assessment in children at an early age.
for intervention. Though the app is a complete package, its shortcomings should lead to creation of better versions furthering the purpose.

**Evidence from the literature that the app is capable of the claims made**: Vision is considered the most important sensory input for the development of other sensory motor skills. Therefore, the studies have shown that there is significant delay in the development of motor skills in the children with vision impairment comparatively. Levtzion-Korach et al (2000) also believes that the ability to reach for the sound stimulus in children with vision impairment limits their motor development.

**General Comments**: Tap-n-See is a great app for developmental educators as it can assist them in diagnosing children with visual impairments for early interventions. This app may also appeal to other children without visual impairments.
**Reviewer:** Tshering Wangdi

**Name of app:** Light Detector

**Operating System:** IOS

**Location:** Apps Store

**Cost:** $AU 1.99

**Description:** A simple app converts any light source into sound reading even its intensity. The brighter the light, the higher is the pitch and if you tap the display, it will speak the reading. This can help give direction to a user with vision impairment and help to locate objects.

**Alignment with the UDL guideline:** Navigation and interaction appears as a barrier for children with physical disabilities. It is important to provide such learners with materials to help them with their movement and interaction. This app therefore aligns with UDL Principle II as it provides multiple means of action and expression. It also aligns with UDL Principle III as it would motivate people with vision impairment to cope and engage in the activities they are interested within their environment that is a part of multiple means of engagement.

**Curriculum area:** This app mainly can be a part of life skill learning for people with vision impairment. It can help solve the problem of looking for directions and in searching for objects. The sound that it produces can help guide the user through doorways and other outlets in unfamiliar areas. It can apply across all age groups.

**How the app meet the National Disability Standards?** This app enables learners with visual impairment to be flexible in their independent participation and engagement with the instructions in navigations aspects. It also addresses the potential disadvantage in life because of the disability by providing additional support for the development of disability specific skills.

**How the app changes pedagogy (SAMR)?** Light detector can help modify the teacher’s pedagogy. The teacher may now consider adapting navigational activities in designing lesson as to impart life skill lessons whenever possible. The teacher may also create fun activities involving the use of the app to acquaint the children with visual impairment with it.

**How the app encourages person centred planning.** Light detector is a kind of app that requires an individual to test it independently within his environment or in unfamiliar locations. It helps the teacher to design life skill lessons, which test people with visual impairment in navigation of direction, and objects across various locations by the student alone.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** This app encourages creativity. People with vision impairment are challenged by unfamiliar places and they can learn their own way of coping with the place because of the app. They get to know the direction and the placement of objects. It helps in improving ways to live independently within the environment.
Evidence from the literature that the app is capable of the claims made: Rivera-Rubio J. et al (2013) believes that visual impairment brings many challenges including reduced independence and increased social exclusion. Smart phone apps as such this that are emerging rapidly can play a greater role in alleviating these challenges.

General Comments: Light detector is a simple app, which reads the light with intensity for the people with vision impairment. It is great for navigation.
Conclusion and Recommendations

The purpose of the eBook is to demonstrate how apps for mobile devices can enhance the lives of people with disabilities and promote their inclusion by narrowing the gap between people with and without disabilities. This section has focused on the specific disability of vision impairment.

The specific functions of each app are summarised earlier, to enable quick reference and comparison for educators selecting appropriate apps for their classrooms and students. These functions include mobility aides (GPS), mobile device access, electronic-text access, recognition (object, colour, etc), printed-text access, and others.

The advancement of modern technology and applications has meant that assistive technologies accessed through regular mobile devices do not burden the user with the potential social stigma attached to more outdated and less socially accepted forms of assistive technology (Nees & Berry, 2013). This means that people of all abilities are able to access a wide variety of apps for various reasons, and this commonality can serve to bridge social gaps and misunderstandings.

Many of the apps discussed above are important for enhancing independence and community inclusion. However, the success of these apps depends on skilled and willing teachers and support personnel to devote time and patience to training the user in how to effectively access these apps in order to enrich their quality of life.

Therefore, while learning can be challenging for a person with vision impairment, nevertheless, the access to specific educational content through an alternative means can reduce gaps in learning (Ashraf, Hasan, Lewis, Hasan & Roy, 2017). Overall, these varied reviews on applications compiled in the eBook will be helpful to educators in incorporating technological applications that will be useful in their teaching pedagogy for users with vision impairment.
References


Wong M.E. and Tan S.S.K (2012). Teaching the benefits of Smart Phone Technology to Blind Consumers; Exploring the Potential of the iPhone. *Journal of Visual Impairment and Blindness*, October-
Useful Links

BIG Launcher - biglauncher.com
Read2Go - www.bookshare.org/cms/help-center/reading-tools/read2go
Aipoly vision - aipoly.com/aipoly-vision.html
Tap Tap see - taptapseeapp.com
KNFB reader - www.knfbreader.com
Look Tel Recogniser - www.looktel.com/recognizer
Look Tel Money Reader- www.looktel.com/moneyreader
Read me the Weather - appcrawler.com/ios/read-me-the-weather-a-weather-a
iMove - itunes.apple.com/us/app/imove/id593874954?mt=8
Text Detective - itunes.apple.com/us/app/text-detective/id541494875?mt=8
HeyTell – www.heytell.com
RAY App - play.google.com/store/apps/details?id=com.ray.manager&hl=en
BlindSquare – blindsquare.com
Voice Dream Reader – www.voicedream.com
Eye-d pro -play.google.com/store/apps/details?id=in.gingermind.eyedpro&hl=en
Google Talkback - play.google.com/store/apps/details?id=com.google.android.marvin.talkback&hl=en
WhatsApp Messenger – www.whatsapp.com
Auto Ringtone Pro Talking Caller ID Ringtones - itunes.apple.com/us/app/autorington pro-talking-caller-id-ringtones/id333264447?mt=8
VisionAssist - visionassist.slinkyware.com/
Ariadne GPS - www.riadnegps.eu/
Chimes - itunes.apple.com/us/app/chime/id414830146?mt=8
Dragon Dictation - itunes.apple.com/us/app/dragon-dictation/id341446764?mt=8
Ulexia - itunes.apple.com/us/app/ulexia/id1118132345?mt=8
Learning Ally - www.commonsensemedia.org/app-reviews/learning-alley-audio
Voice Brief - www.macworld.com/article/1161944/voice_brief_for_iphone.html
Be My Eyes - itunes.apple.com/au/app/be-my-eyes-helping-blind-see/id905177575?mt=8
Tap-n-See Now - itunes.apple.com/us/app/tap-n-see-now/id491247565?mt=8
Specific Learning Disabilities
Specific learning Disabilities is a general term referring to a group of disorders, presumed due to central nervous system dysfunction rather than an intellectual disability, covering significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical skills. Specific learning may be associated with Attention Deficit Disorder.

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<th>Name</th>
<th>Names of app</th>
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<td>Chloe Papavasiliou</td>
<td>1. Explain Everything</td>
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<td>3. Word Builder</td>
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<td>Sithu Win</td>
<td>6. Conversation Builder</td>
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<td>8. Evernote</td>
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<td>9. Learn to Read, Write &amp; Spell</td>
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<td>10. Abilipad</td>
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<td>Kim Martin</td>
<td>11. Noisili</td>
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<td>14. Prizmo</td>
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<td>15. MyScript Calculator</td>
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<td>Renita Adhia Wardani</td>
<td>16. Lectio</td>
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<td>17. Ghotit Real writer</td>
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<td>19. Mod Math</td>
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<td>Max Sharpe</td>
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<td>22. Easy Spelling Aid</td>
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<td>23. Marble Math</td>
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<td>24. Articulation Station</td>
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Introduction

Specific learning disabilities are considered in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013) as a type of Neurodevelopmental disorder that impacts an individual’s ongoing psychological ability to learn, understand or use specific skills such as reading, writing, listening, speaking, reasoning or numeracy. Common specific learning disabilities diagnosis that affect such skills include dyslexia, dysgraphia and dyscalculia and all can vary in severity from mild to moderate to severe. A defining factor of specific learning disabilities is that learning difficulties are theorised to be a result of central nervous system complications and not considered a result of environmental factors such as economic disadvantage or diagnosed visual, hearing, intellectual or physical disabilities.

Whilst aspects of their development are typical and not related to external factors, students with specific learning disabilities usually experience difficulties with learning and grasping concepts and may require an individual support plan without meeting the diagnostic requirements of a disability diagnosis. To facilitate educational inclusion, independence and overall quality of life, these students may also benefit from concernedly chosen apps on their device as part of their educational interventions and individualised learning plans. Meeting such needs are particularly important as the learning capacities of individuals with specific learning disabilities are usually below the corresponding average capacity level of their chronological age therefore supportive intervention may be crucial (Cortiella and Horowitz 2014).

It is important to consider that students with a diagnosed learning disability can also have coexisting additional needs (Hulme and Snowling 2013). For example, a student may have both Dyslexia and Attention Deficit Hyperactivity Disorder (ADHD). Therefore, a person centred approach is crucial when considering apps to support and enable independence, communication and access to the curriculum amongst students with specific learning disabilities.

Mobile technology and strategically chosen applications have the potential for improving learning outcomes for students with specific learning disabilities (Murphy, 2011). Such assistive technologies and applications are suggested to be aligned to the curriculum goals and educational needs of the learners using them to ensure their individual needs are facilitated (Murphy, 2011; Finegan & Austin, 2002). Furthermore, it is suggested that the student must be involved in the decision making process when choosing an assistive digital technology tool such as a mobile application. Also consideration of the elements of Zabala (2010) SETT framework; Setting, Environment, Task and Tools (SETT) is beneficial to promote collaborative decision making, maximise success and support universal design for learning principles. The 25 mobile application reviews that have been specifically chosen to support the holistic development, inclusion and independence of students with specific learning disabilities.
Reviewer: Chloe Papavasiliou

Name of app: Explain Everything

Operating System: IOS, Android, Computer

Location: https://explaineverything.com/

Cost: From $4.99 - 49.99

Description: Explain Everything is an interactive, collaborative presentation tool, which allows multiple users to create, edit and follow in real-time. The app is able to connect with interactive whiteboards and tablets to create a learning community, or for an individual, a tool, which they can use to create, take notes or edit/work with others on a project. The app allows users to insert a web browser for live annotations, draw, annotate, import photos, images, files, move, interact and include audio if required. The app enables a student with a learning disability to both receive and create work in a format, which meets their needs, images and drawings to support understanding for students with problems concentrating on a text based format or those with difficulties following written comments (Explain Everything Inc., n.d.).

Alignment with the UDL guideline: The Explain Everything app aligns with UDL guidelines as it enables key information to be understood by all learners due to the provision of information via use of multimedia. This deepens student understanding, engages learners and provides tools that students with varying abilities can utilise effectively. The app therefore aligns predominantly with Principle II, by providing multiple means of action and expression and the requirements of Guideline 2: Provide options for expression and communication and checkpoint 5.1 Use multiple media to communicate (CAST, 2014). Explain Everything provides a flexible format for information to be received, edited and added and then linked with web browsers or annotated to improve student understanding.

Curriculum area: Explain Everything is a tool which is not aligned with any one particular curriculum area, rather it would be useful in every subject within the national curriculum and in higher educational institutions. Due to its flexibility, it can be used for Maths, English, Science, Geography or other subject projects and more. The app promotes the creativity general capability within the national curriculum of creative and critical thinking as students can use it to create notes, etc. (Australian Curriculum, Assessment and Reporting Authority, n.d.a). The ability of the app to allow for students and teachers to share information also promotes collaboration.
How does the app meet the National Disability Standards? The app provides information in a format, which can be individualised to meet the needs of individual students and facilitates learning, participation and inclusion. Thereby meeting Standard 2.3, which relates to respecting and facilitating individual preferences in relation to learning (Department of Social Services, 2013).

How the app changes pedagogy (SAMR)? The app is an enhancement tool for use by teachers and students. Explain Everything fits within SAMR as Redefinition of the task as the app allows for creation and editing of interactive documents which can then be shared for greater understanding, with multiple users able to work on the same task simultaneously on their own devices (Schrock, 2017).

How the app encourages person centred planning. As Explain Everything provides information in variety of formats and promotes students ability to annotate and add links to aid individual understanding. The ability to share information also promotes understanding between individuals in formats that best meet the needs of individual learners. If a student has difficulty following written comments then short videos or audio can be shared between group members or student and teacher to promote understanding and to direct key information.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Explain Everything covers all five of the 21st century approach this is because students can connect with others, while collaborating by adding thoughts or ideas in real time to the community that they are involved in. Whether working alone or in a group students can be creative with how they complete the final piece as they can draw, add files, audio or anything else to bring their ideas to life while also having the ability to curate what they have created or key information provided.

Evidence from the literature that the app is capable of the claims made: Palis and Quiros (2014) supports this view, found that applying learning principles such as interactivity can increase the effectiveness of the learning process. In addition, Mullet and Rinn (2016) discuss the importance of providing the appropriate supports such as opportunities to apply their strengths, which are necessary for children with learning disorders such as attention deficit disorder, to enable success. The app is easy to use and therefore teachers are not only able to save time by quickly creating interactive videos, but the app enables teachers to collaborate on video creation, thereby promoting the sharing of content and curriculum alignment (Larcara, 2014).

General Comments: The app presents many uses for educators and teachers because of the ability to integrate content from a multitude of sources. Teachers are able to provide presentations in engaging formats, which can be difficult with students who struggle with text based lesson formats. The only difficulty may be in learning to use the app to ensure presentations are not overwhelming for students with too much detail, which would distract from the overall lesson goal.
**Reviewer:** Chloe Papavasiliou

**Name of app:** SoundNote

**Operating System:** IOS

**Location:** iTunes store

**Cost:** $7.99

**Description:** SoundNote can be used on either an apple computer or ipad, syncing recorded audio with notes or drawings added to aid understanding. Content can be shared by email or accessed URL by other devices using the same network. If users stop typing or drawing the app will continue to record, even allowing the user to find important details or listen to parts of lectures if students fall asleep or just want to replay a section to improve understanding, by simply tapping on a word. The app is particularly useful for students who have difficulty concentrating in classrooms or are easily distracted such as students with auditory processing disorders and attention deficit disorder (Estes, 2017).

**Alignment with the UDL guideline:** The app provides options for students who have difficulty decoding as it allows students to add notes or drawings as needed whilst recording audio. The app provides a means for students to listen to an entire lecture, or specific sections, several times to aid understanding. As such, the app aligns with UDL guidelines Principle I, Provide multiple means of Representation, Guideline 2, Provide options for language, mathematical expression and symbols and specifically, checkpoint 2:3 Support decoding of text, mathematical notation, and symbols (CAST, 2014)

**Curriculum area:** Due to the apps ability to record and take notes, students in any curriculum area can use this app to assist them with understanding a topic. This could be due to a teacher explaining a new topic, introducing information or simply to allow students to reinforce learning. If a student is sitting one-on-one with a teacher, the teacher can use the app to draft a student’s work with their voice so the student is able to listen to the recording, pause and then keep going.

**How does the app meet the National Disability Standards?** The app meets the requirements for Standard 2: Participation and Inclusion of the National Disability Standards. In particular, 2.3 because the app facilitates individual preferences and abilities to learning situations (Department of Social Services, 2013). SoundNote allows students who have difficulty concentrating, which includes many students with learning disabilities, to replay audio as required and add notes in any format they need which
will aid understanding and eventually accessibility of services and supports. Thereby meeting Standard 5: Service Access (Department of Social Services, 2013).

**How the app changes pedagogy (SAMR)?** SoundNote enhances the teacher’s pedagogy through Augmentation (Schrock, 2017). Students are able to record the audio of the lecture and take notes, add drawings and share content using the app instead of relying on handwritten notes or audio alone.

**How the app encourages person centred planning.** When drafting student work or introducing new information, this app gives the user the ability to record notes, doodle ideas or write text all at the same time giving them the best way to access the information later. Students, who cannot keep up have the ability to go back and listen to specific areas of the lecture or the whole recording, and then ask relevant questions, adding notes or drawings to clarify their understanding. Students can email notes or drafts to teachers to ask for further clarification, or share with other students to encourage peer review and support.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** This app allows users to connect, create and curate. By being able to record, note take in their own way, with as much or as little extra drawings and/or notes, students can creatively construct a document that supports their learning. The app encourages connection, by allowing users to email and share the content to other students or teachers, or to store for later use.

**Evidence from the literature that the app is capable of the claims made:** Students that have difficulty with note taking and writing would benefit from this app that allows the student to take notes or drawings to support an audio recording. The app is also beneficial to students with learning disabilities such as auditory processing disorders who have problems with concentrating in noisy environments, have a limited vocabulary or difficulty in following the content provided in a lecture (An, Alon, & Fuentes, 2014). Researchers have found that the ability to replay lectures at a later time is an important learning strategy for students with a learning disability, enabling students to concentrate on the required learning, play-back areas requiring further knowledge and aid understanding (Leadbetter, Shuttleworth, Couperthwaite & Nightingale, 2013; Lotfi, Mehrkian, Moossavi, Zadeh & Sadjadi, 2016).

**General Comments:** The app is particularly useful for students who have difficulty concentrating in class. Students that are encouraged to use SoundNote in classes, particularly classes that are lecture-based, will have the benefit of an audio copy of the lecture that they can return to later to aid understanding. Content can be shared with the teacher and other members of the class for feedback or review.
**Reviewer:** Chloe Papavasiliou

**Name of app:** Word Builder

**Operating System:** IOS, Windows 10

**Location:** http://www.readingdoctor.com.au/word-builder/

**Cost:** $24.99

**Description:** Word Builder is an app designed for students with auditory processing disorders, autism spectrum and dyslexia that have difficulty with identifying and sequencing the sounds and patterns in words. Word Builder provides the most common letter-sound patterns in English for students to read or provides the option of the teacher can work with a student and say a word out loud for the student to build using the tiles. The app assists students to build on their knowledge by changing the selection of letter-sound tiles available for students to either enable students to practice using the most common patterns or reduce the selection to increase the challenge. A memory-aid system built into the app can assist students to remember letter-sound relationships. Students can manipulate letter-sound patterns to learn the irregular sounding patterns used in the English language and an inbuilt dictionary ensures students spelling is checked (Reading Doctor, 2016).

**Alignment with the UDL guideline:** Word Builder aligns with the UDL guideline Principle 1. Provide Multiple Means of Representation: Guideline 2: Provide options for language, mathematical expressions, and symbols: Checkpoint 2.1 Clarify vocabulary and symbols (CAST, 2014). As it presents information on clarifying vocabulary for students who struggle with identifying the sequences, sounds and patterns in words, which improves reading and spelling. As the program uses sound and visual prompts it allows users to connect with what they are learning, through levels that the student builds on, via a multimodal means.

**Curriculum area:** Literacy is one of the general capabilities in the national curriculum (Australian Curriculum, Assessment and Reporting Authority, n.d.). This app focuses on the literacy area of the curriculum, particularly for the primary and junior primary level students whose literacy skills are developing. Considering the app from a subject point of view, the app would cover aspects of the English curriculum within the primary context, by working within components of English such as reading and spelling. Word Builder assists with word sounds and teaching the learner how to create and recognise letter combinations and sounds. Students with a learning disability have difficulty
understanding the link between letters and sounds and therefore basic literacy skills are impacted to the detriment of the learner throughout every area of the curriculum.

**How does the app meet the National Disability Standards?** The app fits within standard two, Participation and Inclusion, as the app provides a method of learning that is flexible to meet the needs of individuals (Department of Social Services, 2013). Word Builder assists learners to improve their level of literacy. Thereby promoting participation in economic and community activities, which benefits the individual and the community and promoting the right to accessibility to services

**How the app changes pedagogy (SAMR)?** The app allows teachers to integrate available tools into the classroom, to improve the learning experience. This is an enhancement of existing pedagogy through a modification of learning tools (Schrock, 2017).

**How the app encourages person centred planning.** By providing students with this app it allows teachers to further students understanding and knowledge, which they can, transfer to multiple tasks. It gives them an engaging and motivational tool, which offers flexibility to the student to ensure that students are continually building on their level of understanding. The app provides the options for students to visualise the letter-sound patterns while hearing the sound and allows students to work independently and reaching goals that they can attain and transfer to literacy based tasks.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app allows students to create and understand words in an engaging and creative way. It also fits within community, as a group or classroom of students could all be working on their literacy skills at the same time, albeit working with different groups of letter-sound tiles. Thereby no one student is singled out as being different to the others.

**Evidence from the literature that the app is capable of the claims made:** The ability to teach students with dyslexia and auditory processing disorders, the sound, letter or blend of sound and letters in multisensory ways rather than traditional text based learning, is recognised as good practice (Pavey, 2016). This app encourages students to use visual and auditory senses as well as gross motor skills to build words, which has been shown to enhance learning (Lee 2016). Daffern (2017) discusses the difficulties for primary students in learning to spell the complex English language and highlights the importance of teaching spelling through phonology. The literature does, however, also highlight the fact that a reliance on commercial products only may not be enough to support the needs of all students (Daffern 2017).

**General Comments:** The app allows students to improve decoding and encoding skills through practice of seeing and hearing, through a tool that young children can operate easily. Thereby providing teachers with the ability to allocate their classroom time more effectively to address individual student needs, highlighted by the progress students make through the levels of the app.
Reviewer: Chloe Papavasiliou

Name of app: Auditory Memory Ride

Operating System: IOS

Location: ITunes store

Cost: $38.99

Description: Auditory Memory Ride is designed for students aged six to thirteen who have difficulties with immediate information recall and receptive language. In particular those students with auditory memory problems, including central auditory processing disorder, autism and receptive language disorder. The aim of this app is to assist students with their auditory memory by recalling anything from numbers, words, sentences, detail and paragraphs. This is done through a tiered approach in four categories with first category providing recall of sequences of digits and numbers, second category targets recognition of words and sentence with pictures to support, third category targets recall of two objects and the final category presents questions related to paragraphs with audio and text prompts. There is also varying difficulties and responses requiring no delay, 5-second delay, 10-second delay, and 15-second delay. The app uses pre-recorded audio and the option of adding background noises to simulate real-life classroom situations to assist students to practice their recall and ability to retain information (Virtual Speech Center Inc., 2014).

Alignment with the UDL guideline: The app assists students with recognition and recall through multiple repetition and audio and visual means thereby aligning with Principle I: Provide multiple means of representation, guideline 3: Provide options for comprehension and specifically checkpoint 3.4: Maximise transfer and generalisation (CAST, 2014). As the app enables learning through a means other than a reliance solely on text based information, with audio and visual stimuli, the app to a lesser degree also meets guideline 2: Provide options for language, mathematical expressions and symbols and checkpoint 2.5 Illustrate through multiple media (CAST, 2014).

Curriculum area: Auditory Memory Ride would be a general capability under the national curriculum. Australian Curriculum, Assessment and Reporting Authority (Australian Curriculum, Assessment and Reporting Authority, n.d.a) aim to equip students with the abilities to not only succeed in the classroom but in real world applications. By using this app student will develop the skills to improve immediate memory and retain more information, which can assist in every subject in the curriculum area, and also help their critical and creative thinking. If students are able to retain and recall then they can adapt this skill to their own individual and creative pieces.
How does the app meet the National Disability Standards? The app meets Standard 2: Practice and Inclusion and promoting participation and active inclusion in community and learning through improved memory and recall (Department of Social Services, 2013). This relates in particular to the ability of individuals to connect with communities and promotes respect for individual preferences in learning included in Indicators 2.3 and 2.4.

How the app changes pedagogy (SAMR)? As the app is an enhancement of cue cards which have been used to improve memory and recall it fits within Modification in SAMR (Schrock, 2017). Not only does the app promote improved auditory memory in students it promotes engagement by the visual and audio effects and ability to individualise the app for the learner by means of the delay. The reward of a game is also an incentive for students to continue to practice without the aid of a teacher one-on-one.

How the app encourages person centred planning? The app allows teachers, parents and caregivers the ability to adapt the app for the individual student’s needs by setting the delay and/or the background noise to challenge the individual student and provide visual stimuli specifically targeted to the student. This means that teachers can use this as an engaging tool, whilst ensuring the task or game is at the right level of challenge to engage their students.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app allows students to work individually on their learning tasks while in a group environment, thereby promoting a sense of community within the classroom. The ability to learn in an engaging and fun way, with auditory and visual media and the option of a game as a reward, also encourages creativity.

Evidence from the literature that the app is capable of the claims made: The importance of building auditory memory capacity to build knowledge, speech perception, vocabulary and literacy for use in everyday life outside the classroom, is discussed by Lotfi et al. (2016). The app provides students with learning disabilities and with difficulties with auditory memory to practice on one task at a time, which has been shown to be a beneficial learning method by University of Missouri-Columbia (2016). The app is game based which has been proven to assist students with disabilities as it makes “learning enjoyable and effective” whilst being “challenging, instructive, and absorbing” (Durkin, Boyle, Hunter, & Conti-Ramsden, 2013).

General Comments: Educators recognise the importance of auditory memory and recall in building literacy and numeracy skills. The ability of an app to provide an engaging method for students to practice and develop these skills independently assists classroom management for teachers that are time poor and struggling to meet the needs of all students.
**Reviewer:** Chloe Papavasiliou

**Name of app:** LetterReflex - Letter Reversals & Backwards Writing

**Operating System:** IOS

**Location:** iTunes store

**Cost:** $5.99

**Description:** LetterReflex is an interactive tool to help pre-school and primary students who have difficulty with letter reversal, by assisting students to learn left from right then incorporating letters. Students commonly reverse the letters “b” or “d” and “p” or “q”. Students learn through two different games, Tilt It and Flip It. Activities are designed to be fun and engaging and with repeated use, aim to address issues with letter formation, subsequently assisting students with difficulties differentiating letters, particularly those with dyslexia and attention deficit disorder. In Tilt It, students have to tilt the device to roll a ball into the correct circle to complete a letter, with audio and visual prompts as the game becomes progressively more challenging. Flip It differs to Tilt It, as the learner has to swipe letters and words floating on the screen, in the right direction to orient them correctly. Both games are engaging and offer practice to assist learners to correlate the correct orientation of letters. Reports can be generated for teachers to track student progress (BinaryLabs, Inc., 2011).

**Alignment with the UDL guideline:** LetterReflex helps learners to clarify and understand letter and number forms, through alternative representations, accessibility for all learners. This connects with UDL guideline Principle I. Provide multiple means of representation, guideline 2: Provide options for language, mathematical expressions, and symbols; checkpoint 2.1 Clarify vocabulary and symbols (CAST, 2014). This app uses kinaesthetic learning techniques to pre teach symbols in a way that learners can connect with and use outside of the classroom. Students with difficulty associating correct letter orientation and those students with dyslexia who struggle with executing writing letters can benefit from the multimodal instructional format.

**Curriculum area:** This app aims to assist with learning issues within the general capabilities of literacy in the Australian Curriculum, which are taught through all years and across all subject areas. LetterReflex aims to assist with letter formation for early childhood and junior primary students, when they are at the developmental stages of learning. Letter reversals and difficulty with orientation of letters and numbers are also common with students with dyslexia. Paper forms of
helping these students can be frustrating, time-consuming and repetitive. Assisting students in the developmental stages with literacy will improve their chances of keeping at standard.

**How does the app meet the National Disability Standards?** The app meets standard 5: Service Access, as the provision of additional assistance and support in specific areas of literacy and numeracy helps to remove potential barriers to access (Department of Social Services, 2013). In addition, the app assists students with a disability to meet intended learning outcomes, which have been set for all students, thereby promoting standard 2: Participation and Inclusion.

**How the app changes pedagogy (SAMR)?** LetterReflex is an app, which enhances the pedagogy of literacy through augmentation as it “acts as a tool with functional improvement” (Schrock, 2017).

**How the app encourages person centred planning.** By providing students with an app which assist them in the formation of numbers and letters it means that when teachers in primary are setting their lessons they can adapt and personalise the lessons for the specific students needs. The provision of reports also assists teachers to track progress and personalise lessons. When learning letters in junior primary instead of a worksheet or copying from the board teachers can use a different platform to engage and teach these students who have trouble. Using the same device as other students in a class also reduces the risk of labelling specific students as different.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app allows creativity as it gives students a safe place to learn and therefore want to create, as it will help inspire writing but also curation as it records data for teachers, parents and therapists to track how the student is going by emailing reports.

**Evidence from the literature that the app is capable of the claims made:**

Computer games provide competition either between two or more people or just by moving up levels, this can stimulate engagement into the learning/game as they try to succeed to complete levels (Ke, 2009; Datchuk, 2015). LetterReflex allows students to learn through games and stages, which means that the participant has to follow set rules in order to obtain the end goal to improve their handwriting skills, which can be helped by the rise in the growth of technology (Ke, 2009). Just like games which creating letters to make a word or sentence students need to follow rules, for students with dyslexia this app allows them to practices these rules in an engaging platform, which is at the appropriate challenge for the students. By students learning this at a young age it can stop the steady decline students may have in older years (Datchuk, 2015). In addition, kinaesthetic learning has been shown in literature to support memory and learning (Lee, 2016).

**General Comments:** This app provides new teachers who may not have much knowledge on how to assist students with dyslexia understand letters creation, it also provides them with a different way of doing it or if the students have an ipad or tablet they can work on it as homework.
Reviewer: Sithu Win

Name of app: Conversation Builder

Operating System: IOS

Location: ITunes Store

Cost: (30.99 $AU)

Description: Conversation Builder is an application, which is designed to help elementary aged children with specific learning disabilities to have multiple ways of conversing with their peers in different settings.

Alignment with the UDL guideline: The app is aligned with UDL guideline 1 by providing multiple means of representation and expression by visual image, audio pattern and written format. It is aligned with principal 1, guideline 1, check-point 1.1 offering customisable display of information, check-point 1.2 offering chance for audio information and check-point 1.3 offering new options for visual information.

Curriculum area: Conversation Builder can be used as a language builder for students with Dyslexia, Language Processing Disorders and nonverbal learning disabilities. Conversation Builder can help elementary students to learn how to communicate multiple types of conversations with their peers and friends. The pattern of conversation is presented in visual format. However, this app can be used for all students with communication disabilities from primary level to adult life.

How does the app meet the National Disability Standards? Conversation Builder encourages children with learning disabilities by meeting NDS Standard 2.2 (The service works together with individuals to connect to family, friends and the communities), Standard 2.4 (Where appropriate, the service works with an individual’s family, friends, carer or advocate to promote community connection, inclusion and participation). Beyond these standards, Conversation Builder also provides collaboration with others by means of mail and network to ensure the requirements are met as described in checkpoint 3:5.

How the app changes pedagogy (SAMR)? This application is enhancing the pedagogy of language learning skills by means of modification because it can assist the child to access a conversation of pre-recorded audio files from the student’s own saved audio files. Students can also use their own image in the conversation so it will improve their creativity by means of modification. The ability to save the conversations and availability to use them in other applications is helpful for the teacher in their pedagogy.
How the app encourages person centred planning. This application encourages the person centred planning by focusing on individualised creative support and aiming for the social inclusion of the child with a disability, offering valued roles and community participation.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The app encourages the child with a specific learning disability to improve in the connectivity, community and collaboration of academic activities. It is a tool for teachers and parents to give the children with communication disabilities practice in peer interaction in a more engaging way.

Evidence from the literature that the app is capable of the claims made: Ine et al.,(2011) discussed that students with language disabilities have difficulties in academic learning because Children with language disabilities need initiation of activity and a strategy that attract their attention. Using Conversation Builder can attract the children on their conversation, give them more confidence, and let them more independence. Individuals living with various types of communication disabilities need augmentative and alternative communication for their daily communication and mobile application like Communication Builder which gives not only to increase the opportunities to communicate well, but also to reduce the barriers to social participation (Vance et al., 2014). Ganz et al., (2012) found that speech-generating devices like mobile application, which have prompts and cues to encourage the communication is really helpful to students with learning disabilities. On this app, students can introduce themselves, their interest along the sequence of graphic presentation, which can attract not only the users but also for other peers. Jackson et al.,(2014) pointed out that people with learning disabilities have difficulties to communicate with their peers because their communication has fell behind the individual’s understanding. With the help of Communication Builder, students with communication difficulties can communicate with their friends using multiple ways by means of visual, oral, graphical or textual presentation.

General Comments: People with Specific learning disabilities have difficulties in communication, speech, language and pragmatic functioning, forming low self-esteem as a result. Students can introduce themselves, ask questions, make conversation and change the subject of conversations by using this app. Children with communication impairment can get opportunity to have quality of life by using this app. Furthermore the app memorises the interest of the child and makes it part of the conversation, so the child can have satisfaction by expressing his own interest to his peers and can get friendships with common interests.
Reviewer: Sithu Win

Name of app: Phonics Genius

Operating System: IOS

Location :iTunes Store

Cost: Free

Description: Phonics genius is an application with customisable flashcard function and is designed to teach children, phonic of letters and their relationship to words. This app can be used as a multi-sensory learning tool with a combination of audio, graphics, voice and written words. It has built-in games, ranging from easy to challenging levels, which can motivate the students by playing games while they are learning new words. It also gives students a chance to add their own card and record their own voices.

Alignment with the UDL guideline: Phonics Genius has audio and visual representation and so it is aligned with the multiple means of representation of UDL principle I, guideline 1, checkpoint 1.2 and 1.3. It also includes the games so the student can play while learning the phonics and vocabulary of the words.

Curriculum area: It can be used for students with Dyslexia, Dyspraxia and for students who have difficulties in reading, writing, speech and language issues. This app allows children to learn consonants and vowels, as well as letter combination and word parts. The library of Phonic Genius is carefully structured and can be linked to the Curriculum area of primary level in teaching Languages. It can also be used in audio therapy. The app giving the chance to educators in planning their lessons with unique search facility. A research made by Ainsworth et al (2016) found that the use of curriculum towards letter-sound correspondence increased the students’ literacy performance.

How does the app meet the National Disability Standards? The service encourages the students with specific learning disabilities to meet the National Disability standards 2.1(The service actively promotes a valued role for people with disability, of their own choosing), 2.2(The service works together with individuals to connect to family, friends and their chosen communities).

How the app changes pedagogy (SAMR)? The application encourages the SAMR model by augmentation. This app can be used in any kind of learning vocabulary by supporting fun and engaging voice. The font size, font colour and spelling can be customised way to support visual impairment persons.
How the app encourages person centred planning. It provides person centred planning by customizable settings. It gives the ability to add customized own flashcard and can record own voice. It is a multi-sensory learning tool which has combination of audio, voice and written words.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This application represents the connectivity and collaboration of Carey (2013) 5Cs because it improves the vocabulary, speech (phonics) and language skill of individuals. It can also nurture the creativity of the students because one can have his own design of audio files and visual cards.

Evidence from the literature that the app is capable of the claims made: A research made by Elbro and Peterson (2004) proved that the achievement of reading skill is closely related with the ability of manipulation to phonemes. Finnegan (2012) and Fredrick et al., (2013) found that students with significant intellectual disabilities who are able to orally produce sounds and verbal can get benefit from learning phonics skill. Ainsworth et al., (2016) proved that students with specific learning disabilities and communication impairments could learn phonics by using a curriculum based instruction and get a lot of improvements in literacy skill. They also found that students with different IQ level can acquire same literacy skill if the instruction is direct and systematic (Ainsworth et al., 2016). The best way to learn reading, speaking and word recognition is by means of phonemic awareness practice. O’Connor et al., (2011) support the fact that phonemic awareness is the catalyst to improve reading difficulties. With Phonics Genius application, students can learn and distinguish words by sounds. In addition, Phonics Genius give the students an opportunity of graphical presentation with visual cards. A teacher who is using graphical presentation in reading lectures can lead his or her children to utilise key ideas, organise important information, and can improve comprehension skill. (Singleton & Filce, 2015).

General Comments: The words in Phonics Genius are best for the students who have previous reading experiences because it lacks in some combination of words, which are essential for beginners in reading. Beginners can handle three- or four-letter words more easily. Phonics Genius does however, encourage and challenge the students to read words that are more complex. This app gives the children the practice to learn words by sounds making them phonemic aware. The application also encourages practice in fluency to difficult words, which can improve their reading comprehension.
Reviewer: Sithu Win

Name of app: Evernote

Operating System: iOS

Location: iTunes Store

Cost: Free

Description: Evernote is the application for synchronising, organising and archiving notes that the user wants to keep. Notes can be any type of file such as a word file, a photo, a voice memo, a web page or a handwritten note. The user can also use Evernote as a digital notepad in which checklists, to-do lists, and mind-maps can be described. Students with learning disabilities have difficulties in taking notes, expressing their ideas and some have long or short-term memory problems. For them, Evernote would be very useful.

Alignment with the UDL guideline: Evernote provides option for self-regulation by means of facilitating personal coping skills and strategies. It also provides options for recruiting interest as the app enhances optimisation of individual choice and autonomy. Evernote is inline with the UDL Principle 2, guideline 6, checkpoint 6.3, as it facilitates management of information and resources.

Curriculum area: As it can be used as a tool for collecting, collaborating and curating, any students with or without disabilities can use Evernote as an assistive app. It allows teachers or special educators to have 24/7 access to their resources at any place or circumstance. Evernote would be more useful for Students at university level or tertiary education. Furthermore, Evernote can be used primary resources of a particular subject in curriculum area because the teacher can create a notebook related to his subject and can share this notebook to all his students.

How does the app meet the National Disability Standards? Evernote brings collaboration with other online network providers in supporting service delivery and internal capacity, as described in checkpoint 3:5 of National Disability Standard. The app also provides continuous improvement and feedback, delivering the service with individuals’ compliments, with the guideline 4:5 in NDS. In accordance with the checkpoint 6:4, Evernote is monitoring the feedback of users, reflecting the process with continuous improvement.

How the app changes pedagogy (SAMR)? Evernote can enhance a teacher’s pedagogy by means of modification. Evernote is enhancing changes in pedagogy as the app promotes ways of collecting resources, by which students become more active participants rather than passive learners in a conventional education system. Educators will also benefit because the over abundance of
resources on the internet can be categorised according to the student’s educational capability and performance, helping the teachers in selecting their resources. Students can download and keep their textbooks in Evernote and they can use Evernote instead of their textbooks. Evernote also serves as a substitution model for Textbooks and any other learning materials.

