

This fact sheet will help answer some of the questions that teachers and parents have about using iPads and other tablet devices in the classroom and at home.

There is increasing interest in the use of tablet devices with school aged children. Some schools are already using them with students, many parents are interested in accessing them for their child and there are early intervention services that are recommending them for some children. There has been media coverage of the topic and the internet provides many recommendations about devices and applications (apps) that may be useful for children on the autism spectrum.

While it is clear that iPads and other tablets are attractive to many children, not just those on the spectrum, it is important that the role and use of tablets and other devices is carefully considered. This is particularly important when tablets are being recommended as communication and teaching devices.

What is a tablet? What is an 'app'?

A tablet device is an all-in-one computer that is accessed via a touchscreen operated by the user's finger tapping on or swiping the screen. There are a number of different types of tablet, one of which is the iPad by Apple. Tablets are used to access the internet and as a platform for pieces of software known as 'applications' or 'apps'. Tablets may be easier for many people to access because of the touchscreen (rather than using a mouse or a keyboard) and because they are highly portable.

A simple search of the Apple 'app store' using the word *autism* gives more than 1200 different options related to autism.

Tablets as communication devices

Traditional voice output communication devices have, for many years, provided specialised augmentative communication options for children on the spectrum and other disabilities. These devices are often highly individualised and robust. They are generally supported with training from a range of professionals. They can, however, have drawbacks including lack of portability, weight and cost¹.

One of the important uses of tablets and smart phones (which, although smaller, can be used in the same way as tablets) has been as communication devices for people with complex communication disorders. Using specialised apps, users are able to select words or build sentences by tapping on pictures that are then spoken by an electronic voice, providing a means of communication.

For some children, tablets can provide an economical, flexible and socially acceptable means of communication that have multiple functions extending beyond augmentative communication^{1, 2}. The devices are lightweight and highly portable meaning they can be more easily carried and used by children on the spectrum who tend to be able to walk independently (as compared with a student using a wheelchair). In addition, tablet devices are mainstream devices which mean that they are appealing to many children, easy to operate and provide a high degree of 'normalisation' of augmentative communication. In addition, features of the iPad and other tablets, such as the ability to take photos and videos, mean that communication can be highly personalised and relatively quickly modified. Direct touch access (rather than mouse, switch or keyboard) makes the devices highly accessible. The visual displays are also often highly appealing and motivating for children on the spectrum.

It is important to note, however, challenges such as access, glare, fragility and sound quality may impact on usage. In addition, because the systems are so easy to buy and use, they may not be specially designed or supported for the person using the device in the same way as a traditional device.

What does the evidence say?

The ability of children on the spectrum to use traditional speech generating devices, and the positive impact this can have on communication and other skills is well established³.

There is widespread and encouraging anecdotal information about children on the spectrum learning to use tablet devices to communicate; however, there is still limited scientific research. Recent reviews have confirmed that children on the spectrum and other developmental disabilities can be taught to use a range of speech generating devices,⁴ but only a small number of studies have looked at using tablet devices specifically.

One such study⁴ taught three children to use a small hand held device (iPod Touch, a phone-sized device that can access apps, games and the internet) to respond to a verbal cue ('Let me know if you want a snack/toy'). A trainer initially physical prompted the children to touch the device and access the appropriate symbol. Two of the three children became proficient at using the device, although it is important to note that systematic and relatively intensive training was required. There was no information about whether the children learned to use the device to request in everyday contexts. The third child, who had the most limited communication skills prior to the study, did not learn to use the device even after 40 training sessions, indicating that there are likely to be some baseline skills required to learn to use these types of systems.

A follow up to this study⁵ looked at teaching two children more advanced operations such as turning on the device and following multiple steps to make a request. Both children learned to unlock the device and access multiple pages to make requests but, as in the earlier study, there was no discussion of spontaneous use beyond the training sessions in which the communication partner had indicated they could make a request ('Let me know if you want something').

Other recent studies have compared speech generating devices (iPods and iPads) with signing and picture exchange^{6, 7}. This research found that children preferred different modes and that their preference was related to how quickly they learned to use the communication system. For most children, the iPod was the most preferred and most easily learned option, but the authors made a note that there was not a single system that was suitable for all children.

A recent review of 15 studies⁸ in this area concluded that iPads had a positive effect on the communication skills of the children participating in the research and were seen as a preferred option for communication by parents. While many of the participants learned to use the devices, it is important to note that direct instruction was required for the children to learn and there was no information about the use of the tablets in normal daily activities. More research in this area is required.

Tablets to support features of autism

The number of apps that have been developed with the aim of supporting features of autism is enormous. Some of the purposes of these apps include:

Communication:

- Creating visual supports
- Creating schedules and timetables
- Sharing information between home and school
- Functioning as a speech generating device

Social interaction

- Providing a platform for social stories and video modelling
- Social sharing and turn taking
- Social skills modelling (facial recognition, emotions)
- Programs that purport to teach eye contact

Behaviour support

- Tracking and monitoring patterns of behaviour
- Providing behaviour supports such as reward charts
- Diaries, journals (using alternate mediums)

Sensory processing support

- Visually stimulating apps
- Calming and self-regulation

What does the evidence say?

