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Cover design: Representation of a tukutuku showing the stepped poutama pattern symbolising growth or achievement - like climbing a staircase. The MTchgLn poutama (Te Poutama: Ngā Pou te Ako) is organised around the four core values of the programme and represents pre-service teachers’ development and growth of adaptive expertise and action competence.
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Welcome to the third issue of the Journal of Initial Teacher Inquiry. The journal celebrates inquiry based research as conducted by Initial Teacher Education (ITE) students completing the intensive, one year Master of Teaching and Learning (MTchgLn) course at the University of Canterbury, Christchurch, New Zealand. Our MTchgLn programme whakataukī (proverb) emphasises the value we place on our ITE students and their learning;

_Ahakoa he iti, he pounamu_  
*Although it is small, it is greenstone*

Our programme has an emphasis on professional inquiry with a specific focus on developing the skills of critical analysis and reflection on practice experiences to support _ākonga_ (learner) achievement. It is common for beginning teachers to have queries concerning contemporary issues in education based on personal experiences. This allowed our MTchgLn students to explore their own puzzles of practice through a research informed approach (as opposed to a practice based approach) into exploring such issues. Therefore our ITE students need to learn the skills required to explore, understand and critique research as they develop an inquiry approach to support their learning. One outcome of our ITE students’ learning was a critical literature review based on a contemporary issue in education that resonated with puzzles of practice emerging from their developing contexts.

The themes for this issue were drawn from the Bolstad et al. (2012) report _Supporting future-oriented learning and teaching – a New Zealand perspective_ and were:

- Personalising learning
- Equity, diversity, and inclusivity
- Rethinking learner and teacher roles
- Partnerships and relationships
- The role of new technologies

Our ITE students were asked to consider these emerging principles for 21st century education system arising from a vision of future-orientated learning and teaching and to consider what aspects resonated with their current experiences, what were their puzzles of practice, what were their developing interests that would lead them to inquire into their own practice. This journal is the result of those inquiries.

_Ko te ahurei o te tamaiti arahio o tatou mahi_  
*Let the uniqueness of the child guide our work*

Personalising Learning

In the first article, Swan introduces the notion of personalised learning and considers how it is conceptualised and the implications on students learning. It discusses some of the benefits and constraints that can result from personalised learning approaches. The second article builds on the first and Stewart continues to examine what personalised learning looks like in the context of classroom practice. From his review of the literature, Stewart identifies and discusses four emerging themes that influence the effectiveness of a personalised learning approach. The next review, by Harris, looks more specifically at how schools have been able to use the key competencies as defined in the New Zealand Curriculum (Ministry of Education, 2007) to support students as future focused learners. This article discuss how personalised learning can support competency development.

In the final article in this section, Gibson takes a more philosophical approach as he discusses and critiques personalised learning and the implications for implementing it in practice.

Equity, Diversity, and Inclusivity

In her article, Harbott identifies that although New Zealand is an inclusive society, teaching practices vary widely with regards to educating for diversity. In this review she explores the challenges facing teachers as they attempt to respond to the complex student diversity of their classes. The second article has a specific focus on gender equity within the Science, Technology, Engineering, and Mathematics (STEM) disciplines. Specifically, Huddlestone explores the importance of developing, maintaining and retaining gender interest in STEM. In the third article within this section, Falconer has a particular interest in supporting Pasifika literacy education. In her literature review she discusses some of the key factors that influence Pasifika literacy outcomes and identifies two clear strategies for teachers that may improve literacy achievement. In the next article, Ford approaches the theme through an analysis of streaming in a secondary mathematics context and explores the influence of streaming on how students perceive their own capabilities (student self-concept) in mathematics. The final article, by Ladkin, also takes a student perspective on inclusivity and considers the role of student voice and power relations within a school and the implication for minority students.

Rethinking Learner and Teacher Roles

The first article within this theme by Robertson explores the idea of student voice and considers how students can gain more agency within a school setting and the implications for teaching practice. The second article, by Denton, considers citizenship education. In particular the role of the teacher, with respect to their beliefs, values and pedagogy is examined and the impact this may have on the teaching and learning of citizenship education for students. In her article, Page examines a specific pedagogical practice, cooperative learning, and considers some of the barriers and enablers to facilitate it in the classroom. The next article, by Spenner, looks specifically at growth mindset and discusses some examples of growth mindset interventions in the primary classroom as well as with parents. The potential for using this pedagogy to support learning and the potential challenges associated with it are explored. In her article, Hooker has a particular interest in student wellbeing. Her literature review explores those factors that contribute to student wellbeing in schools and discusses the connection to student achievement. She also identifies the importance of considering teacher wellbeing and how it may be a significant influence on student wellbeing and makes the connection to the importance of developing shared learning environments that promote wellbeing. The last article in this section, by Johns, continues the theme of wellbeing and in particular examines mental health and wellbeing in schools. She provides a review of current support systems, identifies those factors that may place students at risk, and discusses the paucity of research into adolescent mental health and wellbeing in New Zealand.