**How the app encourages person centred planning.** Students who have an account of Evernote can use the app both on his/ her computer, mobile phone or tablet. The library of contents are based on cloud storage and can be accessed from any devices. Therefore, students with learning disabilities, do not need to carry their books all the time. Once they have internet, they get all the resources. Moreover, the app gives the function of collaboration by means of Work Chat, where people with some impairments can participate any creative activities from their home or form somewhere else.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** When information is overabundant, the curation of information is at the heart of the learning process and we need to select, collect, store and share digital content as part of the curation process (Weisgerber & Butler, 2016; Seitzinger, 2014). Evernote can serve all these aspects of the learning process. A Notebook can be shared via Facebook, LinkedIn, Twitter or email a reminder can be sent, saved in a calendar and then an alert sent to team members, while the Work Chat feature allows a team to have real-time conversations. These functions are helpful to increasing cooperation and collaboration, which can result in participatory design creativity.

**Evidence from the literature that the app is capable of the claims made:** Research by Alloway et al., (2009) and Martinussen & Tannock (2006) prove that students having learning disabilities are deficient in working memory. There will be no sufficient processing space for new information, if the working memory is being overloaded. Martinussen & Major (2011) show evidence of working memory is directly connected to the ability of keeping data and following the instructions. Evernote can help students with Specific Learning Disability (SpLDs) to keep their data systematically, and helping them in the curation process. As Reid & Johnson (2011) and Scruggs et al., (2011) report in their research, better note taking skills with well-organised contents will help the students with SpLDs to be more successful and independent.

**General Comments:** Evernote is the application for curating and archiving notes, including texts, images, voice memos and webpages. The contents can be sorted into folders, exported as notebook, and then it can be annotated and tagged for sharing. Evernote offers the users the ability to store their contents in the Evernote cloud. With the help of a scanner or handphone’s camera, anyone can save his or her handwritten note in Evernote at anywhere, anytime. Practitioners can use Evernote as a helpful tool. Uploading Client information and searching using Endnote’s search engine.
Reviewer: Sithu Win

Name of app: Learn to read, write & spell

Operating System: IOS, Android

Location: iTunes Store

Cost: Free

Description: Learn to Read, Write & Spell is the application that improves reading and writing skills in English for children and adolescents. Students who have Dyslexia can use this application as an assistive tool for academic learning. It is a multi sensory program associated with auditory, visual and kinaesthetic elements to help students to improve their skills.

Alignment with the UDL guideline: This app is aligned with UDL principle II, presenting multiple ways of actions and expression. It provides guideline 4, checkpoint 4.1, as it can teach students to improve their motor skills with writing letters. It also give options to have guideline 5, checkpoint 5.1 by means of providing multiple media such as speech, text, illustrations and videos.

Curriculum area: It can be used for children aged 3 and above. Students who have difficulties in reading, writing and comprehension skills could use this application. It has 6 modules namely, teaching letters, reading, writing, spelling, language rules and dictionary lessons. Each module has different levels so the students with different academic levels can use the same apps in the same classroom setting, which will help students with LD to appear no different from their peers. Because of the apps user friendliness and easy to use option, teachers can use this app as an assistive pedagogical tool. The application can be used as an assistive tool for teaching English in for all students with or without disabilities in primary school curriculum.

How does the app meet the National Disability Standards? The app gives individual students measurable learning outcomes described in NDS standard 3:3. This app works along with the checkpoint 3:1 as it promoting and fulfilling the strengths and requirements of each student. The planning of this app is an all-inclusive structure of disability, age and language proficiency skill, fulfilling the checkpoint 3:4 requirement.

How the app changes pedagogy (SAMR)? This app can enhance the substitution, augmentation and modification steps of SAMR model. It helps students to read and write on a digital platform rather than traditional reading and writing in books. It also provides augmentative learning styles by means of different media and settings. The app modified learning styles as it teaches letters first, and then teaches the reading of letters together as words, at the same time helping to learn how
to pronounce each letter and words. It starts with very basic steps of English language, to advance levels, helping students to be fluent users in English.

**How the app encourages person centred planning.** It helps with multiple means of presentation to fit with individual needs. With this app, teachers can adjust their teaching method to follow the sequences along the curriculum, giving better options to make decisions based on the student’s skill and participation. Students are encouraged to have self-study by means of this app. The app can assist the independency in learning for students who are not going so well with their peers in the classroom.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Learn to Read, Write & Spell app can provide the students with specific learning disabilities (SpLDs) to have collaboration, cooperation and skill. Students who have enrich in usage of words can participate more with communication. A student who used the app will improve their reading skill as well as writing skill, which are useful in learning context. Improving these skills will encourage the student to have more cooperation and collaboration in the classroom.

**Evidence from the literature that the app is capable of the claims made:** Developmental educators must have potential to encourage the development of self-regulation strategies for the students with Dyslexia or learning disabilities (Reid et al., 2012). Reid et al., (2013) discussed the self-regulation process involved with self-monitoring, self-evaluation, self-instruction, goal setting and self-reinforcement. Learn to Read, Write & Spell app can provide the students with all these important steps, encouraging them to be more inclusive in academic context. Correct spelling can be resulted only with specific morphological forms which will improve a student’s writing skills as well as reading (Graham & Santangelo, 2014). The illegibility of words and incorrect spelling can affect negatively on a student’s writing competency (Graham, Harns, & Hebert, 2011). Learn to Read, Write & Spell can teach the students starting from the basic steps of handwriting letters to more advanced levels of English grammar.

**General Comments:** This app can be used for students with disabilities in reading and other Language based related skills as it teaches the basics of letters, words, sentence and paragraph procedure, step by step. Students with auditory or visual impairments can also adjust the settings to fit their needs and learning styles. It has built-in interactive games, and progress report, by which a teacher or educator can know the level of each individual students. A student’s reading skill is fundamental to all learning competencies to have future endeavours and so students with specific learning disabilities and development educators should think about the use of this app in their classroom setting.

**Reviewer:** Sithu Win
Name of app: Abilipad
Operating System: IOS
Location: iTunes Store
Cost: 19.99 AU$

**Description:** Abilipad is the application with customisable keyboard and adaptive notepad. It has word prediction setting with 4 languages (English, French, German and Spanish). The keyboard, font size and Colour can be changed in accordance with the user requirements. It has text-to-read function and can be adjusted to the reading speed.

**Alignment with the UDL guideline:** Abilipad provide UDL Principle 2, guideline 5, checkpoint 5.1, by using multiple means of communication as it supports different languages such as French, Dutch, Arabic, Korean, Japanese and Italian. Abilipad is also aligned with UDL Principle III, guideline 7, checkpoint 7.2, because it can be personalised and contextualised to fit individual requirements. Furthermore, this app has a customisable keyboard which is aligned with guideline 4, checkpoint 4.2, optimising the accessibility to assistive technology and communication.

**Curriculum area:** Abilipad can be used for students older than 4 yrs. Students who have dyslexia, language difficulties, speech difficulties and ASD can use it. People who have been diagnosed with a stroke can also use this application. Abilipad can be used in the curriculum areas of Maths, Language studies, Science, Social Studies and many more.

**How does the app meet the National Disability Standards?** This application promotes the National Disability Standards 2:1 as it give options to choose the type of keyboard and layout, which is suitable for an individual’s requirements. It also gives students with SpLD more connections to their families and communities, which is aligned with the NDS checkpoint 2:2. It also allows the students to have more participation in the society as described in checkpoint 2:5.

**How the app changes pedagogy (SAMR)?** This app enhances the augmentation and modification steps for pedagogical context. It can be used as an augmentative tool of communication for people who have difficulties in speech, reading and writing. It also supports VoiceOver compatibility, so it increases accessibility for persons with vision impairment. It helps with more expressive language usage and can be used as a way to participate in curricular activity for students with specific learning disabilities.
How the app encourages person centred planning. Abilipad encourages the person centred planning by means of customize keyboard setting, and presentation. It can be adjust to fit the person’s requirements. With Abilipad students with some learning difficulties can be participate more in the classroom setting as the app assisted the student’s communication with his/her peers. By using this app, students with communication difficulties, can express their ideas and thoughts. Students with vision impairments can use the app’s text to read function in their studies.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) Abilipad can be used as a creative tools as in this app, student can nurture creativity by means of graphis, contextual appearance, colour, background and font styles. Speak to text function and writing context enhance the communication of the students with their peers forming a community with better collaboration.

Evidence from the literature that the app is capable of the claims made: Wong (2000) identified that students with writing difficulties cannot express their ideas well, having limited vocabularies, and need practice to achieve mastery of writing. In addition, most of the students do not get required writing fluency within the school setting (Graham & Harris, 2011). McCormick (2013) stated that the conventional keyboard known as QWERTY keyboard has not improve learning English especially to young learners (ages 3-6) because layout of letters is not conductive to write well in English. Conventional keyboards cannot facilitate efficient learning as the arrangement of letters on keyboard hinders learning new words (McCormick, 2013). Gomide et al., (2015) proved in a research that virtual keyboard can be used as alternative and augmentative devices for persons with less motor and speech impairment in communication and can optimize data entry. Writing lessons assisted by digital technology can attract students who are struggling to pay attention, resulting self-regulated learning in their studies (Ronimus et al., 2014). Therefore, the usage of Abilipad in the classroom setting would give benefits to students with specific learning disabilities, to learn mastery in writing English.

General Comments: A keyboard is the basic input device for commands and communication in modern technology. Some people living with disabilities cannot use standard keyboards because of their impairments and special assistive technology devices are required. Abilipad can be serve this role and a customized keyboard for individual persons can even share via email. Notepad and keyboard can be shared via Dropbox or through Abilipad Library between school and home. Read to text function really helps students with vision impairment or students who have difficulties in reading.
Reviewer: Kim Martin
Name of app: Noisili
Operating System: IOS, Android, Chrome Extension & Browser
Location: iTunes Store
Cost: $2.99

Description: Noisili is an app that provides background noise with the aim of improving focus and supporting productivity. It offers approximately 16 different sound loops, including waves, rain, wind, fire and even coffee percolating. Any sounds can be combined and the volume of each sound can be adjusted by the user with no limit of how many sounds can be played simultaneously. Combinations can be saved and reused. There is also a timer feature and the layout is clear and intuitive to use.

Alignment with the UDL guideline: The app design supports guidelines three, section 7 and nine within the area of providing multiple means of engagement. This is because the design simplicity enables options for encouraging interest including individual choice and autonomy and minimising distractions along with facilitating personal coping skills and strategies which provide options for self regulation for the individual user of the app.

Curriculum area: This app may be used to aid study, support self-regulation and concentration, not a specific curriculum area.

How does the app meet the National Disability Standards? Noisili has the potential to support learners who have difficulty with background noise or find comfort in sounds they can control when they become anxious or if white noise enabled them to concentration. Therefore this app supports standard two, participation and inclusion.

How the app changes pedagogy (SAMR) Noisili is an enhancement tool. It would be categorised within the SAMR model as an Augmentation app. This is because it’s main purpose is to support productivity and focus. It doesn’t change the task being completed by the user or the expectations set by the teacher but adds extra function to support learning.

How the app encourages person centred planning. The Noisili app offers the individual user personalisation of the elements within the app that support relaxation and calming background noise. Sounds are not predetermined or set and can be manipulated to different levels of awareness within the selection of sounds chosen. A user can determine or self advocate when, where and how they would like to use the app. A group of individuals could all be on the app at the
same time for different purposes, such as relaxation, aiding concentration, calming aid or blocking background classroom noise with headphones and without distracting others meeting their own needs.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)** Noisili encourages connectivity through its ability for the user to personalise the background noise they hear whilst working which encourages a connection to preferred entertainment to support concentration and encourages control and independent work.

**Evidence from the literature that the app is capable of the claims made:** Noisili co-founder Sabine Staggl (2017) markets their app with claims that it can improve focus and boost your productivity and white noise can both help you concentrate and fall asleep just by mixing different sounds to create the perfect environment. Tunney, Cooney, Coyle, O'Reilly (2017) validate this claim in their research comparing face to face and technology delivered mindfulness and relaxation techniques. They found that common benefits of mindfulness practices such as relaxation and awareness emerged from both face to face and technology delivered focus groups. The results of the research indicate that mindfulness delivered via technology can offer a rich experience for the user.

**General Comments:** Noisili can be used independently on a device for students with auditory processing difficulties or Attention Deficit and Hyperactivity Disorder (ADHD) to encourage concentration and relaxation and minimise distraction of others and classroom noise. A teacher could also use this with a whole class and allow students to choose the background noise played whilst working.
Reviewer: Kim Martin

Name of app: Padlet

Operating System: IOS, Android, Chrome Web Store and Browser

Location: iTunes Store

Cost: Free

Description: Padlet is essentially a web based digital corkboard (display board). A user can display text, images, video clips, URL links, files and more that can then be shared publically or kept private and is really easy to use for both students and teachers. Although not necessary, I recommend getting a free account so that you can save the Padlet pages you create and can refer, add and share them at a later date.

Alignment with the UDL guideline: Regardless of the intended content to be shared or collected, Padlet offers users the opportunity to meet guideline one of the UDL Guidelines by providing multiple means of representation. This offers the user options for perception in the way information is displayed and offers alternative modes of access to information including auditory and visual information. Padlets ability to personalise information gathering also supports options for comprehension as the creator has the ability highlight patterns, critical ideas and is able to guide, visualise and manipulate data to facilitate information processing. Padlet also meets guideline two by providing the creator and person viewing the data options for expression and communication and the ability to use a variety of media types including text, photos, links, audio and video. In this way Padlet is facilitating options for executive functions including multiple means of managing information and resources.

Curriculum area: Padlet can be used across any curriculum area, for any purpose where a collection of thoughts, ideas and digital resources is needed for an individual or to be worked on collaboratively. Individual students of any age could use this to gather their thoughts and resources in preparation for a report or presentation, groups could work together on sharing resources for a project in any learning area and it could also act as a support for children with additional needs of sites they need to view or reference where memory or literacy difficulties would make traditional referencing and note taking difficult. This is a multi mode platform that makes sharing and learning accessible and inclusive.

How does the app meet the National Disability Standards? Padlet provides the creator and viewer of the created page an alternative means of accessing, recording and sharing information. This meets
standard 2: participation and inclusion. This standard emphasises enabling an individual’s participation based on their interests, preferences, goals and aspirations.

How the app changes pedagogy (SAMR) Padlet is essentially a communication curation tool. An online creative medium for remembering and collecting information and resources can be shared. I see this app fitting in the AUGMENTATION category as note taking can be done other ways, Padlet provides additional functionality for note taking and resource sharing in a visual manner.

How the app encourages person centred planning. Padlet provides a platform for an individual to communicate and share their thinking, understanding, knowledge and interest and second to this it also allows the individual to access another person(s) ideas, thinking and interests. Padlet can provide an individual with the potential to influence others, express ideas and access information independently.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) Padlet it offers opportunities to connect, create, curate and collaborate. Users are able to make connections and reconnect with resources selected by them, for them or in collaboration with them enabling easy access to online information. The ease of use, personalisation features encourage control and independence and the tool could be used for learning or personal reasons. Users can easily create and share curated lists of information and resources on any given topic, presenting their ideas and information in new ways that can be manipulated by any end user or themselves multiple times. Padlet also has the potential to support community if it was a shared Padlet utilised by like minded people. By far its greatest asset is the simple ability to curate information. Padlet provides an individual or group a place to, collect, categorize and collate data for easy retrieval later.

Evidence from the literature that the app is capable of the claims made: The Padlet app developers (Wallwisher Inc, 2017) claim that their software is easy to use, portable, inclusive, collaborative and intuitive; empowering every user to make content they want in a way that suits them. Dunbar (2017) and Ellis (2015) support these claims because they found that Padlet was an easy to use app that can be used to enhance student engagement as well as improve interactions, discussions and learning.

General Comments: This app is both useful for educators and students to curate and share their learning and understanding about concepts. A teacher could prepare a Padlet of previously reviewed resources for a new topic to reduce time students take to find relevant online resources. A student could use Padlet to store links and information about a topic they are researching or a project they are working on as a team and use the padlet as either a working area whilst gathering knowledge and information or as a presentation tool for sharing what they found out and useful links for others.
Description: Timer:Min2Go is an a visual timer that has the potential to aid transition for students who require support when moving between tasks. It can also be used to teach the concept of time, work as an alarm clock and aid time management. The app provides voice announcements as the time counts down and the minutes remaining are displayed on the icon face.

Alignment with the UDL guideline: Timer:Min2Go has the potential to meet all 3 principles of the Universal Design for Learning Guidelines depending on the intent of use for the app for any given task by the teacher and or learner. Principle One,

Curriculum area: Mathematics and Numeracy are the obvious connections with this app. However, for a student with additional needs this app offers supported transition between activities and therefore a skill that supports the development of a life skill.

How does the app meet the National Disability Standards? The Timer:Min2Go app meets standard 5, service access by providing assistance and support for learners to independently manage time and support their transition between activities. Standard five recognises that individuals should be supported to understand criteria and processes that the timer app also supports through non-threatening reminders that can be controlled by the user or support person.

How the app changes pedagogy (SAMR)? This app acts as a “direct tool substitute, with functional improvement.” (Puenredura, 2013) by replacing the teacher’s voice, a support adult or other means of reminder in the hands and control of the child.

How the app encourages person centred planning. This app encourages independent transition for the student and therefore supports person centred pedagogy and allows the teacher and student to focus on the learning, content and expectations of the task and supports self-regulation and could be of benefit for a child with an ADHD diagnosis.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) Connectivity when linked to supporting control and independence is encouraged by the Min2Go timer app. The timer can be used during times of learning and person leisure time. The app could also support an
individual to link with others, doing things together and therefore meets the community element of the 5c’s of a 21st century approach to teaching and learning.

**Evidence from the literature that the app is capable of the claims made:** Bamford’s (2016) research on the effect of using an iPad to increase on-task behaviours of high school students with Attention Deficit/Hyperactivity Disorder (ADHD), He found that when students used an iPad app for self monitoring their on task behaviour it increased in comparison to when they were not able to support their learning with the tool. Whilst this is a small study it indicates that Nueron (2012) industries timer app and other apps in this category whilst not designed specifically for education or users with additional diverse needs may assist learners who experience difficulties with concentration and sustaining periods of attention and persistence on a task.

**General Comments:** This app works well for supporting independent transition between tasks for a student requiring support in this area to minimise anxiety and positive responses to transitioning activities or even moving between learning spaces or teachers.
**Reviewer:** Kim Martin

**Name of app:** Prizmo

**Operating System:** IOS, OSX

**Location:** iTunes Store

**Cost:** $14.99

**Description:** Prizmo scan is a document scanner. The free version of this scanning app is packed with features which make it one of the best app scanners currently available. It auto corrects perspective distortion, has edit and enhancement tools and has storing and sharing options. The upgrade to the premium version (via in-app purchase of approx $9.00) removes the advertisements, enables you to import PDFs, lets you upload immediately after scan and supports cloud storage services like Dropbox, Evernote and Google Drive.

**Alignment with the UDL guideline:** Even at its basic level the features of the Prizmo app align with the Universal Design for learning principle 1.1.1 by offering an alternative way of customising and displaying information including text to speech with optical character recognition software built into the app and 1.2.3 as the manipulation of the image by the app supports decoding of text and symbols on the page. Therefore, the features built into this app also offer the user multiple means of action and expression, guideline principle 2. The ability to photograph a page of written text, or writing on a whiteboard then amend and improve the new image to suit your needs before saving, sharing or hearing the text read aloud provides options for expression and communication which can be represented by principle 2.5 and 2.5.1. Prizmo also embodies principle 2.6.3 due to the users ability to manage information and resources, store and share them.

**Curriculum area:** English and Literacy are the learning areas where the Prizmo app could be of most benefit for a student who has difficulties accessing printed text. However, any curriculum area has the potential to use text that is not inclusive and accessible for all students, whether this is via a textbook, worksheet or handout or even notes on a whiteboard and therefore this app is a cross curricular study tool that can aid independent access to printed material.

**How does the app meet the National Disability Standards?** Prizmo provides alternative access to printed material and therefore facilitates participation and inclusion, standard two, by providing the potential for the user to access the information at the same time as their peers in their preferred medium including audio output through text to speech options via the optical character recognition features supporting the development of literacy skills. The app could also provide the means for
standard three, supporting individual outcomes and participation in decision making and collaboration.

How the app changes pedagogy (SAMR)? This is a powerful enhancement app as it enables the individual to be in control of how they access the information scanned and has the potential to provide previously inaccessible content to the user. It does more than an enlarged photocopy of the original text because the file can be shared, heard via inbuilt speech to text features and saved for later reference and easy recall.

How the app encourages person centred planning. Prizmo provides the user with assistance in accessing written text and images enabling the student to access information at the same time as their peers, transfer the scan into other applications to aid with reading and comprehending or storing of information to retrieve at a later stage with cloud based storage integration options with the app also providing additional features of tagging and search to aid curation.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) This app supports independent access to printed text. It can be categorised as a connectivity, creativity and curation app depending on the intended purpose of the user. Connectivity because it provides ease of control to access printed text independently whether for personal or educational purposes. Creativity because it equips the student with a means for manipulating data or information that was presented in an inaccessible way and curation because the purpose of this app is to support the user to collect, store and categorise the collected scans for easy access at a later stage. It also offers means to share the scanned images and therefore collaboration could also be considered.

Evidence from the literature that the app is capable of the claims made: Prizmo creators boast an elegant and intuitive Interface with a focus on usability with Optical Character Recognition (OCR) and powerful editing capabilities, text-to-speech as well as supporting VoiceOver on iOS devices. Fälth & Svensson (2015) review of the Prizmo app as part of their study of the interaction between an individual with a dyslexia diagnosis and assistive technology and they verify that the scanning and text to speech functions can support individuals with reading difficulties such as word decoding and reading comprehension supporting access to text at the same time as their peers.

General Comments: Replaces the expensive devices with a free alternative that provides instant access to materials that is in the control of the learner. They are not dependant on a support adult running to the photocopier or transcribing for them thus allowing them to receive information in a timely manner and potentially even at the same time as their peers. A text to speech feature within the app would make a great additional feature to increase its inclusivity for all users.
**Reviewer:** Kim Martin

**Name of app:** MyScript Calculator

**Operating System:** IOS, Android

**Location:** iTunes Store

**Cost:** Free (with in app purchase options)

**Description:** The MyScript Calculator is able to complete quite complex calculations or the simplest with impressive handwriting recognition capabilities. It is a free app with an interface that looks like a piece of graph paper with the potential to help users who have difficulties with functional or basic math concepts as well as more complex concepts like square roots. MyScript Calculator is like a calculator and a piece of paper in one and even has options for palm rejection and left handed users. The user is able to write either numbers and/or calculations by hand and is able to choose whether the calculation is automatically shown or whether they would like to work it out. It also has storing, sharing and export features meaning the students working memory can be supported and the calculations can recalled, reviewed and displayed in a tidier manner than they could potentially present on their own with paper and pencil. If you have a student who with a dyscalculia or dysgraphia diagnosis this is a great app for them.

**Alignment with the UDL guideline:** MyScript Calculator meets the UDL Guidelines Principle 1: Provide Multiple Means of Representation. It provides options for perception (1.1) by offering ways of customizing the display of information converting handwriting to text (1.1.1). By providing this option to change the mathematical expressions, and symbols MyScript calculator also supports the second UDL learning guideline and offers the user support for decoding of text, mathematical notation, and symbols (1.2.3) enabling the user and the audience to clarify vocabulary and symbols (1.2.1).

**Curriculum area:** Mathematics and Numeracy. Age range is dependent on an individual’s needs. I can see this used in the primary school as a general calculator incorporating the written features and also for secondary school students whose handwriting is difficult to read or fatigue easily.

**How does the app meet the National Disability Standards?** MyScript Calculator offers an alternative for students with illegible handwriting to demonstrate their learning to others and have pride in their work, thus supporting standard two; participation and inclusion. Students using the app who experience specific learning difficulties associated with literacy and numeracy are able are supported to record their understanding in a way that can be shared and retrieved meeting
individual outcomes and complete tasks and processes and find solutions to mathematical problems with scaffolded support in their preferred way. (standard three).

**How the app changes pedagogy (SAMR)?** MyScript Calculator app enables a user with mobility needs, handwriting difficulties, organisation and executive functioning deficits to successfully use a calculator and for their work to be legible and shared with peers, parents or teachers. MyScript Calculator is able to provide significant task redesign and fits within the modification classification level of the SAMR model.

**How the app encourages person centred planning.** The MyScript Calculator app supports the correct formation of numbers and assists with legible recording of a user’s thinking and calculations. Therefore the user is able to participate and meet expectations of the learning opportunity.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)** MyScript Calculator app encourages creativity as it enables written text, the manipulation of data and a way for the user to present information and ideas in new ways or ways not possible using traditional resources, tools and materials.

**Evidence from the literature that the app is capable of the claims made:** Fabien Ric, Product Manager, MyScript Calculator (2017) believes that by leveraging handwriting and removing an input barrier it enables children to write any equation on a digital device, as they would on a real piece of paper, helping them to focus on the problem they’re trying to solve. Dyspraxia and dyslexia can have an impact on a child’s ability to write legibly as well as mental arithmetic with working memory also often affected they often have difficulty completing these tasks at the same speed as their peers. Students who struggle with print, visual, and auditory inputs may be less likely to experience deep engagement while learning new content because their working memory is overloaded by the processing power they need to decode the input and organise their thoughts on paper that uses a disproportionate share of working memory. (O’Connell, Freed, & Rothberg 2010) My Script Calculator can scaffold writing and organisation whilst supporting the use of handwriting as a form of input, which is known to support the activation of the brain’s reading and writing circuit in contrast to typing which doesn’t seem to activate this area of the brain (James and Engelhardt, 2012). Writing on the screen with a finger instead of typing may also be of benefit a student with dysgraphia because it is more of a gross motor movement rather than a fine motor movement.

**General Comments:** Educators can provide access to this app for students who have difficulties with handwriting and organisation skills. Educators can track progress and receive a visual artefact of a learners thinking through the save and export features.
**Reviewer:** Renita Adhia Wardani

**Name of app:** Lectio

**Operating System:** IOS

**Location:** iTunes Store

**Cost:** $4.99

**Description:** Lectio is an application that can be used as an assistive technology. This application helps people with learning disabilities, especially dyslexia, to be independent and fluent readers. People using this application only need to take pictures from the source that they want to read. It also allows the users to select just the words that they want to read, instead of reading the entire passage. After taking the picture using Lectio, the words that available in the Lexio’s dictionary will be highlighted in yellow, and the users can select the words that they want to be read by tapping the single word. If the users press and hold on the word selected, the definition will appear. The advantage of this application is that the users do not need internet access. Therefore, they can use it everywhere and anytime using portable devices (Lectio, 2015).

**Alignment with the UDL guideline:** According to the Universal Design for Learning (UDL) principle, Lectio is an application that is suitable with principle I. Provide multiple means of representation, guideline 2 ‘Language, expressions, and symbol,’ checkpoint 2.3 ‘Support decoding text, mathematical notation, and symbol’ (CAST, 2014). This application allows people or students who are struggling to read the text, by enabling them to listen to the word sounds and help them to understand. Besides that, Lectio can help students to understand the meaning given based on the dictionary by listening to the voice of the readers. This aim is in line with the checkpoint 2.4 ‘Promote understanding across languages’ (CAST, 2014).

**Curriculum area:** Lectio supports students to read the material in the school. Therefore, they can comprehend the material by listening to the sounds of the reader which is read aloud for them. This application is suitable from later elementary students to college or adult. Because it helps individuals who want to learn to read.

**How does the app meet the National Disability Standards?** It meets two standards in National Disability Standards. First, this application helps people with a learning disability to improve their individual outcomes that meets the standards three ‘Individual outcomes’ (Department of Social Services, 2013). It also enables people with a learning disability to reach the standards of service which involves reaching their goals, by helping them to read material that they need. Second, it meets
standard five ‘Service access’ (Department of Social Services, 2013). This application helps the users to access what they need regarding ability to read the material.

**How the app changes pedagogy (SAMR)?** Lectio application supports student by giving access in different functions of technology. It augments the basic functions of technologies to the higher functions that is helping people with learning disabilities to use their technology to read the words around them. It is in line with the SAMR pedagogy in enhancement and augmentation standard.

**How the app encourages person centred planning.** Lectio is not a one-on-one intervention renewal in study. It is designed to enhance learning support strategies. Having this application will assist students to read the material individually. Therefore, Lectio can be categorised as a person-centred technology that is meeting the needs of people with learning disabilities.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Lectio encourages connectivity and creativity in this modern era. Users might be connected to the material by taking the pictures and allowing the application to be read aloud. Furthermore, Lectio might be used to interpret the words into sounds that are able to be understood by people with dyslexia. It means that Lectio can create new ways to help students or people with learning disabilities in reading and understanding words.

**Evidence from the literature that the app is capable of the claims made:** The inventor of Lectio claims that this application, as an assistive technology for people with learning disability, has several advantages. Regarding the inventor’s claims, this application is portable because it can be brought everywhere easily, affordable because users can use their own technology or smart phone that they already have, and effortless because users do not need to scan the reading materials. It means that this application is able to cope with the barriers of assistive technology. The barriers of technology used by individual with disabilities are lack of access, training and support, and expense of technologies (Carey, Friedman, Bryen, & Taylor, 2005). Furthermore, this application is designed to promote independent reading. Messinger-William and Marino (2010) noted that the assistive technologies help students to overcome their limitation by creating technology that can enhance their independence. This statement is in line with the purpose of the Lectio to help users become independent readers.

**General Comments:** This application provides support for students who are struggling to read the material. Having this application is not only helping students in learning but also reducing the barriers in teaching process. Therefore, educators can provide this application to support their students in learning process.
Reviewer: Renita Adhia Wardani

Name of app: Ghotit Real Writer and Reader

Operating System: IOS, Android

Location: iTunes Store

Cost: $159.99

Description: Ghotit Real Writer and Reader is an application that can be used to assist people with dyslexia, dysgraphia and other writing difficulties. The main aim of this application is to enable people with dyslexia to read their text aloud using Text To-Speech features. The users need to mark the text that they want to be read and press F6. It also allows the users to read one word that they choose. This application also provides a text editor like correcting and checking the spelling, grammar, and punctuation mistakes. Moreover, Ghotit Real Writer and Reader are equipped with a word dictionary and word predictor. Having this predictor about what is likely to be written, will help people with learning disability to be more independent in writing (Ghotit ltd., 2017)

Alignment with the UDL guideline: In line with the UDL guideline principles II. Provide multiple means of action and expression, guideline 5 ‘Provide options for expression and communication,’ checkpoint 5.2 ‘Use multiple tools for construction and composition’ (CAST, 2014). It pointed to the grammar and spelling checks that help students understand how to revise to the proper compositions. Besides that, in accordance with the principles I. Provide multiple means of representation, guidelines 2 ‘Provide options for language, mathematical expressions, and symbols’, checkpoint 2.3 ‘Support decoding text, mathematical notation, and symbols’ (CAST, 2014). Because this application helps students with learning disabilities to read their reading material.

Curriculum area: Ghotit Real Writer supports students in reading and writing area. This application is suitable for people with dyslexia and dysgraphia. Therefore, it would helpful for them and teachers to support the learning process. This app is suitable for students from elementary to adults.

How does the app meet the National Disability Standards? This application fits with two standards in the National Disability Standards. Supporting students to improve their ability in reading and writing as an individual outcome and facilitating students to read the books or material in purpose to reach their goals relate with standards three which is ‘Individual outcomes’ (Department of Social Services, 2013). Furthermore, having access in material used is in accordance with standard five ‘Service access’ (Department of Social Services, 2013). The easiness in access the material will influences students to reach their goals in learning process.
How the app changes pedagogy (SAMR)? Ghotit Real Writer could be classified as augmentation, because it is used to substitute the pencil and paper used in writing. It also has improvement in the functional, because it has dictionary that can help students to understand the meaning of the words and grammar checking that support students to make writing with less grammatical errors. Besides that, it provides programs to complete the words to reduce the misspelling.

How the app encourages person centred planning. This application helps teachers to provide a person-centred approach. It allows students with learning disabilities to read and write based on their own needs in the classroom. It meets the requirements of students to be independent in study in the classroom, because this application can be used individually based on the needs of the users.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Using Ghotit Real Writer makes several aspects in 5C fulfilled. First, the connectivity between the users and the technology that is used, meets to support users become independent in doing their work. Second, using this application enables students to collaborate by sharing their data. Starting from doing their works and tasks that the result of their works could be shared to others. Moreover, creating new ways to support people with learning disability to share and present their ideas through their writing.

Evidence from the literature that the app is capable of the claims made: The provider (2017) claims that Ghotit Real writer could support people with dyslexia and dysgraphia by providing several modules. First module is the spell checker, which help to verify the spelling. The use of spell checker is allowing individual with learning disabilities to keep focused on the communication task rather that trying to identify and correct spelling errors (Burgstahler, 2002). Second, word prediction propose the users a list of word choices that they are going to use (Evmenova, et al., 2010). The purpose of this approach is to improve areas of deficiency. Third, Text-To Read is the main features to help people with learning disabilities. According to the Balajthy (2005), using application that can help to read aloud is not only important in reading effort but also important in teaching areas to support people who struggling in reading. Based on the features that are offered, it will improve the ability in reading and writing to support people with learning disability to read and write independently.

General Comments: Ghotit Real Writer and Reader provide teachers and educators in supporting their students, especially students with learning disabilities. Equipping students with this application will help to leverage students’ ability in reading, confidence in the classroom and independence in learning process. Therefore, it is important for educators to acknowledge about application that can support their students.
Reviewer: Renita Adhia Wardani

Name of app: Dexteria

Operating System: IOS, Android

Location: iTunes Store

Cost: $5.99

Description: Dexteria is an application for people with dyspraxia. The purpose of this application is to train and build the dexterity and fine motor skills, like strength and control (Cool Apps for School, 2017). There are three main activities to improve and develop fine motor skill. First is ‘Tap It’ which purpose is to enhance the ability of fingers in movements and sequencing. In this part, the users are asked to tap the shapes that appears in the screen using 4 fingers in turns without moving the thumb. Second, ‘Pinch It’ aims to provide practice for fine motor skills. Some crabs appear in this step, and the users are asked to pinch the moving crabs. Furthermore, ‘Write It’ provides practice before writing. In this step, tracing letters based on the dots that become visible in the screen can be a practice for children to write letters. In tracing the letters, the users can use stylus or their fingers (BinaryLabs, Inc., 2017).

Alignment with the UDL guideline: This application in line with the Universal Design for Learning guidelines principles II. Provide Multiple Means of Action and Expression, guideline 5: Provide option for expression and communication, and checkpoint 5.3 ‘Build fluencies with graduated levels of support for practice and performance’ (CAST, 2014). Because Dexteria provide features to practice in improving fine motor skill which will later be useful in writing skills. Using this application, students or people with learning disabilities can practices. This rehearsal can help them to improve their ability in motor skills. Therefore, it can influence in the ability in writing.

Curriculum area: This application relates to the fine motor skills of the children. Fine motor skills are related to a lot of skills using hands like writing, cutting, tearing the paper, sewing, etc. This application will support students to practice their fine motor skills that later on can be used not only in the classroom activities, but also in their daily lives. This application can be used people in every age, because it is a practice for fine motor skills.

How does the app meet the National Disability Standards? According to the National Disability Standards, Dexteria is fit with the standard three ‘Individual Outcomes’ (Department of Social Service, 2013). Because, using this application can help people with disabilities to improve their
outcomes. Practicing using this application is expected to improve individual motor skills. Therefore, it will influence the outcomes of people with learning disabilities.

**How the app changes pedagogy (SAMR)?** This application changes pedagogy in enhancement (substitution). Because using this application can encourage to improve the technology used in the activities that are related to motor skills. This application can also be used to practice in improving the ability of fine motor skills.

**How the app encourages person centred planning.** This application can meet the needs of people with learning disability, especially dyspraxia. As a tool that can be used for practicing in motor skills, this application can fit with their needs. By practicing with this application, it helps people with dyspraxia to improve their fine motor skills. Practicing many times will give a good result for the improvement.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Dexteria encourages creativity to teaching and training. This application helps people with learning disabilities to practice in motor skills. It means that there are any creativity in the usage of technology that can be used as a tool to improve people’s abilities. This application is not only as a game but also can be used as a practice tool to improve the ability based on their needs.

**Evidence from the literature that the app is capable of the claims made:** There is a claim from the inventor of this application that this application can be used as a therapeutic tool. Having routine practice using this application will give the best result of therapeutic (Apple Inc., 2017). Because it can increase the coordination and the motor control in the hands and fingers. Having practiced using this application many times can help to improve motor skills of people with learning disability. Sungden (2007) mentioned that doing the remedy will give advantages in doing the tasks. Besides that, practicing in fine motor skills will influence to the other skills in the future, like handwriting. According to Smits-Engelsman, Niemeijer, & van Galen (2001), the handwriting shortcoming is accompanied by the lack of fine motor.

**General Comments:** Teachers and educators can use dexteria to support their students with learning disability. It is not only for practicing for children with dyspraxia but also an interesting game that can be played by them. Teachers can monitor the improvement of the skills from the level in this application. Therefore, this application will be very useful for educators and teachers for activities in the class too.
Reviewer: Renita Adhia Wardani

Name of app: ModMath

Operating System: IOS

Location: iTunes Store

Cost: Free

Description: ModMath is designed for students with dysgraphia and dyslexia. It allows students to type the math problem on the virtual graph paper. It is not only dealing with the basic math problem but also complex algebraic equations, like multiplications or division. The users can create worksheets by tapping the graph paper to make a keypad appear. The equations can be legible in a neat columns and rows. It makes easier for the users to do the short and long division or equations. The color settings in this application can also be changed and adjusted. The users can save their worksheet and create paper to be shared or printed (ModMath, n.d.).

