# HOW CAN DIGITAL TECHNOLOGIES SUPPORT LITERACY LEARNING FOR STRUGGLING LEARNERS IN NEW ZEALAND SCHOOLS?

## PURPOSE

We live in a rapidly changing world with education undergoing massive reform. With the rise of digital technologies, students are increasingly expected to function in a "highly advanced, technological, global world" (Gunter & Kenny, 2008, p. 85). However, Ziemke (2016) states, "just because the students of today have grown up with devices, doesn't mean they know how to use them" (p. 33). It is therefore important that students are given the skills to utilise digital technologies efficiently. As found by the O'Riley, Amos, Copeland, Fidow, Langford, Newton,...& Vester (2014) students need to be "digitally competent, so they can participate successfully in a modern economy and society, support their families, and contribute to the wider community" (p. 2).

The purpose of this literature review is to consider the value of learning with digital technologies, particularly for students who are struggling in literacy. The effective use of digital technologies is a skill in itself, and one which is not always seen as important for students struggling with basic reading and writing.

Many schools are increasing the number of devices available for students or introducing BYOD programmes. Research is beginning to be done to analyse the effect of this technological revolution. One such initiative in a low socio-economic status community in Auckland in 2015 saw "netbooks and applications used to raise literacy levels" (Jesson, McNaughton & Wilson, 2015).

## WHAT IS DIGITAL LITERACY?

Digital literacy is more than just technical skills (O'Riley et al, 2014; Parliament, 2012). Being digitally literate means confidently using digital technology, but also being "well prepared with the skills necessary for...in the modern world [and] the ability to understand and fully participate in the digital world" (Parliament, 2012, p. 10). Digital literacy has become progressively more essential, both during and post schooling. Students who are digitally literate are, as outlined by Casey (2015), "critical, collaborative, and creative. [They] use other people's knowledge and ideas in respectful ways and build on that to create new knowledge".

New Zealand learners are now surrounded by technology of all kinds. Ohler (2012) asserts that "being digitally literate allows you to access employment, culture, power, and personal fulfillment." This suggests that to not be digitally literate would be debilitating. Ziemke (2016) believes "we should give students both print and digital texts  - and then teach them to navigate each effectively" (p. 32). It is not a question of either/or. To be fully literate one must be competent in all aspects of literacy, digital included.

## CURRENT DIGITAL LITERACY PRACTICE

Research studies undertaken in New Zealand show that the use of digital technologies varies throughout schools. (Parliament, 2012; Jesson et al, 2015; Sweeney, 2013). It appears that students are being expected to use digital technologies, often without specifically teaching them how to do so (Ohler, 2012). McDowall and the Core Education Team found that there was much decoding and encoding happening, but not a lot of critical literacy development (2010).

Two New Zealand reports recently found that excellent practice with digital technologies was happening in the country. Sweeney, as part of the Manaiakalani Trust (2013) found that students making regular use of devices made more than expected progress in literacy. Parliament, (2012) stated that "lack of access to online learning could have a detrimental affect on...families' educational opportunities" (p. 30).

## POSITIVE IMPACT

### *ENGAGEMENT*

Ask any teacher and undoubtedly they will tell you that students are motivated to use digital technologies. Numerous opportunities are created with digital technologies that can't otherwise occur. McDowall et al (2010) found evidence that those "opportunities afforded by e-learning contexts to work across a range of modes supported engagement and achievement in reading and writing print texts, especially for students with a history of underachievement in these areas" (p. 1). E-learning is learning with the use of digital technologies.

Engagement is an integral part of student achievement. When a student is engaged, they are more likely to want to learn and to make progress. Bullard (2014) states "computers are motivating for young children, increasing their time in on-task behaviour" (p. 2). This is pertinent when it comes to struggling students of literacy, as often they are the students who are off-task in class.

Jesson et al's research in Auckland showed high levels of behavioural engagement and very little off-task behaviour. By removing more of the behaviour management issues, it allowed for more interactions between teacher and student, promoting deeper thinking (Jesson et al, 2015, p. 213). A study by Gulek & Dermirtas in America outlined that laptop using students were so much more engaged than their non-laptop using counterparts that they spent more time doing their homework (Gulek & Dermirtas, 2005, p. 5).

The Manaiakalani Project also found that digital technologies promote engagement in struggling students of literacy. This project provides digital technologies and support for students in low socioeconomic schools in an Auckland cluster. The project has "provided purpose and enthusiasm for literacy…[motivating] students to write and to ensure they had clarity and correctness in their work" (Gleeson, 2010). These students, many of whom are from low-socioeconomic backgrounds and have a history of underachievement, became more focused on their work through the project (Gleeson, 2010).

