Premier’s Australian Association of Special Education NSW Chapter Research to Practice Special Education Scholarship

iPads as Assistive Technology in Inclusive Education

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The focus of my study tour was to investigate how iPads are being utilised as an assistive technology tool to support students with a disability to access the national curriculum and engage education and training ‘on the same basis as students without disability’ (*Disability Discrimination Act* 1992).

The research involved investigating how iPads and iPad software are being used by classroom teachers in Western Sydney Region and in the United States to assist students with disabilities to access the curriculum and engage in high quality teaching and learning programs. The aim of my research was to identify instructional techniques that encompass the purposeful application of iPad technology within special educational settings to enable students to effectively communicate, engage in rich learning experiences and enhance their learning outcomes.

The *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2008; Melbourne Declaration) provides the policy framework for the Australian Curriculum. It includes two goals:

* 1. that Australian schooling promote equity and excellence
	2. that all young Australians become successful learners, confident and creative individuals and active and informed citizens (ACARA, 2012).

My research supports these goals as it investigates an assistive technology tool that enables students with disabilities to access and participate in the Australian Curriculum and provides specific advice with regard to meeting the learning needs of students with disability. The propositions that shape the development of the Australian Curriculum establish expectations that it is appropriate for all students. These propositions include:

* + that each student can learn and that the needs of every student are important
	+ that each student is entitled to knowledge, understanding and skills that provide a foundation for successful and lifelong learning and participation in the Australian community
	+ that high expectations should be set for each student as teachers account for the current level of learning of individual students and the different rates at which students develop
	+ that the needs and interests of students will vary, and that schools and teachers will plan from the curriculum in ways that respond to those needs and interests (MCEETYA, 2008).

My study supports the Australian Curriculum in that it aims to investigate alternative opportunities for students to represent their learning (for example, using technology and augmentative alternative communication systems). The purpose of this advice is to support teachers in meeting their obligations under the *Disability Standards for Education 2005* (Commonwealth of Australia, 2006) to ensure that all students with disability are able to participate in the Australian Curriculum on the same basis as their peers through rigorous, meaningful and dignified learning programs.

Communication is an essential skill for all students, including those with special education needs. With new assistive technologies, specifically iPad applications, available for students with special educational needs it is important that we identify effective instructional techniques and practical apps that enable students to both communicate effectively with their teachers and provide opportunities for independence in their learning.

My Study Tour

My study tour provided me with the opportunity to investigate the latest trends in assistive technology at the Assistive Technology Industry Association (ATIA) Conference in Orlando, Florida; the latest research at the Council for Exceptional Children Division on Autism and Developmental Disabilities (CEC DADD) in Clearwater, Florida; and iPad technology at the iPad Summit in San Diego, California, as well as research evidence-based practice integrating technology in schools catering for students with additional needs. The aim of my study was to research and identify examples of best practice when using iPad technology and share examples of high quality teaching with other professionals. With new assistive technologies, specifically iPad technology, available for students with special educational needs, it is important to identify effective instructional techniques based on best practice.

School Visits

Throughout my study tour, I had opportunities to visit and network with many teachers, both in the United States and throughout Western Sydney Region during organised school visits and impromptu discussions at the conferences I attended. The opportunity to develop global networks was one of the most rewarding components of the tour. During the school visits in the United States, specifically Florida, I was able to network with lead teachers from a few schools in Orange County that cater for students with special educational needs. I appreciated the opportunity to discuss how those teachers support their student’s learning and engagement with the curriculum using mobile technology as assistive augmented communication (AAC) devices and to support engagement with the curriculum.

During my classroom visits I was able to observe students and speak with teachers from a variety of classes. One observation I made is that within classrooms where mobile technology is used in a one-to-one ratio many students were using low tech communication systems alongside their mobile devices to communicate with peers and teachers. Many of the teachers stated that they believed their students needed to master low tech communication (simple and complex) systems before moving to high tech mobile devices for the same purpose.

Many of the classroom observations I made in the United States consisted of iPad technology supporting student engagement with learning content, both individual and in small group situations. Similarly one the schools I visited in Western Sydney Region uses iPad technology specifically to support curriculum goals, using the iPads’ accessibility options to improve levels of engagement and an app selection tools to make informed decisions when selecting apps for purposeful learning experiences.

Most of the organised school visits in Western Sydney were in schools for specific purposes. They were using iPad technology to support students communication skills, with many of the iPads locked to a communication app. In the schools I visited, Proloquo2go and TouchChat were identified as the most utilised apps to support students communication.

I was able to observe and discuss with classroom teachers how iPad technology is being incorporated into teaching and learning activities to provide students with opportunities to build on their personal learning goals. A few examples of mobile technology supporting students include the apps First and Then and 30Hands being used to enhance students’ independence when completing tasks in sequence. Teachers are using the Proloquo2goand Aacorn apps during daily interactions, as well as for community access. One teacher commented that the reception from community members during community access has been extremely positive. She attributed that to the iPad being viewed as a universal device, with one store owner asking which communication app he should purchase for their store’s iPad to support people with disabilities in the community. The iPad’s universal design was is also addressed by Cumming and Draper-Rodriguez’s (2012) research when they suggested: ‘… as iPads and other tablet devices become more prevalent in both schools and society …’; however, they also stated: ‘ … it is crucial that an evidence base be developed in order to inform teachers, parents, and other stakeholders of the best educational practices related to this popular technology.’