Alignment with the UDL guideline: This application is aligning with the Universal Design for Learning principles I. Provide Multiple Means of Representation, guidelines 2 ‘Provide options for language, mathematical expression, and symbols, and checkpoint 2.3 ‘Support decoding text, mathematical notation, and symbols (CAST, 2014). Because students can use this application to read the symbols in math problems. It also provides calculator features aligning with principles II. Provide Multiple Means of Action and Expression, guidelines 5 ‘Provide options for expression and communication,’ and checkpoint 5.2 ‘Use multiple tools for construction and composition’ (CAST, 2014). Therefore, this application can help students with learning disabilities to do the math problems. Moreover, this application aligns with the principle I. Provide multiple Means of Representation, Guideline 1 ‘Provide options for perception’, and checkpoint 1.1 ‘Offer ways of customizing the display of information’ (CAST, 2014). Because this application allows the users to adjust the color setting that can help the users to be more comfortable in using this application.

Curriculum area: There are several curriculum areas covered with this application. Providing features to work with numeracy will help students with learning disability in Mathematics area. It also helps students in writing area and motor skills, because this application substitutes the functions of pencils. Therefore, students can write the numbers using the keypad. ModMath can be used by students in primary school through to high school.

How does the app meet the National Disability Standards? ModMath meet the National Disability Standards standards two ‘Participation and inclusion’ (Department of Social Services, 2013).
Because, using this application allows people to connect with others and can be a support device in joining the inclusion program. Besides that, it also meets standards three ‘Individual outcomes’ (Department of Social Services, 2013), because this application supports people with a learning disability to be able to do the mathematical problems in their own ways.

**How the app changes pedagogy (SAMR)?** ModMath helps to change the pedagogy as a transformation (augmentation). Because it provides tools that can change pencils. Therefore, it will help people to be able to formulate mathematical problems by tapping the keyboard on the screen. Moreover, it improves the usage of technology from a regular purpose to the devices that can be used to help people with learning disability in solving the mathematical problems. It means that there are an improvement of the technology.

**How the app encourages person centred planning.** This application helps the teacher and educators in providing a person-centered approach. Because it gives access for people with learning disability to be able to do the algebraic equations. It will be fit the need of person with learning disabilities, because it can help them in doing and solving mathematics problems.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** ModMath encourages the collaboration approach. It allows people with learning disabilities to share their worksheets. Besides that, it provides features, so people can save their worksheet in a searchable document library. It is in line with the curation approach in the area of 5C, which is people can collect their data and they can find and use it again when they need it.

**Evidence from the literature that the app is capable of the claims made:** The inventor of the ModMath claim that the purpose in creating this application is to create an assistive technology that can help students or children with a learning disability or a physical ability. Alper and Raharinirina (2006) noted that technology can be an assistive technology for people with learning disabilities to improve their academic, communication, and social life. It also in line with Lee and Templeton (2008) article that assistive technology can support the student in learning and living. Therefore, using this application can help students to improve their performance and join in the class activities.

**General Comments:** This application will assist students with learning disabilities in joining in the math classroom activities. Teachers can use this application because it helps to support student in doing and solving mathematics problems. Therefore, having and using this application can help students to improve their performance and confidence. However, this application can be used not only for people with learning disabilities. Teachers and educators can also provide this application for other students. Therefore, they can solve the problems easier and faster.
Reviewer: Renita Adhia Wardani

Name of app: Photomath - Camera Calculator

Operating System: IOS, Android

Location: iTunes Store

Cost: Free

Description: Photomath is an application that can help people with dyscalculia. This application enables the users to solve the math problems. Photomath can do the handwriting recognition, and then that handwriting can be input into the devices used by the students with learning disabilities. There are several steps to do with the Photomath application. First, the users can scan the handwriting mathematics problems. It will be recognised directly in the application. Then, it provides step by step instruction in solving the problems. Moreover, having smart calculator enable the users to solve the problems easily. Besides that, this application can solve not only the simple problems like addition and subtraction but also the higher mathematics problems, like integers, logarithms, trigonometric, integrals, etc. (Photomath Inc., 2016).

Alignment with the UDL guideline: Photomath has two features that align with Universal Design for Learning. First, this application can be used as a calculator. It is aligning with the principle II. Provide Multiple Means of Action and Expression, guidelines 5 ‘Provide options for expression and communication, and checkpoint 5.2 ‘Use multiple tools for construction and composition’ (CAST, 2014). Therefore, students are able to solve the problems using this application. Second, Photomath can scan the handwriting to put in the application. This scanning features is in accordance with principle II. Provide Multiple Means of Action and Expression, guidelines 4 ‘Provide option for physical actions, and checkpoint 4.2 ‘Optimise access to tools and assistive technologies’ (CAST, 2014).

Curriculum area: The curriculum area covered by this application is mathematics. Because this application enables students with learning disabilities to solve the math problems by providing calculator. Besides that, this application provides the steps to teach the users in solving the problems. Therefore, this application will support students in learning and doing their tasks related to the mathematics problems. This application is suitable for the students from the elementary to the high school.

How does the app meet the National Disability Standards? Photomath meets the National Disability Standards point two ‘Participation and Inclusion’ (Department of Social Services, 2013). In line with standards, this application enables students to participate in doing the activities is math class.
Besides that, this application meets standard three ‘Individual Outcomes’ (Department of Social Services, 2013). Because it helps to support students to have progress related with mathematics as an individual. Therefore, students can provide better outcomes using this application.

**How the app changes pedagogy (SAMR)?** Photomath provides a feature that enables the users to scan the handwriting math problems. It means that this application chance in pedagogy in enhancement (modification), which is from the handwriting into numeracy that can be read in the devices. Because using this application, people with disabilities are not only helped in solving the problems but also helped in reading and transforming the handwriting into numeracies in the devices.

**How the app encourages person centred planning.** In line with person centred planning, this application supports students and people with a learning disability to be independent in doing and joining the lesson activities. This application can fit for people with learning disability, because it will help them to read the numbers. It fits with the needs of the people with dyscalculia and dysgraphia. Because using this application, people with learning disabilities can comprehend and accomplish the mathematics activities.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** The areas encouraged by using this application are connectivity and creativity. It covers connectivity because it supports students with learning disabilities to be independent in their works. Then, they can connect directly with mathematical problems to solve it independently. It covers creativity because this application helps to manipulate data from handwriting into the devices used. Therefore, it can help people with a learning disability to reach the solutions.

**Evidence from the literature that the app is capable of the claims made:** The provider claims that this application can support individuals with dyscalculia in solving problems. Hersh (2016) noted that the principal advantage of having technologies with math apps for people with disabilities is increasing the autonomy and participation in the social life. Therefore, PhotoMath helps students with dyscalculia to be independent in class and to join in the class activities. If students able to do it the problems independently, it will also influence the self-confidence of the students. Because they believe about their self. According to Bruning (2011), students can succeed in their situation because of believing about their self. Therefore, this application will be helpful to improve the self-belief indirectly.

**General Comments:** This application could help students to be more independent in learning process. Teacher can use this application to support their students in working with the learning, especially in mathematics area. Using this application can help in doing and solving the mathematics problems easier.
Reviewer: Max Sharpe

Name of app: Voice dream reader

Operating System: IOS, Android

Location: iTunes store (IOS) or the Google play store (Android).

Cost: $22.99

Description: Voice dream reader is an accessible reading mobile application designed to support individuals to read various forms of text. Voice dream reader converts digitized text to speech in order to allow users to listen to text from resources such as documents, web pages and books whilst the spoken word is simultaneously highlighted on their mobile device screens. Users can import text from multiple sources such as web pages, PDF documents, book share and drop box and instantly listen to or visually customise the source content. The application also has a highly configurable layout which allows users to make adaptations that meet their specific reading needs. Such customizable options include reading speed, speech rate, language and style of spoken voice and the visual representation and layout of text such as font colour, size and style. Voice dream reader is suggested to be an accessible tool in assisting reading amongst students specific learning disabilities that impact reading capacity, such as dyslexia (Voice Dream LLC, 2016).

Alignment with the UDL guideline: Voice dream reader aims to support the reading capacity of students with dyslexia and reading difficulties through providing customizable, auditable and visual alternatives to traditional reading. This aligns with the Universal Design for Learning Guideline principle ‘1. Provide Multiple Means of Representation’ (CAST, 2014). Aligning with guideline ‘1: provide options for perception’ and checkpoint ‘1.1 offer ways of customizing the display of information’, students are able to customize the size, colour, font, background contrast and layout of text and the speed of audible speech in order to tailor information to meet their individualized reading needs. Furthermore, voice dream reader aligns with checkpoint ‘1.3 offer alternatives for visual information’ through converting visual text, tables and graphs to audible information which allows students with reading difficulties to alternatively listen to visual forms of text. (CAST, 2014).

Curriculum area: Voice dream reader has the capacity to assist students in developing reading skills and attaining equal access to written information. Reading is a fundamental skill throughout a diversity of educational curriculum areas and across all grades and ages. The text to speech functionality and visual customization may be particularly useful for students with dyslexia, vision impairment or generalised reading difficulties.
How does the app meet the National Disability Standards? Voice dream reader meets National Disability standards ‘2: participation and inclusion’ and ‘3: individual outcomes’ (Department of Social Services, 2013). The app meets these standards through providing people with specific learning disabilities with accessible and alternative methods of reading textual information and adaptations for individualised preferences such as language, font size and audible speech.

How the app changes pedagogy (SAMR)? The Voice dream reader app can be a tool for pedagogy enhancement when teaching students with reading difficulties. The app is classified as a form of ‘Augmentation’ as it substitutes traditional reading with a text to speech alternative and provides functional benefits such as customizing the visual presentation of text and rate of speech (Schrock, 2017).

How the app encourages person centred planning. Voice dream reader encourages person centred planning through providing an accessible auditory alternative to visual reading and customisable visual and textual configurations. This allows individuals with specific learning disabilities and educators to adapt textual resources based on person centred preferences and individualized learning needs.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Voice dream reader can serve as a modern tool for encouraging ‘Creativity’ through providing new ways to read visual text.

Evidence from the literature that the app is capable of the claims made: Voice dream reader claims to facilitate reading capacity and acquisition through accessible speech to text software and customizable displays. Carr (2013b) expresses that voice dream reader has been utilised to assist independent reading skills amongst students with vision impairment, ADHD, dyslexia and disabilities, which affect reading abilities. Parr (2012) found that text to speech assistive technologies can support students with disabilities, reading difficulties to access, decode, and comprehend textual information. Further findings indicated that this form of assistive technology increased student self-efficacy and self-confidence in reading independently (Parr, 2012). White and Robertson (2015) also found that text to speech assistive technology guided by teacher facilitation was able to increase reading comprehension, fluency and engagement amongst students with learning disabilities.

General Comments: Voice dream reader can be a useful tool for teachers and developmental educators who support students with reading difficulties. The app provides such educators with a method to alter the presentation and delivery of textual information in order to best facilitate the reading capacity and preferences of students with diverse abilities thus enhancing educational accessibility and inclusion.
Reviewer: Max Sharpe

Name of app: Easy Spelling Aid + Translator

Operating System: IOS, Android

Location: iTunes store (IOS) or the Google play store (Android).

Cost: $5.99

Description: Easy Spelling Aid + Translator is an Australian developed app designed to facilitate spelling and translation amongst individuals of all ages, with a specific focus on assisting students with dyslexia. The easy spelling aid app utilises speech to text functionality to convert a user’s voice into correctly spelled digitized text which then can be read, spoken back through voice over or translated into multiple languages. This functionality allows users to tap the screen of their mobile device, speak into the microphone and quickly retrieve the correct contextual written format, spelling and pronunciation of spoken words and full sentences. The easy spelling aid app has configurable ‘OpenDyslexic’ font and colour overlays designed specifically to assist the comprehension of learners with dyslexia. The app is also able to be configured to align with state specific Australian primary school writing styles to ensure educational consistency. Furthermore, there is a history log were previous translations and spelling results are saved for future access (Nuapp Productions Pty Ltd, 2017).

Alignment with the UDL guideline: Easy spelling aid + translator provides an accessible tool designed to support spelling and literacy development through providing customizable textual displays and self-efficient ways to check spelling and express grammar. This aligns with UDL guideline principles ‘1. Provide Multiple Means of Representation’ and ‘2. Provide multiple means of action and expression’ (CAST, 2014). Aligning with checkpoint ‘1.1 offer ways of customizing the display of information’ the app provides customizable font styles, text size and colour contrasts designed to be accessible for learners with dyslexia.

Curriculum area: Easy spelling aid + translator is suitable for students with dyslexia or literacy difficulties aged three and above and is utilisable in various curriculum areas that involve literacy skills, such as Literacy. A student can utilise this application to independently clarify spelling and sentence structure whilst constructing a piece of writing.

How does the app meet the National Disability Standards? The easy spelling aid app meets National Disability standards ‘2: participation and inclusion’ and ‘3: individual outcomes’ (Department of Social Services, 2013). The app promotes educational inclusion for students with specific learning disabilities that affect spelling or literacy capacity. The app achieves this through providing
accessible speech to text and text to text to speech functionality that allows students to check written spelling, sentence structure and pronunciation.

**How the app changes pedagogy (SAMR)?** Easy spelling aid + translator app enhances pedagogy through providing teachers with a tool for ‘Augmentation’ (Schrock, 2017). This allows students with literacy difficulties to alternatively use their speech to check spelling and grammatical structure and construct written information without overcoming possible barriers such as waiting for teacher feedback, checking dictionaries or physically writing.

**How the app encourages person centred planning.** An educator could utilise the easy spelling aid app as a tool to facilitate person centred planning for students with literacy difficulties. The app provides a method to support the individualised literacy needs of a diverse range of students through providing accessible font, language translation, spelling support, speech to text and pronunciation reinforcement through clarifying playback.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** Easy spelling aid + translator improves ‘Collaboration’ and ‘Creativity’ as it provides an accessible speech to text method for students with writing difficulties to express and share written information with others.

**Evidence from the literature that the app is capable of the claims made:** Nuapp Productions (2017) claims the Easy Spelling Aid + Translator app is able to improve spelling and literacy amongst students with dyslexia. Supporting this, previously utilised assistive technologies with speech to text, text to speech and spell checking functionality has been found to increase spelling accuracy, reading comprehension and self-efficiency amongst students with learning disabilities (Maor, Currie & Drewry, 2011). This may be associated to the apps combinational use of auditory and visual representation of words. This provides multisensory representation, which has been found to facilitate reading and spelling amongst individuals with dyslexia (Lee, 2016; Kast, Baschera, Gross, Jäncke & Meyer, 2011). Furthermore, font types have been found to have an impact on the readability of text amongst people with dyslexia, thus the apps customizable font features is beneficial (Rello & Baeza-Yates, 2016). In regards to font styles for people with dyslexia, Rello and Baeza-Yates (2016) found font types such as Courier, Arial increased readability, and no significant advantages for OpenDyslexic font were found.

**General Comments:** Easy Spelling Aid + Translator can be a useful tool for teachers and developmental educators who support students with dyslexia. The customizable visual text and speech functionality promotes person centeredness and allows students with writing, spelling and reading difficulties to alternatively use their voice to write, check spelling and receive speech-generated words.
Reviewer: Max Sharpe

Name of app: Marble Math

Operating System: IOS, Android

Location: iTunes store (IOS) or the Google play store (Android).

Cost: $5.99

Description: Marble Math is an interactive maths game designed to develop and reinforce core maths skills through engaging gameplay amongst children aged 9 years and older. Users practice maths skills through rolling or dragging a marble through a maze whilst dodging obstacles, gaining score and collecting numbers in order to complete a diversity of basic math problems. The game incorporates individualized profiles and game settings, customizable avatars and skill levels, collectable marbles and bonuses, three levels of challenge and the ability to replay questions or receive maths answers. The inclusion of maths problems and skills such as multiplication, subtraction, addition and currency can be configurable by a teacher of parent to align with the desired area of practice or set to randomly generate (Artgig Studio, 2016).

Alignment with the UDL guideline: The Marble Math app can support in motivating and retaining the engagement of students with Attention Deficit Hyperactivity Disorder (ADHD) or Dyscalculia (specific mathematical learning disability) through providing an engaging and interactive way to practice maths skills. This aligns with UDL guideline principle 3: ‘Provide Multiple Means of Engagement’. Aligning with guideline 7: ‘Provide options for recruiting interest’ checkpoint ‘7.2: Optimize relevance, value, and authenticity’, marble math incorporates individual avatars, promotes active participation and fosters the use of exploration and imagination to solve maths problems in creative ways. This may assist in motivating and sustaining maths practice amongst students with ADHD or Dyscalculia as the experience is personalised, appropriately challenging and multisensory engaging thus creating a maths task that is valuable, motivating, concrete and authentic.

Curriculum area: Marble Math is able to facilitate the delivery of the maths curriculum through providing an interactive and engaging way to practice and develop basic maths skills. The app is recommend as suitable for students who are aged nine and above and can be an effective learning tool to engage students with ADHD or Dyscalculia.

How does the app meet the National Disability Standards? Meeting National Disability standard ‘2: participation and inclusion’, Marble Math is able to actively promote the participation of students...
with ADHD or Dyscalculia through providing a more engaging, interactive and relatable method of developing fluency in maths.

How the app changes pedagogy (SAMR)? The Marble Math app transforms traditional methods of teaching maths skills through ‘Modification’ (Schrock, 2017). The app gives teachers the ability to promote the development of core maths skill in a redesigned way through interactive gameplay combined with foundational maths problems, such as addition and subtraction. Interactive functionality such as virtual avatars, marble upgrades and auditory feedback, gives students engaging maths interactions that are difficult to achieve without this form of technology.

How the app encourages person centred planning. Marble Math is a suitable tool for implementing a person centred approach with students with ADHD or Dyscalculia. The app is able to be individually customized to the maths ability of each student with three degrees of challenge and for further refinement, maths questions are fully configurable and can be pre-prepared by a teacher or caregiver. The app also allows for multiple saved profiles on one device so a student is able to login to their profile and automatically retrieve their personalised configurations, gaming progress and avatar.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Marble Math encourages ‘Creativity’ through presenting traditional maths problems in an imaginative and interactive gameplay format.

Evidence from the literature that the app is capable of the claims made: In comparison to traditional teaching methods, Artgig studio (2016) claims that Marble Math app is an engaging alternative. Interactive maths games and applications have the ability to increase attraction and motivation towards learning maths, self-efficiency and performance in foundational math skills (Panoutsopoulos & Sampson, 2012; Ahmad, Batool & Asghar, 2016; Riconscente, 2013). For students with Dyscalculia or ADHD, Soares and Patel (2015) express that Dyscalculia and ADHD often co-exists and as dyscalculia affects the neural cognition of maths comprehension, interventions are suggested to incorporate multiple components and sensory stimulations (Soares & Patel, 2015). Furthermore, Panoutsopoulos and Sampson (2012) and Chuang, Chen, Tsai, Lee and Tsai (2014) highlight that interactive educational games has been found to increase motivation and improve student-learning performance.

General Comments: The marble math app is suitable tool for educators to deliver maths in a more interacting and engaging way. The gaming functionality provides multiple forms of sensory stimulation and may be a powerful tool in retaining engagement and developing core maths skills amongst students with Dyscalculia and/or ADHD.
**Reviewer:** Max Sharpe

**Name of app:** Articulation Station

**Operating System:** IOS

**Location:** Can be downloaded from the Apple iTunes app store

**Cost:** Free (offers in app purchases for additional letters)

**Description:** Articulation station is a speech pathologist developed app designed to help the speech development of children through practicing the pronunciation of consonant sounds in the English language. The app is comprised of 22 different sound programs that can target phonological sounds in the first, middle or final positions of words, stories and sentences. Target sounds are represented in written, auditory and image formats and are practiced through six different activities that are specifically designed to engage children. Activities vary in difficulty and comprise of flashcards, matching, rotating sentences, unique sentences and two levels of story articulation activities. The app is designed to be utilised by a parent or educator in partnership with a child. Utilising the app involves creating an individual profile for each child, selecting an area of phonological sound, selecting the desired activity and then the child participates in the interactive activity whilst an educator records the correct, proximal and incorrect attempts of sound articulation. This data is saved to each individual child’s profile and available for review and progress analysis (Little Bee Speech, 2017). The supportive articulation methods that this app offers may be particularly useful for supporting children with specific learning disabilities that affect speech articulation and language comprehension such as specific language impairment (SLI), dyslexia and dystonia.

**Alignment with the UDL guideline:** Articulation Station aligns with the UDL guideline principle ‘1. Provide Multiple Means of Representation’ guideline 2: ‘Provide options for language, mathematical expressions, and symbols’ checkpoint ‘2.1 clarify vocabulary and symbols. The app aligns with these UDL guidelines through providing children with a combination of visual, auditory, written and interactive representation of the phonological sounds and words that produce articulation of the English language.

**Curriculum area:** Articulation Station is a suitable tool to support the development of language amongst children who have difficulties with oral expression and language comprehension. Fluency in oral expression and language comprehension is a skill that holistically improves capacity in communication, academics and daily life. The mobile functionality of the app means that it could
be used in a therapeutic, home or schooling environment and integrated into curriculum areas such as English.

**How does the app meet the National Disability Standards?** Articulation Station meets National Disability standard ‘2: participation and inclusion’ through supporting the development of speech and language amongst children with specific learning disabilities such as SLI dyslexia and dysnomia. This promotes fluency in verbal communication which assists in social, educational and community participation and integration.

**How the app changes pedagogy (SAMR)?** Articulation Station is a tool for enhancing the pedagogy of the comprehension and pronunciation of the English language through ‘Augmentation’. The app provides a convenient digitalized substitute for physical speech developing activities such as flashcards and memory games.

**How the app encourages person centred planning.** The Articulation Station app facilitates person centred planning through incorporating individualised child profiles, customizable word lists, the ability to add new images and create personalised flash cards and various degrees of challenge. This allows the developmental activities to be tailored to the individualised needs of children with specific learning disabilities such as SLI, dyslexia and dystonia.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCS)?** Articulation Station is a modern developmental tool for encouraging ‘Creativity’ through providing engaging and creative speech developing activities. The customizable activities and word lists promote both the educator and child to create new ways to explore and develop the expression of language.

**Evidence from the literature that the app is capable of the claims made:** Children with specific language impairments and dyslexia often experience phonological deficits and difficulties in oral expression, word processing and phonological memory (Moav-Scheff, Yifat & Banai, 2015; Robertson, Joanisse, Desroches & Terry, 2012). Articulation Station aims to support speech and language development through providing multisensory representation and interactive activities, such as flashcards and memory games, which involve practicing the pronunciation and comprehension of phonemes, words and sentences (Little Bee Speech, 2017). Supporting this method, augmentative signs such as visuals and symbols and interactive, multi-sensory and working memory approaches have been proven to be effective interventional methods for developing speech and language comprehension amongst individuals with learning disabilities, language impairments, ADHD and dyslexia (Goldbart, Chadwick & Buell, 2014; Kamhi, 2014).

**General Comments:** Articulation Station could be a useful tool for educators who work with children with specific learning disabilities that affect speech such as specific language impairment (SLI), dyslexia and dystonia. An educator is able to create multiple student profiles on one device.
**Reviewer:** Max Sharpe

**Name of app:** myHomework Student Planner

**Operating System:** IOS, Android

**Location:** iTunes store (IOS) or the Google play store (Android).

**Cost:** Free (offers in app purchases)

**Description:** The ‘myHomework Student Planner’ app is a digitalised student planner designed to facilitate time management and help students organise, plan and achieve their academic commitments. Utilising the app, students can input and track their class timetables, homework, assignments and tests through a visual planner. The app incorporates alerts to remind students of upcoming classes and task due dates. Whilst inputting a task, students are able to specify the title, curriculum area, type of task and due date. From this information, the app allows students to view their planner by due dates, class area, and task type or priority level. The app is versatile, as it does not require a network connection to operate. Additionally, teachers and schools can use a companion app called ‘Teachers.io’ to share due dates, assignment files and class information directly onto a student’s ‘myHomework Student Planner’ profile (Instin LLC, 2017). The independent use and external supportive functionality of this app has the potential to support students with specific learning disabilities such as dyslexia and ADHD who struggle with time management and alignment with the UDL guideline:

**Alignment with the UDL guideline:** MyHomework Student Planner aligns with the UDL guideline principle 2. Provide multiple means of action and expression’, guideline 6: ‘provide options for executive functions’, checkpoint ‘6.3 Facilitate managing information and resources’. The app achieves this by supporting executive processing and working memory through providing an accessible scaffold for saving and organising academic requirements and due dates.

**Curriculum area:** Students can utilise the MyHomework Student Planner app to support the organisation and completion of their academic commitments throughout all curriculum areas. The app is designed for students in middle school; high school and university as these periods include various academic classes and requirements.

**How does the app meet the National Disability Standards?** Meeting National Disability standards ‘2: participation and inclusion’ and ‘3: individual outcomes’, MyHomework Student Planner assist students with learning disabilities to structure, manage and achieve their academic goals and successful integrate within academic environments.
How the app changes pedagogy (SAMR)? The MyHomework Student Planner app enhances a teacher’s ability to promote organisation and time management through ‘Augmentation’. The app acts as a digital substitute of written physical student planner and adds the increased functionality of sharing plans and requirements between teachers and students, multiple forms of visual planner representation and a single source of information.

How the app encourages person centred planning. MyHomework Student Planner facilitates person centred planning for students with learning disabilities through providing a planning scaffold that is designed to be adapted to the individual class timetables and academic requirements of each student. Furthermore, individual planners can be created by a student or sent to a student’s device by a teacher. This assists teacher who help students with learning disabilities who have executive functioning difficulties with independently adapting and monitoring their study planner.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) The MyHomework Student Planner app encourages ‘Curation’ for students through providing a digital source to save, access and organize class timetables, assignment due dates and academic commitments. When paired with the companion app called ‘Teachers.io’, the app encourages ‘Connectivity’ and ‘Collaboration’ as students and teachers are able to share information, files and due dates and collaboratively promote student organization and time management.

Evidence from the literature that the app is capable of the claims made: Individuals with learning disabilities often experience a decreased capacity in executive functioning and difficulties in organisation and time management (Sharfi & Rosenblum, 2016). The MyHomework Student Planner app aims to support these difficulties amongst students through providing individualised academic planners that facilitate organisation and provide reminders (Instin LLC, 2017). Supporting this, Carr (2013a) expresses that the use of student planners and due date reminders increases student skills in time management, working memory, self-regulation and homework completion.

General Comments: Educators can utilise the myHomework Student Planner app to effectively support the organisational skills and time management of students with learning disabilities. Combining the app with the ‘Teachers.io’ complain app allows educators to easily update students with new assignments and supportive resources from any location. This also can be utilised to keep both educators and parents aware of the academic progress of students and required tasks that facilitates a holistic support network for students.
Conclusion and Recommendations

“Learning disabilities are not a prescription for failure. With the right kinds of instruction, guidance and support, there are no limits to what individuals with learning disabilities can achieve” (Horowitz, 2014, as cited in Cortiella and Horowitz, 2014, p. 3). Swanson and Meltzer (1993) observed that students with specific learning disabilities (SpLDs) have problems in four areas: difficulty in accessing and organising the learning activity; they cannot use their idea effectively; failing to engage self-regulation and they do not have effective strategies for an academic task. Therefore, these factors become our base line in the research of effective applications for the students.

It is recognised that students with SpLDs need assistance with new technology to encourage and strengthen their capabilities within the academic context. Based on that fact, the importance of finding and reviewing the appropriate application to support students is highlighted. Through sourcing and reviewing multiple assistive applications, it becomes apparent that there are many sources of user-friendly applications available for students with Learning Disabilities. These applications can be used by students with SpLDs, teachers, parents and developmental educators to encourage successful academic learning, promote independence and development and assist in providing an effective teaching process. This finding corresponds to research conducted by Korner and Leske (2012) which highlighted that mobile devices and apps are the future prospective instruments for students with disabilities.

In searching assistive applications for various impairments in learning process, our priority also focused upon the universal design for learning (UDL) and other pedagogy enhancement tools such as SAMR and Greg’s 5Cs of 21st century learning concept. We also emphasised how a particular type of application can achieve person-centred planning and how this app fitted with National Disability Standards (NDS). In search of the application, we also paid attention to the core academic content (literacy and mathematics) as well as the student’s communication, autocracy, independence and self-management (Anna Courtad & Bouck, 2013). With recognition of all these factors, we selected 25 applications that can be used for learners with various disabilities. Some applications can be used particularly for a certain type of SpLDs such as Dyslexia or Dysgraphia. But most of the applications are useful for all students with or without disabilities. We have a strong belief that our collection of applications would help students with SpLDs and their educators to become more successful in their learning, teaching, independence and holistic inclusion throughout curricular environments and within the community.
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Useful Links

Physical Disabilities
## 25 apps for people with Physical Disability

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Introduction

A physical disability is the limitation of a person’s physical functioning, dexterity or mobility, which can include neuro-motor impairments, degenerative diseases and orthopaedic and musculoskeletal disorders (Best, Heller, & Bigge, 2010). Some example for physical disabilities are: paraplegia, quadriplegia, muscular dystrophy, cerebral palsy, absence or deformities of limbs and scoliosis. These physical disabilities can either be congenial or acquired and can impact an individual’s life to various extents (Best, Heller, & Bigge, 2010).

Bellon, Snell, Best, Westling, Owens and Hallahan (2015), discuss the importance of teachers, parents, guardians and caregivers of people with physical disabilities to work towards reducing the functional impact of the disability in their loved one’s daily lives. The reduction of the functional impact can be done by facilitating people with physical disabilities to develop functional living skills, improve physical task performance, and engage in fundamental and assisted communication and individualized preparation for transition. These above-mentioned areas of development vital for gaining independence, participating in social networks, gaining employment and having a valued role in society which promotes self-confidence and improved quality of life (Bellon et al., 2015).

Cho and Erin Lee (2017), conducted a study amongst adults with mobility impairments in South Korea and found using smart devices amongst this populations created a sense of autonomy and elevated the quality of life of the participants. However, it was also found that the participants used their smart device as their primary means of communication with caregivers during an emergency (Cho, & Erin Lee, 2017). However, in this eBook it will be revealed the numerous smart device applications that can be utilized for people with physical disabilities to develop living skills, offer alternatives to perform physical task and facilitate support during transitional stages in their lives.

Thus, this eBook contains thirty well researched smart device applications that can be used for people with physical disabilities. The eBook also includes how each app aligns with the 5’c of 21st Century teaching/training, meets the National Disability Standards, facilitates person centred planning and its alignment with the Universal Design for Learning Guidelines. Moreover, each app will be examined and compared with the appropriate literature to ensure that each app can execute the claims made by the developer. This collection of apps aims to inform teachers, parents and any interested individuals of the wealth of smart device applications and how it can positively impact the lives of people with physical disabilities.
Reviewer: Nhung Pham

Name of app: Speech Hero AAC

Operating System: IOS, Android

Location: iTunes and Google Play

Cost: $99.99

Description: Speech Hero app uses a system of “tiles” to support people with communication difficulty to construct sentences. Every tile illustrates for a word or concept. Users can import images to create your own tiles; for instance, a photo of the child’s mother can be labelled “Mom.” Drag and drop tiles around the interface to assemble sentences, which are then read aloud by text-to-speech voices. This app is great for aiding independent communication, language comprehension, and purposeful touch. SpeechHero features over 6000 unique tiles are provided and 7 unique Text-to-Speech voices with predictive tap-and-type mode with thousands of common utterances. Creation of tiles from photos, web images, anywhere is possible due to a powerful edit mode with the ability to reorganize the entire interface. The app can be used as a basic communication system for people with communication difficulty such as people who has recently suffered a stroke.

Alignment with the UDL guideline: The Speech Hero AAC aligns with the Universal Design for Learning guidelines as it provides multiple means of representation, multiple means of action and expression, and multiple means of engagement. Principle I: Provide Multiple Means of Representation. The app helps students to create of tiles from photos, web images and either in text or speech. Guideline 1: Provide options for perception, Checkpoint 1.3 Offer alternatives for visual information” best reflects this adaption. Principle II: Provide means of action and expression. The app uses multiple tools for construction and composition such as speech-to-text application. Checkpoint 5.2 Use multiple tools for construction and composition may best reflects this adaption. Principle III: Provide Multiple Means of Engagement. The app provides options for recruiting interest: people with communication difficulty can drag and drop tiles to assemble sentences, which are then read aloud by text-to-speech voices, hence they will make a more successful comprehend which will attract them to get involved in the conversation. Checkpoint 7.1 The app optimize individual choice and autonomy as user can import images to create their own tiles to illustrated word or concept and use the system of “tiles” construct sentences. The app also Provide options for sustaining effort and persistence. Checkpoint 8.3: Foster collaboration and community. The Speech Hero AAC is a great collaborative toll to help people with communication disability to enhance communication in class, in family and community.

Curriculum area: communication. This App would be suitable for people at all ages that have communication difficulty.

How does the app meet the National Disability Standards? Standard one: Rights The intervention helps individuals with communication difficulty to have a basic communication system to express their thought so it certainly promotes their rights to freedom of expression. Standard two: Participation and inclusion. The app helps connect people with communication with disability with people in their family and in society; therefore, they give them more opportunities of participation and inclusion.
**How the app changes pedagogy (SAMR)?** The app enhances the teacher's pedagogy as the app provides a system of "tiles" to help students with disability to construct sentences for aiding independent communication. This is a transformation (substitution)

**How the app encourages person centred planning.** The app focuses on people with communication disability to enhance independent communication, language comprehension, and purposeful touch. The usage of images, video, and text-to-speech voices in the app are appropriate to help students.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Speech Hero AAC encourages 4S including connectivity, community, collaboration and creativity. In specific, people with communication disability certainly meet a range of barrier in communicate independently to other people. Speech Hero helps users construct sentences, using alternative means like images, video instead of voice. The app helps user to communicate independently, encourage the sharing of information of users to a variety of people connected to their study, work, or in their community.

**Evidence from the literature that the app is capable of the claims made:** According to Chipinka (2016), AAC modelling interventions provide verbal and visual language models to support language comprehension and use for children with complex communication needs. AAC modelling increase the number of communicative turns, accuracy in answering comprehension questions, comprehension of story grammar terminology, and production of story retells. AAC has expanded its reach to include more people with a wider range of complex communication needs (Shane et al., 2012).

**General Comments:** In general, Speech Hero AAC is a powerful and it's that flexible tool to establish a basic communication for individuals with communication disability. Speech Hero AAC is designed for both Android and IOS users with communication difficulty. Although the app can be installing in many kinds of phone, the price is still high to many people with disability.
Reviewer: Nhung Pham

Name of app: SCI-Ex

Operating System: iOS, Android

Location: iTunes store Google play

Cost: free

Description: Shepherd Centre’s SCI-Ex App is designed to help people with spinal cord injury to achieve and maintain a healthy lifestyle. Users can do exercises shown and described in how-to videos, with the assistance of a trainer. The app can be installed for both Apple and Android devices. It is available as a free download in the Apple iTunes and Google Play stores. The app includes several of video demonstrations with detailed descriptions of proper equipment use, accurate transfer methods and adaptive exercise techniques. Not only people with spinal cord injury, people who are not familiar with spinal cord injuries such as exercise professionals, family members, caregivers, and clinicians all benefit from the SCI-Ex app because it will promote education about SCI health and wellness for individuals and wellness center professionals. Users can choose exercises appropriate for their own injury level, track fitness goals, and save information on their exercise routine. SCI-Ex also includes links to helpful resources. SCI-Ex features exercises for people with an SCI between C-3 and T-12. Exercises are available in four categories: strength training, cardiovascular, flexibility/balance, and neuromuscular.

Alignment with the UDL guideline: The SCI-Ex app aligns with the Universal Design for Learning guidelines as it provides multiple means of action and expression and provide multiple means of engagement. Principle II: Provide means of action and expression. Guideline 4: Provide options for physical action. Checkpoint 4.2 Optimize access to tools and assistive technologies the app provides video demonstrations with detailed descriptions of proper equipment use, accurate transfer methods and adaptive exercise techniques. Principle III: Provide Multiple Means of Engagement. Checkpoint 7.1 The app optimize individual choice and autonomy as the app allows users to choose exercises appropriate for their injury level, set and track fitness goals, and save information on their exercise routine. The app also Provide options for sustaining effort and persistence. Checkpoint 8.3: Foster collaboration and community. This app will enhance users’ ability to share information with the SCI community so people can take part in healthy behaviours – in particular, addressing the challenges faced by people with SCI in following an exercise regimen after they leave a rehabilitation facility. Curriculum area: education about SCI health and wellness This App is suitable for people with spinal cord injury

How does the app meet the National Disability Standards? Standard two: Participation and inclusion. The SCI-Ex app supports those with spinal cord injury, family members, caregivers, exercise professionals and clinicians who are not familiar with spinal cord injuries. It will promote education about SCI health and wellness for individuals and wellness center professionals. Therefore, the app promotes opportunities for meaningful participation and active inclusion in society for individual with spinal cord injuries. Standard 3. Individual Outcomes The app includes exercises for the entire body, but can also be broken down based on specific muscle groups, types of exercises, and based on a user’s functional ability and level of assistance required to perform the movements. Therefore, it is built on individual strengths and enables users to reach their goals. Standard 4: Feedback and
Complaints: Before launching the app, Shepherd Center asked some people with SCI and some fitness professionals to test the app and provide feedback. Standard 6. Service Management: The Shepherd Center service has effective and accountable service management and leadership to maximise outcomes for individuals.

How the app changes pedagogy (SAMR)? The app enhances the teacher's pedagogy, as the app can be a great resource for individuals to become more knowledgeable and independent with developing an exercise routine in community gym settings and also aid fitness professionals and/or caregivers on how to properly assist with various types of exercises outside of a typical SCI rehab setting. This is a transformation (substitution)

How the app encourages person centred planning? The SCI-Ex app encourages person centred planning as it allows users to choose exercises appropriate for their injury level, set and track fitness goals, and save information on their exercise routine. Also, the app includes exercises for the entire body, but can also be broken down based on specific muscle groups, types of exercises, and based on a user’s functional ability and level of assistance required to perform the movements.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? The SCI-Ex app encourages 4 areas of a 21st Century approach to Teaching/training which are connectivity, community, collaboration and creativity. This app promotes individuals with SCI to become more knowledgeable and independent with developing an exercise routine in community gym settings.