*21ST CENTURY SKILLS*

Digital literacy has become an accepted 21st Century Skill that students will need in their lives. Teaching digital literacy can "provide opportunities for the types of literacy learning needed for living and learning in the 21st century" (McDowall et al, 2010, p. 8). Digital devices are allowing students to learn where they want, when they want, and how they want. Students are able to take ownership of their learning in ways that were unthinkable not long ago.

Other 21st Century Skills can be enhanced through digital literacy. Collaboration with family and peers, positive social and ethical behaviour, problem solving, cognitive and social development, and a wide variety of communication skills are all fostered through technology use (Bullard, 2014). Technology can be the catalyst for bringing a child out of its shell. It can also bring communities and families together. McDowall et al (2010) found that it allowed community partnerships to be built, to establish decentralised models of learning, as well as building learning capacity and the understanding of meaning making within a community (p. 2). Outcomes are generally better when a community and whanau are engaged with the students' learning.

Jesson et al (2015) saw "benefits in task management and students self management" as well as tasks which were "more authentic, public, collaborative and [allowed] for more autonomy". The Manaiakalani project also reported that students took more ownership and began to manage their own learning (Gleeson, 2010). They did mention that research skills were not always being taught well, and was a gap in students' digital literacy skill-set (Jesson et al, 2015).

There is possibility for technology to "be used to support outmoded teaching and learning approaches" (Bolstad, Gilbert, McDowall, Bull, Boyd & Hipkins, 2012, p. 2). Again, for digital tools to be effective at promoting 21st century skills, how they are applied is imperative.

*ACCELERATION*

Many low achieving students are reluctant readers and writers. Gunter & Kenny (2008) say that digital media could be a way to "teach reading and writing, focusing on strengths not weaknesses; on acceleration, not remediation" (p. 86). It was found by McDowall et al (2010) that students "were able to access texts above what they could have via print alone" through digital technologies. This extension could promote acceleration of learning, not just remediation. By supporting them with higher level texts, it would support higher level thinking.

Acceleration can be achieved in other ways through the use of digital technologies. Parliament, (2012) made it clear that "parental engagement is fundamentally important to educational outcomes" (p. 30). Digital technologies enable parents and whanau to be able to collaborate more with their children's learning (Parliament, 2012). If parents can engage more with their children through the use of digital technology, it follows that students' levels could increase.

The study undertaken by Jesson et al (2015) in Auckland had some successful progress to document. It showed more than expected progress in writing, but conversely not in reading. Further research into this is needed, but it may be that the digital environment offers more potential for the acceleration of writing than reading (Jesson et al, 2015, p. 219). The use of

digital interactions in the schools improved the quality of exchanges between teachers and students. These interactions were shown to increase reading comprehension, content knowledge, and higher order thinking skills (Jesson et al, 2015).

The Manaiakalani project also showed "exceptional progress" (Parliament, 2012, p. 11). Literacy skills were seen to improve; although it was mentioned that there could have been several reasons for this and it could not be attributed solely to the project (Gleeson, 2010). There was significant acceleration of learning shown in the assessment data gathered.

Gulek & Demirtas' (2005) study also indicated "that students who did participate in the programme tended to earn significantly higher test scores and grades for writing, English-language arts...and overall Grade Point Averages" (p. 29) than the non-laptop students. Few of these students were low achieving students, so it is unclear if this made a specific distance for these students.

## CONSIDERATIONS

### *PAEDAGOGY*

Various studies indicate that it is the paedagogy behind technology that is the key element in successful digital literacy teaching (Anderson & Balajthy, 2009; Clement, 2016; Dalton, 2014; Jesson et al, 2015; McDowall et al, 2010). Simply giving students digital devices will not automatically raise their achievement. It is what is done with the device that is most important (McDowall et al, 2010).

Greaves, Hayes, Wilson, Gielniak & Peterson (2010) found in Project Red, an American study into the effectiveness of technology integration, that digital technologies combined with effective teaching practices can improve learning outcomes in a substantial way. On the flip-side, if the technology is not used appropriately, it can actually reduce its effectiveness (Anderson & Balajthy, 2014, p. 542).

Due to knowledge being ever changing and evolving, it follows that it will not be enough for students to be filled up with knowledge - they need to become creators and makers themselves. They need to know how to work with the ever-changing nature of knowledge and be able to upskill themselves as they go through their chosen career path (Bolstad et al, 2012, p. 4). Becoming digitally literate could be a step in the right direction for many students to achieve this goal.

