Inquiry Submission

Education and Health Standing Committee: Digital Innovation in Secondary Education

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Thank you for the opportunity to present this submission to the Education and Health Standing Committee's inquiry into *Digital Innovation in Secondary Education*.

As the coordinator for the Digital Technologies curriculum specialisation and ICT-Enhanced Curriculum units at Edith Cowan University, I am pleased to see that this inquiry into how we can better use technology in secondary education in Western Australia is taking place. This inquiry could better inform how we train our pre-service teachers, support our in-service teachers, allocation of funding for schooling infrastructure, resources, teacher professional learning and education policies.

As the field of technology is a specialised area with an evolving language, I would like to start by clarifying the terms I will be using in this submission as to alleviate any confusion with terminology that may not be familiar or understood by the readers of this submission.

Digital Technology	As described by SCSA "The Western Australian Curriculum: Digital Technologies empowers students to shape change by influencing how contemporary and emerging information systems and practices are applied to meet current and future needs. In-depth knowledge and understanding of information systems enable students to be creative and discerning decision-makers when they select, use and manage data, information, processes and digital systems to meet needs and shape preferred futures. Digital Technologies provides students with practical opportunities to use design thinking and to be innovative developers of digital solutions and knowledge. Digital Technologies enables students to become innovative creators of digital solutions, capable users of digital systems and critical consumers of information conveyed by digital systems." (https://k10outline.scsa.wa.edu.au/home/teaching/curriculum-browser/technologies/technologies-overview/rationale) In this submission, I will refer to Digital Technologies as per the definition in our state's curriculum and not use the term Digital Technologies as a general term to describe the use of Information and Communication Technology (ICT) in an educational context.

Information and Communication Technology (ICT)	Information and Communication Technology (ICT) as described by SCSA "In the Western Australian Curriculum, students develop ICT capability as they learn to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school, and in their lives beyond school. The capability involves students in learning to make the most of the digital technologies available to them, adapting to new ways of doing things as technologies evolve and limiting the risks to themselves and others in a digital environment." (https://k10outline.scsa.wa.edu.au/home/teaching/general-capabilities-over/information-and-communication-technology-ict-capability/introduction) In this submission, I will refer to ICT as per the definition in our state's curriculum and will not use the term Digital Technologies to describe the use of Information and Communication Technology (ICT) in an educational context.
Educational Technology (EduTech)	Educational technology is referred to in this submission as the use of both physical hardware and software together with pedagogical practices to support innovative teaching and learning.

As stated on the Parliament of Western Australia website, the inquiry is focussing more on how we can use ICT to enhance teaching and learning and that it "is not focussing on teacher competence and skills", but we do need to address the issues around teacher competencies and skills in effectively utilising these technologies to teach for positive student outcomes. This submission will address teacher competencies and skills and how we can better support teachers.

How digital innovation can assist secondary students to learn anything, anywhere, anytime

1. Online learning platforms like Khan Academy (https://www.khanacademy.org), AltSchool (https://www.altschool.com/post/the-altschool-platform) and Schoology(https://www.schoology.com) can assist students with anything, anywhere, anytime learning. It allows educators to create and manage their teaching through an online platform that allows students to engage with the content at the level they are at and not the level of understanding perceived by their teacher. These systems have sophisticated learning analytics that monitors the student's work and progress and adjusts the content and learning tasks to support their learning and moves learners to mastery of learning model (https://www.cultofpedagogy.com/khan-mastery-learning/).
2. Students can access a world of information and knowledge online but need to have the skills to discern what is useful information and what is not suitable for their needs. Presently we teach in secondary school issues around cyber safety and digital literacy, but we need to move to a more global perspective on how we engage in this online world and develop a Digital Intelligence. Digital intelligence is the sum of

social, emotional and cognitive abilities that enable individuals to face the challenges and adapt to the demands of digital life. “DQ is a comprehensive set of technical, cognitive, meta-cognitive, and socio-emotional competencies grounded in universal moral values that enable individuals to face the challenges of digital life and adapt to its demands.” (https://www.dqinstitute.org/)

3. Online learning platforms can take the role of the teacher for the aspects of teaching that are about students learning content, definitions - the lower level knowledge aspects of learning. It frees up the teacher's time in the classroom to support students who need additional support on the content. It allows the teacher to engage the students in higher-order thinking activities that encourage students to be more creative, critical thinkers and improve their communication and collaboration skills. Online learning platforms are not a replacement for effective teaching in the classroom.