Evidence from the literature that the app is capable of the claims made: Nash (2005) asserts the necessary of exercise after SCI. Used in conjunction with a Health Professional this app supports and encourages exercise when the patient returns home. This app provides the point of care support that Ventalo (2014) found to be so important by health care professionals to giving detailed descriptions of proper equipment use, accurate transfer methods and adaptive exercise techniques that ensures the correct procedures during exercise. Other aspects of the app such as reminders set by the health professional and educational videos provide essential education for the patient. Using this app saves time and cost by providing support at home for the patient, freeing up health professionals resulting in a cost effective healthcare model (Kratzke and Cox, 2012)

General Comments: The SCI-Ex is a free download app in the Apple iTunes and Google Play stores which promotes fitness for people with spinal cord injury (SCI). As it provides video demonstrations with detailed descriptions of proper equipment use, accurate transfer methods and adaptive exercise techniques, SCI-Ex app benefits people with spinal cord injury, family members, caregivers, exercise professionals and clinicians. It will promote education about SCI health and wellness for individuals and wellness center professionals.
Reviewer: Nhung Pham and Cindy Steele

Name of app: Physiotherapy Exercises
Operating System: IOS
Location: iTunes store
Cost: free

Description: The Physiotherapy Exercises application allows people with spinal cord injuries and other neurological conditions to search for appropriately exercises. It is also a useful resource for physiotherapists and other professionals. It includes more than 600 exercises with over 1000 images. Users can search by condition, body part, age category, exercise type or equipment available. People with spinal cord injuries and other neurological conditions also can select exercises and save them to up to five different slots for future reference. The application is fully self-contained as online connection are not required to run the app. this application is free and being developed for the physiotherapists of the Department of Health, Sydney - NSW Australia. It will be developed in some other languages.

Alignment with the UDL guideline: The SCI-Ex app aligns with the Universal Design for Learning guidelines as it provides multiple means of action and expression and provide multiple means of engagement. Principle II: Provide means of action and expression. Guideline 4: Provide options for physical action. Checkpoint 4.2 Optimize access to tools and assistive technologies. The app provides over 600 exercises are available with over 1000 images. Principle III: Provide Multiple Means of Engagement. Checkpoint 7.1 The app optimize individual choice and autonomy because the app allows users to search exercises by condition, exercise type, body part, equipment available and age category. The app also provides options for sustaining effort and persistence.

Curriculum area: Education about health and wellness

How does the app meet the National Disability Standards? This App is suitable for people with spinal cord injuries and other neurological conditions Standard two: Participation and inclusion. The Physiotherapy Exercises app supports people with spinal cord injuries and other neurological conditions, their family members, caregivers, exercise physiotherapists and other professional. Therefore, the app promotes opportunities for meaningful participation and active inclusion in society for individual with spinal cord injuries and other neurological conditions. Standard 3. Individual Outcome: Using the app, users can search physiotherapy exercises suitable for their own condition, exercise type, body part, equipment available and age category. User also can select exercises and save them to up to five different slots for future reference. It is certainly build on each user’s strength enables users to reach their goals.

How the app changes pedagogy (SAMR)? The Physiotherapy Exercises app improves the teacher's pedagogy because this app effectively supports to people with spinal cord injuries and other neurological conditions to search for appropriate exercises. Therefore, the users become more knowledgeable and independent with developing an exercise routine in life. This is a transformation (substitution).
How the app encourages person centred planning? The Physiotherapy Exercises app encourages person centred planning because it allows users with spinal cord injuries and other neurological conditions to search for appropriate exercises based on user’s condition, exercise type, body part, equipment available and age category. User can control the exercises.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The Physiotherapy Exercises app aligns with criteria of connectivity, and curation. The Physiotherapy Exercise app encourages curation as it includes over 600 exercises and users select exercises and save them to up to five different slots for future reference.

Evidence from the literature that the app is capable of the claims made: According to Noreau & Shephard (1995), a lack of physical fitness for specific tasks can be a serious obstacle to autonomy following SCI. In a very short period of time, physical deconditioning can significantly decrease quality of life in individuals with SCI, ultimately placing them in a state of complete dependency. The video illustrates some Physiotherapy exercises for people with spinal cord injuries such as cupping the hand on the table, rolling two balls around in the hand with a thump, picking up a coin etc. Kristin Kaupang, Physical Therapist at Harborview Medical Center at the University of Washington in Seattle, explains the benefit that Physiotherapy Exercises brings to people with Spinal cord injury. It can reduce the risk for heart disease, improves respiration (breathing), muscle strength, circulation, body composition, self-esteem, self-confidence, depression, anxiety, and independence. It also helps to prevent secondary complications (such as urinary tract infections, pressure ulcers, and respiratory infections), reduce the risk for diabetes, improve immune system function, and reduce constipation. (https://www.youtube.com/watch?v=tUAO99Nyajg)

General Comments: The Physiotherapy Exercises app is a free download app which provides exercises appropriate for people with spinal cord injuries and other neurological conditions. In general, the Physiotherapy Exercise app is an effective tool and resource for users with spinal cord injuries and other neurological conditions, as well as physiotherapists and, educators. Translation into many other languages in the future will help people with spinal cord injuries and other neurological conditions all over the world.
Reviewer: Nhung Pham

Name of app: HelpTalk

Operating System: IOS, Android

Location: iTunes store Google Play

Cost: free

Description: HelpTalk app is designed to assist in communication for people who are unable to communicate orally or through written word. It features a basic default profile that has a list of basic sentences and phrases. User can also create their own profile with whatever phrases you want. The user can create profiles in various languages including Spanish, English, Finish, German, Norwegian, French, Italian, Hungarian, Portuguese, Swedish, Danish, and Polish. The user can even use it to configure an emergency phone number, an emergency message, and an SOS button that will text a certain number if someone needs help.

Alignment with the UDL guideline: The HelpTalk app aligns with the Universal Design for Learning guidelines as it provides multiple means of representation, multiple means of action and expression, and multiple means of engagement. Principle I: Provide Multiple Means of Representation. With HelpTalk, users can create a profile containing the actions most useful to any situation. A user can create a profile suited for their day-to-day life, a specific event, travelling, education, etc. It helps people unable to communicate in a traditional fashion (people with aphasia, tracheotomised, ventilated with endotracheal tube, muteness, autism, illiterate, other language, children, etc.) to express their basic needs. Guideline 1: Provide options for perception, Checkpoint 1.3 Offer alternatives for visual information best reflects this adaption. Principle II: Provide means of action and expression. The app uses multiple tools for construction and composition such as speech-to-text application. When each action is tapped, the device speaks the respective command. Checkpoint 5.2 Use multiple tools for construction and composition may best reflects this adaption. Principle III: Provide Multiple Means of Engagement. The app provides options for recruiting interest: users can create a profile containing the actions most useful to any situation. A user can create a profile suited for their day-to-day life, a specific event, travelling, education, etc. It helps people communicate orally or through written word to express their basic needs. Therefore, they will make a more successful communication which will attract them to get involved in the conversation. Checkpoint 8.3: Foster collaboration and community. The Speech Hero AAC is a collaborative tool helping people with communication disability enhance communication.

Curriculum area: Communication. This App would be suitable for people at all ages that have problem with oral communication and written communication.

How does the app meet the National Disability Standards? Standard one: Rights. The intervention helps individuals with communication difficulty to express their basic needs so it certainly promotes their rights to freedom of expression. Standard two: Participation and inclusion. The app helps connect people with communication with disability with people in their family and in society; therefore, they give them more opportunities of participation and inclusion. Standard 3. Individual Outcomes Using the app, users can create sets of actions that represent their needs in terms of communication, with the actions most suited for each disability/user. Therefore, it is built on individual's strength enables users to reach their goals.
How the app changes pedagogy (SAMR)? The app enhances the teacher’s pedagogy as the app provides a profile containing the actions most useful to any situation to help students with communication disability to express their needs and have an independent communication. This is a transformation (substitution)

How the app encourages person centred planning. The app focuses on people who are unable to communicate in a traditional way including people with aphasia, tracheotomised, ventilated with endotracheal tube, muteness, autism, illiterate, other language, children, etc. HelpTalk allows users to create sets of actions that represent their needs in terms of communication, with the actions most suited for each disability/user. The HelpTalk app also presents two big Yes/No buttons, S.O.S. button, an SMS message is then sent to the configured number. The user also has the option to include his current location’s coordinates. With the support of this app, the users will become more independent in their communication.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The HelpTalk app encourages 4S including connectivity, community, collaboration and creativity. People with communication disability certainly meet a range of barrier in making basic communication such as expressing their basic needs to other people. The app helps user to communicate independently, hence they become connected in family, school and community.

General Comments: In general, HelpTalk is an effective app supporting people who are unable to communicate fluently orally or through writing. A profile containing the actions most useful to any situation. As HelpTalk app can be installed free for both Android and IOS users, it is easily accessible for people with communication difficulty.
Reviewer: Cindy Steele

Name of app: Dial2Do

Operating System: Android

Location: iTunes Store, Google Play

Cost: Free 30 day trial then $2.49 a month, or $24.99 per year. Pro option $5.99 per month or $59.99 for the year.

Description: The App can create and listen to reminders by voice, as well as give voice to text transcriptions and has a recording time of 20 seconds. This is for the Basic Option. The Pro option includes everything within the Basic Option as well as text messaging, sending, listening as well as replying via text and email messaging. This also can occur when posting tweets on Twitter whereby you can listen to posts and post tweets via your voice. The Dial2Do app also allows you to access and stay informed of the local weather in your area, listen to news, sports and finance, as well as post audio notes using your voice via Evernote. This is a productive app allowing access to Google Calendar, Face book, Blogs, Word press and more.

Alignment with the UDL guideline: This App meets the UDL Guidelines of both Principle 2: Provide Multiple Means of Action and Expression and Principle 3: Provide Multiple Means of Engagement.

Principle 2: Provide Multiple Means of Action and Expression. In Guideline 4: Provide options for Physical action. Checkpoint 4.1: Vary the methods for response and navigation. Whereby this App ensures there are multiple means for navigation and control is accessible via voice to command to be able to post, text and email to be able to communicate with others.

Principle 3: provide Multiple Means of Engagement. In Guideline 7: Provide options for recruiting interest. Checkpoint 8.3: Foster collaboration and community. This App helps people communicate and collaborate effectively within a community of learners. This App helps encourage and support opportunities for peer communication and interaction, as the person who has a physical disability is able to communicate via voice when collaborating online via email or social media channels. This helps the person stay motivated, as they are able to interact and communicate effectively using their voice.

Curriculum area: Dial2Do app is suitable in a broader life skills area. A hands free assistant that can help you use your voice to be able to text, email and more whilst you are driving, or sitting in a chair and not being able to hold anything. This App would be suitable for people aged 10 years and above who may have a physical disability.

How does the app meet the National Disability Standards? Dial2Do app encourages the second National Disability Standard that apply to Disability Service Providers which is “Participation and Inclusion” whereby it offers opportunities for “meaningful participation and active inclusion into society”(page 13). This standard emphasises the importance of staff actively supporting and encouraging people with physical disabilities to connect with family and friends and therefore feel included in their chosen communities. This app encourages individuality for people who have a physical disability, as they are able to command, reply to messages via their voice, as well as socialise via online social media channels as discussed above.
**How the app changes pedagogy (SAMR)?** This Dial2Do app could enhance the teacher’s pedagogy as it would be considered a transformational substitute. It uses text, email, accessing Google Calendar and interacting on Social Media channels via physically texting or messaging, as this App is able to substitute these actions by using your voice to command this instead, so no physical body is needed to perform these tasks. Therefore, this app would be classified as Substitution.

**How the app encourages person centred planning.** Dial2Do allows a teacher/trainer to provide a person-centred approach by organising individualised, natural and creative supports, which reduces the reliance on the service system with the person. For example, the app gives the person who has a physical disability the ability to participate within online and offline communication that helps them feel included socially and be able to participate, as they are able to reply to messages using their voice, instead of other parts of their body.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Dial2Do encourages Connectivity where you can connect with other people using voice via social media channels such as Face book and Twitter, as well as developing a community of like-minded people, such as other students, or teachers, or people who also have a physical disability whereby you can interact using your voice, rather than needing to text message physically. It allows the person to collaborate with others using voice to dial a phone number or communicate online, as well as listening to the weather or local news.

**Evidence from the literature that the app is capable of the claims made:** Dial2Do app can create and listen to reminders by voice, as well as give voice to text transcriptions and has a recording time of 20-30 seconds depending on the option purchased. It also has the option of text messaging, sending, listening as well as replying via text and email messaging, as well as posting tweets on Twitter or Face Book whereby you can listen to posts and post tweets using your voice. Many websites discusses how “Speech to Text” (STT) benefits the person who has a physical disability, and how voice/speech recognition is used in creating mobile phone accessibility for users who have a physical disability (see for example [http://www.etoengineering.com/speechtotext.htm](http://www.etoengineering.com/speechtotext.htm)).

Augmentative and Alternative Communication (AAC) includes all forms of communication that are used to express thoughts, needs, wants, and ideas. AAC may be used to support the understanding of communication as well as to promote expressive communication. Recent evidence indicates “people who are non-verbal need to be presented a minimum of 200 opportunities a day to interact” (Baker, Carrillo, & Stanton, 2012 p. 125). AAC strategies need to be tailored to the person so they “fit in” with lifestyle, environments, social circumstances and peers. Aided AAC refers to communication strategies, which involve the use of an external item such as ‘high technology’ (high tech) aids, such as a computer or speech-generating device such as this app Dial2Do.

**General Comments:** This app could be helpful to developmental educators and teachers as they are able to communicate to the student who has a physical disability using student email via the school intranet and know that they are able to reply via Dial2Do using their voice, as well as collaborating with other students using their voice on this app.
Reviewer: Cindy Steele

Name of app: Smart Hub App
Operating System: IOS
Location: iTunes Store, Google Play
Cost: $159.99

Description: Smart Hub App is a Cross Platform home automation app for people with a physical impairment/disability for environmental control whereby you can control home appliances using pre-programmed button from nine hotspots. Smart Hub App allows you to record remote control commands and reproduce all infrared devices from one iPad. Smart Hub can connect with Light wave Radio Frequency technology allowing you to turn on and off lights and plugs. The user can allocate many actions connected to the hotspot within the home, such as staying up to date via social media feeds from Face book and Twitter as each feed built into the app and on the home screen as a default. The home screen also includes other functions such as accessing their calendar, weather and the user can send emails as the app can pre-program a pre-written email that can be sent out using one touch.

Alignment with the UDL guideline: This App meets the UDL Guidelines of Principle 2: Provide Multiple Means of Action and Expression Guideline 4: Provide options for Physical Action. Checkpoint 4.2: Optimise access to tools and assistive technologies Whereby Smart Hub App provides support with the teacher, family member or support worker to help navigate the person who has a physical disability through their environment, in terms of physical space. Therefore, the person who has a physical disability can fully participation from the home. The app allows to control appliances to help them continue to learn and grow and participate online with friends and fellow classmates, for example; watching a live stream video of friends in class whilst at home when a lesson takes place using pre-programmed buttons via the home hotspot. An important design consideration is to ensure that the person who has a physical disability is able to use assistive technology within the home to access pre-programmed commands to connect their home to the classroom.

Curriculum area: Smart Hub App is suitable in a broader Life Skills area because it has a hands-free assistant that can help automate a home whilst sitting in a chair and not needing to use your physical body to control appliances and Assistive Technology. This would allow participation with other people online and help develop further social skills and increase their own self-esteem and confidence. This App would be suitable for people aged 10years and above who may have a physical disability with the support of their family, teachers and/or support workers.

How does the app meet the National Disability Standards? The Smart Hub app encourages the second National Disability Standard that apply to Disability Service Providers which is “Participation and Inclusion” whereby it offers opportunities for “meaningful participation and active inclusion into society”(page 13). The Human Rights principles overarch all the National Disability Standards, such as helping the rights of people who have a physical disability, for example, supporting the right to participate in their chosen community, as well as having the right to decide how much contact they would personally like with their family, friends and community.
How the app changes pedagogy (SAMR)? This Smart Hub app could enhance the teacher’s pedagogy as it would be considered an enhancement, whereby the teacher or Para-professional would ‘add’ or ‘augment’ to the task. This would be a substitute with the technology acting as a direct tool substitute with functional improvement. For example, the app can be used either as a visual scene display or a grid based display which can be set up easily within your home. The app can control home appliances from pre-programmable buttons from a pre-arranged grid that has nine hotspots, or it can be made specifically to meet the needs of each individual by re-shaping up to 99 hotspots. Each hotspot within the home can be allocated various actions, such as communicating via social media or sending emails automatically. This App is able to enhance these actions by using technology with functional improvement. Therefore, this app would be classified as Augmentation.

How the app encourages person centred planning. Smart Hub app allows a teacher/trainer to provide a person-centred approach by aiming for social inclusion, valued roles and community participation. A common characteristic of this type of person-centred approach can include empowerment and choice, as well as flexibility and creativity. For example, person-centred programs recognise that people change over time and the supports they need must adapt to match their changing life situation, thereby tailoring support to the person who has a physical disability via this home automation app which helps with increased communication and other tasks discussed above.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? Smart Hub app encourages Connectivity where you can connect with other people using social media channels such as Face book and Twitter, as well as developing a Community of like-minded people whereby the person who has a physical disability can see the latest updates from social media and pre-program a pre-written email to communicate or respond. This app is also able to encourage collaboration whereby you can share data and ideas both asynchronously as well as in real time.

Evidence from the literature that the app is capable of the claims made: Using this Smart Hub App for home automation allows the user to control other appliances within the home, as well as in providing educational opportunities for students with physical disabilities in the classroom (Smart Inclusion, 2017 & Dunn & Inglis, 2011)

General Comments: This app could be useful to developmental educators and teachers to encourage further communication between student and staff as well as the family of the student who has a physical disability and can enhance collaboration. Technologies, which enhance remote access, such as this app, can reduce barriers for education and communication. Therefore, the service delivery of the Australian curriculum can be both direct, in real time, as well as indirect, such as using video or email as discussed above. Teacher mentoring, and collaboration can also in real time or delayed time according to the needs of the individual who has a physical disability.
Reviewer: Cindy Steele

Name of app: Catch The Cow App
Operating System: IOS
Location: iTunes Store
Cost: $1.99

Description: The Catch the Cow App helps children and adults with physical disabilities, to learn to select pictures using a scanning device. This is a low cost app, which helps children, and adults who have physical disabilities, to learn to select various images with only two images to start with, and will increase the level of difficulty using multiple rows and columns according to the achievement level of each individual person using the app.

Alignment with the UDL guideline: This App meets the UDL Guidelines of Principle 1: Provide Multiple Means of Representation Guideline 3: Provide Options for Comprehension. Checkpoint 3.1: Activate or Supply background knowledge. Catch the Cow App allows the teacher, parent or para-professional to access as well as assess whether the student or person who has a physical disability can learn the beginning skills for choice making by using this app to show their auto scanning. Information, such as one or two of the squares shown to the user to then select a picture that is harder using multiple rows and columns can be presented to the user that primes, activates and/or provides any pre-requisite knowledge. This pre-requisite information helps teachers to plan and assess according to individual needs of each person.

Curriculum area: Catch the Cow App is suitable to children 3 years of age and above who may have a physical disability. This app provides access, guided practice and support, as well as independent practice to help students develop ways to transform information into useable knowledge that is accessible for future decision-making for both the teacher and the parent, which support the student. Therefore, this app is suitable for more formal educational curriculum areas, such as the Literacy area as well as Mathematics to allow the student to have choice making via auto-scanning and allowing critical thinking opportunities. For example; a teacher may anchor an instruction by linking as well as activating relevant prior knowledge, such as using visual images and concept anchoring.

How does the app meet the National Disability Standards? The app encourages the third National Disability Standard that apply to Disability Service Providers which is “Individual Outcomes” for example the student has the right to lead and direct decisions about their life and how the educational services the person with a physical disability supports them. The goal would be to build on the person’s strengths and help them reach their life goals. Achieving individual outcomes requires collaboration between the individual, teacher/s, family and service provider to ensure active choice and decision-making.

How the app changes pedagogy (SAMR)? Catch the Cow app is a modified tool, whereby the task is partially modified using elements in the tool that allows modification. The level of difficulty of this particular app can also be modified to scan 2 images or multiple images. This is a significant task design whereby children and adults with physical disabilities learn to select pictures using a
scanning device which helps provide information to teachers and other support workers/families to help support the child/adult further.

**How the app encourages person centred planning.** Catch the Cow app allows a teacher/trainer to provide a person-centred approach by tailoring support to the needs of the person. Person centred approaches focus on the individual’s unique interests and preferences, which can build on strengths and tailor supports to achieve the person’s goals and future direction.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Catch the Cow app encourages Collaboration between teachers, clinicians and/or parents to assess whether a user can learn beginning skills for choice making through auto scanning. Direct touch can also be used and therefore accuracy of the two modes can be compared. This collaboration via the encouraging of sharing data according to the auto scanning can occur both in real time and asynchronously.

**Evidence from the literature that the app is capable of the claims made:** The Catch the Cow App helps children and adults with physical disabilities, to learn to select pictures using a scanning device. This eye-tracking device can be a powerful alternative for individuals with no or little control, over their hand movements. The device follows the movement of the eyes and allows the person to navigate through the web with only eye movements. ([http://webaim.org/services/](http://webaim.org/services/)). This app helps children and adults develop strengths to be able to use the eye tracker to help increase their independence by using appropriate assistive technology to use websites and other devices to improve their independence, self-esteem and in turn their standard of living (Parette & Scherer 2004).

**General Comments:** This app could be useful to developmental educators and teachers to encourage further communication between student and staff as well as the family of the student who has a physical disability and can enhance collaboration, as the child or adult who has a physical disability can communicate via assistive technologies such as eye trackers.
Reviewer: Laura McGill

Name of app: ProLoQuo2Go
Operating System: IOS
Location: iTunes Store
Cost: $399.99

Description: Proloquo2Go is an Alternative and Augmentative Communication (AAC) app supported by audio output and symbols. It is designed to promote growth of communicative and language skills whilst also assisting with other educational domains such as fine motor and cognitive processing. Proloquo2Go has features such as sounding text-to-speech voices, as well as three complete research-based vocabularies, over 10,000 symbols, as well as word prediction. Proloquo2Go is used by people with disabilities ranging from but not restricted to Autism, Down syndrome and Cerebral Palsy. It is an AAC app that covers a diverse set of users, from beginning to advanced communicators and comprises of three levels: Basic Communication, Intermediate Core and Advanced Core. The program offers several features that promote an easy to use system including subject and topic folders, sentence starters, customisable voices and full grammar support.

Alignment with the UDL guideline: Provide Multiple Means of Representation 1.4: Provide options for language, mathematical expressions and symbols. ProLoQuo2Go provides symbols and pictures to represent each item, object, or request an individual is seeking. Therefore, it provides avenues of understanding and making meaning of picture to spoken language representation. It enables a picture or image to convey meaning for where a there are skill deficits or cultural differences. Guideline 2.1: Clarify vocabulary and symbols. The app provides representation of information in different forms, using written and spoken words, as well as symbols, numbers and icons. As well, it promotes individual accessibility for all via the use of culturally exclusive phrases, vocabulary and labels and language. The app can be formatted as to represent the individual in reference to voice options, as well as unique categorisation options. Lastly, as well as symbolic representation of language and communication the app provides text to voice options. Provides Multiple Means for Action and expression Guideline 5.1 Use multiple media for communication Using Alternative and Augmentative Communication the app promotes expressive communication via a form of technology. It allows individuals using the app to problem solve with others via communicating through the device using symbols as well as text to audio.

Curriculum area: ProLoQuo2Go falls under the curriculum domain of language and communication, as it assists individuals in developing expressive and receptive communication via teaching meaning of words and phrases using pictures and symbols, as well as providing a voice for expressive communication when it may have not been accessible before. It would also fall under socialisation as it promotes positive interactions between the individual and others allowing significant relationships to be formed.

How does the app meet the National Disability Standards? The National Disabilities Standards state that an individual has the right to decide how they interact and make contact with family, friends and community (National Standards for Disabilities). ProLoQuo2Go promotes this as it allows the individual to communicate using a device in any way they wish. Furthermore, it allows the individual to have a valued role within the community, as they are able to express their thoughts,
values and opinions either vocally via the device or through pictures and symbols. It also aligns with standard three ‘Individual Outcomes’ as the individual is in control of how they express and use their communication through the app. It allows individuals to tailor the app to enhance their strengths and support their limitations to each individual’s strengths and needs and deliver positive outcomes.

**How the app changes pedagogy (SAMR)?** ProLoQuo2Go is a form of technology that promotes transformation. It is an augmentative device where it becomes a direct substitute for the development of language and communication for an individual and directly improves daily functioning. It enhances a teacher’s pedagogy breaking down communication barriers within a classroom. It would allow individuals with physical disability to interact and communicate positively and feel included within a classroom.

**How the app encourages person centred planning.** The app promotes a person centred approach as it allows the individual to be in control of his or her own communication. It also allows the individual to choose functions individualised to their personality or lifestyle such as sound of voice, types of categories and groups used, use of symbols and pictures tailored to their needs. Furthermore, it enhances independence within the community and gives an individual a sense of identity and freedom of vocal expression.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)** The app encourages a collaborative approach as it allows an individual to share ideas through communication in real time. As well as this, it incorporates the opportunities for creativity in presenting information in new and individual ways through imagery and symbols. Overall, the technology presented in the app promotes ease of integration into the communicative world.

**Evidence from the literature that the app is capable of the claims made:** There has been an increase in the development of Augmentative and Alternative Communication devices. Using communicative devices can promote a positive learning environment. A study conducted by Niemeijer, Donnellan, and Robledo (2012) showed that more than 50% of participants reported improvements in interactions with family members and others as well as in independence for over 40% claiming to be more independent. The study also showed that over 40% reported improvements in behaviour and general wellbeing (Niemeijer et al., 2012). Communication is also a vital tool when integrating into inclusive settings within the community. McNaughton, Light and Arnold (2002) found that the use of AAC’s such as ProLoQuo2Go are an important technology in supporting to obtain, as well as maintain employment. Furthermore, they found that participants with cerebral palsy within their qualitative study found the AAC assisted with the rate of success on the job on a day-to-day basis (McNaughton et al., 2002).

**General Comments:**

Overall ProLoQuo2Go is a useful tool for educators and individuals with disabilities, such as Down syndrome and Cerebral Palsy as it creates a portal for effective communication. With effective communication, a teacher is able to recognise the needs of an individual, as well as the individual being able to appropriately communicate independently.
Reviewer: Laura McGill

Name of app: Talk IT
Operating System: iOS, Android
Location: iTunes Store, Google Play
Cost: Free

Description: Talk IT is an app produced by Mobile Assistant that can be downloaded to both iOS and Android devices to transcribe voice to text, with no need to type. Talk IT allows you to speak and it accurately transcribes the notes, which has the capabilities of being formatted into documents and emails. The apps overall features include: quality assurance overview, no time limit per session, and Review and storage section to archive all your transcriptions.

Alignment with the UDL guideline: Provides multiple means of Representation. Guideline 1.1 Provide options for perception: This guideline states “learning is impossible if information is imperceptible to the learner, and difficult when information is presented in formats that require extraordinary effort or assistance”. This app reduces these barriers through auditory means and vision and allows the user to be in control. It assists in wellbeing by reducing communicative barriers between an individual and their peers, family and educators by ensuring the information is comprehend by others. The Talk IT app allows individuals with physical disabilities whom are unable to either write or text; turn spoken information into written text. Digital material allows learners to access and give information to others more freely and independently. It allows individuals to manage the visual layouts and storage of the spoken information being processed into the written language.

Curriculum area: This app would assist communication, language and comprehension. It assists individuals in making sense of written language via the use of spoken language. It also assists in self-management as it teaches individuals how to manage, store and categorise written information. It would be useful for individuals in storing information that can be used again or received by several recipients, such as transcribing emails for school or work. This app would be most useful to individuals with physical disabilities, such as paralysis or Muscular dystrophy where their upper limbs are difficult to use immobile. It would assist all age groups as it can be used in schooling or work, as well as out in the community.

How does the app meet the National Disability Standards? Talk IT allows individuals to be integrated into inclusive settings, as the app is an assistive device that promotes independence of writing and storing information, where an individual is then able to make a valuable contribution to the community in either their work or learning environment. It also meets the standards of ‘Individual Outcomes’ as it promotes the individual to minimise their barriers to learning and strengthen their needs to deliver positive and meaningful outcomes (National Standards for Disability Services, Pg. 15). The app encourages meaningful written dialogue between the individual and the people in their lives, as well as minimises restrictions of their aspirations and goals.

How the app changes pedagogy (SAMR)? It enhances a teacher’s pedagogy as it expands academic opportunity for individuals with physical disabilities. Through the apps technology it provides an avenue for experiencing what was previously not possible allowing the individual to experience
what can be classified as normality among other people; this directly aligns with Redefinition in the SAMR Model. It can be used effectively within a classroom as a student can dictate what needs to be written without teacher assistance.

**How the app encourages person centred planning.** A person centeredness approach requires understanding that an individual with a disability should be able to make his or her own aspirations and goals in life. Through Talk IT they can do so via having accessing academia in a way that may not have been possible before, directly opening up many career and life possibilities. For example, individuals whom aspire towards a Higher Education are now able to transcribe their assignments and essays, therefore accessing what may have been difficult before technology. Furthermore having the opportunities presented to them individuals can now make their own decisions about what their goals are as they are endless, therefore directly influencing their quality of life.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Talk IT encourages community. If a person aspires to opportunities involving writing and text the app allows them to access individuals whom are like-minded and by doing so the individual is able to form significant relationships with others. Furthermore, it allows a person to be creative, through expression of ideas, thoughts, feelings and imagination through written text. Lastly as the app has a storage and retrieval system it allows an individual to have a place to store, collection, categorise and confirm information that is easily retrievable; this can be referred to curation in the 5C’s.

**Evidence from the literature that the app is capable of the claims made:** It is known for a very long time that it is imperative that individuals with physical disabilities access education and work as readily as those whom are considered abled. The technology era is allowing a more sophisticated way of accessing talk to text methods and products are becoming rapidly more available within this domain (Damper, 1984; De La Paz, 1999). Furthermore Smith et al. (1989) found that when individuals used such systems, once they were shown how to set them up, they did not required assistance in the facilitation. This same study resulted in 80% of their subjects were able to complete the planning or generation and revision their text independently (Smith et al., 1989). There is much research to show that the use of AAC devices individuals using speech to written text software promote metalinguistic awareness (Luke 2016; Schaefer-Whitby, Lorah, Love, & Lawless, 2016). Research within the topic of talk to text indicates positive outcomes in promoting independence and academic competencies (Koester and Arthanat, 2017; Thiel, Sage and Conroy, 2017).

**General Comments:** Talk IT can be useful for teachers and educators in promoting an enriched learning environment for individuals whom previously were unable to translate their thoughts to text. It encourages individuals with physical disabilities to reach their full potential in school and work, as well as how to manage and store information.
Reviewer: (Laura McGill) App 19

Name of app: HireUp

Operating System: iOS, Android

Location: iTunes Store, Google Play

Cost: $35 - $45

Description: HireUp is an app that advances the ways in which people with disabilities find and manage support workers via connecting with others whom share similar interests. It uses social networking systems to join people with carers based on their interests and personality rather than just their support needs. It is a great way for individuals to connect with like-minded people within their local area. The app enables you to send messages to start communication with a potential carer, as well as make bookings with carers you connect with. The decisions are left up to the individual as you may choose how to use the app as you please, you may use it to seek a mentor, a carer, a tutor or even a swimming coach. To do this the app sets up a profile where you enter your personal details and what you are looking for, you then search using a database and map system of people available in your area, form this you begin to form your network. This system also works for individuals seek to support someone with a disability and the process and setup producers are the same.

Alignment with the UDL guideline: Provide Multiple Means of Engagement: 1.7 Provide Options for Recruiting interest. HireUp allows individuals to access information via individualised interests, knowledge and skills. It accounts for individual’s interests, skills and knowledge changing over time and gives them full access of control over the way in which they engage with others through technology. 7.2 Optimises relevance, value and authenticity. The app promotes independence as it advocates individuals to engage in information and interests that are relevant and valuable to their interests and goals. For individuals to be able to access support that is right for them it is important for day-to-day life to be meaningful, thus by connecting with individuals that are like-minded the app assists individuals in finding these significant relationships without even leaving the home. It targets key concepts with this guideline: Socially relevant, Age and ability appropriate, Invite personal response, evaluation and self-reflection to content and activities

Curriculum area: The curriculum area that this would align with HireUp would be self-help and life skills. It promotes independence in seeking services and support for individuals with disabilities. It allows individuals to build skills in self-profiling, networking, and communicating. The skills that can be taught from this app are difficult to teach within a structure curriculum, the app offers a wider opportunity to gain access to these skills.

How does the app meet the National Disability Standards? The standards indicate that it is important to promote connectivity of individuals with disabilities to their family, friends and community (National Standards for Disability, pg. 13). The app allows individuals to connect on a social network with whom they please and with their chosen community. It promotes participation and inclusion by opening up opportunities for individuals in support areas and allows them control over what that support looks like. The indicator of practice that aligns with this app is 2:3: “Staff understand, respect and facilitate individual interests and preferences, in relation to work, learning, social activities and community connection over time”. The app is set up in a way where carers seeking...
work match with like-minded individuals with similar aspirations, personality and goals. HireUp also allows access to services that promotes fairness and equality, as well as extinguishing barriers such as location and capacity of resources. Furthermore, it incorporates accessible information to respond to diverse needs, active referral to relevant providers within the community and personal requirements.

**How the app changes pedagogy (SAMR)?** Access to support services have always been available to individuals with disabilities, however, it is the way in which they are now being accessed that has changed. This app can be described, as a product of augmentation as it presents, as a direct substitute for what is already available, however, is made more functionally usable via technology.

**How the app encourages person centred planning.** The individual seeking support and services is directly responsible for the management and regulation of their profile. This promotes person centeredness, as the individual is the one making the decisions and seeking the support they want, not what everyone else thinks they should have. Furthermore, via the feature of a personal profile it allows the individual to explore their own identity and what their goals and aspirations are.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** HireUP incorporates many of the 21st century teaching approaches. It allows connectivity and community and allows individuals to connect and communicate with people within the same community who share similar values and personal goals, as well as this it allows an individual to service seek easily. Secondly it promotes community. Lastly it promotes creativity through profiling, it allows an individual to be creative with what they share on the social media site from things such as pictures, ideas and maps.

**Evidence from the literature that the app is capable of the claims made:** Computer technology and the Internet have a positive potential to expand and enhance independence and quality of life of people with disabilities (Kaye, 2000). Gaining access to technology and online mediums increases the likelihood of individuals with disabilities accessing academic programs, employment and recreational activities (Hitchcock & Stahl, 2003). Research by Hitchcock and Stahl (2003) indicates that to use these technological portals effectively individuals with disabilities must have access to knowledge regarding technology in relation to inclusion and employment, as well as skills in how to use it once they have been notified of the services. HireUp (2016) suggests the company is aiming to achieve these factors via collaboration with the NDIS (National Disability Insurance Scheme) and ensuring that through active sharing experiences people with disabilities and those whom support them have the information they need to independently navigate choice and control that directly effects the support they are seeking (HireUp, 2016).

**General Comments:** It is important for individuals with disabilities to become a part of a community and inclusive setting. Connecting with others with similar interests and ideas can promote such inclusive settings and improve the quality of life for individuals. This app could be beneficial for educators to prepare students for life after secondary school and how they can access supports independently.
Reviewer: Laura McGill

Name of app: AXS
Operating System: iOS, Android
Location: iTunes Store, Google Play
Cost: Free

Description: AXS Map is an app that uses technology to assist, engage and connect individuals with disabilities. It uses a map system that enables an individual with a disability to access businesses and public places that are easily accessible for an array of physical disabilities, such as toilets, ramps, and disabled car parks. Aside from a map system, the app provides a space for individuals to share their reviews on the extent and ease of access such businesses provide using a star rating system. Features within a business or public area that are rated include how spacious the area it, its noise levels, parking options, lighting and lift access.

Alignment with the UDL guideline: Provide Multiple Means for Action and Expression: 4.2: Optimise access to tools and assistive technologies. It is important for individuals to feel capable to navigate efficiently through their own environment and physical space. This app allows an individual to freely and confidently enter the community via navigating, interacting, and composing on a regular basis. Provide Multiple Means of Engagements: 9.2: Facilitates personal coping skills and strategies. It can become quite stressful for individuals with physical disabilities to independently venture out into the community if they are uncertain of their surroundings and what is accessible to them. The app can elevate this as it presents a space where they can predict what areas are best suited for them, directly allowing them to cope and manage their surroundings without feeling anxious. Furthermore, it delivers alternatives to meet the challenge of individual different and directly influences independence.

Curriculum area: AXS Map would fall under the curriculum area of general life skills and self-help. It promotes independence via seeking information to access to the community independently and learning how to use assistive technology to do so. The skills that can be taught from this app are difficult to teach within a structure curriculum, however, the app offers a wider opportunity to gain confident through self-reliance.

How does the app meet the National Disability Standards? The app supports individual in accessing the community independently therefore promotes participation and inclusion. The app has recognised the need for individuals to access services more readily that directly affects the individual’s abilities within the community. Moreover, AXS provides a feedback star rating system therefore ensure that individuals have a space to raise any concerns or complaints, as well as positive feedback, in reference to service providers allowing ease of access for individuals with physical disabilities. Lastly, the app assists with finding service providers that promote fair and equal rights in accessing facilities and information in which responds to diversity of needs.