There is currently limited scientific research that has looked at the impact of iPads and other devices on these features of autism. There are certainly many anecdotes about how effective the apps can be and there has been a great deal of media attention, including television reports on the program *60 Minutes* in both the US and in Australia. Using iPads and other tablets as speech generating devices for communication now has an evidence base as described above; however, there appears to be limited literature at this point in time that has specifically evaluated the effect of any other social, visual communication or behaviour support functions⁹.

One study that has tried to address this gap is a recent, as yet unpublished, study that has looked at the effect of iPad use on the rate of goal attainment in communication, behaviour and social skills in 34 students on the spectrum in autism-specific education settings¹⁰. This research found that the trial was followed by a substantial increase in goal attainment in communication and behavioural areas, while there was more limited data on social skills goals. Overall, the authors concluded that the majority of the participants had greatly benefited from the trial, but they caution that further analysis is required to evaluate the effectiveness of particular selected applications and their impact on autism related skills.

In general, because apps targeting the core features of autism are so numerous, so popular and so widely recommended in a variety of forums, it is important that teachers and parents carefully evaluate the needs of individual children, the most appropriate app available and the potential benefit for each child.

Tablets to support learning and classroom functioning

Tablets are already being widely used in both specialist and mainstream education settings to provide new or alternative ways of learning a range of skills. Apps have been developed that provide learning platforms for any number of curriculum activities across the age range. These activities include phonics, sight words, spelling, letter and number recognition, vocabulary development and maths activities for younger students as well as science, geography, history and language for older students. Tablets are also used as e-readers, video and slide show tools, and to access the internet for research and other purposes.

What does the evidence say?

A large scale trial of iPads by the Victorian Department of Education and Early Childhood Development (DEECD) in 2011¹¹ looked at the impact on learning of iPads in the classroom, in both mainstream and special education settings. The study aimed to investigate the iPad's capacity to increase independent learning and motivation, to improve teachers' capacity to plan for and meet individual needs, to extend learning beyond the classroom and improved parental engagement. Positive outcomes were found for all these aims, but the researchers noted that that quality teaching was the factor which enables the iPad to be used effectively to improve student motivation, engagement and learning outcomes. Importantly, teachers found that the iPad was especially valuable for students in special education settings, due to 'its design features, multi-functionality and access to specific purpose apps'.

A number of small studies have looked at the use of iPads in video self-modelling for teaching students on the spectrum new skills. One study found a positive impact of using the iPad for video self-modelling on responding in class¹², while others have found similarly positive outcomes on tasks including checking spelling¹³ and teaching numeracy skills¹⁴.

Practical considerations

While anecdotal reports and the media have suggested that iPads and other tablet devices are a 'godsend'¹⁵, a 'miracle device'¹⁶ and capable of 'in a sense, curing the disorder'¹⁷, it is clear from research that iPads require support, teaching and careful planning if they are to be useful for children on the spectrum.

One framework to consider when assessing the suitability of an iPad for an individual child is the SETT framework (Student, Environment, Tasks, Tools) developed by Joy Zabala¹⁸. In this framework, the child's skills and needs are considered along with the environment the child learns and lives in, and the specific tasks they are expected to do. It is only once these three elements have been thoroughly considered by the team working with the child, that tools to help them are considered. Tools in this framework may include services, strategies, training, accommodations and modifications as well as technological tools and devices. Considering children's needs in this way means that iPads and other devices are only seen as part of any solution to a particular need, rather than as a cure-all.

It is clear from the research described above that successful implementation of these devices requires significant support and training for all involved, including teachers and parents, and that practical aspects, such as durability, glare and volume, must be given some thought when considering the use of a tablet. It is also important that other options for communication and curriculum access are developed and supported for times when the iPad or tablet is not available, such as when undertaking a water-based activity or when damage or technical issues occur.

Overall, tablet devices, such as iPads, appear to hold promise for children on the spectrum in terms of communication, supporting features of autism and in curriculum access when their use is individualised. It is important to note, however, that there is limited empirical evidence at this point and that research to date clearly indicates that *'it is quality teaching and support that makes (positive outcomes) possible, not just the device'* (DEECD, 2011).

Recommended further reading and websites

Spectronics blog: www.spectronicsinoz.com/blog/wp-content/uploads/2012/09/Successfully-using-iPads-to-support-Students-with-Autism-LINKS.pdf

The Autism Association of WA has produced a website that reviews apps that may be of use to some students with autism: www.autismapps.org.au

The learning app guide: www.learningappguide.com/

iTunes U course, including the Apps for ASD wheel developed by Mark Coppin:
<https://itunesu.itunes.apple.com/audit/COH3CQR8H2>

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