During my interviews with university researchers, I was able to discuss and view new research and the impact this research has on student learning outcomes.

Conferences

Throughout my study tour I aimed to ask educators, administrators, app developers, technology and special education experts about the potential evidence base that is supporting the implementation of iPad technology in special education learning environments.

During the CEC DADD conference I was able to attend conference sessions that covered the following topics:

* + technology supports for literacy and numeracy skill development
	+ an examination of video prompting with and without voice over narration with students with autism spectrum disorder
	+ improving conversational skills via interactive whiteboards for middle school students
	+ a meta-analysis of the empirical basis for apps as interventions for students
	+ instruction to support the acquisition of mathematics and vocabulary for young English language learners
	+ strategies for facilitating spontaneous communication with students
	+ I can speak for myself
	+ how to ensure implementation of educational best practise in special education classrooms
	+ Project Math: Embedded Instruction of Early Numeracy Skills.

The ATIA conference was very memorable. I was able to build my global networks by becoming a member of the #ATIAchat and #ATchat groups, and engaging in the first ATIA conference tweetup. I also had an opportunity to attend a luncheon with ATIA Director David Diker due to my active online social media presence. He was very interested in my study tour and what I had learnt. Both the ATIA conference and the iPad Summit were coordinated via a mobile app. This in itself was a great opportunity to personally see how apps can support personal schedules, providing alerts, reminders, links to conference materials and further detail about presenters.

I attended many sessions over the four-day conference, where I was able to generate a detailed list of apps, discuss instructional strategies with researchers and network with teachers. The sessions I attended were:

* + Assistive Technology Bootcamp (two days)
	+ Using the iPad for AAC and Education: What’s New?
	+ A classroom AAC Progression Strategy from Bigmack to Sounding Board
	+ Low Cost Apps as Tools for Teaching Care Language
	+ Clicker Apps Reading Writing and Communication
	+ Making AAC in the Classroom Work
	+ Proloquo2go 4 in Depth: More Communication at Your Fingertips
	+ Not Your Typical Poddsters: Implementing PODD
	+ Transitioning from Picture Exchange Communication Systems to iPad Based Communication Systems
	+ App Smack Down
	+ Finding Text for Students; Apps Included
	+ Intervention + Apps Behavioural Success; Strategies for Student Outcomes
	+ The Communication Matrix
	+ Assistive Technology System with Universal Design for Learning (UDL) in Active Classrooms
	+ Get It Write Apps and Accessories for Assisting Handwriting.

At the iPad Summit I attended conferences focussing on app identification and increasing my technology skills. This was a great opportunity to meet many of the technologically savvy people I follow on YouTube, Pinterest and professional blogs to learn a few new skills.

I attended the following sessions (many of which had waiting lists due to their popularity):

* + App Smashing
	+ Explain Everything
	+ The School Leaders iPad Implementation Checklist
	+ Come On Get Appy! A Blueprint for the Innovative and Effective Integration of iPads in the Classroom
	+ The Paperless Classroom Made Simple: Workflow Tips and Tricks
	+ Panel Discussion Leadership in Technology.

During my discussions with university researchers, Catholic education office administrative staff, teachers and community members, I was able gain deeper knowledge about implementing mobile device programs, effective instructional techniques, recent research and projects being undertaken. Much of the current research around using mobile technology to help students with disabilities acquire new skills is single case study design. After discussions with Dr Jennifer Stephenson at the Macquarie University Special Education Centre, Dr Therese Cummings at the University of New South Wales, and Dr Kate O’Brien at the Catholic Education Office Sydney about current research and projects, the results are promising when using iPad technology in conjunction with evidence based practise.

Discussions with researchers and app developers whilst attending the CEC DADD conference also identified promising results for student learning outcomes when using effective instructional techniques to teach new skills. Some instructional techniques identified include least to most prompt, most to least prompt, self-prompting, reinforcement, use of schedules, video modelling and task analysis.

Draper-Rodriguez, Strnadová and Cummings (2014, p11) state that: ‘… research has indicated success in using mobile technology to support students with intellectual disabilities in learning a variety of skills.’ They continue: ‘… educators can make informed decisions about which applications are going to be the most effective for their students …’ and as ‘… educators are encouraged to implement these technologies with their students, they are equally encouraged to make these choices using the provided framework and information …’In consideration of those remarks, one of the tasks on the agenda for our technology team is to develop an app selection matrix.

Interview Summary

Responses during my interviews provided a variety of insights into how iPad technology is being used to support student learning in the classroom. Participants were asked to the following questions:

**1. The statement that best describes me is ...**

89.5 per cent of participants described themselves as supporting students with a disability in an educational context, with 10.5 per cent of participants saying they support professionals to identify effective assistive technologies to support students with a disability.