How the app changes pedagogy (SAMR)? The technology that this app provides modifies the way in which individuals seek information. Before technology such as this an individual would have to make phone calls or actively go out into the community to find accessible services for people with
a physical disability. It has enabled ease of access and promoted motivation towards inclusive environments in the school and community.

**How the app encourages person centred planning.** AXS assists individuals with physical disabilities to independently find places within the community to go and do their shopping or socialise in which are easily accessible. This emphasises a person centred approach as it enhances quality of life and motivation to become included within a community. It focuses on the individual and their specific needs.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** It relates to the approach of connectivity. By being informed of accessible places within the community individuals with physical disabilities are able to travel effectively for work and leisure without the added stress of knowing if they will have disabled toilets, or ramps for wheelchair access.

**Evidence from the literature that the app is capable of the claims made:** According to the Department for Communities and Social Inclusion (2014) it is a requirement of mainstream agencies to implement ease of access systems that enable people with a disability to participate in their communities equally. Research by Rimmer et al. (2004) into barriers of inclusion within a community has indicated that participants expressed that the natural environment for the most part is inaccessible. This includes inaccessible access routes, doorways being too narrow for wheelchair access, facility front desk being too high for persons in wheelchairs to communicate with the person at the desk, and lack of elevators in older buildings and hotels. AXS necessarily does not elevate the inaccessibility of these issues; it does however allow individuals to avoid such establishments before they enter the community. Jason Da Silva, creator of the app AXS Map, was diagnosed with multiple sclerosis and he described the frustration of not having the freedom he once did and the guidance to help him within the community (Yam, 2015). He continues to explain that: “Opening up the ratings to the community is an attempt to bridge the gap between people living with mobility issues and the larger communities that we live in” (Yam, 2015 p 1). This aligns with the DCIS principles and policies that communities should remain active in making access to information, services and inclusion meaningful for individuals with disabilities about physical, social, economic and cultural aspects of their lives (Department for Communities and Social Inclusion, 2014).

**General Comments:** Overall, the app promotes independence for individuals with physical disabilities in discovering parts of the community that are easily accessible. It is a great way for people to community, through the star ratings, how they feel about the level of access people are providing. It is a reminder that communities should actively be encouraging inclusion.
Reviewer: Loretta David

Name of app: Toilet Finder
Operating System: IOS and Android
Location: Google Play or iTunes Apple store
Cost: Free

Description: Toilet Finder is a smart device application that locates free to the public toilet facilities in the users’ surroundings. The smart device application has more than 150,000 toilet facilities around the world with more with more being added daily by contributors. In addition, the app locates and identifies accessible toilets for people with physical disabilities.

Alignment with the UDL guideline: The application of Toilet Finder meets the UDL Guidelines Two and Three. These guidelines being Provide Multiple Means of Action and Expression and Provide Multiple Means of Engagement, respectively. Guideline Two of Providing Multiple Means of Action and Expression, the Toilet Finder app meets checkpoint 4. Checkpoint 4 aims to provide options for physical action. This can be illustrated in Toilet Finders as the user is able to access the application and find accessible toilets within their area. The application is updated regularly and therefore would be more accurate than a physical map containing accessible toilet locations. Guideline Three of Providing Multiple Means of Engagement, the Toilet Finder application meets checkpoint 7.1. This checkpoint numbered 7.1 is optimizing individual choice and autonomy. Toilet Finder app facilitates a sense of independence as the user can plan toilet schedule as toilet locations can be accessed for your particular area and can be accessed discreetly.

Curriculum area: Toilet Finder is an application that can promote independence and forward planning for minimizing negative experiences for people of all ages. The application can be used to plan field trips and outside school activities. This application would be suitable for students of all ages as it can be used in conjunction with teachers and facilitators when planning excursions. For example, a child with a physical disability that needs to use toilet facilities frequently would be able to notify the teacher of their needs and access the app to find the appropriate toilet facilities. Additionally, teenaged school children could independently access this application to locate accessible toilets without having to explain their need to use an accessible toilet and feeling like they are an inconvenience during field trips.

How does the app meet the National Disability Standards? The application Toilet Finder meets the National Disability Standard One- Rights (page 11). The National Disability Standard One- Rights emphasises the importance of dignity, respect, self-determination and choice. These factors are promoted in the Toilet Finder application as users are able to independently access the application and locate accessible toilet facilities without involving other people. This independence promotes a sense of freedom, autonomy, privacy and choice amongst users which at times is disregarded by people in society.

How the app changes pedagogy (SAMR)? The Toilet Finder application can be classified as a redefining tool whereby a person is able to instantly locate an accessible toilet with the press of a button. This type of technology was not available in the past and people with physical disabilities would have had to ask people for the location of an accessible toilet or refer to a physical map. Therefore, Toilet
Finder can be identified as a redefining piece of technology that allow its users to do something that was not possible.

**How the app encourages person centred planning.** The app encourages person centred planning as the user is able to independently access the app and find a toilet facilitate for their use without assistance from others. For example, a person who has a physical disability in a high school would be able access this app independently and inform their teacher of facilities that they would like to use when on a field trip. In addition, the application would facilitate the discretion of the user as they most likely would not like to share their continence challenges with people that they are travelling with.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** Toilet Finder encourages a curation of learning whereby users are able to gather and store information to be used later. This is demonstrated in the app as users are able to add to the database of the location toilets. Further, the user can categorize the information in stating the type of toilet facility such as its accessibility status and if diaper change table is available.

**Evidence from the literature that the app is capable of the claims made:** Buckley and Lapitan (2010), state that people with mobility impairments often have an increased risk of urinary incontinence. Any form of incontinence can be a debilitating issue as it can cause people affected by it to refrain from outdoor activities and travelling (Continence Foundation of Australia, 2017). Fortunately, the Continence Foundation of Australia in conjunction with the Australian Department of Health have created a website where people can look for public toilets by simply inputting their area code. The Public Toilet Map website provides information on toilet facilities in your postcode area, opening hours and the features and accessibility status of the toilet facilities. In addition, the Public Toilet Map website allows the user to view toilet facilities during commutes from one area to another (Australian Government-Department of Health, 2017). These features of the Public Toilet Map website are similar to the features of Toilet Finder thus making the claims of the Toilet Finder app as plausible.

**General Comments:** Overall, the Toilet Finder application is an effective application that can enhance the quality of life for people with physical disabilities. It does not only facilitate independence but it can also decrease chances of a person experiencing an embarrassing situation due to not being able to find a toilet in time. In addition, this application could have the potential to be used as reasoning tool to increase the number of accessible toilets locations.
**Reviewer:** Loretta David

**Name of app:** iBooks
**Operating System:** iOS
**Location:** Downloaded from the Apple store
**Cost:** Free

**Description:** iBooks is an e-book application created by Apple for its iPad, iPhone and iPod Touch products. The app allows the user to explore a wide range of books from various categories, for all ages and reading levels. With the iBook you can share books and audiobooks with family members and organize your books into personal collections that can be viewed offline. Also, iBook offers a wide range of interactive books for children and a wide range of illustrated non-fiction books such as cookbooks, books on photography and arts and crafts books. Furthermore, iBooks allows users to share quotes or thoughts about the book they are currently reading through various social media websites. Also, with the iBook app you can use the accessibility features to activate the speech command of the application or modify font sizes and contrast colours.

**Alignment with the UDL guideline:** The iBook app meets the UDL Guideline of Principle One: Providing Multiple Means of Representation. Guideline 1: Provide options for perception, Checkpoint 1.1 Offer ways of customizing the display of information. Checkpoint 1.1 aims to offer various means of displaying the same information in various mediums. This includes changing the font size, contrast of backgrounds, layout of elements and colours used to display information. The iBooks application meets checkpoint 1.1 as it delivers its information in ways that can be adjusted to the user. For example, people with physical disabilities are able to access iBooks using voice commands and instead of flipping pages of a traditional book they can scroll from page to page.

**Curriculum area:** iBooks is a versatile application that can be used for personal enjoyment or in a learning environment. As mentioned above, within iBooks there is a plethora of books that can be purchased. For this reason, iBooks can be used to download mathematic textbooks or English textbooks as a prescribed reading text. In addition, fiction books of the authors’ preference can be downloaded to be used in a book report for an English class or for further research in another subject. Thus, iBooks is suitable for students for all ages as it is easy to access and relatively easy to use.

**How does the app meet the National Disability Standards?** The app iBooks meets Standard Six- Service Management of The National Disability Standards (page 21). Service Management ensures that services provided are managed effectively and efficiently. iBooks meets this standard by continuously upgrading the application to fix glitches and address issues found by users. In addition, since iBooks is an application developed by Apple, it is most likely that their organization complies with workplace related legislation and appropriate use of human resource management.

**How the app changes pedagogy (SAMR)?** The iBooks application is a transformative technology as it significantly modifies and redesigns the task of reading books. For example, for people with a physical disability who face difficulties with turning pages of books now can easily scroll through books when reading. In addition, iBooks can also be seen as an enhancing technology as the user is...
directly substituting a physical book for a touch screen book that improves the practicality of a book to the user who may have a physical impairment that limits their hand mobility.

**How the app encourages person centred planning.** iBooks encourages person centred planning as it can be accessed on accessible Apple devices such as iPads and iPhones. These such devices are relatively accessible for people with a disability as they provide a range of options that is useful for people with limited upper body mobility. For example, iBooks allows for a voice command option where books can be accessed through speech prompts. Furthermore, iBooks facilitates opportunities for people with physical disabilities to participate in activities such as books clubs and pursuing higher education independently without support for tasks such as turning pages of books or obtaining physical textbooks from libraries. This opportunity therefore opens up the variety of activities a person with a physical disability can partake in independently.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** iBooks is a versatile app that encourages various approaches to 21st century teaching. This includes: connectivity, collaboration and curation. This is illustrated in iBooks features to connect with other people who use iBooks, and share interesting books and quotes that can also be shared to social media websites. Also, iBooks allows for eBook to be collected, stored and categorized to be retrieved in the future should the use need the book again.

**Evidence from the literature that the app is capable of the claims made:** Lucking, Al-Hazza & Christmann (2013) in a peer reviewed journal article discussed the uses of iBooks in a teaching environment. The article identified valuable teaching tools of interactive learning with eBooks on the iBooks app as an important feature that can positively impact a student’s learning. These interactive tools included: observing 3D objects within an eBook, interactive photo galleries and text-to-speech features. Similarly, Rhodes and Milby (2007), discuss the positive impacts that eBooks have on children with physical and/or learning disabilities. Ebooks were found to boost students’ with disabilities self-esteem, promote the engagement of similar activities with their peers during iPad time, provide access to texts that were not accessible before and utilize unique multi-media features that a smart devices offers. Thus, the above examples of iBooks in peer reviewed journals add to the legitimacy and validity of the stated features of the iBooks app in the Apple Store.

**General Comments:** iBooks is a great app that provides a functional improvement to previous methods of obtaining information. Books have been a source of knowledge for many cultures and societies, however due to the construction of a traditional book it was difficult for people with limited upper body mobility to enjoy books without it having been read to them or pages being turned for them. In addition, people with a physical disability would be able to minimize their feelings of being “different” as iPads and iPhones are devices that the general population utilize as well. Moreover, the Apple devices would be a useful tool for developmental educators to as it has the capacity to store additional information and other useful applications in the devices for the individuals that they are working with.
Reviewer: Loretta David

Name of app: Red Panic Button
Operating System: IOS and Android
Location: Google Play Store and Apple Store
Cost: Free/In app purchases available at $6.99aud per item

Description: Red Panic Button is a safety and emergency smart device application that can be downloaded onto your phone or tablet. The app is initiated by the simple press of the red button to contact emergency services such as police and ambulant services. In addition, the application can be set up to call, email, send a text message or twitter a selected contact in the users’ device. In addition, with the in-app purchases you can have the emergency contact have access to the users’ location when the button is pressed. The in-app purchase will also remove ads and provide the user with unlimited number of panic contacts.

Alignment with the UDL guideline: The Red Panic Button app meets the UDL Guideline of Principle Three: Providing Multiple Means of Engagement. Guideline 7: Provide options for recruiting interest, Checkpoint 7.3 of Minimize threats and distractions. Checkpoint 7.3 states that learners learn best in safe, low risk and low threatening environments. Such risks and potential threats can be decreased by creating an environment that ensures learners that potential risks can be managed (Cast, 2011). The Red Panic Button is an application that can create a safe environment for learners. Users of the application can feel safe and secure knowing that by the simple touch of a button an emergency contact can be alerted and they will be in contact with a person who understands their needs best.

Curriculum area: An important area of the curriculum in any educational institution is having an Emergency Management Plan. Emergency Management Planning ensures the safety of all staff, students and school visitors in the event of an emergency (Victoria State Government, 2017). Therefore, the Red Panic Button can be used to ensure personal safety for the individual who uses the app. For example, a person with mobility challenges could use this app in cases of a fall or when a health-related emergency. Thus, the app would be most useful amongst any age group that has access to a smart device.

How does the app meet the National Disability Standards? The Red Panic Button meets the National Disability Standard Number Five of Service Access (page 19). Standards of Service Access is met and maintained by the developers of the Red Panic Button by ensuring that users agree to the terms and conditions before downloading the application. This provides a transparent agreement for the user during the commencement and exiting of the service. Furthermore, this process of agreement to the terms and conditions allows the user to understand the limit of access the developers have to personal information and the agreement of a payment by the user should the user purchase the in-app purchases. Furthermore, the developer has contact information available on their website for further questions or complaints.

How the app changes pedagogy (SAMR)? Red Panic Button enhances a teacher’s pedagogy as an enhancement of technology. In the past, panic buttons would only be able to alert a designated contact or send for medical services. With the Red Panic Button (with in app purchases), the user
can give their current location, take a video of an event as it is occurring and send their emergency message to several contacts in their device. Therefore, the Red Panic Button is an augmentation of the simple, old style panic buttons that was limited in their features. Also, since the application is downloaded into a smart device it is useful for younger users as it is not a separate device that can indicate to their peers that they are at risk for potential incidents. For example, a person with a motor neuron disease that uses a wheelchair and has epilepsy would benefit from the app. Since the application is downloaded into the users’ phone a separate device is not needed, as this may induce feelings of social anxiety as the user may not want to appear “needy” amongst peers.

**How the app encourages person centred planning.** The Red Panic Button application can provide a person-centred planning by facilitating the opportunity for the user to select their own contacts and set up of their own profile on the app. For example, the capabilities of the user can be considered in which features would best suit their needs. For example, depending on the users’ dexterity and hand coordination the user might be able to access the video capturing feature during emergency situations that can be directly sent to their designated contact. Moreover, since the app is available for both android and apple devices the user can download the application on most likely any smart device.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The Red Panic app promotes connectivity in emergencies. It provides a platform for vulnerable people to connect to others for assistance.

**Evidence from the literature that the app is capable of the claims made:** The Red Panic Button (2017) identified three case studies in which the Red Panic Button app successfully contacted designated emergency contact to come to the users’ aid. In each case, the Red Panic Button app user considered the app to have saved their life from near death or risky situations (Red Panic Button, 2017). For example, a construction worker became trapped under a metal beam in an isolated location. With the use of the Red Panic Button the construction worker was able to notify his colleagues of his location and was taken to the hospital where it was said he would have died had he been trapped any longer under the beams. Similarly, Kurniawan (2008) discusses the ability of mobile panic buttons to save the lives of older people. In a study conducted by Kurniwan (2008) it was found that mobile panic buttons facilitated feelings of safety and security amongst participants. Although the participants of this study preferred a dedicated panic button as they found it easier to use, this article provides evidence that the technology for mobile panic buttons is available in other mobile devices.

**General Comments:** This app is an efficient tool for people with a physical disability who would like to be discreet of their needs during potential emergency. Furthermore, it can be used as a safety tool for user when they are in a risky situation where activities can be recorded as proof of abuse or neglect.
Reviewer: Loretta David

Name of app: Commandr
Operating System: Android
Location: Can be downloaded from Google Play
Cost: Free/ In app purchases from $1.07-$107.47 per item

Description: Commandr is a simple application that once downloaded adds additional commands on the Google Now system that uses speech to access any android smart device instead of tapping and scrolling. These additional commands include but are not limited to: turning the flash light on/off, switching the Wi-Fi and cellular data on/off, read unread emails on Gmail, pause/resume music, restart the device, and take a selfie. Furthermore, with in app purchases, the user can personalize their commands and make it suitable to their commonly used app functions on their device.

Alignment with the UDL guideline: The Commandr app meets the UDL Guideline of Principle Two: Providing Multiple Means of Action and Expression. Guideline 4: Provide options for physical action, Checkpoint 4.1: Vary the methods for response and navigation. Commandr aligns with this UDL guideline as it offers an alternative means for android smart device users to navigate their device and perform functions with voice command. For example, a person with a physical disability who has limited use of their hands can use this app to access their mobile phones hands-free and independently.

Curriculum area: The Commandr app is an application that works on any android smart device. Therefore, it would be most suitable for any area of curriculum that utilizes smart phones or tablets. For example, children with physical disabilities in years 1 to year 3 would be able to use this app to access interactive games and learning tools on smart devices or on the internet. In addition, the Commandr app could be used by high school students who enjoy listening to music or partaking in a school assignment about music and would like to share their music with their peers. For instance, a student with limited upper hand mobility would be able to use Commandr to control the functions of their music libraries in their devices and search for new music with speech commands.

How does the app meet the National Disability Standards? The Commandr app meets the National Disability Standard Two: Participation and Inclusion (page 13). Although the Commandr app was not intentionally created for people with a disability, it promotes independence of people with a disability in accessing technological devices. In addition, it facilitates opportunities for users who have a physical disability to engage with their smart devices similar to their families and friends.

How the app changes pedagogy (SAMR)? Commandr is a transformative means of technology that has redefined the means in which people interact with their mobile devices. The Commandr app has made it possible for android smart device user to command more functions on their device using Google Now. Google Now offered minimal options for voice command and with the Commandr app, options have now increased and it has greatly benefited people with limited dexterity and hand functioning.
**How the app encourages person centred planning.** The Commandr app encourages person centred planning as it provides an extra accessibility function to android smart devices. People with physical disabilities are able to access their personal emails, add events to their planners and access the internet through simple voice commands. This function of Commandr facilitates the independent use of smart devices amongst people with physical disabilities which then allows its users to then carry out activities that they choose on their own.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The area of a 21st Century approach to teaching that the Commandr app encourages is connectivity and creativity. These approaches are encouraged in the Commandr app in its features of being able to use the application to connect to the internet and create a new means of accessing information. For example, users can quickly access information from the internet through Commandr’s speech command then continue to control videos or images on the websites of their choosing through speech commands.

**Evidence from the literature that the app is capable of the claims made:** Senanayake (2017), created the Commandr app in summer of 2014 as a senior in high school. Commandr was designed to improve the voice activated options of Google Now, these options included controlling the flashlight, toggle settings and controlling the devices music options and much more (Senanayake, 2017). Wallen (2015), a contributing writer that reviews apps for TechRepublic wrote a detailed review on Commandr, which included the specifics of the features, how to use particular features and how to install and disable and the app. Wallen (2015), suggested that Commandr greatly improved the value of Google Now and best of all the app was free to install.

**General Comments:** This app would be beneficial to Developmental Educators, as it would offer their clients an additional aspect of independence in their lives. Supporting individuals to become independent not only improves their personal skill set but can also build confidence amongst their clients. Furthermore, the use of such technologies can encourage users to seek out other applications that may support them with their additional needs.
Reviewer: Loretta David

Name of app: IFTTT-If This Then That
Operating System: IOS, Android
Location: iTunes Store, Google Play
Cost: Free

Description: IFTTT is a smart device application that uses applets to bring together a user’s favourite services and apps together on their smart device. IFTTT is able to bring together apps and services such as Twitter, Google Drive, Instagram, Gmail, Pinterest, Philips Hue and home devices such as Google Home and Amazon Alexa. IFTTT allows for its users to streamline social media, back up and share photos captured on your device automatically and trigger events based on the users’ current location. Furthermore, with the use of devices like Google home and Amazon Alexa, IFTTT allows the user to back up important files and keep updated with daily news by simply voicing the command. In addition, it allows for the user to control home appliances and have automated home security alerts (if initially controlled by specific services) with simple voice commands to their Google Home or Amazon Alexa devices.

Alignment with the UDL guideline: The IFTTT app meets the UDL Guideline of Principle Two: Providing Multiple Means of Action and Expression. Guideline 6: Provide options for executive functions, Checkpoint 6.3: Facilitating managing information and resources. IFTTT aligns with these guidelines in its ability to gather information and data from various applications and services and control them from one app. This management of information and resources promotes an organized and synchronized smart device. Moreover, this allows users to save time maintaining information in various apps individually to synchronizing information throughout all applications through one medium.

Curriculum area: The area of curriculum that would be most suitable for the use of IFTTT would be for students, teachers and administration staff that would like to synchronize information. For example, teachers can use IFTTT to tweet our reminders on their accounts to remind students of upcoming events and tests. However, this would most likely be useful for older students ranging from ages 13 and above that have legal access to social media accounts. Another example of the valuable use of IFTTT would be for parents to be updated on school or support activities through social media and their emails and it can even be added to their planners through voice activation on the Google Home or Amazon Alex devices. Moreover, students and parents with physical disabilities would greatly benefit from the IFTTT app as it would allow the user to control the app through speech/voice commands and not with their hands.

How does the app meet the National Disability Standards? IFTTT meets the National Disability Standard Four: Feedback and Complaints (page 17). IFTTT meets this standard due to the plethora of avenues to seek support for the app. For example, IFTTT regularly replies to comments on their Google Play account to offer support for users’ experiencing problems with the app. In addition, IFTTT provides their email address and blog links for users to make complaints and seek additional support for using IFTTT.
How the app changes pedagogy (SAMR)? The app IFTTT is a transformative piece of technology that redefines the way in which smart device users sync information. The IFTTT app has allowed smart device users to interact with their devices and utilize a single app to perform tasks that may have been repeated over several other apps and services. In addition, IFTTT has made devices such as Google Home and Amazon Alexa become a sort of home assistant that collates information and access services through simple voice commands.

How the app encourages person centred planning. IFTTT encourages person centred planning as the user is able to decide which apps and services they would like to collate to have information synced too. This facilitates an independence of choice and supports independence of living. For example, with the use of IFTTT users are able to control home appliances such as TV’s, radios, lights, and Wi-Fi modems. These features of IFTTT would allow people with physical disabilities to have more control over basic activities in their home which may reduce support services hours and promote independence and build the users self-confidence.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The IFTTT app encourages all C’s of the 21st Century approach to teaching/training. This is illustrated through IFTTT features allowing its users to connect, create communities, collaborate within the communities, explore their creativity through various apps and curate data and information. For example, IFTTT users use the IFTTT blog, Twitter and Facebook accounts to meet other users and create a community of users that support each other in utilizing the app. Also, IFTTT supports the syncing of social media websites which promotes connecting with other people, creating communities whereby collaboration take places. Furthermore, IFTTT allows users to create their own applets that allow them to synchronize their personally selected apps and services that can be saved and retrieved for review later.

Evidence from the literature that the app is capable of the claims made: Ovadia (2014) found that IFTTTs’ most attractive feature was the apps ability to automate particular tasks rather than duplicating actions to various apps. For example, an IFTTT user is able to take a picture on their device, post it on Instagram, and synchronize it to Pinterest and save it in their cloud storage space. Likewise, Hoy (2015) suggests that with IFTTTs’ automated task services, it allows for an improvement of tracking issues faced by its user and saves time and energy of repeating tasks over multiple services and apps.

General Comments: The IFTTT app is a revolutionary piece of technology that with further improvement will create homes that can be managed without pressing buttons or manually inputting data. This will alter the way in which people with physical disabilities will live their lives as the IFTTT app facilitates means of independence in everyday technologies. Developmental educators would find IFTTT a most useful app if working in accommodation services for people with a disability to promote independence and improving quality of life.
Reviewer: Brooke Fisher

Name of app: WheelMate
Operating System: IOS, Android
Location: http://www.wheelmate.com/en/
Cost: Free

Description: WheelMate is a community driven App which aids in finding the nearest wheelchair friendly toilets and parking spaces. WheelMate is powered by people who use a wheelchair who add and verify each location ensuring accuracy. It allows you to add accessible toilets and parking spaces directly via the App or through the WheelMate website. WheelMate also allows users to rate and comment on locations as well as create a printable list of locations to plan trips in advance.

Alignment with the UDL guideline: This App meets the UDL guidelines of Principle 3: Provide Multiple Means of Engagement In Guideline 7: Provide Options for Recruiting Interest Checkpoint 7.2: Optimise Relevance, Value and Authenticity. WheelMate meets this checkpoint as it offers information that is relevant and valuable to the individuals seeking accessible toilets and parking spaces. This can also be personalised according to geographical location to ensure social relevance and create outcomes which are meaningful. This App also promotes active participation and invites personal responses and evaluation of locations to ensure authenticity. In Guideline 8: Provide Options for Sustaining Effort and Persistence. Checkpoint 8.3: Foster Collaboration and Community. Collaboration and community are fostered whereby users of this App are encouraged to add accessible locations to be shared with others. In this way, WheelMate creates a community of people who are engaged in a common interest and desire a common outcome. Collaboration is fostered through users providing feedback each location in order for accuracy and relevance to be maintained and optimised for all users. Checkpoint 8.4: Increase Mastery-Oriented Feedback: This App provides the opportunity for providing feedback that is substantive and informative. The feedback that this App encourages has the potential to benefit people who use a wheelchair and the wider community. By providing feedback on locations improvement is emphasised and used to achieve a standard of accurate information.

Curriculum area: WheelMate is useful in the domain of broader life skills as it can be utilised to promote independence. People who use this App have the opportunity to research accessible toilets and parking spaces before arriving at a venue or when planning a trip. This is further supported by the option to create a printable list of locations that are geographically relevant to the person. This App is suitable for people the age of 12 and over and can be used independently or in conjunction with family members, friends, employers and caregivers.

How does the app meet the National Disability Standards? This App meets the National Disability Standards of Standard 1: Rights, Standard 2: Participations, Inclusion, and Standard 6: Service Management. In Standard 1, WheelMate promotes an individual’s rights by affording the user the dignity of ensure that the location they are traveling to is accessible for their particular needs or requirements. In this way is also encourages self-determination by giving the user choice and control over the services they use. WheelMate meets Standard 2: Participation and Inclusion by promoting a connection with the community based on factors that may include the individual’s interests, identity, preferences and needs. This is achieved through providing readily available
information on accessibility to facilitate an inclusive environment. It also encourages people to actively participate in ensuring the reliability of the App that is to the benefit of both the individual and the broader community. In Standard 6, service management is achieved by providing all users the opportunity to add and rate accessible locations. This is used to create a culture of continuous improvement that is the basis for quality service delivery.

**How the app changes pedagogy (SAMR)?**

WheelMate transforms the way in which people obtain information on the accessibility of toilets and parking spaces. It can be seen as an augmentation as it replaces the need to view a locations website in order to assess accessibility. This App also provides functional improvement as all information is collated and can be retrieved from a singular App, promoting efficiency. In addition to this the ability to rate and comment on locations adds to the reliability of the App whereas information on website or past reviews may be outdated and contain misleading information.

**How the app encourages person centred planning.** WheelMate encourages person centred planning by providing choice and information that is useful for the user. This is achieved through providing a list of accessible toilet facilities and parking spaces that are geographically relevant to the individual’s current or desired location.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This App encourages collaboration within a community of people who have the same interests and requirements. WheelMate actively promotes collaboration by providing individuals with the means of evaluating locations that are proposed to be accessible on the App. It also allows for new locations to be added according to the individuals own personal experiences. In this way WheelMate promotes asynchronous collaboration to create a database of accessible toilet and parking locations that can be viewed and reviewed at any time.

**Evidence from the literature that the app is capable of the claims made:** WheelMate provides information on accessible toilets and parking spaces for people who use a wheelchair or have a degree of physical disability. Access and mobility are essential elements for maintaining quality of life, however people with a physical disability can encounter many personal, interpersonal and environmental barriers to accessibility (Iwasawa et al 2015, Kasemsuppakorn et al 2015, Welage & Liu 2011). Accessibility is also important in facilitating social inclusion and community involvement (Welage & Liu, 2011). Simple day trips to unfamiliar places can be a major challenge due to the inaccessibility (Business Wire 2012, Kasemsuppakorn et al 2015). Having knowledge of accessible facilities allows people who use a wheelchair and other physical disabilities to enter and use them safely and with dignity (Iwasawa et al 2015, Welage & Liu 2011). Iwasawa et al (2015) highlights that smartphone technology is an inexpensive, quick and effective way of checking the accessibility of a location. WheelMate is a free App accessible both through the internet and via the App. WheelMate can provide meaningful information that works to promote dignity and community participation.

**General Comments:** This App could be useful for developmental educators and teachers when it comes to planning trips and accessing services. The ability to determine beforehand if a venue or location is accessible to could help to ensure the safety and dignity of the individual while allowing them to fully access the available services.
**Reviewer:** Brooke Fisher

**Name of app:** PhysioAdvisor Exercises  
**Operating System:** IOS, Android  
**Location:** iTunes Store and Google Play  
**Cost:** Android: $3.99, IOS: $4.49

**Description:** PhysioAdvisor Exercises is an App designed for people of all ages with a physical disability or mobility impairment. This App offers comprehensive range of physiotherapy and injury rehabilitation exercises. It offers a range of over 500 exercises and over 800 images that have been specifically designed by experienced physiotherapists to promote safety, diversity and meaningful outcomes. It offers a range of exercises to suit differing abilities, interests and fitness levels and stages of rehabilitation. The options that PhysioAdvisor Exercises are flexibility exercises for every major joint in the body, stretches for the major muscle groups of the body, strengthening exercises for every major joint and muscle group, core stability exercises, Pilates exercises, postural exercises, balance exercises, Swiss ball exercises, foam roller exercises, massage ball exercises and resistance band exercises. These exercises aim to improve a wide range of factors such as strength, flexibility, fitness, posture, core stability, balance and co-ordination. PhysioAdvisor Exercises offers a range of services and tools that promote success use of the App. These include the ability to create an individualised, customisable workout program. It also offers a ‘Body Chart’ that provides comprehensive details on which exercises could be beneficial for a particular body part the person wishes to target. In addition to this, the App shop allows for the purchase of professionally verified physiotherapy products and an exercise reminder to help keep users on track with their plan.

**Alignment with the UDL guideline:** PhysioAdvisor Exercises meets the UDL guidelines of Principle 1: Provide Multiple Means of Representation and Principle 3: Provide Multiple Means for Engagement. Principle 1: Provide Multiple Means of Representation. In Guideline 2: Provide options for language, mathematical expressions, and symbols. Checkpoint 2.5: Illustrate through multiple media. This checkpoint is met through the content and instructions of this App being illustrated through both image and text. Each exercise is accompanied by a text and description and an image depicting the correct way to perform that exercise. In Guideline 3: Provide options for comprehension. Checkpoint 3.1: Activate or supply background knowledge. Using the ‘Body Chart’ PhysioAdvisor Exercises provides pre-requisite knowledge on the exercises that are beneficial for the targeted areas of the user’s body. This encourages the best outcomes for the individual using the App.

**Curriculum area:** The curriculum area that this App is suitable for is Physical Education. This App offers physiotherapy techniques that are delivered in an accessible way regardless of geographical location and are inexpensive compared to face-to-face physiotherapy services. The PhysioAdvisor Exercises is suitable for people of all ages however adult supervision, monitoring and implementation would be needed for children of a younger age.

**How does the app meet the National Disability Standards?** This App meets the National Disability Standard of Standard 3: Individual Outcomes. PhysioAdvisor Exercises encourages individual outcomes whereby it promotes person centred approaches to service delivery. This is achieved
through to individual being able to lead and direct their own use of the App. The customisable nature of PhysioAdvisor Exercises ensures that each exercise plan is flexible and tailored to the individual’s strengths and needs to facilitate positive outcomes. PhysioAdvisor Exercises promotes active choice and decision-making while being responsive to diversity among users.

**How the app changes pedagogy (SAMR)?** PhysioAdvisor Exercises transforms the way in which individuals access physiotherapy practices and expertise. It acts as a substitute to face to face consultations and therapy sessions with a licensed physiotherapist. This is due to PhysioAdvisor Exercises being created and managed by physiotherapists and encompasses their knowledge to help provide a safe and effective program.

**How the app encourages person centred planning.** This App is designed to optimise personalisation and ensure person centred planning. This is achieved by a wide range of exercises that can be customised to suit the individual’s strengths, abilities, interests, fitness levels and rehabilitation goals. These factors are easily adjustable to ensure that the exercises are appropriate for the individual through any fluctuations in their abilities and goals.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** PhysioAdvisor Exercises encourages connectivity. This is achieved whereby this App offers a simple way to connect to their exercise interests and physiotherapy needs. It also gives the user added control over their own services promoting control and independence in both leisure and rehabilitation specific activities.

**Evidence from the literature that the app is capable of the claims made:** The literature highlights that movement is a central need for people to function in society in a way that is both meaningful and fulfilling (Houdijk & Janssen, 2017). It has been shown that there is a strong relationship between exercise and psychological wellbeing (Graham et al 2008, Houdijk & Janssen 2017). Exercise and physical fitness is widely recognised as a significant determinant of personal and public wellbeing (Graham et al 2008, Houdijk & Janssen 2017). It has been shown to improve mood and aid in the prevention and management of depression which can be debilitating both socially and psychologically (Graham et al, 2008). People with a physical disability can often engage in lower levels of physical activity due to personal and societal limitations and barriers (Houdijk & Janssen, 2017). This can lead to less opportunities for community engagement and a reduced quality of life (Graham et al, 2008). Physiotherapy focuses on varying aspects of movement, strength, flexibility and mobility (Houdijk & Janssen, 2017). However due to expenses and travel requirements, physiotherapy is not always accessible to everyone through face to face meetings (Ar & Akgul, 2014). PhysioAdvisor Exercises helps to overcome these obstacles by offering appropriate exercises that are readily accessible through smartphone technology.

**General Comments:** This App could be utilised extensively by both developmental educators and teachers to facilitate and maintain exercise and physiotherapy routines for individuals with a physical disability. The customisable nature allows for the collaboration of users and professionals to create an exercise program that suits the person’s strengths and needs. This gives the professional the ability to ‘meet the person where they are’ and keep track of the individuals progress.
**Reviewer:** Brooke Fisher

**Name of app:** JABtalk  
**Operating System:** Android  
**Location:** [http://www.jabstone.com/](http://www.jabstone.com/)  
**Cost:** Free

**Description:** JABtalk is a communication tool that was originally designed for children and adults who are non-verbal or have speech or language difficulties. It has evolved beyond this and is now utilised as a communication tool by people who have had a stroke, toddlers, speech and language pathologists and people with a physical disability. This App provides a speech tool that is efficient, fun and easy to use. This is achieved by JABtalk through a combination of personalised voice and images that create a simple and easy to navigate user interface. JABtalk offers a variety of functions and adaptations were created specifically for ease of use and to maximise the communicative potential of the user. These features include Intuitive one-click navigation with vibration as immediate feedback when touching a word or symbol. In addition, there is the ability to organise words into categories defined by the user, rearrange and resize pictures add you own pictures and add audio to words and categories. It also has text to speech support.

**Alignment with the UDL guideline:** JABtalk meets the UDL Guidelines of both Principle 1: Provide Multiple means of Representation and Principle 2: Provide Multiple Means for Action and Expression.  
**Principle 1:** Provide Multiple Means of Representation. In Guideline 1: Provide options for perception Checkpoint 1.1: Offer ways of customising the display of information. JABtalk meets this checkpoint by allowing the user to rearrange and adjust the size of images. It also allows the user to add their own pictures, audio and words to best match their needs and interests. Checkpoint 1.3: Offer alternatives for visual information. Alternatives for visual information are offered in the form of a text to speech function and the ability to add personalised audio recordings to images, categories and words. In Guideline 2: Provide options for language, mathematical expressions and symbols. Checkpoint 2.5: Illustrate through multiple media. This checkpoint is met whereby media is illustrated through both text and images within this App. **Principle 2:** Provide Multiple Means for Action and Expression In guideline 5: Provide options for expression and communication Checkpoint 5.1: Use multiple media for communication. JABtalk uses multiple media for the purposes of communication to suit the user’s preferences, abilities and interests. Communication is expressed using text, audio and images.

**Curriculum area:** The curriculum area that JABtalk is suitable for is speech and language. This App contains customisable voice and images to communicate clearly and effectively with communication partners. JABtalk makes communication accessible for people who may have speech difficulties due to a physical disability. The easy to navigate screen also makes JABtalk more accessible to people with a physical disability and younger children. JABtalk is an easy to teach and creative way of communicating that could be utilised by students within a classroom.

**How does the app meet the National Disability Standards?** JABtalk meets the National Disability Standards of Standard 2: Participation and Inclusion and Standard 3: Individual Outcomes. In Standard 2, social participation and inclusion are encouraged through providing individuals with
the means of communicating. This allows for the person to engage in meaningful conversation and express themselves and their feelings. JABtalk offers alternatives to verbal speech and therefore works to remove barriers for communication. In Standard 3 individual outcomes are achieved through the customisable and person-centred approach of the JABtalk technology. The way in which this App is utilised in communication is flexible and can be tailored to their strengths and needs. This is achieved through tools that facilitate communication of a text, audio or visual nature. Providing options such as these also encourages individual outcomes.

**How the app changes pedagogy (SAMR)?** JABtalk has the potential to transform the way in which a person with a physical disability communicates. Speech may be challenging for a person with a physical disability, this App creates a form of augmentative and alternative communication that acts as a substitution for verbal speech.

**How the app encourages person centred planning.** JABtalk encourages a person-centred approach to service delivery in many ways. The interface is can be modified by the user or communication partner to contain images that are more meaningful to the user than generic images. It also offers multiple options for the method of communication to best suit the user.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)** This App encourages community as the use of this communication system can create the catalyst for social growth and personal expression. Being able to communicate is vital to integration and inclusion within the community. It also fosters creativity using different means of communication. The ability to personalise images and words gives the user control and the opportunity to be creative in the way they communicate.