Technology allows for opportunities to revisit work several times in different modes - which allows for it to be refined and more effective feedback to be acted upon (McDowall et al, 2010). Feedback is one of the most powerful influences on learning and achievement (Hattie, 2012).

If used appropriately, digital devices can be practical learning, something which many students benefit from. Teaching digital literacy requires effective pedagogy. It must be noted that when digital technologies are used ineffectively, it will make little difference to educational achievement (Goodwin, 2011).

*EQUITY*

From the findings on engagement alone, it can be reasoned that digital technologies are an essential component in effective teaching and learning. There is a large issue surrounding the equity of access to digital technologies in New Zealand. This 'digital divide' could be detrimental to New Zealand's future.

The American laptop study suggests "the digital divide may also create society that is divided by academic achievement" (Gulek & Dermirtas, 2005, p. 31). New Zealand research findings make similar assertions. O'Riley et al, (2014) state that without equitable access to digital technologies, there could be "serious negative consequences" (p. 2).

This review has established that digital technologies can have a marked effect on student learning outcomes when used appropriately. However, many New Zealand learners are missing out. O'Riley et al, (2014) emphatically state that "doing nothing is not an option. Inaction will only increase inequity and compound the difficulties for learners who are already doing less well. A further digital divide will exacerbate an already serious achievement gap" (p. 7).

The equity of digital technology also extends to how the technology is used. In some cases, low socioeconomic students are being given lower level "activities that require less higher order engagement" (Hollingworth, Mansaray & Rose, 2011, as cited in Jesson et al, 2015, p. 218). What is needed is high expectations for all students, not deficit thinking. Warschauer & Matuchniak (2010) found that the use of digital technologies 'solely for drill and practice activities and remediation can and often does negatively affect student achievement, not to mention engagement, motivation, and self-esteem" (p. 204).

*KAUPAPA MAORI*

Maori students are at high risk of not becoming digitally literate in New Zealand. Issues about equity of access to digital tools are especially pertinent for these tamariki. Many struggling students are Maori. "Historically, achievement is low in schools serving the poorest communities, and for Maori and Pasifika students" (Jesson et al, 2015, p. 199).

Many of the principles of Kaupapa Maori can be found within the reasons for teaching digital literacy. Students taking ownership of their own learning, which has been discussed in this review can be compared to Tino-Rangatiratanga; a student asserting their self-determination and independence (Rangahau website).

It may be said that 1:1 device usage, which is being used more and more in primary settings, is not acknowledging Kaupapa Maori, as it does not allow for the collaborative nature of Kaupapa Maori; the principles of Whanau, Kaupapa, and Ata. Many Maori educators disagree. Ripeka Lessels, a Kura Kaupapa teacher, believes devices "promote the skills of collaboration and social skills to do with empathy and perspective taking - which often work well in a Maori setting" (Clement, 2016). Certainly, the potential for whanau engagement and collaboration afforded by devices outlined previously in this review would affirm this.

Lessels continues; "not giving Maori kids eLearning will leave them at a deficit as they leave school" (Clement, 2016). Addressing the large percentage of Maori learners who aren't achieving is adhering to Kaupapa Maori. Using digital technologies will ensure that Maori students are prepared for the 21st Century and beyond.

<u>IMPLICATIONS</u>

It is difficult to say with certainty that digital technologies can accelerate a priority learner. The research discussed in this review makes it clear that it is possible to make shifts in student achievement with digital tools, but not with them alone. It is the pedagogy behind how those tools are used that is the vital factor for success. Yet, "current research on the relationship between technology and learning is inconclusive" (Gluckman, n.d., as cited by Parliament, 2012). Some studies show improvements, while others show that technology can be a distraction. Gluckman suggests that research into potential risks of technology use on healthy development should be undertaken.

However, digital technologies and digital literacy have been shown to be vital in today's ever changing world. Digital tools also help with the engagement of students and subsequently their motivation to achieve, and their development of 21st century skills. Research projects like the Manaiakalani project in Auckland are trying to broach the 'digital divide'. Further research of this sort would identify whether there is a pattern of progress across a wider sample size.

More research needs to be undertaken in New Zealand to answer the question this literature review hoped to address. O'Riley et al, (2014) noted the lack of research around digital teaching and learning practices in a New Zealand context. If we are to lead the way with digital literacy this needs to change.

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