**2. Which assistive technology devices do your students/clients currently use?**

Interestingly, 89.5 per cent of participants identified using the iPad as an assistive technology tool. Other tools participates identified included laptops, visual supports, Picture Exchange Communication System (PECS), Big Mac Communicator, and Jelly Bean Switches, Tech Speak and Dynavox systems.

**3. Why was this assistive technology device selected? How was this assistive technology selected?**

Almost half of the participants stated the iPad was selected as an assistive technology device for their students because it was available within the learning environment and was a universal tool for the students. Most participants also commented that due to software flexibility, built-in accessibilities and ability to connect switches, the iPad was a preferred tool for meeting the students’ personal needs.

**4. How do your students/clients use iPads as an assistive technology?**

The iPad is a flexible tool providing educators with many purposes for its use. This became prevalent when interviewing teachers. Most of the responses to this question were unique to the teacher and the needs of their students. However, many participants mentioned the inbuilt accessibility options of the iPad as well as naming the specific apps they use to provide their students with opportunities to communicate.

Teachers identified the accessibility functions of the iPad as assisting their students to:

* + communicate ( using different software)
	+ access zoom text functions (visual enhancement functions)
	+ access recording functions (modelled language, isolating sounds)
	+ access speak-to-text functions (supporting written expression)
	+ access headphone function (limiting background noise)

Many of the curriculum-related educational experiences identified by the special education teachers could be categorised into the following three areas:

* + supporting literacy (reading, writing and research)
	+ supporting maths computation (mostly rote learning apps were identified in regards mathematics instruction)
	+ providing create/publish functions (incorporate drawings, photos, and videos)

**5. Are you aware of any trials/research using iPads as an assistive technology?**

Only a few participants were able to identify and discuss research and/or trials incorporating iPad technology to support students learning outcomes. Two of the schools I visited in the Western Sydney Region were identified during these discussions. I was able to discuss the impact of the findings from those studies with teachers in the schools and with Dr Stephenson at Macquarie University.

During those discussion a few important implications were identified, including:

* + the importance of incorporating evidence-based practice with iPad technology to improve student learning outcomes
	+ the need for an app selection criteria to inform decision making and purpose based on student needs
	+ the potential of increased student engagement levels through incorporating iPad technology with evidence-based practice.

**6. In your opinion, are there any applications and/or software that you have found useful as an assistive technology tool?**

I asked participants who were using iPad technology which software applications they preferred. Almost all respondents identified an app they use to support students communication in the classroom. These included Proloquo2go, Touchchat, iTalk, speak-to-text apps, Pictello, Choicemaker, Dragon Dictation, Spell Better App (dyslexic and phonetic spell checker, word prediction and auto-completion, text-to-speech with word highlighting).

**7. In your opinion, are there any barriers to using iPads as an assistive technology in the classroom?**

I also asked teachers if they believed there were any barriers to using iPads as an assistive technology in the classroom. Many of the challenges identified I believe could be categorised as professional development, procedure/policy or infrastructure. Some of the challenges beyond the funding of the device included:

* + professional development
	+ teacher training about available apps
	+ teacher training about effective teaching strategies for using the apps to support student learning
	+ procedure/policy
	+ managing iPads in a school setting
	+ time to set up/prepare the devices for the students
	+ setting the iPads up for multiple users to save work
	+ equity in the classroom
	+ infrastructure/accessories
	+ wifi/internet signal strength
	+ providing switches to support students with physical disabilities
	+ providing support for students with visual impairments
	+ providing support for students with challenging behaviours
	+ engaging students with iPads.

I believe these challenges need to be considered as the iPad trend in schools continues to grow and many schools (including where I am teaching) are purchasing iPads for the first time or expanding the school’s collection.

Conclusion

Through this opportunity I have been able to develop a global network that includes assistive technology specialists, administrators and teachers. Through these global connections and attendance at several conferences I have been able to develop and critique an evolving list of apps that are in current use in our classrooms to support students with disabilities and assist their access the curriculum and personal learning goals.

I have also delivered professional learning opportunities at a school and regional levels, inviting teachers to share and discuss mobile technology in their classrooms and apps they are using to support student learning, as well as sharing what I have learnt about managing mobile technology at network meetings. It is important to emphasise the essential role of evidence-based practice in conjunction with iPad software to improve student learning outcomes, a key focus of my discussions with colleagues. I have compiled a list of research articles that discuss effective practise when using iPad technology to acquire new skills.

The experience of my study tour has deepened my knowledge and provided an opportunity for a new journey to begin at our school. As recent recipients of the *Daily Telegraph*’s Fair Go for the West campaign in the category Classrooms of the Future, we have begun to implement a new project – Assistive Technology Supporting Communication and Curriculum Access for Students with Disabilities. The aim of the project is to implement a 1:1 mobile technology learning environment to support communication and curriculum access for students with disabilities. This project began with my successful application for this NSW Premier’s Teacher Scholarship sponsored by the NSW branch of the Australian Association of Special Education. The experience I gained whilst engaged in this study tour from developing global networks, identifying apps, developing a matrix to inform decision making and gaining a deeper understanding of evidence-based practice has been invaluable.

Endnote

For further information about my study tour visit my [blog](https://ipadsasinclusivetechnology.com/)

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