**Evidence from the literature that the app is capable of the claims made:** People with a physical disability may have complex communication needs (CCN) and be unable to effectively use verbal speech in everyday communication (Arthur-Kelly et al 2009, Raghavendra et al 2011). This can lead to more restriction to participation and result in social exclusion or isolation (Raghavendra et al, 2011). Visual supports such as the use of images and graphic stimuli can enhance communication, comprehension and learning for people who have difficulty communicating via speech (Arthur-Kelly et al 2009, Tilly et al 2002). An App such as JABtalk uses visual supports for this purpose and to promote accessibility (Tilly et al, 2002). Communication and being able to express ourselves is an important element in mental wellbeing, quality of life, social inclusion, and empowerment and provides the framework for meaningful connections (Arthur-Kelly et al 2009, Raghavendra et al 2011). The customisable nature of JABtalk adds to the ease of communication and self-expression leading to more meaningful and active participation.

**General Comments:** This App could be helpful for developmental educators and teachers who are working with people who have complex communication needs in conjunction with a physical disability. It could be used by the individual to have their needs met, and facilitating social and personal communication.
Reviewer: Brooke Fisher

Name of app: Assistive Touch
Operating System: Android
Location: Google Play Store
Cost: Free

Description: Assistive Touch is an Android application that creates a floating panel on the screen of your smartphone. This floating panel contains ‘Quick Touch’ buttons that make navigation easier and more efficient. This panel is customisable to the user’s preferences and makes accessing favourite Apps, games and settings more convenient. The Assistive Touch floating panel also contains a virtual ‘Home’ and ‘Volume’ button. This feature is to prevent the wear of the equivalent physical buttons. It is also to make these functions more accessible to individuals who may experience difficulty operating the physical buttons. Furthermore, the layout and settings of Assistive Touch are also customisable to suit the individual. The colour of the floating panel can be changed and so can the gesture settings. The gesture settings can be set as one tap, double tap or long press to suit the individual’s preferences and fine motor skills.

Alignment with the UDL guideline: Assistive Touch meets the UDL Guidelines of both Principle 1: Provide Multiple Means of Representation and Principle 2: Provide Multiple Means for Action and Expression. Principle 1: Provide Multiple Means of Representation In Guideline 1: Provide options for perception Checkpoint 1.1: Offer ways of customising the display of information. This checkpoint is met whereby Assistive Touch allows for the floating panel to be customised to show buttons and Apps the individual uses more regularly, allowing for easy access. The presentation of the Apps display is also customisable as the colour of the floating panel can be changed to reflect the individual’s favourite colour or a colour that is more visually accessible. Principle 2: Provide Multiple Means for Action and Expression. In Guideline 4: Provide options for physical action. Checkpoint 4.1: Vary methods for response and navigation. Assistive Touch provides gesture settings that vary the method for response and navigation. These gesture settings can be changed from single touch, double touch or long press when selecting an App on the floating panel. Checkpoint 4.2: Optimise access to tools and assistive technologies. Assistive Touch optimises access to tools through the floating panel that is customised by the user. This optimises the function and convenience of the App.

Curriculum area: Assistive Touch is suitable for broader life skills and lifestyle enhancement. It allows for easier access to regularly used Apps and simplifies smartphone navigation as well as creating a more convenient layout. In addition to this, the virtual ‘Home’ and ‘Volume’ buttons may be more easily accessible to people who face challenges of weakness in the hands or challenges with fine motor skills.

How does the app meet the National Disability Standards? This App meets the National Disability Standards of Standard 3: Individual outcomes. Assistive Touch promotes individual outcomes through providing choice and control over the layout and settings of the floating panel. It allows for a person-centred approach to making the design accessible and relevant for everyone.
How the app changes pedagogy (SAMR)? This App transforms the way in which the android smartphone is designed and navigated. The customisable floating panel acts as an augmentation of the regular screen design and improves the function and efficiency of use.

How the app encourages person centred planning. Assistive touch encourages person-centred planning through providing options for use and design. The ability to adjust the gesture settings to navigate the App can remove design barriers for people with a physical disability who may have weakness in their hands or fingers. On screen, virtual buttons are also provided as the physical buttons on the side of the device may be inaccessible to some people.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs) In the 21st Century approach to teaching and training, Assistive Touch encourages connectivity. It does this by facilitating a connection to the individuals favourite Apps or preferred settings. The floating screen makes this connection easier and more convenient for the person and has the potential to make smartphone functions more accessible for people who have a physical disability.

Evidence from the literature that the app is capable of the claims made: Touchscreen technology is commonly utilised in information and communication technologies (ICT) (Cho & H 2017, Sesto et al 2012). The reasons for this are due to the flexibility of design, speed and overall convenience (Sesto et al, 2012). However, literature highlights that people with physical disabilities can experience difficulties when operating a touchscreen on a smartphone (Cho & H 2017, Grussenmeyer & Folmer 2017, Sesto et al 2012). This is due to small sized buttons and widgets that can lead to low precision and target acquisition for people who experience challenges with fatigue and fine motor skills (Cho & H 2017, Grussenmeyer & Folmer 2017). Assistive Touch simplifies the use of the touchscreen by allowing the user to select specific Apps and settings to appear on a floating screen over the original screen display. Assistive Touch also allows for the gesture settings to be changed. Some people with physical disabilities have been reported as having long ‘dwell times’ when pressing a button (Sesto et al, 2012). This can sometimes result in errors in the software opening (Sesto et al, 2012). Assistive Touch has a ‘long press’ gesture setting to overcome this issue and remove this barrier to accessibility. The literature suggests that applications that add to or enhance the diversity of function in a smartphone can be beneficial for a person with a physical disability (Cho & H, 2017). This added accessibility can provide practical assistance to overcome challenges they may face when navigating the touchscreen (Cho & H, 2017). Cho & H (2017) highlight that effective use of a smartphone can support social inclusion, life satisfaction and contribute to everyday quality of life.

General Comments: Assistive Touch could be useful for developmental educators and teachers by informing the people they work with about this App. This App can be beneficial for all people however it may have added benefits for people who have weakness in their hands or who experience challenges with dexterity and precision.
Reviewer: Brooke Fisher

Name of app: Dragon Dictation
Operating System: IOS
Location: iTunes Store
Cost: Free

Description: Dragon Dictation is a simple and free speech to text App. It allows you to speak and record personal notes and reminders as well share your location and get directions ‘on the go.’ Dragon Dictation can also be connected to social media accounts such as Facebook and Twitter giving the user the ability to speak their status updates and Tweets. It can read back your notification, messages, incoming calls, alerts and upcoming appointments. It also allows for emails and texts to be sent by speech alone and can search other websites such as YouTube and Yelp. These voice commands can be given in a multitude of different languages. The developers of this App claim that it makes sending texts and emails up to 5 times faster than if they were typed on screen. It is optimised for people who want to work ‘on the go.’ Dragon dictation allows for the creation of a personal ‘voiceprint’ so that the App will only respond to the voice of the owner of the smartphone. It also allows the user to set a ‘wake up’ word of phrase to activate Dragon Dictation. Furthermore, Dragon Dictation has an ‘Attentive Mode’ that allows for it to be used even when the phone screen is locked.

Alignment with the UDL guideline: Dragon Dictation meets the UDL Guideline of Principle 2: Provide Multiple Means for Action and Expression. In Guideline 4: Provide options for physical actionCheckpoint 4.1: Vary methods for response and navigation. Dragon Dictation meets this checkpoint by allowing your smartphone to be navigated verbally rather than physically. Checkpoint 4.2: Optimise access to tools and assistive technologies Access to the tools on your smartphone device are optimised by Dragon Dictation. This is achieved using the speech to text system that allows for hands free use of the mobile device. In Guideline 5: Provide options for expression and communication_Checkpoint 5.1: Use multiple media for communication This checkpoint is met through because Dragon Dictation converts speech to text. This text can then be shared in many different ways on a number of different platforms. These include social media sites, text messages and emails. Checkpoint 5.2: Use multiple tools for construction and composition Dragon Dictation offers speech to text as an alternative method of construction and composition to physically typing.

Curriculum area: This App is mostly suitable for enhancing everyday life. It can be used to make the daily tasks and leisure pursuits easier, quicker and more convenient for people with physical disabilities. This would be especially beneficial for those who have difficulty operating the on-screen keyboard. However, Dragon Dictation could also be used in a classroom setting to allow students to easily send emails to their teacher, record notes and participate in online discussions.

How does the app meet the National Disability Standards? Dragon Dictation meets the National Disability Standard of Standard 2: Participation and Inclusion. This App promotes participation and inclusion by promoting the connection of people with a physical disability with their families, friends, interests and chosen social communities. With the added accessibility due to the speech
to text function, Dragon Dictation promotes valued roles for people with a physical disability such as friend, colleague, employer and student.

How the app changes pedagogy (SAMR)? Dragon Dictation is an App that enhances the use of smartphone technology. It does this by modifying the way in which messages, emails, alerts and notes are composed. The speech to text feature allows for a significant task redesign and aims to make navigation and composition quicker and more convenient.

How the app encourages person centred planning. This App could be used by a teacher or trainer to encourage person-centred planning by allowing students and the people they are working with to use this App as a substitution for physical typing. This could be useful for taking notes, completing online activities and writing assignments. This could facilitate and maintain interaction with their peers as well as allowing for work assessments to be fair and valid.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs): Dragon Dictation encourages connectivity, community and curation. Connectivity is encouraged through access to social media and chosen websites. Community is likewise encouraged through social media and the ability to post, record and share events. Curation is achieved whereby Dragon Dictation allows for notes to be recorded which can then be retrieved later.

Evidence from the literature that the app is capable of the claims made: Dragon Dictation has the potential to enhance the accessibility of smartphone technology. This accessibility extends to several forms of social media. Access to social media has been shown to be a source of empowerment for people with disabilities and can strengthen and create social networks that positively contribute to psychological well-being (Shpigelman & Gill, 2014). Applications that allow speech to text such as Dragon Dictation, can overcome barriers to smartphone use that people with a physical disability may encounter such as limitation of motor skills (Shadiev et al, 2014). Shadiev et al (2014) highlights that speech to text can be utilised by multiple speakers at once. This may be useful in producing transcripts from discussions, meetings and other collaborative activities (Shadiev et al, 2014). In this way Dragon Dictation could facilitate collaboration amongst students and employees with and without a physical disability.

General Comments: Developmental educators and teachers could use Dragon Dictation to ‘level the playing field’ when it comes to assessment. As mentioned in the literature, it could also be utilised in collaborative activities. It could also be useful for professionals taking notes of their observations and experiences. This would be quicker and easier than physical writing or typing notes. It could aid in sending emails and messages making it more time efficient for a busy professional.
Conclusion and Recommendations

Modern Technology is one of the driving forces behind the progress of a more inclusive environment for a person who has a physical disability. Things that people with a physical disability couldn’t formally accomplish are now possible because of the innovative ways science has allowed us to do, via the Internet of Things (IoT) and the Internet of People (IOP).

These Apps can be used for people who have a physical disability in many ways, such as; touch screen controls, cameras and text-to-speech software. These Apps can improve day-to-day accessibility, along with others that can help overcome communication barriers between people with and without disabilities. Many of these Apps can replace physical buttons with on-screen controls, and provides alternative gestures for a variety of uses such as navigation, communication etc. (Male, 1997).

In this mobile equipped generation, having access to every bit of information, people who have a physical disability can interact, customise technology based on the needs of the individual, as well as be augmented and socially connected. These Apps can connect with educational research that works to expand learning opportunities for all individuals through alignment with Universal Design & Learning guidelines that can provide multiple means of representation, action and expression as well as engagement. It is important for all Apps to meet the National Disability Standards which encourage differentiation or individuality for people. All of these Apps included in this E-book encourage a person centred approach which also encourage connectivity, community, collaboration, creativity and curation (Forgrave & Karene, 2002) Creating a vision of Technology for empowerment, for people with disabilities, is important to enhance improvement of life for so many people who have a physical disability. As technology is constantly changing, so too are the Apps and it’s important to see how technology can allow independent learning with a person who has a physical disability.
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Hearing Impairment
30 apps for people Hearing Impairment:

Encompasses deafness, hearing impairment, and hearing loss, which can cause severe restrictions in communication, and in the ability to participate in community life.

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Introduction

Hearing Loss and Deafness is described by Zeng and Djalilian (2012) as completely, or partially, being unable to hear and is often noted as an invisible disability. It is estimated that over five percent of the world is diagnosed with hearing loss to a disability level, and that there are over thirty million children in the world with hearing loss or deafness (Zeng & Djalilian, 2012).

The area of hearing disabilities is deemed as unique compared to other disabilities due to its implementation of its own language – sign language (Zeng & Djalilian, 2012). Sign Language generally differentiates between countries and has its own vocabulary, word order, and style; often incorporating body expression. It is significant to note that sign language is not simply creating hand movements for already existing words as a substitute for speech (Zeng & Djalilian, 2012). Instead sign language is used to express meaning (for example, a multi-word sentence in English may equate to a singular sign in sign language) often incorporating a multi-faceted approach to communication (Saladin, 2004).

Due to the first language of most people with a hearing impairment being sign language, people learning in an English-based society and in mainstream schools often struggle with barriers to communication (Saladin, 2014). This can include limitations in reading, writing and comprehending English which is often an essential requirement of learning in Australian schools and fitting into society. Not only can this limit participation in learning but it can lead to social isolation and stigmatisation; common for people with disabilities (Saladin, 2014).

Assistive Technology (AT) can be described as a range of devices with adaptive supports involving three main categories: prosthetic, software and hardware (Hurst & Tobias, 2011). With the boom of technology in the last century and the integration of smart devices into everyday life, the importance of developing software based assistive technology has risen. Adopting AT that is described as low-level technology, is often cheap to buy, cheap to use and is easily integrated into society (Muhammad, Aasma & Iftikhar, 2015). A good example of this technology is the creation of hearing-loss specific applications on already established platforms Android and iOS (Abdullah & Fayyoumi, 2016). This, linked with the capabilities of mainstream applications, caters for people with disabilities and creates new options for holistic and socially acceptable AT.

The purpose of this E-Book is to review mainstream and assistive technology apps used on Android and iOS platforms and discuss their usability in education and learning settings for people with hearing disabilities. The reviews will address each apps’ alignment with Universal Design for Learning, Person Centred Planning, the National Disability Standards and the 5Cs. How the literature supports the use of these apps in learning environments will also be discussed.
Reviewer: Tommy Hari Firmanda

Name of app: Sound Scouts
Operating System: IOS, Android
Location: iTunes, Google Play
Cost: ($AU) 14.99-499.999

Description: Sound Scouts is a game for preschoolers that functions as a tool to test their hearing ability. The game, which has been designed for children with a minimum age of 4 years 9 months, is child-friendly and fun to play. In this game, you take on the role of Patch, a bionic-eared dog, that works in a National Park. Against a detective story backdrop, Patch's job is to solve the mystery of finding a missing ranger who is lost inside the park. Patch can use his super hearing to help the forest guards to find their friend. Apart from being a game, this app can be used to detect any hearing problems in children.

Alignment with the UDL guideline: Based on the UDL Guidelines, this App aligns with the second principle, which is to Provide Multiple Means of Action and Expression, guideline 6: Provide options for executive functions, checkpoint 4 Enhance capacity for monitoring progress (CAST, 2011). This App helps parents by giving a clear picture of their child’s hearing development; whether there is a hearing impairment or not. In addition, parents can monitor the progress of their child’s hearing ability from age 4+. Information gathered from monitoring the results, and feedback from this app, can later be used as a source of data on its users which can be beneficial to determine the next steps in the app’s design. It is expected that through early detection, preventative action can be taken to help children overcome hearing issues and adapt to the limitations and conditions imposed due to the hearing loss. As a result, children can learn according to their abilities and needs, even though they have problems with their hearing.

Curriculum area: This App aligns with monitoring and evaluation of the F–10 Australian Curriculum (ACARA, 2013). This monitoring area is critical for information gathering and review. The game is designed for children aged 4+. The reasons why the developer chose that age range are not clear. However, the Women’s and Children’s Health Network (WCHN) (2017) explains if children at 4 to 5 years of age, in general, want to work together and engage in ‘listening to’, they need to be able to discuss the sounds they hear or do not hear.

How does the app meet the National Disability Standards? This App aligns with Standard Three, the Individual Outcomes of the National Standards for Disability Services (Government, 2013). This standard includes recognizing and responding to issues related to age and disability. Its focus on individual outcomes includes children and service providers working together to review progress toward planned and measurable results from the App.

How the app changes pedagogy (SAMR)? Based on the SAMR Model, this App shows a level of modification, which significantly redesigns the use of a hearing test (PuenteDura, 2010). This app is designed in the form of a game, so children will focus on playing and not be aware that they are being tested. Parents or teachers can use this App without the risk of getting invalid results due to
anxiety because of the child knowing he or she is being tested. Both parents and schools should work collaboratively with health services and share information regarding the hearing issues.

**How the app encourages person centred planning?** This App provides an opportunity for teachers/trainers and services providers to offer a new way of supporting families. They can have full control; making the important decisions over the direction of their own lives (Disability & Care, 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Based on the 5Cs approach, this App encourages control and independence in children’s learning and leisure activities. Sound Scouts allows children to independently play the game because it was designed specifically for children aged 4 and above. They can learn how to solve a problem as well as enjoying their leisure time.

**Evidence from the literature that the app is capable of the claims made:** The game is created, developed, and tested by the developer (cmee4 Productions) which collaborates with organizations that primarily conduct hearing research. This internationally recognized organization, National Acoustic Laboratories, is one of the divisions in Australian Hearing. According to NAL (Hearing, 2016), health officers play a major role as experts in providing games, explaining outcomes, linking treatments and arranging referrals, as well as working with schools and families in sharing information. Moreover, Sound Scouts is able to detect whether there are problems within the inner ear, middle ear, an auditory processing or language disorder (Hearing, 2016). Displayed on a curve form, the results show the normal range for their age.

**General Comments:** Instead of using a traditional testing process and instruments that may be costly, this App provides a simple, fun and affordable resource for its target audience. Educators can use it as one alternative for monitoring a child’s development, especially their hearing ability. Users should be aware that this App was designed as a one-off hearing check and is not appropriate as a repeat test.
**Reviewer:** Tommy Hari Firmanda

**Name of app:** AUD-1  
**Operating System:** iOS (9.0)  
**Location:** iTunes  
**Cost:** ($AU) 10.99

**Description:** AUD-1 is an application that can be used as a hearing aid for the deaf. This application is designed in such a way that it can modulate, process research-based signals, and control the loudness of the sonic environment so that users with hearing loss can hear more clearly. This application also gives full control to the user to choose from various settings to suit their needs. Based on the research, AUD-1 is enhanced to add to the user's comfort and get crystal clear sound because this App is based on BioAid signal processing algorithm.

**Alignment with the UDL guideline:** This App aligns with the UDL Guidelines, the third principle Provide Multiple Means for Engagement, guideline 7. Provide options for recruiting interest, checkpoint 7.1 Optimize individual choice and autonomy. Through this application, students with hearing impairment can determine their own destiny or can become more independent in their activities and make decisions (CAST, 2011a). This condition happens because AUD-1 offers opportunities to achieve learning objectives, improving achievement motivation and increasing participation or providing opportunities to be more connected to the community through an alternative way of gathering information.

**Curriculum area:** AUD-1 represents the area of Student Diversity from the Australia Curriculum. ACARA aims to promote excellence and equality in education for all students throughout Australia. Each student is entitled to receive the same, relevant and appropriate education based on the same curriculum that meets the learning needs of each (ACARA, 2013a). This app provides an opportunity for Deaf students to acquire those rights. AUD-1 is suitable for all ages.

**How does the app meet the National Disability Standards?** The App aligns with the second standard, Participation and Inclusion from the National Standards for Disability Services. It allows people with hearing loss to engage and participate in their chosen community, by connecting with their families and friends. AUD-1 enables the contribution and inclusion of people with hearing impairment and their valuable participation in society, primarily involved in the learning environment (Government, 2013).

**How the app changes pedagogy (SAMR)?** In the integrated technology (SAMR) model, AUD-1 represents the level of Augmentation. Basically, according to Puentedura (2010), the App (through the smartphone devices), directly replaces the hearing organ, but instead of just substituting the organ, it provides functional improvements for the user by allowing flexibility in setting the device to fit their needs. For example, it has settings to allow each ear to be adjusted separately and allows the use of high-quality audio peripherals.

**How the app encourages person centred planning?** The App will enhance the authority, control and power among people with hearing loss. People with a hearing impairment and their families are
supported and encouraged by teachers or service providers to initiate and design their own plans for a desirable future (Disability & Care, 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** According to the 5C’s approach, the App encourages Community. The App allows individuals with hearing impairment to connect with the community and encourages their social growth by providing opportunities to minimalise the limitations and increase the potential of their hearing ability.

**Evidence from the literature that the app is capable of the claims made:** This App has not been created to replace traditional hearing aids. In fact, this app does not adopt all the signal processing components that make up modern digital hearing aids. The applications which run through this software only serve as a warning about severe hearing loss. The developer does not expect to replace actual hearing aids. If this app is not working properly, then you are advised to see a health worker (Clark, 2013). In addition, the developer also explains, applications designed on the iOS platform can only provide a limited output level. Therefore, the developer advises conducting further tests carried out by professional personnel (Clark, 2013). This explanation indicates this application cannot be used widely among the Deaf.

**General Comments:** The use of AUD-1 can improve the students’ ability regarding gathering information through hearing. Teachers play a crucial role in providing the opportunity to support students because this app/device could not entirely substitute traditional hearing aids which are specifically designed for treatment purposes. Users should be aware of its limitations and should seek professional advice and consultation when this app cannot make the hearing better.
Reviewer: Tommy Hari Firmanda

Name of app: Ear Spy: Super Hearing
Operating System: IOS, Android
Location: iTunes, Google Play, Amazon
Cost: ($AU) Free ($1.99 for in-App)

Description: Ear Spy is a mobile app that has the ability to improve the sharpness of hearing, and the ability to eavesdrop on people around the App users. It requires headset Bluetooth (earphones or headphones), and the sound from the next room will be heard through the headset. In the process, the app will amplify voices that enter through the phone’s microphone and can be directly heard through earphones. The developer suggests using a graphical audio equalizer to control the incoming sound and obtaining optimal voice results. Interestingly, this app is not specifically designed for people with hearing impairment, but only for people who have 'spy' souls or people who are highly curious. However, in its implementation, many people with hearing loss or who are hard of hearing (HOH) can benefit from using the app. Thus, many people with hearing loss recommend the app as one of the alternative substitutes for conventional hearing aids. The app also provides a feature to record what we hear, but this feature must be purchased and can only be found in the pro version.

Alignment with the UDL guideline: The App aligns with the first principle of the UDL Guidelines, Provide Multiple Means of Representation: Guideline 4. Provide options for physical action; checkpoint 4.2 Optimize access to tools and assistive technologies. This app offers an opportunity for students with hearing loss to be able to participate fully in the classroom. Ear Spy can serve as an alternative assistive technology tool for navigation, interaction, and composition for both children and adults who are hard of hearing.

Curriculum area: The area of student diversity is aligned with the App, Ear Spy. The Australian Curriculum provides equity and equality regarding education. It means that all learners should have access to information without exception. In fulfilling the purpose of the Australian Curriculum, the app supports students who have difficulty hearing and allows them to have the same access to information as their peers. This App is suitable for all ages, yet its suitability is dependent on the severity level of their hearing impairment and the availability of the device (smartphone).

How does the app meet the National Disability Standards? Based on the National Standards for Disability Services, the app aligns with the second standard, Participation and Inclusion. This app supports, encourages, and offers an alternative for members of the Deaf community to build relationships with family, friends, school and community. Thus, the app allows contribution and participation in the community including work and learning (Government, 2013).

How the app changes pedagogy (SAMR)? Based on the SAMR Model, Ear Spy can be included at the Augmentation level of integrated technology. The basis of the Augmentation level is when technology becomes a direct substitute, but there is also a functional enhancement over the traditional way followed prior to using the technology (PuenteDura, 2010). For instance, instead of just being a regular hearing aid, it also has the ability to record the sounds that we want to hear.
How the app encourages person centred planning. In a person-centered approach, the question that arises is whether this App could remove the barriers, which occur from people’s attitudes toward the Deaf so that they can build a respectful relationship. This App can also remove the challenges that might be faced by children with a hearing impairment. This App provides authority, control and power to connect with other people (Puentedura, 2010). For example, Ear Spy will strengthen voices that come from the user’s surroundings directly to earphones through the phone’s microphone, as well as controlling the incoming signal.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This App does encourage children to have control and independence in making decisions and adapting to their condition. Connectivity and Community are the areas that the App encourages. By using the App, individuals with hearing impairments are able to enhance their hearing so that they can connect and participate in the community and learn to communicate independently.

Evidence from the literature that the app is capable of the claims made. There is no evidence-based research yet, to show the effectiveness of the app. The app does manipulate the processing of signal sounds to increase human’s hearing. A study by Villchur (1973) found that amplifying each acoustical element of speech, through signal manipulation, improves speech recognition. Other research shows that the use of alternatives to hearing aids does, at least, provide similar levels of amplification, better speech-in-noise performance and greater self-reported compared with the conventional hearing aids (Maidment, Barker, Xia, & Ferguson, 2016). It means that the app might offer benefits to users with hearing impairments, but more research is necessary to gain further proof of its effectiveness.

General Comments: The app, Ear Spy, might help educators to communicate more effectively with their students who are hard of hearing. The app does not replace conventional hearing aids but rather offers a more simple and affordable alternative.
**Reviewer:** Tommy Hari Firmanda

**Name of app:** Phonak Leo - Interactive Stories  
**Operating System:** IOS (iPad), Android  
**Location:** iTunes, Google Play, Amazon  
**Cost:** Free

**Description:** Phonak Leo is an App that can help children with hearing loss to understand their condition and the possible solutions. It is designed in the form of an interactive storybook. There are two different stories, 'Leo gets hearing aids' and 'Leo gets a Roger system' but they are related to each other. Each tells a story of a cheerful and delightful lion cup, named Leo. This App was created and designed to provide knowledge about hearing impairments and also to help children overcome anxiety in adapting to their limitations and the use of assistive technology. Based on these aims, parents, teachers, and caregivers can use this application as an alternative way to help children with hearing impairments and their peers understand hearing loss and the available adaptive technology/devices.

**Alignment with the UDL guideline:** Phonak Leo aligns with the UDL Guidelines’ first principle: Provide Multiple Means of Representation; provide options for comprehension; checkpoint 3.1 activate or supply background knowledge. Phonak Leo helps children to obtain or access information about hearing loss and solutions that can be taken or used to overcome the problems caused by hearing impairments. This application also plays a role in reducing barriers to fully participating by providing background knowledge related to how to interact with students with hearing impairments, in particular for their peers.

**Curriculum area:** This App aligns with the area of Technologies from the Australian Curriculum, particularly Digital Technologies. Phonak Leo ensures that all students benefit from learning about emerging technologies related to hearing loss in a fun way (ACARA, 2013b). This App was designed for children from 1 to 8 years old, an age range where kids are still interested in storytelling. Moreover, a storybook can be suitable for older children in this population because they can use context to recognize environmental print, to distinguish between printed letters and words, and to identify some or all of the alphabet letters (Justice & Ezell, 2002). Meanwhile, it can help younger kids, teachers, parents or caregivers to explain the story.

**How does the app meet the National Disability Standards?** The App aligns with the third standard of the National Standards for Disability Services (NSDS) Individual Outcomes. According to the NSDS (Government, 2013), the App can support people with hearing impairments in leading and directing the services they want with the help of family, friends, nurses and stakeholders (with consent) related to the person.

**How the app changes pedagogy (SAMR)?** Based on the SAMR Model, Phonak Leo can be placed at an Augmentation level of integrated technology. The basis of the Augmentation level is when technology is a direct substitute, but there is a functional enhancement, for the traditional way used without the technology (Puentedura, 2010). For instance, in Leo’s storybook, instead of just telling a story, it also comes with additional features such as moving animation when we touch the picture or the ability to bookmark their favorite pages.
How the app encourages person centred planning? With regard to a person-centered approach, the question that arises is whether this App can remove any barriers that may exist due to people’s attitudes toward the Deaf so that they can build a respectful relationship and if this App can remove the challenges faced by children with hearing impairments. The developer, Phonak, collaborated with hearing care professionals, teachers, researchers, children and their families, for 40 years to create, develop and offer technology that can support children with hearing loss or hearing difficulties reach their full potential (Phonak, 2014). This interactive App provides 8 different languages; is child-friendly so children can operate the App by themselves; and the developer provides a hardcopy for those who do not have an iPad.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? This App encourages children to have control and independence in making decisions and adaptations. Connectivity is the area that the App is encouraging. By learning from Leo’s experiences and how he adapts and uses assistive technologies to support him participate in his favorite activities, children with hearing impairment can learn to be independent, including independence to choose appropriate technology which can assist them in daily activities.

Evidence from the literature that the app is capable of the claims made: The developer, Phonak, has always used scientific sources as a basis for developing their products, including Phonak Leo. In using this application, support from family, teachers, or service providers is needed by a child who is Deaf. One study by Singh, Lau, and Pichora-Fuller (2015) states that there is a relationship between social support gained and satisfaction in using hearing aids. There is still a lot of evidence-based research that forms the basis for technology development in Phonak. Studies can be seen in the resource on the Phonak website (https://www.phonakpro.com/au/en/resources/information-forms/evidence.html#).

General Comments: This App provides resources and an alternative way of introducing, giving knowledge, and help to children with severe hearing difficulties to help them to adapt to their condition as well as giving understanding to the peers. Teachers, parents or caregivers can use the App to minimize the effect of being hearing impaired at a very young age and provide a more comfortable way to explain how they can still participate in any activities with the help of assistive technologies.
Reviewer: Tommy Hari Firmanda

Name of app: Connect
Operating System: iOS, Android
Location: iTunes, Google Play
Cost: Free

Description: Connect by BeWarned is a mobile app that can be used by people with hearing impairments to communicate with others without a disability. This App can convert voice to text and vice versa (text-to-speech) using voice recognition technology. For example, if a student with a hearing impairment wants to ask his teacher a question, then he will type what he wants to say on his mobile phone and Connect by BeWarned converts the text into a voice that can be heard by the teacher. Conversely, when the teacher answers the student’s question, this App will change the teacher’s voice into text so that the student can read it through their smartphone’s screen.

Alignment with the UDL guideline: The App aligns with the first principle of the UDL Guidelines, Provide Multiple Means of Representation, and guideline 1. Provide options for perception, checkpoint 1.2 Offer alternatives for auditory information. Students with disabilities are in a disadvantaged position because their limitations will affect the information they receive. Students with a hearing impairment, for example, will have difficulty understanding the information or content conveyed in the form of audio. To ensure that all learners have access to learning, the App offers an alternative to communicating for students with a hearing impairment, without having to worry about missing things when their teachers deliver material or information. Therefore, this enables the student to build better communication.

Curriculum area: The App, Connect, is aligned with the area of Student Diversity in the Australian Curriculum. One of the objectives of the Australian Curriculum is to provide equity and excellence in education for all learners. In line with this aim, this App helps students with a hearing impairment to have full access to knowledge, understanding, and skills that provide a foundation for successful and lifelong learning and participation in the Australian community (ACARA, 2013a). The app offers an alternative way of communicating and obtaining all the knowledge or skills they need to be equal in terms of education.

How does the app meet the National Disability Standards? The App aligns with the second standard of the National Standards for Disability Services, Participation and Inclusion. In meeting this standard, the App, Connect, will actively support and encourage children with hearing loss to feel connected to their families, friends, educators, and gives them the opportunity to feel included in learning communities (Government, 2013).

How the app changes pedagogy (SAMR)? Based on the SAMR model, the App aligns with the Modification level of integrated technology (Puenteledura, 2010). Although the App substitutes the traditional way (sign language), it does significantly change the mode of communication. People with hearing loss who use Sign Language may leave that ‘traditional way’, instead they just type whatever they want to say and the App will voice the texts. Moreover, it also has the ability to convert speech to text.
How the app encourages person centred planning? Connect was created based on the belief that people with disabilities have the right to be present and participate in their community. As Ramsey (2007; cited in Disability & Care, 2009, p. 25) claims, “planning has to place greater emphasis upon the importance of social contribution, intentional relationship facilitation, valued roles, disproving negative stereotypes and introducing a more critical thought base into the process”. Thus, the App encourages planning by providing opportunities, and facilitating people with hearing loss, to build relationships and participate in their community.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? The App encourages the areas of both Connectivity and Community based on the 5Cs model. It does offer alternative ways to connect with their community by encouraging the control and independence to communicate with others. As a result, people who are Deaf or hard of hearing can increase their opportunities to fully contribute, and this condition will lead to their social growth.

Evidence from the literature that the app is capable of the claims made. The App, Connect, was designed by a group of people who are Deaf and were concerned with difficulties in communicating with people without disabilities. The developer then created this App, which is based on evidence-based research. A study shows a benefit for Deaf people in maintaining the information received after listening to lectures when they use speech-to-text technology rather than if they use an interpreter service (Stinson, Elliot, Kelly, & Liu, 2009). However, another study by Marschark et al. (2006) revealed that there is no significant difference between using the real-time text through speech to text technology and direct (sign) instruction in supporting Deaf students’ learning from lectures. It means that there are improvements to be made and this technology definitely needs to be integrated with other approaches in order to obtain optimal results.

General Comments: The App can provide both students and teachers an alternative way to build communication and understanding. Teachers do not need to have specific skills (e.g. sign language) to deal with those who have a hearing impairment. Instead, they just need to support them with other practical approaches to ensure the full contribution of these children.
Name of app: Z5 Mobile

Operating System: iOS, Android
Location: iTunes Store and Google Play
Cost: Free

**Description:** This app allows people with a hearing impairment to make and receive point to point phone calls to and from any videophone. Sign language interpretation is one of the main barriers for people with a hearing impairment when communicating with a hearing caller. Z5 Mobile enables communication with non-signers by creating a video session with an interpreter. Sign language is translated to the hearing caller. This app has a special feature, “Number look up”, which finds the phone numbers for hotels, restaurants, business places by searching GPS map. In addition, it supports automatic emergency calls, as it works with any valid three-digit phone numbers. This app can be downloaded on iPad, iPhone, Android, Mac and PC.

**Alignment with the UDL guideline:** According to UDL guideline five, it is important to provide alternative modalities to express knowledge, ideas and concepts. This app aligns with checkpoint 5.2 which is “use multiple tools for construction and composition” (CAST, 2011). People with a hearing impairment can express their ideas and knowledge to non-signers through this app in collaborative study tasks. In addition, this app is highly associated with guideline 2 checkpoint 2.4, “promote understanding across languages”. Z5 Mobile supports understanding between people who use sign language and non-signers.

**Curriculum area:** Z5 Mobile app promotes collaboration on tasks between people with hearing impairments and other students as it allows the sharing of information and knowledge through point to point phone calls. Therefore, this app is suitable for secondary school children and tertiary education students.

**How does the app meet the National Disability Standards?** This app meets National Disability Standard two, “promote participation and inclusion”, by connecting people with a hearing impairment with their families, friends and their communities who have not got the skill of communicating through sign language. The “Number Look Up” option in this app meets standard 2, “Service access” by providing access to the contact details of the selected services such as restaurants, hotels and business places, and allowing the user to connect to them (Department of Social Service Australian Governent, 2013).

**How the app changes pedagogy (SAMR)?** In SAMR model, Z5 Mobile represent the modification level (Puenteledura, n.d). People with hearing and speech impairment are facing difficulties in communication with non-signers via the phone. Previously they have been used the text massaging to communicate with each other, but this app modifies the communication through the text massages to face to face communication with non-signers by providing video session interpretation of the sign language.
How the app encourages person centred planning. This app offers an opportunity for people with a hearing impairment to communicate with other people and it fits with the principles of person centeredness which states the importance of, “social inclusion, value roles and community participation” (NSW Department of Ageing, 2009). This app will provide opportunities for teachers, education developers and service providers to understand the needs of people with hearing impairments in their lives now and in the future.

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? 21st century teaching is the online teaching era. The teachers and students meet in virtual environments and teaching takes place in an online basis. This app promotes the online education of people with a hearing impairment and ensures the inclusion of people with a hearing impairment in online communications and group discussions.

Evidence from the literature that the app is capable of the claims made: Article written by (Crow, 2008), focuses on the four types of disabilities and their impact on online education in the USA, identified the difficulties of students with a hearing impairment for engaging in online learning. This app provides a solution for one of the difficulties in real time engagement with online discussion. However, this app should be developed further as the reviews of the app state that this app takes a long time for video interpretation (Google Play, 2017).

General Comments: As this app is free and supports IOS, Android, PC and Mac, accessibility and affordability might not be an issue. Z5Mobile app provides an alternative method for communication between people with hearing impairments and non-signers. Therefore, it promotes an inclusive society for people with hearing impairments.
Description: This app is designed to learn sound differences for children between the ages of 3 to 9 years. It helps children who are hard of hearing to learn sound, speech and differentiate between consonant sounds at an early age. The aim of this learning sound variations is developing the awareness of what the mouth, vocal chords and ears do when speaking and hearing. These speaking lessons are examples of the real-world environment. Funny cartoon characters, visuals and music are embedded so learning is fun. The “Rap Sound” option reinforces the target sounds while entertaining the child with singing and dancing. In addition, children can record their own speech and listen which increases the child’s self-monitoring skills and independent learning (iMoufe, 2014).