The role of education-based ICT in addressing secondary student engagement and retention

1. We need to educate our pre-service and in-service teachers in the use of ICT and Educational Technologies (EduTech), so they can create innovative learning opportunities for their students. By using theoretical models and frameworks like TPaCK, SAMR and Bloom’s Taxonomy of Educational Objectives, to guide the teacher in making sound digital pedagogy choices.
2. All schools have access to the Microsoft Office 365 suite of apps. Teachers can use this to create activities that have students collaborating on shared documents, creating digital content and communicating in their classroom and with the world more widely. Google and other platforms offer similar suites of apps. By using these readily available apps, teachers have the opportunity to improve retention rates as technology enables students to learn at their own pace, students naturally enjoy using technology and use it in their lives outside school. Technology allows for better communication, collaboration and immediacy of feedback from their teachers, their peers (online group work), and parents.
3. If teachers utilise education-based ICT effectively and integrate it as part of their teaching, then the impact on students learning can be overwhelmingly positive and is supported through research (https://doi.org/10.1016/j.compedu.2016.02.005). As a consequence of increased student engagement, this can have a follow on effect on student retention (https://research.acer.edu.au/cgi/viewcontent.cgi?article=1135&context=research_conference)

How digital innovation can increase equity of opportunity in secondary education

1. As with point raised in the next section, using educational technologies to provide opportunities for differentiating learning, affords educators opportunities to move from teacher-centred to student-centred learning.

2. Students enjoy using ICT and use it outside of the classroom, so why not use it in the classroom and break down the barriers between home/community and school.
3. Learning about technology and using it in practical, authentic ways in the classroom helps students to stay relevant in the global society. It helps to prepare students for the digital future. These 21st-century skills are essential to be successful.
4. Digital innovation in the schooling system is vital as the changing landscape of work and economy; we see massive disruptions to industry, culture and society. We are now in the Fourth Industrial Revolution, which is the digital revolution that has been occurring since the middle of the last century — characterised by a merging of technologies that is blurring the lines between the physical, digital, and biological spheres. The rate of current breakthroughs and innovation has no historical precedent. Compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. The disruption is in almost every industry and every country. Moreover, the breadth and depth of these changes signal the revolution of entire systems of education, production, management, and governance. Because of this, our education system needs to be a leader in the ways we educate the next generation of workers to compete in an economically changing society.
5. Not only can using technologies in the classroom support their learning and growth, but they can help students to develop social intelligence, adaptive thinking, critical and creative thinking and cross-cultural competencies. (http://www.iftf.org/futureworkskills/)

The potential for digital technology to cater to the needs of high performers and at-risk learners in secondary education

1. All students can benefit from the effective integration of ICT in school. The key to its success is skilling teachers with the digital pedagogy to complement their subject knowledge and teaching strategies.
2. Some schools are supporting students, who come from low-income families not able to provide their child with a BYOD, by providing students with a laptop. Students can borrow a laptop through a system usually based in their school's library, and some cases are recycling old laptops to provide them to these students.
3. Students with disabilities benefit from using technologies in the classroom to engage them with their learning. Students with visions impairment can use screen readers to support their learning of traditional visual-based learning resources. Assistive technologies like Text-to-Speech Software, Speech Recognition Software, Reader Pens can support students with dyslexia and dyscalculia. These technologies ensure independence and can enable dyslexic individuals to break down barriers and overcome their challenges.
4. Online learning platforms like AltSchool (https://www.altschool.com/post/the-altschool-platform) and Schoology(https://www.schoology.com) can assist teachers in creating innovative learning opportunities for students of all abilities. They can scaffold the learning and build in additional resources to support the learner who is

struggling and to also support the learner who is highly skilled in the subject as to not "hold" any student back.

5. The teacher is a crucial part of the learning process and will never be “replaced by robots”.

Challenges to implementation, including the provision of digital infrastructure, resources and technical support

1. Many factors pose challenges to implementation, but more than issues in infrastructure and resources are supporting teachers to develop a skill set that inspires them to be innovative educators.
2. IT infrastructure and resources are an ongoing evolution in schools. As the access to reliable internet is more the norm today, we still see school around the state who regularly suffer from connectivity issues, power outages and no technical support to fix these issues.
3. In the Government schools, teachers log IT issues with the Central support office and sometimes wait days to receive a response and eventual resolution. This delay affects teachers' ability to teach using technology and leaves them not wanting to use these technologies in future. Shorter wait times at the Central support office need to be prioritised and address staffing levels. New satellite IT support offices could be set up to support clusters of schools and reduce wait times for resolutions and work closely with the school to respond to their individual IT needs.
4. Earlier this year, WA students took part in NAPLAN tests online for the first time as a pilot for the full roll-out of the online NAPLAN system. Approximately 40,000 students were not able to correctly complete the test. The issues caused disruptions, distress and confusion to school, teachers, students and parents. (https://www.abc.net.au/news/2019-05-15/naplan-test-glitches-prompt-wa-schools-to-abandon-computers/11114770). This is a perfect example of why establishing new digital systems for assessment and learning need to be tested and piloted before we can have mass-rollouts for new digital systems for education.
5. We also need to be aware of issues of inequity with student access to technology at home as they may not be able to complete their required schoolwork. We cannot assume that all students have access to a laptop and the internet at home and schools and teachers need to be mindful of this inequity when planning and implementing new ICT based teaching strategies.

If you would like clarification on any point, please email me: zinacordery@hotmail.com

Thank you for the opportunity to submit.

Yours sincerely,

Zina Cordery.