Alignment with the UDL guidelines: The iMoufe app aligns with the UDL guidelines 2 checkpoint 1, “Clarify vocabulary and symbols”. This app facilitates learning vocabulary by using funny animations, music and text. The words are clarified by embedded visuals, sounds and text. It also, can be fitted to the checkpoint 4, “Promote understanding across the language”. The lessons of the iMoufe app, offer visuals, pictures, sounds and texts to support understanding language. The “Record own speech-Listening” option of this app aligns with UDL guidelines 9, checkpoint 3, Develop self-assessment and reflection”. Learners can recognize their own progress. (CAST, 2011)

Curriculum area: This app could be used as a foundation for Literacy General capacity and Numeracy General capacity of children in F-2 year(ACARA, 2017). In addition, it is a self-learning tool for basic English language such as words, spelling, simple grammar and numbers.

How does the app meet the National Disability Standards? iMoufe promotes the National Disability standard one, “rights of the person” and standard two “Participation and Inclusion”. (Department of Social Service Australian Government, 2013). Every child deserves to become literate. Regardless of the disability, iMoufe helps a child with a hearing impairment develop proper articulation, pronunciation and sound recognition. Literacy is a core value of society, and learning language, pronunciation and speaking ensures understanding of the verbal communication around them and enables participation.

How the app changes pedagogy (SAMR)? This app is transformational of the teacher’s pedagogy at augmentation level. By augmentation of book based learning methods to visuals, music and text based learning methods. As this is an independent learning tool, this enhanced teaching refines the traditional teacher centered learning lessons to self-learning(Puentezura,2010).

How the app encourages person centred planning? This app focuses on the person’s unique interests and preferences. iMoufe is created for the children at age 3 to 9 years. It focuses their interest by adding funny cartoon characters, music and dance. It offers beyond the available options for the
children with hard hearing for articulation and pronunciation of the commonly use words. and helps to success their future (NSW Department of Ageing Disability and Home Care, 2009).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? Communication is a critical part of living with others in the diverse world of the 21st century. This app encourages communication between children with hearing impairments and other children. This also helps them to work together and supports connectivity and collaboration (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: If children who are Deaf or hard of hearing have functional hearing, they can learn both signed and spoken languages when input includes both (Lederberg, Schick, & Spencer, 2013). However, language and literacy development in children with hearing impairments is identified, significantly poor (Moeller, Tomblin, Yoshinaga-Itano, Connor, & Jerger, 2007). This app provides audio, visual lessons with subtitle for children aged 3-9 years. Case control study done among hearing people and people with early onset deafness shows early and continuous exposure to visual speech can improve the spoken language of people with early onset deafness (Auer & Bernstein, 2007). “Rap sound” option of this app reinforces target sounds and allows shared reading. Qualitative research done among young children with hearing impairments shows early shared reading, promotes achievements in the literacy skills of children (Mueller & Hurtig, 2010).

General Comments: Developmental educators and teachers could use this app for early years teaching for children with deafness/hardly hearing. It helps to develop children’s pronunciation and articulation, and improves the literacy of the child. Instead of traditional teacher centred teaching, this app provides self-learning tools which are fun and self-monitoring.
Reviewer: Samitha Gowinnage Dona

Name of app: Dragon Dictation

Operating System: IOS, Android

Location:

Cost: Free

Description: The Dragon Dictation app is a voice to text app. When someone talks to the iPad or iPhone, this app will process what it has heard and convert it in to text. The interface of this app is very simple and easy. It is five times faster than typing the text. The converted text can be published on Twitter, Facebook or can be sent as text message or email. This app uses the data from spoken messages collected over time and continuously improves its accuracy. It supports up to seven languages, English, French, German, Italian, Spanish, Dutch and Japanese. It benefits people who have hearing impairments to communicate effectively with non-signers. In addition, it helps children who are hard of hearing to self-practice their speech (iTunes Preview, 2017).

Alignment with the UDL guideline: Dragon Dictation app primarily aligns with the UDL guidelines 1, “Provide multiple alternatives”. This app allows students with hearing impairments access to auditory information. It helps to improve their knowledge of spelling, as it converts spoken voices to text. In addition, this app gives learners opportunities to express their ideas and emotions in communication with others. Therefore, it fits guideline 5, check point 1, “use multiple media for communication” (CAST, 2011).

Curriculum area: This app is useful in F-10 curriculum area. It helps students with hearing impairments to develop literacy. This app can translate teaching lessons to text in the classroom as well as online and, it enables them to interact with their peers, teachers and groups. This would be beneficial in developing life skills. (ACARA, 2017).

How does the app meet the National Disability Standards? Dragon Dictation matches the National Disability Standards 1 and 2. “Right of being literate and Participation and Inclusion” (Department of Social Service Australian Government, 2013). This app supports improvements in literacy and making decisions in their own life by providing access to inclusive education. It overcomes communication barriers of people with hearing impairments and assists them in engaging in conversations with family, friends and their community.

How the app changes pedagogy (SAMR)? This app modifies the teacher’s pedagogy by changing the sign language teaching method to voice to text translation method. Therefore, this app fits for the modification level of the SAMR model (Puente dura, 2010). Teachers and lecturers who do not have the skill of sign language, can use this app to deliver their teaching lessons to students with hearing impairments in the classroom/online teaching.

How the app encourages person centered planning. Persons with hearing impairments are able to use this app as a learning tool as well as a communication tool. It supports people with hearing
impairments to reach their life goals and increase their independence and community participation (NSW Department of Ageing Disability and Home Care, 2009)

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This app encourages community, connectivity and collaboration by encouraging students with hearing impairments in work and leisure activities with joining with other students and sharing data and ideas (Carey, 2013). When students with hearing impairments have difficulties in identifying what other people say, this app converts the voice to text, which can then be read by the person. Evidence from the literature that the app is capable of the claims made: Speech is a natural medium for expressive communication and it is faster than typing, writing and sign language. Today, automatic speech recognition technologies can correctly identify and write down more than 90% percent of a long series of spoken words in many languages (Wagner, 2005). As a speech to text transferring app, “Dragon Dictation” gives people access simultaneously to spoken words and auditory events. This real-time speech-to-text transfer is a powerful tool which provides people with a hearing impairment access to oral communication (Wagner, 2005). Wald & Ben (2008), explain the potential of voice to text applications in assisting universal access to communication and learning for children with a disability. Students with hearing impairments find it difficult to take notes while following speech through lip-reading or watching a sign language interpreter.

**General Comments:** This app is a cost-effective product that can ensure universal access to communication and learning. This app supports inclusive education. As it is free and supported by both iOS and Android operation systems, students can afford this app. However, this app has limitations as it does not have text to voice conversion or sign language interpretation feature. If this limitation can be overcome, Dragon Dictation would be more effective for students with hearing impairments.
Reviewer: Budur Alamrani

Name of app: WhatsApp
Operating System: cross-platform: IOS, Android
Location: Apple App Store & Google Play
Cost: Free

Description: WhatsApp helps people to stay connected to their friends and family at anytime and anywhere. It is a free and multilingual tool; which provides simple, secure, and trusted messaging and calling on smartphones. There are different features that WhatsApp has; in fact, it supports the exchange of information by various kinds of media like text, photos, videos, documents, and location, as well as voice calls. In addition, the app has the capacity to create a chat group with up to 256 people and to send them messages; whether it is documents, videos, and pictures (WhatsApp.com, 2017).

Alignment with the UDL guideline: According to UDL guidelines, it is necessary to ensure that important information is equally tangible for all individuals to reduce barriers faced by them. This can be achieved by providing information in different and various forms (e.g. via vision, hearing, or touch) (Rose & Gravel 2011). Taking WhatsApp into account, it provides multiple means for representation via pictures, videos, text, and audio to allow a diverse group of people to have enhanced communication. For example, a person with a hearing impairment can use WhatsApp to have a conversation with friends or family members not only using text messages but also using Voice Messages, which is one of the features of the WhatsApp application.

Curriculum area: By looking at some features in this application, we can see that it can assist individuals with hearing impairments in a social context as well as an educational context. Socially, WhatsApp is fundamentally a social app that allows people to stay connected. It enables users to start a conversation with each other at any time and in different ways like texting, voice messages, sharing video and so on. In the educational context, WhatsApp provides a feature, which is called “Document Sharing Made Easy” where individuals can share PDFs, documents, slideshows and more in a more convenient and faster way (WhatsApp.com, 2017). In addition to this, there is an opportunity to make a group where there is a chance to share with your friends at school or university some thoughts about a lecture or an assignment that requires collaboration.

How does the app meet the National Disability Standards? WhatsApp aligns with the National disability standards as it reflects the second standard, which is participation and inclusion. It refers to the service that involves individuals and families, friends and carers in order to promote a set of circumstances or opportunities that are designed to promote participation and effective inclusion within society (National Standards for Disability Services, 2013). This app addresses those points as it enables users to participate in their community; share their thoughts and ideas; and most importantly, feel included.

How the app changes pedagogy (SAMR)? This app may enhance teacher’s pedagogy at the redefinition level. At this level, technology allows for new tasks to be completed that were not previously conceivable. In the functional change at this level, the necessity of student’s collaboration and engagement in the curriculum becomes a part of the learning process. At this stage, this assistive
technology will allow for communication to occur where students are more likely to take a role in generating questions and discussions (SAMR Model, 2017). Considering that, WhatsApp is an effective tool, has many benefits in the area of collaboration, and is helpful in increasing social interactivity with peers and teachers (Bansal and Joshi 2014). WhatsApp’s instant messaging assists online collaborative tasks that require students to work as a team; in addition, information and knowledge can easily be constructed and shared via this app (Barhoumi, 2015).

**How the app encourages person centered planning.** WhatsApp is a communication tool that allows people to communicate as individuals or in groups by allowing them to create a group discussion where everyone can participate asynchronously and in various ways. Therefore, this clearly supports the idea of person-centeredness. According to the literature, “online support allows for sharing and following up communication between face-to-face meetings, such that the sharing can continue anytime at each person’s own pace and with each person having equal “voice” in the virtual world. A “Healthy” mix of face-to-face and online elements would combine the advantages of each medium and enhance the potentialities of person-centered education” (Motschnig-Pitrik and Standl 2013).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** WhatsApp encourage the 5 C’s especially in these principles: Connectivity, and community. First, connectivity is obvious when individuals use the app to have a conversation with others and to express needs and thoughts. In fact, it is helping people to stay connected and to understand each other through sharing thoughts, ideas and information. Also, community building is evident in one of the features that this app provides; being able to stay connected with groups of people who share your interests or thoughts, like your family or co-workers. In addition, with group chats, you can share messages, photos, or videos with them at once; name your group; notifications can be muted or customized (WhatsApp.com, 2017).

**Evidence from the literature that the app is capable of the claims made:** This app is capable of being an assistive technology that enhances different areas. According to research that aims to evaluate the media richness of various message delivery methods in mobile learning (m-learning) environments, the result shows that students’ preferences for the media that will best support mobile learning are as follows: 65% for WhatsApp, 25% for Email, 10% for Twitter, and 10% for BBM (See figure 6). However, most of the learners agreed that using WhatsApp in learning is much more convenient. Most learners attested to the fact that they chat with friends through WhatsApp on their mobile device every day in contrast to other media (Boyinbode et al. 2017)

**General Comments:** This app can be used both in the social context and the educational context. It is an assistive tool that enhances communication among communities and among universities and schools where support from online discussions becomes a critical element in building a learning community.
Reviewer: Budur Alamrani

Name of app: TextHear
Operating System: Android
Location: Google Play
Cost: Free

Description: Text Hear is a hearing aid app that assists people with hearing impairments in everyday conversations, by immediately converting natural speech to text and displaying it in large and clear font on the screen. This app is multilingual and built on high accuracy Speech-To-Text engines. Moreover, in order to ease comprehension, automatic punctuation & spacing is provided in this app. In the area of privacy issues, Text Hear app values users’ privacy, and that is why this app does not store anything users say or any other data about you. In fact, all the users’ notes are being saved on their own devices. See Google’s privacy policy as we work with their Speech-To-Text engine, and analytics services available for Android apps (Play.google.com. 2017).

Alignment with the UDL guideline: Information only transferred through sound is not equally attainable to all learners especially for people with hearing disabilities; therefore, to ensure that all learners have access to learning, alternatives should be tangible for any kinds of information (Rose & Gravel 2011). The Text Hear application allows users to have more alternatives for auditory information and this is by its capability to convert natural speech to text and display it large and clear on the screen.

Curriculum area: This app can assist people with hearing impairment in certain areas like social or educational life. For instance, if students who use this app in a group discussion, they will be able to participate and engaged with people around them more effectively. Moreover, it can also assist students in their learning environment where teacher speak and the app converts the information into written text. Consequently, this will address their needs and decrees the barriers in the learning environment.

How does the app meet the National Disability Standards? The Text Hear application aligns with the national disability standards especially at the first standard, which particularly promotes peoples’ rights such as self-determination, choice, privacy and freedom from discrimination (National Standards for Disability Services, 2013). This app in particular acknowledges the value of promoting users’ privacy and this by not storing users’ data of they say or share. In addition, in the second standard which emphasises the importance of inclusion and participation (National Standards for Disability Services, 2013). This app clearly assists people with hearing impairment to stay connected with family and friends. This obviously provides them with inclusive environment where they feel connected and they have the opportunity to participate and share their needs and interests with their chosen communities.

How the app changes pedagogy (SAMR)? Clearly, Text Hear app allows for transformation at the level of modification where the common classroom tasks are being accomplished through the use of assistive technology (SAMR Model, 2017). Engagement and participation are accessed by the use of Text Hear app. For example, students with hearing impairment are now able to understand what the teachers are saying at the lessons. Teachers who teach a person with hearing difficulties will
benefit from introducing this app tho the student because it is clear that it will improve the learning process for this student.

**How the app encourages person centred planning.** Text Hear application aligns with the person cantered approach. This app is designed in order to ensure that people with hearing disability are able to engage in the daily life conversations. From that, one of the key outcomes of person centred approaches is to enable people with disabilities to have normal and meaningful lives in the community and this what this app achieves to address from providing their service (Person Centred Approaches, 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs):** This app encourages connectivity and collaboration as well. First, Text Hear application allows individuals with hearing difficulties to communicate and participate in everyday conversation by the capacity to transfer the sounds to written text and this clearly help them to stay connected with their community. In addition, it aligns with collaboration where it provides individuals to share information and thoughts. By the feature of providing alternative auditory information, people with hearing disability are able to be among a group discussion and be able to participate and engaged collaboratively in real time.

**Evidence from the literature that the app is capable of the claims made:** Looking at the literature review shows that there is no articles or reviews that discussed effectiveness of this app in particular. However, according to the star reviews on the Google Play Store (2017), 39 individuals review this app including people who are with hearing disabilities and 32 of them rate this app with five stars, which shows positive trend.

**General Comments:** Overall, this app is an optimal tool for people with hearing disabilities. It allows them to engage in a real time conversation and it allows for collaboration being connect to the society where the barriers of connection is eliminated by the use of this app. It will assist them to be access to the information in their learning environment and take the benefit from it.
Reviewer: Budur Alamrani App 13

Name of app: TapTap
Operating System: IOS
Location: App Store
Cost: $4.49

Description: This app is designed to help people with hearing impairment in their life and this by assisting them to be aware of a loud noise such as shout, honk, crash that is near them. Basically, all it is needed to use this app is to launch it and it will vibrate and flash once there is a loud noise or if someone talks nearby. Adjustment of the sensitivity can be suited according to your environment and personal comfort level (TapTap app 2017).

Alignment with the UDL guideline: This app clearly aligns with the principles of UDL especially in regard of ensuring that individuals have safe space where there is a minimizing threat and distractions (Rose & Gravel 2011). Clearly, this app provides people with hearing impairment with the tool to be aware of what is happening in their environment and most important part is that they will be able to know if there is a very loud noise that might be dangerous for them. Therefore, we can say that this app minimizes threat in the environment and as a result it addresses the third principle that emphasizes the importance of providing individuals with alternatives means to be engaged in their learning environment as well as their daily life (Rose & Gravel 2011).

Curriculum area: This app could be used to address people with hearing impairment in their daily life and it helps them to response and to be aware of their audio environment (Tap Tap by David Vondracek 2017). “Alerting devices for a person with sight and hearing difficulties will let them know what is happening in the home eg. a caller at the door, activated smoke alarm or alarm clock, telephone ringing etc” (Deafblind Information. 2017). Therefore, this kind of app is very importance a person who is with hearing difficulties.

How does the app meet the National Disability Standards? This app follows the National Disability Standards and this by looking at their effort to provide users with options of vibration adjustments, which can be set according to a person’s needs. According to the NDS, under the Individual Outcomes Standard, a service planning, implementation and review should be designed according to individual strengths, needs and life goals and this clearly addressed in this app (National Standards for Disability Services, 2013).

How the app changes pedagogy (SAMR)? This app provides a clear functional improvement at the augmentation level where the users are having the opportunity to have a tool that considered to effective in their life. By this app users are being more engaged in the community (SAMR Model, 2017).

How the app encourages person centred planning? This app encourages person-cantered approach by allowing its users to be engaged and connected independently to the outside community (Person Centred Approaches. 2009). A clear example that the service provides is that an individual with hearing impairment might be in public in line at the bank, and there is a person behind him or her
who wants to tell this person that the teller is ready to serve the next customer. In this situation, the sounds will come to TapTap app and it will assist the person by activating the vibration and flash. This clearly helps a person to be aware of the environment by using the assistive technology.

**What area of a 21st Century approach to Teaching/training does the app encourage (SCs)?** According to Carey 2014, connectivity is one of the 5cs, it refers to the value of being connected to both leisure, and work activates with ease so that a person is encouraged to have control over the barriers and feel independent. Clearly, this app aligns with this principle in particularly because it allows the person with hearing impairment to engage actively of what is happening around them so there is opportunity to respond to the stimulus in the public environment.

**Evidence from the literature that the app is capable of the claims made:** No evidence from the literature has proven the effectiveness of this app; however, it is address a very important issue in a people with hearing impairment’s life, which is being in a public area and not being aware of sounds around them.

**General Comments:** This app assists people with hearing impairment to be aware of there is a loud noise in their environment and this very important any person’s life because there might be a dangerous situation that might need action to be save like a fire alarm.
Name of app: Sign Instant Message (SIM)  
Operating System: IOS  
Location: Apple Store  
Cost: Free

**Description:** Instead of having a regular keyboard in your phone, which has the alphabet, by the use of this app you can use sign language alphabets to send an instant messaging. This app is designed so that it can be used in real-time chats with the use of Internet. This app helps people with hearing impairment to stay connected to their friends and be able to chat with them (Apple Store 2017).

**Alignment with the UDL guideline:** This app aligns with the UDL guidelines if we look at the guideline 5, which is providing options for expressions and communications. This app provides people with hearing impairment to use the media of communications that is suited their way of communication. In fact, they use the sign language to communicate with their friends, which support the positive increase of wide range of expression in the media world today (Rose & Gravel 2011).

**Curriculum area:** This app is suitable in the area of communication and education. It assists the users to develop their community by having the mean to stay connected with them.

**How does the app meet the National Disability Standards?** This app focuses on assisting people with hearing impairment to communicate more effectively with their social networking and this by providing them with the use of sign language to chat. It focuses on certain individual’s strengths in order to assist them obtain more independence and control and this follows the National Disability Standards, especially in the regard of person centred approaches and the outcomes (National Disability Standards 2013).

**How the app changes pedagogy (SAMR)?** This app can clearly enhance the pedagogy in this by providing a functional improvement in the augmentation level where this app allows for student with hearing impairment to do a common task more effectively and helps them to engage in the learning process (SAMR Model, 2017).

**How the app encourages person centred planning?** This app provides its users to chat with the use of their sign language, which helps them to feel more comfortable, and this clearly will results in helping them to achieve their personal goals and feel more independent in the way they interact with the surrounding. This gives clear examples of the person centred approach where there are consideration of a person’s cantered needs and opportunity to achieve his or her potential in life (Person Centred Approaches. 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app encourages the 5Cs and this by allowing its users to build their social networks in order to have their own community that includes minded people who they like to do things together (Carey 2014).

**Evidence from the literature that the app is capable of the claims made:** There is no evidence in the literature review that could shows us the effectiveness of this app and according to App Store there
is no enough ratings received to display an average for the current version of this application. However, they clearly stated their two objectives and they are mainly important; the first one is to provide the users with the sign language instant messaging and to bridge the gap between deaf community and hearing (Apple Store 2017).

**General Comments:** Overall, this app mainly helps people with hearing impairment to be more engaged in the community and this providing them with a method that suite their way of communication. It is provide sign language alphabet keyboard.
Reviewer: Gwendolene Doyle App 16

Name of app: Let Me Hear Again
Operating System: IOS, Android
Location: Apple App store, Google Play
Cost: Free/Pro $2.49

Description: The Let Me Hear Again App has four different tools in one application. The first tool is a Face to Face Chat feature which recognizes seventy-one different languages and translates them into the users chosen language. It can carry out live translations of forty-one languages. It also converts text to speech so the user can type their side of a conversation and the recipient can hear the text as speech. The reverse of this is also possible whereby speech is converted into text. This text is shown on the screen and the font can be re-sized to suit the user. The second tool in the app is a Virtual Notes feature. This records speeches and conversations then saves it as text in the phone’s memory. The saved text/notes can be edited later and can also be translated to a language of choice. The notes can also be shared online, for instance through social media. The third tool built into the app is Quake Awake Alarm for Deaf. This tool sounds an alarm that reaches 100db and vibrates. The fourth tool included in the app is called Guardian Angel. This tool can be set to search for loud sounds in the surrounding area. It can be set for a designated amount of time. If it detects a loud sound that may pose a threat, it vibrates in order to alert the Deaf person to the danger.

Alignment with the UDL guideline: The Let Me Hear Again App allows Deaf people another way to express their knowledge through the conversion of speech to text, text to speech and storing long speeches like lectures in the phones memory. Therefore, it aligns with the UDL guidelines of providing Multiple Means of Representation and Multiple Means of Action and Expression.

Curriculum area: The Let Me Hear Again app could be used in all subjects as it aids communication between Deaf and hearing people. It would be particularly beneficial for university students who are deaf as they could record lectures as text then review and edit them later. It would also allow students to collaborate with their peers and work together on projects as it can instantaneously convert speech to text and vice-versa. Its translator feature would also support inclusion and collaboration.

How does the app meet the National Disability Standards? The app allows deaf people to participate in conversations in real time as it converts text to speech and speech to text. This automatically differentiates the resources used to access information and to participate. Therefore, the app meets the National Disability Standards, Standard One: Rights which focuses on self-determination, anti-discrimination and the right to have choices. It also meets Standard Two which relates to participation and inclusion as its tools support conversation and communication between all people. This promotes connection and collaboration amongst Deaf people and their families, friends and peers.

How the app changes pedagogy (SAMR)? The various features of the Let Me Hear Again app support Transformation, for instance, it converts speech to text and text to speech. It is a useful tool for the teacher and student as long speeches/lectures can be converted to text then stored and edited.
This helps students study at their own pace and helps them access information synchronously and asynchronously.

**How the app encourages person centred planning?** This app could support communication between the teacher, student and the student’s family, thereby encouraging person centred planning. Communication is vital in person-centred planning as listening to the person with a disability’s wants and needs is necessary in order to support them effectively.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** The app encourages Collaboration and Curation as it allows communication and collaboration between Deaf and hearing people. It also encourages Curation as it records and transforms speeches into text then stores them for later editing and use.

**Evidence from the literature that the app is capable of the claims made:** Alliano et al., 2012 supports the claims that Augmentative and Alternative Communication apps such as Let Me Hear Again can support and enable communication needs as well as being cost-effective. The literature also notes that using apps on a smartphone or iPad is also more socially accepted.

**General Comments:** This app could help developmental educators to be more inclusive in their transference of knowledge and information as Deaf students can listen to speeches and lectures then have them converted to text instantaneously. They can also store the verbal information in the memory of their phones to be used asynchronously. It would also support communication and collaboration between a student, their family and the developmental educator so that their wants and needs could clearly be communicated which would support effective planning. Another merit of the App is its cost effectiveness. There basic version is a free, but a Pro version is priced at $2.49.
Reviewer: Gwendolene Doyle

Name of app: Subtitles Viewer (Pro)
Operating System: IOS, Android
Location: Apple App Store, GooglePlay
Cost: Free/ Pro $9.99

Description: The Subtitles Viewer allows the user to synchronise their iOS device with a television or cinema screen in order to view subtitles. Users can select the language that they want to view subtitles in.

Alignment with the UDL guideline: This app could be used in the classroom for closed caption video that would meet the UDL guideline of Multiple Means of Representation. A Deaf student or a student with a hearing impairment could access content when a video is used as an educational or instructional resource. Therefore, the Subtitles Viewer App aligns with Checkpoint 1.2 of the UDL guidelines which is to offer alternatives for auditory information thereby making information equally accessible to all learners, particularly those with hearing disabilities.

Curriculum area: This app could support the incorporation of English Language Arts/Literacy Common Core Standards through allowing its user to interact with, and access, literature presented visually through movies. In doing so, the app would also support the content area of integration of Knowledge and ideas as well as building vocabulary.

How does the app meet the National Disability Standards? The app meets the National Disability Standards by enabling the user to exercise control and choice when they use a service or supports. For instance, they can choose the movie they want to see at the cinema instead of the cinema choosing for them; by deciding which movie will have subtitles. The app also supports the individual’s right to participate in their chosen community. For instance, they can go to the cinema with their hearing family/friends and enjoy the same movie as them.

How the app changes pedagogy (SAMR)? The Subtitles Viewer app is an example of an accommodation as it helps “a student fully access the subject matter and instruction (Nolet & McLaughlin, 2005, p. 84).

How the app encourages person centred planning. Disability, A., & Care, H. (2009) states that person centred planning has ‘a clear value base of achieving genuine social inclusion and community participation’ (p.9). This app supports the aims of social inclusion and community participation through enabling Deaf people and people with hearing impairments to engage in social activities with hearing people and have access to the same resources, such as going to the movies. The same aims can be realised in the classroom. As the teacher can include the use of visual animations/films in their planning and feel confident that a Deaf student can access the information/content from the film.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? The app encourages Connectivity as it encourages control and independence in leisure activities. For
example, going to watch any movie at the cinema because the app provides synchronised subtitles. It also encourages Community as movies can help us increase our knowledge and understanding of concepts, cultures and societies. Consequently, our ability to collaborate on those themes and share ideas is heightened.

Evidence from the literature that the app is capable of the claims made: According to Barbero, J. M., de la Riva, I. R., & Páez, M. S. S. (2015) TV subtitling (close-captions) is an extremely important technology as it significantly improves the lives of Deaf people and people with hearing impairments.

General Comments: Subtitles Viewer can allow a developmental educator to ensure equal access to information for all their students. The user can also choose the size, font colour and background to enhance the readability of their subtitles. This enables developmental educators to allow for individual preferences.
Reviewer: Gwendolene Doyle

Name of app: Skype
Operating System: IOS, Android
Location: www.skype.com, GooglePlay, AppStore
Cost: Free

Description: Skype allows users to send text and video messages instantly. It also allows users to send and receive digital documents such as images. Skype also has a Skype Translator which allows speech to be instantaneously converted into text.

Alignment with the UDL guideline: Through Skype, teachers can join Skype in the Classroom and use Skype to develop their curriculum along UDL guidelines. Skype can allow teachers to provide Multiple Means of Representation. For example, information about a topic or project can be accessed through an actual skype conversation with an expert in that field. This information can instantaneously be converted into text so that a Deaf student can gather and categorise what is seen and read. In this way, information and content is presented in different ways. Learners who are Deaf can also use Skype to express what they know through video or text conversations/presentations which supports Multiple Means of Action and Expression. Skype can stimulate interest and learner engagement as it allows those who are Deaf to connect with both hearing and non-hearing people all over the world. The opportunity to place the learning experience in a real-life context by having a virtual field trip or an expert virtually visiting the classroom may also motivate learners to engage with the content. Therefore, this aligns with Multiple Means of Engagement.

Curriculum area: Skype in the Classroom can be used to support all areas of the curriculum and all age groups of students

How does the app meet the National Disability Standards? Standard One of the National Disability Standards is Rights. Skype meets Standard One as it allows a Deaf person to engage in conversation instantaneously with people who are not Deaf as well as those who are. It also allows the user to speak and communicate privately. They also have a choice concerning whether they use the video call so they can sign or if they want to use Skype Translator so they can convert speech to text. As Skype can be used on a computer or smartphone, it also allows for choice regarding when and where it is used. It also increases the level of self-determination for Deaf individuals as they can access more information and resources as well as connect with more people so they can be more in control of their lives through informed decision making.

How the app changes pedagogy (SAMR)? The app allows the teacher to deliver more engaging resources such as a conference call with an expert or a virtual field trip. In this way, it is an Enhancement as well as a Transformation. It modifies the lesson as the delivery of information/resources becomes more accessible to all and it transform the lesson into a dynamic, collaborative community of learners rather than the teacher alone delivering information as a ‘sage on the stage’
How the app encourages person centred planning? Skype for the Classroom allows a teacher to provide person-centred planning as the needs, strengths, goals and interests of the Deaf student are taken into account, just as they are for every student. Skype provides technology which enables students who are Deaf to access the same information, resources and connect with people through the video messaging service and the speech to text feature. The student can also have autonomy over how they use the app and the supports it provides.

What area of a 21st Century approach to Teaching/training does the app encourage (SCs)? The apps encourages Connectivity as the user can use it to collaborate with others and resources connected to work or leisure. This increases their sense of self-determination and fosters independence. The app also encourages Community as it supports the building of online communities and can be a catalyst for social growth through the sharing of ideas and information in real time or asynchronously. This also highlights how the app encourages Collaboration.

Evidence from the literature that the app is capable of the claims made: The Victorian Curriculum F-10 proposes the use of Skype in the Classroom and discusses this in the Teacher Support Resources on their website. It highlights the positive impact of Skype on students’ learning as they can take virtual field trips, converse with experts and collaborate with peers. Skype’s Skype Translator was designed to also accommodate people who are Deaf or hearing impaired and set out to break down the hearing barrier (Lewis, 2015).

General Comments: It can support global education projects using videoconferencing that allows students to go on virtual field trips or speak to experts around the world. Students can connect with other students around the world also. Students who are Deaf or have a hearing impairment can use sign language when speaking to other sign language users or they can use Skype Translator to convert speech into text instantaneously. Therefore, they are included in and can avail of the same learning experiences and opportunities as students who are not Deaf.
Reviewer: Gwendolene Doyle

Name of app: RIDBC Auslan Tutor
Operating System: IOS, Android
Location: iTunes, GooglePlay
Cost: $19.99

**Description:** Staff at the Royal Institute for Deaf and Blind Children, along with expert Auslan users, developed the Auslan Tutor App to help families of Deaf children learn Australian Sign Language (Auslan). The Auslan Tutor is a video based teaching app. In addition to showing over five hundred individual signs, the app has an additional five features. Firstly, video footage showing the sign. Secondly, a photo of the hand shape the user must form to make the sign. Thirdly, video footage of the sign being used as part of a phrase. Fourthly, video footage of the sign being used in a sentence. Lastly, information on the Auslan grammar connected to the sign, phrase and sentence. The Auslan Tutor App also teaches the Auslan alphabet, numbers as well as Auslan Northern and Southern dialects.

**Alignment with the UDL guideline:** The Auslan Tutor App aligns with the UDL guidelines by providing Multiple Means of Representation for its users. Barriers to learning are reduced by delivering essential information through various modalities, for example, photo, video and text. Deaf children and their families could use this app together and each access the information in a way that suits them. The app allows the information to be adjusted to meet the user’s needs, for example, sounds can be amplified. Its five different features also allow a variety of users to access and understand the information. It provides Multiple Means of Action and Expression, more specifically UDL checkpoint 5.1: Use multiple media for communication as it teaches its users to communicate and express themselves through Australian Sign Language.

**Curriculum area:** By teaching and enabling its users to communicate and express themselves through Australian Sign Language, this app supports literacy throughout all the curriculum areas.

**How does the app meet the National Disability Standards?** This app encourages individuality and therefore meets the National Disability Standards by teaching its users an alternative means of communication.

**How the app changes pedagogy (SAMR)?** It is a Modification as it has modified the traditional way Auslan may have been taught. It allows the user to search through and access the information or sign they want to learn at a time that suits them. They can also replay any point as many times as they wish. The opportunities for individual choice regarding content and repetition modifies the traditional classroom lesson format.

**How the app encourages person centred planning?** The app encourages person centred planning as it focuses on the person and who they are as a member of the Deaf community. It also allows the Deaf person’s friends and family to be actively involved. In allowing the user to teach themselves, it provides an opportunity to empower them and give them autonomy over their learning.
What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This app encourages Community. The Deaf Community view themselves as members of a culture with its own traditions, values and language. The language of the Deaf Community is sign language and English is an additional language (Hallahan, Kauffman, & Pullen, 2015). By teaching children who are Deaf, their families and friends how to use Auslan it is building community.

Evidence from the literature that the app is capable of the claims made: Through supporting a child who is Deaf’s family or friends to learn Auslan, this app benefits the psychosocial development of a child who is Deaf. The ability to communicate with those around us aids our social-emotional development. As children who are Deaf, and children with hearing impairments, face barriers in their communications with others, they encounter challenges in forming peer relationships (Wolters, Knoors, Gillessen, & Verhoeven, 2014). This can lead to feelings of loneliness, isolation and depression (Connolly, Rose, & Austen, 2006). This can negatively impact upon their sense of belonging and inclusion in the classroom and in society. Hallahan et al (2015) believe that this results in people who are Deaf preferring to associate with other people who are Deaf or those with hearing impairments. By teaching hearing people to use Auslan, this app can support people who are Deaf to feel included in the classroom and society.

General Comments: This app could support teachers in learning and teaching Auslan.
Reviewer: Emma Farquhar

Name of app: Ear Machine
Operating System: IOS
Location: Apple App Store
Cost: Free

Description: Ear Machine, funded by the National Institute of Health (USA), is an application created to assist people to filter what sounds and noises they are hearing around them, allowing greater control over what they hear and do not hear. It can be beneficial to use in busy restaurants or classrooms to assist in focusing or being able to communicate effectively. Ear Machine has a simple wheel interface to allow the user to swipe and find the perfect setting. It also features EarShare an engine which allows the application to scan the sound environment and recommend settings to the user. EarShare also has the ability to learn what the user’s preferences are and adapt its recommendations accordingly (Apple, 2017).

Alignment with the UDL guidelines: The app Ear Machine can be seen to align with the guideline Provide Multiple Means of Engagement and more specifically aligning with Minimise Threats and Distraction (UDL Guidelines, 2014). The aim of the application to filter noise, which is not helpful to the user, allows the application to limit the level of distraction created by noises in a loud environment. The application can also be seen as an assistive technology and thus aligns with Optimizing access to Tools and Assistive Technology (UDL Guidelines, 2014).

Curriculum area: Ear Machine could be used in the classroom to aid in the curriculum areas surrounding interacting with others. It could be used in multiple instances where learning is reliant on being able to listen and synthesise information effectively (ACARA, 2017). Although not seen as linking directly to a curriculum area, the application can be linked to assisting a person with a hearing impairment in becoming more independent. It can also aid autonomy over their own environment. This can be elaborated into life skills, where the assistive technology allows the person to have control in environments such as classrooms, in the workforce or enable the ability to engage in social and community events where beforehand it may have been too hard to hear or induced sensory overloading.

How does the app meet the National Disability Standards? Ear Machine can be closely linked to Disability Standard Two: Participation and Inclusion (National Disability Standards, 2014). Using this application may allow the person to participate in facets of life they were unable to before because of their disability. These areas could include connecting with their community, by being able to actively engage in work or study, due to reduced distraction and ability to understand and comprehend verbal information more efficiently. It could also allow the user to collaborate with services. Therefore, it links in with Standard One: Rights, where the user could clearly understand what is being said and then be able to communicate their own thoughts and opinions about their life.

How the app changes pedagogy (SAMR)? Initially the application can be seen as a Transformation; in the sense that it can be used as a substitution to what may have been a low sensory environment or a
smaller classroom for the learner (Romwell, Kidder & Wood, 2014). Although, Ear Machine is more likely to be seen as an enhancement, as learning can be redefined to allow a learner to engage in the curriculum in a way that was not possible until the technology was available. For example, it could allow a person with a hearing impairment to engage in group based curriculum activities where they can limit the background noise and focus on group conversation (Romwell, Kidder & Wood, 2014).

**How the app encourages person centred planning.** Similarly to the National Disability Standards, Ear Machine could allow the user to be more involved in their own life, linking into the person centred standard of Authority, Control and Power (Person Centred Approaches, 2009). In the classroom, it could allow the teacher to work with the student to discuss assignments and what they are able to achieve with the use of the app. This could also transfer into services adapting to provide more support that is tailored to the person as they will have further input into the planning.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Ear Machine can be utilised to link in with Collaboration and Community by allowing the user to receive information clearly and instantly and to assist in communicating with others in the community, allowing the user to build social networks (Carey, 2013). It does this by creating an easy environment, one with selected sounds, for the user to communicate within.

**Evidence from the literature that the app is capable of the claims made:** It is discussed by Shinn-Cunningham & Best (2008) that social settings and classrooms, due to the amount of noise, are often regarded as the worst places to be able to listen and decipher by people who are hearing-impaired. People with regular hearing are able to single out a particular noise and isolate it (Shinn-Cunningham & Best, 2008). However, people who are hearing impaired often have difficulty or are unable to do this. Live Caption is able to limit the sounds that can occur in social settings and aid in isolating the important or preferred sounds, theoretically allowing the person with hearing-loss to reclaim this ability. Although most technology that is able to limit sounds is regarded as beneficial, there have been some reports which advise that sometimes these types of apps actually remove beneficial sound which aid in understanding language (Saripella, Loizou, Thibodeau & Alford, 2011). However, it is widely recognised that these types of technology tend to boost ability to learn language and comprehend it, especially in children (Douglas & Behrens, 2016).

**General Comments:** A developmental educator could use Ear Machine when working with people who have trouble focusing in loud environments, or experience sensory overload, as it would provide the ability to access the community and develop life skills. For example, a person could be supported to use the application when shopping to limit the amount of audible noise and focus on the feedback provided by their friend, or the service assistant, about the clothing they are purchasing. This would promote independence within, and connectedness to, their community. Overall, Ear Machine could be beneficial in multiple environments where noise can worsen limited hearing capabilities, allowing for extended opportunities for engagement in the classroom and community.
**Reviewer:** Emma Farquhar

**Name of app:** Live Caption

**Operating System:** IOS & Android

**Location:** Apple App Store & Google Play

**Cost:** $4.99

**Description:** Live Caption created by Gut Reaction Inc. is an iOS and Android application designed to translate spoken word via face-to-face conversations to text in real-time by using voice recognition. Live Caption allows people who are hearing impaired to talk with people around them and facilitate conversations with colleagues, family, and friends by showing the user what they have said in text format on their device of choice. Live Caption has capabilities of extending distance by use of Bluetooth and this enables it to be used in classrooms or meetings where required (Apple, 2017).

**Alignment with the UDL guidelines:** Live Caption can be seen as meeting the guidelines under UDL’s Provide Multiple Means of Representation (UDL Guidelines, 2017). For example, Live Caption aligns with guideline Offer Alternatives for Auditory Information as explained in the UDL Guidelines (2017) using captioning and voice to text technology. Live Caption also allows use of multiple languages, therefore, also meeting the UDL guideline Provide Options for Language in Alternatives for Visual Information (UDL Guidelines, 2017).

**Curriculum area:** Live Caption could be used to enhance life skills for a range of ages (as long as they have basic reading comprehension) by providing opportunities for the user to engage in their community. For example, Live Caption would provide the ability to talk with a sales assistant and have easy communication between them, promoting understanding and independence. The app could also be used in literacy settings, allowing a student to work on their listening* and reading skills as the app translates verbal speech into written speech promoting reading comprehension by the user. This specifically aligns with the curriculum around interacting with others (ACARA, 2017). *Listening can be modified to comprehension of what has been said.

**How does the app meet the National Disability Standards?** Live Caption is in alignment with Disability Standard One, Rights and Disability Standard Two, Participation and Inclusion. Under the Standard of Rights, Live Caption can be seen to promote choice and control and freedom of expression through the ability to use the app to further understand the verbal communication around them. This also aligns with Participation and Inclusion as it provides a tool to assist in engaging conversation and participation in their life (National Disability Standards, 2014). Live Caption also touches on multiple other standards as it can be used as a tool to aid in communication which would assist in meeting other standards (National Disability Standards, 2014).

**How the app changes pedagogy (SAMR)?** Live Caption could be seen simply as a transformation by substitution of paper based or hand typed communication styles. Creating an ease of communication between students and teachers allowing more efficient learning. However, Live Caption is also an enhancement by modification as using the app would provide opportunities for redefining learning and engagement by the student. For example, a task could be redefined to allow
collaborative communication within the classroom and instantaneous peer feedback to the user (Romwell, Kidder & Wood, 2014).

**How the app encourages person centred planning.** Person Centred planning as used within Live Caption can be seen as promoting independence which aligns with the theme ‘Authority, Control and Power’ as discussed in Person Centred Approaches (2009). This independence allows the person an opportunity to have their own input into their lives because they have the ability to understand the world around them and their own needs better. Live Caption can also be seen as linking in with the core theme ‘Tailoring Support to the Person’ when the app is used as a special device in the classroom to enable effective learning (Person Centred Approaches, 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Live Caption inherently encourages Communication, Collaboration and Community. Communication is the key focal point of the use of Live Caption, the app allows the user to understand verbal conversations if they are unable to hear or lip read them, providing greater knowledge, learning and independence (Carey, 2013). This communication also allows for the aspect Collaboration by allowing the user to engage in feedback and share their ideas with the ability to easily understand what their peers are sharing and discussing. Live Caption could also be seen as promoting Community as it would allow students to communicate with hearing impaired persons and the deaf community without needing to learn sign language or other forms of communication (Carey, 2013).

**Evidence from the literature that the app is capable of the claims made:** Wald (2006) suggested that the use of voice to text captioning in classrooms is more efficient than using a sign language based interpreter for multiple reasons, highlighting that students were not always able to comprehend all of the information being translated into sign language because students assumed they knew more sign language than they actually did. Marschark, Leigh, Saprere, et al. (2006) support this and explain that speech to text applications have the ability to improve information absorption in the classroom. However, it was also discussed that voice-text did have its downfalls, for example, some students were unable to read the text as fast as it was produced. It was interesting to note that the use of an audio to text and an interpreter in the same classroom severely limited learning, as students were unable to decide which source of information to prioritise. However, literature discussing the use of face-to-face audio to text software in life skills and groups in classrooms is limited and therefore the ability to judge the effectiveness of the app is reduced.

**General Comments:** As a developmental educator, Live Caption could be used to assist in case meetings for clients to promote a greater understanding of what is being discussed. Linking in with the disability standards to ensure excellent provision of services, participation and positive individual outcomes. Overall, the app could be used in collaboration with speech assistance apps or sign language to ensure a holistic approach to person centeredness is achieved and an ability for greatly improved learning in workplace and classroom settings.
**Reviewer:** Emma Farquhar

**Name of app:** Five App

**Operating System:** iOS & Android

**Location:** iTunes Store and Google Play

**Cost:** Free

**Description:** Five App is an iOS and Android social media application created by Five Technologies. It claims to allow the user to connect to the deaf community by sending American Sign Language in the form of small character animations (with expressions) as an instant message (Google Play, 2017). The user can add contacts from Facebook or via their phones contact book for added connectivity. The app has the option of adding text to the message as well as being able to check what a particular sign means by pressing it. The developers of Five App claim that the app was created with people learning sign language in mind as well as working closely with the deaf community (Google Play, 2017).

**Alignment with the UDL guidelines:** Five App can be seen most clearly as aligning with two guidelines in the Universal Design for Learning Framework. The first, 2.4, Promote Understanding Across Languages, is a key design of the app, allowing the user to communicate in their own language and have it able to be interpreted by a user who may not understand it (UDL Guidelines, 2014). The other guideline apparent in the Five App is, 5.1 Use Multiple Media for Communication. This guideline discussed the ability to integrate other types of media into learning, noting that writing is not always the best options for all learners. The ability to use animations of sign language is what Five App uses to meet this guideline (UDL Guidelines, 2014).

**Curriculum area:** Five App could be utilised in an important area of life skills around socialisation and connection to community. The ability for Five App to link in with social networking to provide a specific range of communication tools, allows the user to teach and learn their language in an informal and comfortable setting. In the classroom, this could be seen as allowing the use of alternate language to assist in learning and understanding core English skills. The ability to converse in both sign language and spoken/written language allows the user and teacher to extend knowledge in applicable areas of learning, enhancing communication (ACARA, 2017 – 2).

**How does the app meet the National Disability Standards?** The key area of the National Disability Standards easily seen in promoting use of Five App is the ability to participate and be included (National Disability Standards, 2014). The ability to integrate specific sign language into social media and Five Apps own platform allow for users and people hard of hearing to participate and communicate in ways which are beneficial to them. The ability for the app to also include learners of sign language and the emphasis on communicating with teachers or peers allows the user to widen their inclusion in society (National Disability Standards, 2014).

**How the app changes pedagogy (SAMR)?** The use of social media and applications like Five App create a transformation of teaching through redefining what is possible in learning (Romwell, Kidder & Wood, 2014). Although computers and smart technology often have options for other languages, sign language is limited due to its physical nature of communication. Therefore, the ability to...
transfer this physical information into other media creates an entirely new possibility of integrations. The SAMR theory of teaching would define this as a redefinition of teaching, technology allowing alterations to teaching that were not possible before (Romwell, Kidder & Wood, 2014).

**How the app encourages person centred planning.** The key themes of Person Centeredness focuses around the person being able connect and communicate with those around them to express wants and needs (Person Centred Approaches, 2009). Five App would encourage the themes of Community and Communication in person centred planning through encouraging engagement with a community of people outside of those who already use sign language and aid in communication technologies available for those who already use sign language (Person Centred Approaches, 2009).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Five App can be seen encouraging Communication, Collaboration and Community, three of the five Cs of the 21st Century approach to Teaching. As discussed above, key themes around communication and the link this creates to community encourage a different style of learning and inclusion within community and classrooms. It is also interesting to discuss how this app could meet the ideas around collaboration, with the use of social media and an ability to promote trans-language communication (Carey, 2013). Therefore, it works as an excellent tool to aid in group based activities at school or in the work place.

**Evidence from the literature that the app is capable of the claims made:** Discussed in Saunders (2016) was that using social media, sign language is being used less and thus was reducing the community aspect that is a large part of people’s lives. Saunders (2016) discussed this in relation to other marginal communities such as LGBTI and how the use of language or themes aided in the strength of their community. Five App allows the utilisation of both social media and sign language which limits the negative impact of text-speech and social media technology in the perceived negative impacts on the deaf community. The ability for students to use not only text based supports, but to use sign language in the classroom is discussed by Marschark, Leigh, Sapere, Burnham, Covertino, Stinson and Noble (2006). They note that multiple approaches to expression and language assists the learner to gain more information than from one singular source. Marshark et al. (2006) also mentions the confusion that can be caused when having a live interpreter in a classroom and the issues around dividing attention between multiple sources of information. Five App could alleviate this as the use of speech to text with the inclusion of sign language animations would direct attention to one area with improved understanding through language translation (ACARA, 2017 – 2).

**General Comments:** From discussion, it can be seen that Five App creates a new way of communication and useful adaptations to teaching a learning. Integrating the ability to use instant messaging in their own language removes some of the barriers associated with learning and working in mainstream areas. The most promising area of this app is the focus on including those who are new to sign language, as it promotes the inclusion of all people.
Description: The Application Be Warned is created by Be Warned inc. for people with hearing loss or deafness (Google Play, 2017). The app comprises of four main categories, sound monitoring, text to speech/speech to text, music conversion, and emergency calls. Sound monitoring is explained as able to detect sounds which may be a threat in real-time, meaning things like, car horns, door bells, barking dogs, and screaming are able to be picked up by the application. Once picked up, the application will then try and alert the user through light and vibration. The app also uses the dictation (or text to speech) capability to then aid the user to communicate in the hearing community. A great feature of this app is also its ability to transpose music into rhythmic light and vibration patterns to assist the user to experience music in an alternate way, this component is called ‘Dance’ (Google Play, 2017).

Alignment with the UDL guidelines: Be Warned is an example of UDL guideline one, Multiple Means of Representation and more specifically 1.2, Offer Alternatives for Auditory Information (UDL Guidelines, 2014). The ability for the application to understand and translate audio (voice to text) information and turn it into a different representation including visual stimulus and written word are examples of the application meeting key areas in this guideline. The ability for the Application to provide a visual and sensory option for listening to music also links in with this guideline (UDL Guidelines, 2014).

Curriculum area: Be Warned could also be beneficial in music classrooms with the use of the ‘Dance’ feature. allowing the user to better understand the meaning behind rhythm and possibly allow the chance to learn music even if they have limited hearing in a non-intrusive way (ACARA, 2017). The year three and four curriculum for music covers understanding tempo, silence and volume which could be translated by Be Warned to assist the learning of someone with hearing loss and enabling them to join in mainstream education (ACARA, 2017). A key area for Be Warned to be used in would be life skills around living independently in the community. The use of the app for alleviate needs for other single use assistive technology in the home and would make multiple uses for an app on a platform widely used by all people in society.

How does the app meet the National Disability Standards? Be Warned supports the National Disability Standard One: Rights and National Disability Standard Two: Participation and Inclusion (National Disability Standards, 2014). The text to speech option in the application allows the user to understand and be understood, meaning that the person is able to express their wants and needs, aiding in choice and control. This can then be aided further in the use of ‘dance’ as well as text to speech, which would aid in Participation and Inclusion in activities and learning (National Disability Standards, 2014).
How the app changes pedagogy (SAMR)? BeWarned could be used as an Enhancement through Augmentation, as it could be seen as replacing the need to have someone directly supporting the person with hearing loss and also providing improved functionality and independence for the individual (Romwell, Kidder & Wood, 2014).

How the app encourages person centred planning. The use of the BeWarned application can allow aspects of individualised approaches to be viable. For example, the use of the application could support a person’s goal of living independently in the community, as it would alleviate concerns around duty of care and dignity of risk when a person is low of hearing. The use of the applications speech to text capabilities would possibly enable better communication with service providers, which would assist in the person to share and express their opinions (Person Centred Approaches, 2009).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? BeWarned can be seen as encouraging communication, using dictation and this could lead ultimately to benefits in collaboration and community (Carey, 2013). The ability for the app to aid in communication encourages discussion and expression of learning between teachers and peers and would create options for collaboration in learning as tasks could be designed around using the app to facilitate communication (Carey, 2013).

Evidence from the literature that the app is capable of the claims made: It was discussed by Friedner and Helmreich (2012) that the ability to turn higher pitched sounds into lower frequency sounds, essentially vibrations, ensured that people with hearing loss were able to listen more effectively than the higher pitched sounds. BeWarned therefore is more effective through turning noise into vibrations. Furthermore, Cachia (2015) discusses hearing as including multiple senses not just aimed at the one organ. This includes visual and physical sensations which enables people who are unable to specifically hear, to still listen and understand what is going on around them. BeWarned utilises these ideas and provides visual and physical stimulus through light and vibration to allow the user to listen without necessarily hearing (Google Play, 2017).

General Comments: As a Developmental Educator I could see the app being used to enable independence for people with hearing loss in the community. BeWarned provides the chance for a person with hearing loss to feel safer in the community by providing specified warnings for things that a person with higher levels of hearing would react to. The ability for the app to have multiple uses including the ‘dance’ and ‘voice to text’ components make it more likely for people to continue using the app.
Reviewer: Indiana Patterson

Name of app: Braci Smart Ear
Operating System: Android
Location: Play Store
Cost: Free (in app purchases)

Description: Braci is described as an alert system. It analyses and recognises sounds and then transforms that information into written text. It alerts the user utilising different forms of sensory input. It can be programed to recognise other sounds that the user wishes to add. An example would be a fire alarm going off, the application would recognise the noise, and alert the user possibly by flashing the screen or vibrating and would have written down what the noise was. This application can be considered a safety application. It utilises the microphone on a mobile device to hear the sounds around it (Braci Smart Ear, 2016).

Alignment with the UDL guideline: Braci offers the user a direct substitute for auditory information. As such, there is a focus on 1.2 ‘offer alternatives for auditory information’ of the UDL guidelines. It provides a visual and/or tactile alternative giving the user higher levels of independence and control over their chosen environment (UDL Guidelines, 2014).

Curriculum area: This application can assist its user in a variety of areas. Firstly, in the area of literacy. This application recognises sounds and converts that information into written text which needs to be read off the screen. This can greatly improve a student’s literacy skills at an accelerated rate. Secondly, ICT capabilities are now a recognised area of learning within schools (Australian Curriculum, 2014). As such the user is utilising ICT technology through this application and may have an excellent understanding of ICT because of their usage.

How does the app meet the National Disability Standards? The application aligns with the national disability standards. This can be observed through the manner in which the application enhances the user’s life. For example, the user may be able to participate more in a variety of activities knowing this application will alert them to anything that the user feels they should know (National Disability Standards, n.d.). It can increase feelings of security and inclusion within the user.

How the app changes pedagogy (SAMR)? There is an overall functional improvement, allowing for more information to flow to the user than previously experienced without this application. This is a direct example of modification because situational and task redesign has been shown through the addition of extra opportunities and responsibilities requiring revaluation and redesign (St. Matthew’s Perish School, n.d.). Modification falls under the Transformation section and is the desired category to fall within.

How the app encourages person centred planning. The application offers more independence giving the user more control and power, which moves either way from the traditional approaches where much of the independence is taken away and given to a professional or carer. It can allow for more active participation in the community and meaningful social roles (Person Centred Approaches,
n.d.). The application can also be modified by adding in sounds that the user wishes to add, this allows for the application to be personalised to the user.

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Braci conforms best with the area of creativity within the 5 C’s. This can be observed through the way information is being presented, in new ways, and through the manipulation of information. The application has acknowledged that not all individuals receive information in the same way and instead has offered an alternative which focuses on other senses, such as visual and tactile, alerting the user in a different way and then presenting the information in a different format i.e. written (Carey, 2013).

**Evidence from the literature that the app is capable of the claims made:** The foundation of this application is similar to that of a speech to text application, converting sound into written text. The wider literature supports such an application and has expressed the need for such applications in the public and for individuals who may have a hearing difficulty (Collins, 2013; Kushalnagar, Lasecki, & Bigham, 2013). This support for similar applications implies there is some benefit to the utilisation of Braci. More specifically other alert systems have been studied and the information shows a need for such systems and the importance of such systems. Alert systems are used in a variety of setting and help to save lives and improves individual’s quality of life. There appears to be a positive correlation between alert systems and the individuals utilising them (Pickering, Litell, Herasevich, & Gajic, 2012; Kaur, Sharma, & Kaur, 2016). The wider literature, therefore, shows a need for such applications and there is evidence to suggest that users would benefit in their every-day lives and overall quality of life.

**General Comments:** This application is useful for individuals who may have a hearing difficulty, helping them hear appliances and loud noises. The wider literature has shown support for the foundation of this application both in its delivery and the concept. Due to lack of information it is hard to determine if the application is successful, but it does show promise in that it allows for transformation in SAMR. It also follows the UDL guidelines and has the ability to enhance an individual’s quality of life through independence and control (Whoqol Group, 1995) over one’s environment. There is the possibility that facilitators could have more time to spend on the education of their students because students who have a hearing difficulty would have more independence. For example, the application could tell them when the bell rings, and if there are safety drill bells. The application can have other noises programmed in and the facilitators could utilise this for educational purposes.
Reviewer: Indiana Patterson

Name of app: Transcense (alternative Ava)
Operating System: IOS, Android
Location: App Store and Play Store
Cost: $29 per month

Description: Transcense is an application that offers the user an alternative to spoken language, especially for individuals who have difficulty hearing. The application provides captions in real-time, giving the user the information that is being discussed verbally in written form so that an individual who may have difficulty hearing can still be involved in the conversation. For example, if someone is speaking out loud and the Transcense application is running it will hear what is being said and transform that into words that can be read directly off the screen. This application can be used in a one-on-one setting and in a group setting. The current application is optimised for a group of six to eight speakers, but can go as far as twenty speakers. Interestingly, Transcense connects to other devices in the area in order to hear the conversation more clearly, for example, it will connect to a friend’s mobile phone in order to hear them better (Ava, 2014).

Alignment with the UDL guidelines: Transcense offers the user the ability to collaborate and communicate more effectively. The application allows the user to participate in group discussions in real-time. This allows for opportunities to engage with peers and learn appropriate social skills. This gives clear examples of ‘Multiple Means of Engagement’ through the ‘fostering of collaboration and communication’ found within the UDL guidelines (UDL Guidelines, 2014).

Curriculum area: Transcense was designed with a focus on adults, but it is easily adaptable for younger people. However, a minimum age of six is required, because the user needs a basic level of literacy to operate this application. The Australian Curriculum (2013) recognises literacy and social skills as areas of learning. Transcense can assist in these particular areas. For example, if a student connects the application to their teacher’s mobile phone, then this would allow them to read what is currently being spoken by the teacher. As a direct consequence, the student would be able to participate in the classroom more effectively. Similarly, if the student connects their application to a peer’s mobile phone then they can participate in real-time discussions with their peers. This allows for collaboration and the growth of social skill development.

How does the app meet the National Disability Standards? Transcense meets the guidelines given by the national disability standards. An example of this can be seen through the significant participation that the application offers, giving the user the opportunity to become active members of the community through collaboration. This can be observed in the participation and inclusion section within the national disability standards (National Disability Standards, n.d.).

How the app changes pedagogy (SAMR)? There are two pathways offered by SAMR (St. Matthew’s Perish School, n.d.) and this particular application could relate to either depending on the amount of hearing loss experienced by the user. The first is augmentation (St. Matthew’s Perish School, n.d.), and if the user has a minor hearing difficulty then this pathway would be most applicable. It allows for some functional improvements which can be observed through the usage of more
effective communication. The application acts as a direct substitution. The second one is redefinition (St. Matthew Perish School, n.d.), which allows the user to participate in situations and tasks that would not have been previously possible. This is best suited for individuals who have severe hearing difficulties, are unable to communicate at a satisfactory level, and through the usage of the application are then able to communicate at a satisfactory level.

**How the app encourages person centred planning.** Transcense aligns with the person centred approach. For example, the application can be installed on a mobile device and as such would therefore have been modified to suit the user’s needs. This application was designed to give users who may have hearing difficulties another way to collaborate and communicate effectively, through the optimisation of an every-day device (Person Centred Approaches, n.d.).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This application aligns best with collaboration through the exchange of information and ideas (Carey, 2013). Transcense offers both a one-on-one discussion setting and a group discussion setting. The application is equipped with a real-time feature that gives you the spoken words instantly; enabling live discussions. This encourages collaboration and gives access to a wider audience.

**Evidence from the literature that the app is capable of the claims made:** The wider literature has shown great enthusiasm toward this application (Fernandes, 2015) (Shepherd & Alpert, 2015) (McFarlane & Snell, 2016). Only one of those authors has looked at the utility of Transcense in depth. Fernandes (2015) found that the rate of accuracy from speech to text was above 80%. The author explained that there was still room for improvement such as the amount of people it could accurately analyse, and the connectivity between devices. However, the author concluded that he believed it was an overall success. The founding concept behind Transcense, a speech to text application, has been studied heavily (Kushalnagar, Lasecki, & Bigham, 2013; Udofia, Aloysius, & Agboke, 2015; Collins, 2013). A speech to text application has shown, through other examples, how useful it can be for its users; the results show a positive correlation between the usage of such an application and user satisfaction. Similarly the reviews posted on the Google Play store showed a positive trend. There were a number of complaints centred on the same issues that Fernandes (2015) found. Despite the negatives, this application shows great promise and with a little improvement would definitely be capable of meeting its original aims.

**General Comments:** Over all Transcense has the potential to be an extremely helpful tool for collaboration and effective communication. It has optimised everyday technology to make it more appropriate for the user’s needs, and has a variety of settings making it more accessible to a wider population. If facilitators had access to this application, they may be able to present students who may have a hearing difficulty with more information and allow them to collaborate with peers in the classroom. One important idea to note is that this application can be used by a wide variety of people, and can be effective for a range of students who may have other difficulties in the classroom, for example auditory processing disorder (Moore et al., 2010).
Reviewer: Indiana Patterson

Name of app: VoxSciences (VoxSci)
Operating System: IOS, Android
Location: Apple Store & Google Play Store
Cost: Free

Description: VoxSciences is an application where the main focus is on speech-to-text, utilising voice recognition software. This application specifically handles voicemails left after someone calls the user via a phone. The voicemail is then converted to written text and sent through to the user. The user is provided with options on how they wish to receive the converted voicemail, such as: SMS, email, or API interface (The Really Mobile Project, n.d.).

Alignment with the UDL guidelines: This application provides the user with an alternative to spoken language, which gives them easier access to the wider community. Even a simple missed phone call from a salesman can now be recognised. VoxSciences has a narrow field but it is a powerful tool for fluid information between people. The information is broken down and then constructed and composed into a useful format for the user. This follows the current UDL guidelines and specifically addresses the guidelines that focus on providing a variety of methods for expression and the actions taken to achieve effective communication (UDL Guidelines, 2014).

Curriculum area: VoxSciences falls under ICT which is now a recognised area within the Australian Curriculum (2014). The application gives the user a new way of completing certain tasks, and provides options upon deliverance. It can be a tool to empower, not just the user but society as a whole. It provides the user with greater control over their lives, and helps to encourage an equal environment, especially among school-aged individuals. VoxSciences could be utilised by facilitators, either to directly teach ICT or to help include the users of this application in a fun, creative way.

How does the app meet the National Disability Standards? This application has been utilised by companies such as Microsoft, Vodafone, BBC, and many more. As a result, this application is constantly being reviewed and improved to provide a better service for its users. It enables and supports its users in their everyday lives and their ambitions. As such VoxSciences aligns with the National Disability Standards through equality, management and person centred approaches (National Disability Standards, n.d.).

How the app changes pedagogy (SAMR)? This application helps achieve tasks that might have been otherwise difficult if not impossible. An individual who may have difficulty hearing may also have difficulty hearing another individual through the speaker of a phone. This application provides the individual with a modified version, focusing on another format to better suit the user’s needs. This gives clear examples of modification which falls under transformation within SAMR (St. Matthew’s Perish School, n.d.).

How the app encourages person centred planning. VoxSciences assists their users to participate more within the community through the modification of everyday technology. The users may have more
options for communicating with their friends, family, and acquaintances; leading to more social inclusion and lack of isolation. This application provides a creative way of supporting its users to obtain or maintain their independence resulting in less usage of services. As such this application delivers a person centred approach to its users (Person Centred Approaches, n.d).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** This application encourages communication between people and provides the user with more access to the wider community. Everyday interactions, that can be taken for granted, encourage social growth and understanding; such as calling back the repairman, or getting voicemails about work. And mundane interactions, like the ones previously mentioned, make up a thriving community between exchanges and mutual investment (Nicholls, 2010). Out of the five C’s this application aligns best with ‘community’, due to the interactive nature of the application with the wider community (Carey, 2013).

**Evidence from the literature that the app is capable of the claims made:** The idea of speech to text is not a new concept and as such there is literature on the subject (Stan, Bell, & King, 2012). The specification the application has taken on, with the voicemail function and then conversion, is not a subject found within the literature. But the utility of speech to text which is the centre of the application has a positive perspective from the literature (Acero, Chelba, & Sanchez, 2010). It provides a popular alternative to the standard format of communication utilised often by society. As such the wider literature appears to support an application where the focus is on speech to text, but more research is needed in to the specific area VoxSciences has chosen.

**General Comments:** VoxSciences has moved past the potential stage into the realization stage, and the application is being used by big name companies. It provides the users with easier access to the wider community, and the wider literature supports the foundation that VoxSciences currently rests on. Facilitators could utilise this application for their students. For example, the user could be more involved in decisions and notifications about what is happening, actively encouraging independence. It could be a direct tool to help teach the students about ICT, and lastly it can help teach younger students about what is currently available and why it’s available.
**Reviewer:** Indiana Patterson

**Name of app:** Pedius

**Operating System:** Android

**Location:** Play store

**Cost:** Free

**Description:** Pedius is an application that offers their users an alternative for communication. It has a specific focus on individuals who may have a hearing difficulty. The application utilises voice recognition software. For example if one person calls another person who is using Pedius, the application will convert what the person has said into written text. It also provides the option of responding to the caller through written text that will be delivered using a synthetic voice, or if the user would prefer using their own voice (Pedius, n.d.).

**Alignment with the UDL guideline:** Pedius provides the user with an alternative for receiving and delivering information. Therefore, this application assists the user in actively participating in discussions, and gives the user more freedom that therefore gives more independence. This application as such provides options to its users, and creates a more favourable environment in which information can flow more readily between individuals and groups. This gives a clear example of the UDL guidelines, particularly with the section entitled ‘provide options for expression and communication’ (UDL Guidelines, 2014).

**Curriculum area:** This application assists its users in communicating in a manner that is more appropriate for their needs, and this leads to more interaction with other people. The Australian Curriculum recognises and encourages the education of social and personal capabilities within the school environment and beyond. This application, if utilised in the right way, can give the user access to a wider circle of people and assist them in the development and maintenance of their pre-existing relationships. And as such can also assist them in their development of social and personal capabilities, through access to a wider audience (Australian Curriculum, 2014).

**How does the app meet the National Disability Standards?** Pedius has a focus on giving back independence and control to its users. It supports the users in making their own decisions and directs them to the services they wish to utilise. This is a startling change to the traditional approach where the users were given minimal independence and many of the decisions were decided by the professionals. This gives clear signs of following the National Disability Standards, through innovation, person centred approaches, and effective communication between services to deliver the best they have to offer (National Disability Standards, n.d.).

**How the app changes pedagogy (SAMR)?** Pedius gives the user the freedom to communicate in a way that they find favourable. The application can act as a direct substitute for verbal communication, but it also provides the user options within its service. This is achieved by the usage of one’s own voice or a synthetic voice. Alternatively, the user can type what they wish to send if they do not wish to physically speak. This information indicates that the application can act as a direct subtitle but with functional improvements. This leads to the conclusion this applications falls under
‘Augmentation’, which is a subgroup of ‘enchantment’ within the SAMR framework (St. Matthew’s Perish School, n.d.).

**How the app encourages person centred planning.** This application has a focus on assisting its users to communicate more effectively. It accomplishes this by giving the users alternatives and options for communication, and due to this has the ability to be tailored for the users. The application also encourages a favourable environment, giving an equal opportunity to everyone. This gives clear examples of person centred approaches, shown through focusing on the users and their needs. Pedius moves away from the traditional approach where the professionals decided on what the individuals needed and the expected quality of life was low, with minimal improvements being explored (Person Centred Approaches, n.d.).

**What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)?** Pedius assists the user to communicate more effectively, both in their immediate social circle and in the wider community. Independence is encouraged through Pedius, achieved by assisting clients to communicate with anyone they wish to communicate with, repairmen for example. This application also assists in minimalizing the need for a carer and gives back more control to the user. This provides examples of connectivity based on the 5 C’s discussed by Carey (2013).

**Evidence from the literature that the app is capable of the claims made:** There has been no research completed on this application, but the core features surrounding the application have been researched. The first feature is speech recognition. There is evidence from the literature to suggest that individuals who have a hearing difficulty have positive attributes and outcomes in relation to speech recognition (Healy, Yoho, Wang, & Wang, 2013). There has been a significant positive correlation between speech recognition and individuals who may have a hearing difficulty (Laplante-Lévesque, Hickson, & Worrall, 2010). The positive attributes and outcomes were in part due to the access to more communication, which this application claims to provide. The second feature is the synthetic voice, providing an alternative for the user’s voice. This can be the favourable option in a range of circumstances, for example if an individual has multiple disabilities, if an individual cannot hear at all, or if the user’s spoken language is not at a clearly understandable level. The utility of a synthetic voice has shown positive improvements for individuals who may have a hearing difficulty, a famous example is Stephen Hawking (Mullennix, 2010). The wider literature supports the main components that encompass Pedius, further research is required into the combination of the two core features, and exploration into the application itself.

**General Comments:** Facilitators through this application may have an easier time communicating the information they wish to impart to their students. The application will provide the user with a written copy of what is being spoken, which gives an alternative to the method that is currently being utilised. There is also the potential within the application to assist their users with social participation, which is an important life skill and an area within the Australian Curriculum. In short, this application has the potential to be utilised both inside the class and outside the classroom.
Reviewer: Indiana Patterson

Name of app: Eye-Sign
Operating System: Android
Location: Google Play Store
Cost: Free

Description: Eye-sign is an application which assists an individual with a hearing difficulty communicate more effectively. The best description that can be given is through an example: One individual will say something to another individual who is utilising this application and the information will be converted into sign language, and pre-made videos of sign language will be shown to the recipient so that they understand what has been said using a visual aid (Google Play, n.d.).

Alignment with the UDL guideline: This application assists its users to participate in discussions, it provides another method that can be more suited to the user’s individual needs. Eye-sign aligns with the current UDL guidelines particularly ‘use multiple tools for construction and composition’ which in essence explains that all individuals should have access to multiple tools to optimise their potential. This application provides that option to its users to maximise their potential (UDL Guidelines, 2014).

Curriculum area: Eye-sign conforms in part to the Australian Curriculum (2014), this application has a particular focus on critical and creative thinking. Essentially critical and creative thinking in this context refers to information/data and to deliver it, manipulate it, and organise it. Eye-sign follows that path, the application delivers information one way, manipulates it another way, and stores information for later retrieval.

How does the app meet the National Disability Standards? This application provides its users with the support they need in order to achieve their ambitions. Eye-sign helps their users to communicate more effectively, and can help its users to achieve their goals. The application focuses on certain individual’s strengths in order to assist them in obtaining more independence and control. This follows the National Disability Standards, particularly within person centred approaches and the outcomes (National Disability Standards, n.d.).

How the app changes pedagogy (SAMR)? This particular application opens a great many doors with its unique design. This application is unique in both its design and deliverance. It gives the user the opportunity to communicate more effectively, and allows a wider audience to communicate with, whereas before this may not have been possible. One individual is given the option to speak into the phone, while the other individual has received that information in a format that may assist them in their discussion. Without this technology, these two individuals might never have communicated otherwise. This falls under ‘redefinition’ with the SAM guidelines because tasks that were previously impossible now are possible. Redefinition comes under transformation; the most effective way of utilising technology/devices

How the app encourages person centred planning. Eye-sign assists its user to communicate in a format that they may more comfortable with. This helps them to achieve their goals, and encourage
independence. It helps the user to communicate with a number of different people whereas this may not have been possible before. This gives clear examples of the person centred approach, focusing on the individual’s needs and maximising their potential in life (Person Centred Approaches. (n.d.).

What area of a 21st Century approach to Teaching/training does the app encourage (5Cs)? This application falls under creativity because of its delivery of information in new ways and the manipulation of the information.) As such this application focuses heavily on two out of the five C’s (St. Matthew’s Perish School, n.d.). Firstly, there is creativity. Secondly there is curation as Eye-sign collects and stores videos of sign language to later be received to deliver information to the user. (Carey, 2013

Evidence from the literature that the app is capable of the claims made: Eye-sign is a unique application in that it provides a video visual alternative to the usual system where information is exchanged over the phone via spoken language. The utility of this design has been discussed in depth (Wald, n.d.), and has shown a lot of promise. Currently there are few applications out there that provide this alternative and as such there is not a lot of corresponding literature on the exact angle this application has focused on. There has been a significant amount of research into sign-language recognition systems, where the system analyses what the individual is signing and transforms that into a written or verbal response to the receiver (Debevc, Kosec, & Holzinger, 2011; Li, Lothrop, Gill, & Lau, 2011; Potter, Araullo, & Carter, 2013). That system is very similar to the current application in question. It has shown a positive correlation between the usage of such systems and users’ satisfaction, and there was also a distinct improvement in the flow of information (Potter, Kosec, & Holzinger, 2011). As such, the literature supports the concept and ideas that Eye-sign has utilised, but more research needs to be completed specifically into the utility of an application that has stored videos, in which one person says something and the application then transforms that into sign language.

General Comments: This application has excellent potential and is one of the first to deliver information in such a way through every-day technology. Eye-sign has the ability to help a wide variety of people connect, and before that may not have been achievable. The literature supports systems very similar to this application showing positive correlations between the system and user satisfaction. Facilitators could utilise this technology to deliver information to students who may have trouble hearing. It can provide a process that both the facilitator and student are both comfortable with, and it would create an equal environment among the students. It would also help to teach the student language, both verbal and non-verbal through the usage of the application. This application can also assist with social interaction within the classroom setting and beyond, teaching important life skills about social interaction.
Conclusion and Recommendations

As a group we reviewed 35 applications, we focused on hearing impairments. These applications either had to have a focus on helping individuals with a hearing impairment, often therefore designed specifically for individuals with a hearing impairment. Or a mainstream application and the reviewer explored how that application could be of use for an individual with a hearing impairment. These applications were compared against variety different standards, these standards included: the National Disability Standards, Person Centred Planning, Universal Design Learning Guidelines, the 5 C’s (Connectivity, Creativity, Curation, Collaboration and Community), SAMR Model (Substitution, Augmentation, Modification, and Redefinition) and Curriculum Areas. This was then reviewed against the wider literature, often the literature did not discuss the particular applications under review, as a substitute the group explored the fundamentals of the application and what the application could provide to its users. The overwhelming response was positive, indicating these applications are of benefit to their users and indeed actively achieve what they set out to do.

The implications here are endless, the reviews conducted show a wide range of different applications that can and do focus on hearing impairments. It has been shown that assistive technology can improve an individual’s quality of life (Agree & Freedman, 2011). This gives promise that these applications have that potential, whether that be through helping them in their day-to-day lives through more active social participation or through something else like a safety application that increases their independence.

The majority of the information gathered has been positive, but a recommendation is given within this conclusion. Each application can help enable an individual, can assist him or her in their day-to-day lives, but each individual is different. Some applications may be appropriate and some may not, this can be seen through issues such as: generalisability and accessibility. Often this comes through in forms of location, money, age, knowledge and so forth. For example, one application may help certain students learn but would not be engaging for another.

As the technological age has come about the need for more technology has followed (Collins & Halverson, 2010). There has been a call for more assistive technology (Hurst & Tobias, 2011), and the possibilities for assistive technology are endless. However, even an ordinary mobile phone, an every-day device can be transformed into a piece of assistive technology through assistive applications (Page, 2013). As such the wider literature supports the need for such applications as the ones that have been reviewed within this e-book. It implies that the work being completed by these creators is an important job and that there is current demand for more assistive technology. Whether that be to help with healthcare for individuals with a disability (Hoang & Chen, 2010) or to help our current aging seniors as they develop and maintain their disabilities (Plaza, Marti, Martin & Medrano, 2011).

Overall the applications reviewed have shown great promise, the wider literature giving support for many of these applications. The applications themselves have not been analysed within the wider literature, but the foundation and ideas have been heavily studied within the wider literature.
References


SAMR Model - Technology Is Learning (2017) Retrieved from:
https://sites.google.com/a/msad60.org/technology-is-learning/samr-model on 20th May 2017


Useful Links


http://soundscouts.com/ (App official website)

https://www.facebook.com/soundscoutsapp/ (Facebook page)


http://www.aud1.com/ (App website)


https://www.overpass.co.uk/app/ear-spy/ (web site)


https://getbewarned.com/ (web site)

Facebook: https://www.facebook.com/BraciInc/?ref=search

YouTube: https://www.youtube.com/channel/UC45Tsa_KWhjk3E8cvk8PbuA

Home Page: http://www.braci.co/

Facebook: https://www.facebook.com/VoxSci/?ref=br_rs

YouTube: https://www.youtube.com/user/VoxSciences

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Facebook Page: https://www.facebook.com/PediusCall/

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