Partnerships and Relationships

The notion of connectedness is developed within this theme, drawing on connections between participants within schools, schools and outside organisations and schools and the wider community. In the first review, Hegarty explores how innovative
learning environments (ILE) provide opportunities for students and teachers to engage in a new type of partnership. The use of specific organisations that have a disciplinary focus, such as science centres, to help provide a greater contextual connection for learning opportunities is discussed by Abernethy. With a focus on science outreach, Abernethy provides a range of examples where positive outcomes for learning have been reported. Munro takes a particular interest in home-school partnerships and explores how technology can foster such partnerships. She identifies the challenges of using digital technologies to support home-school relationships. In her review, Mackie explores the role of religion as a basis for a community-based and inclusive approach to education. In particular she explores the role of school leaders and faith-based schooling and its impact on the development of community relationships. The last article in this section, by Lawry, considers the relationship between teacher early into their career (pre-service and beginning teachers) and teacher mentors. The complexities of the mentoring process are explored and in particular the implications of mentoring on beginning teacher job satisfaction, job turnover, and student achievement are discussed.

**The Role of New Technologies**

Schools that are technology-rich learning environments have been shown to utilise technology to: enable and support infrastructure, provide opportunities to connect and inspire, enhance capability, and to support innovation (Bolstad et al., 2012). In this theme Heath presents a review that explores how technology can be used to support the nature of science in the classroom. In particular he discusses how technology can support student agency, access to new knowledge, opportunities to collaborate, and a contextual relevance to inquiry. Jackson continues the theme but explores it through mathematical discipline knowledge. His review explores a range of factors affecting the use of integration of information and communications technology (ICT) in the mathematics classroom. The role of ICT to support a teaching as inquiry approach is examined by Dobbertin-King. In the review he discusses a variety of strategies that are required to support teachers. Husband explores the use of e-tools for assessment and in particular focuses on the challenges associated with the transition to technology based assessment, the benefits and challenges. In the final article of this section, Findlay discusses the notion of digital access within learning environments and the role of digital literacy. He explores a number of innovative practices, specifically the role of gamification as an example of future-focussed learning to support enhanced reading and writing skills in learners.

The articles selected for this journal reflect the high quality of our ITE graduates and provide an intrinsic value to those engaged in exploring practice through a teaching as inquiry approach. We value each and every article, and, for our ITE students as they begin their journey, we remind ourselves of the importance of each one of their contributions - *ahakoa he iti, he pouanamu*.

**Chris Astall**  
Associate Editor


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Personalised Learning: Understandings and Effectiveness in Practice

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Abstract

Personalised learning is being promoted in New Zealand and around the world as one of the key components of a future-focused education system. Although it is conceptualised and implemented in many different ways, it appears that the common aim of personalised learning is to tailor the education system to meet all students’ diverse needs. While, or possibly because, most educators would support such an aim for education, there is very little research concerning its effectiveness. Studies have also shown that personalised learning is understood and implemented by teachers in multiple different ways. This literature review examines various conceptualisations of personalised learning and their effect on students’ learning. Both benefits and detriments to students’ achievement and engagement are identified and discussed in this review. The inconsistent findings suggest that ambiguities in the concept of personalised learning need to be addressed and further research done into its effects on students’ learning.

Keywords: Personalised Learning, Primary, Secondary, Inequality.

Introduction

In New Zealand, personalised learning has been promoted as one of the principles that support a future-focused education system (Bolstad et al., 2012). Personalised learning moves away from a traditional one-size-fits-all, teacher-centred model to shaping the system around students, providing differentiated education to support diverse needs (Bolstad et al., 2012). This focus is part of a global movement and now personalised learning is being implemented in education systems around the world (Beach & Dovemark, 2009). It is called many different names (personalised learning, personalised learning, personalisation, and in Sweden, individualisering) and there are many variations in the concepts (Beach & Dovemark, 2009; Campbell, Robison, Neelands, Hewston, & Mazzoli, 2007; McGuinness, 2010; Prain et al., 2013). A common aim, however, appears to be tailoring the education system to meet all students’ diverse needs (Bevan-Brown et al., 2011; Underwood et al., 2007). The New Zealand Ministry of Education (MOE) positions personalised learning as a student-centred approach that strives to make learning meaningful (MOE, 2006). Within this initiative, students become informed and actively involved in their own education, and the school system is “responsive and flexible enough to ensure every young person can achieve their potential and is set up for life-long learning” (MOE, 2006, p. 3).

Although it would be difficult to find an educator who would disagree with such an aim for education, little research has been conducted on the implementation or effect of personalised learning programmes. What evidence there is reveals that personalised learning has been understood and implemented in schools in multiple different ways. Bevan-Brown et al. (2011) surveyed New Zealand educators’ understandings and enactment of personalised learning. Although responses were mainly from primary schools with little student diversity, their findings suggest that there is great variety in educators’ conceptions of personalised learning and that many are somewhat limited. The majority understood personalised learning as tailoring teaching to fulfil all learners’ diverse talents and needs (Bevan-Brown et al., 2011). A small few, however, believed that personalised learning was individualised plans for special needs students (Bevan-Brown et al., 2011). Underwood et al. (2007) found similar disparities in teacher understandings and implementation of personalised learning in their study in England. Their research also found that personalised learning does not necessarily lead to increased academic achievement, especially in high-performance schools (Underwood et al., 2007). Underwood’s study is not the only one to raise questions about the effectiveness of personalised learning (Beach & Dovemark, 2009). This present literature can be expected to raise many questions about the effectiveness of personalised learning.
review, therefore, examines various conceptions of personalised learning in schools and their impact on student learning.

**Successful Programmes**

Two different programmes of personalised learning implemented in New Zealand secondary schools have shown some benefits (McGuinness, 2010; Russell & Riley, 2011). They both are based on a concept of personalised learning that reflects that of the MOE (2006), in which teaching is tailored towards all students’ holistic needs and students become co-authors of their learning supported by *whānau* (family) and teachers (McGuinness, 2010, Russell & Riley, 2011). Russell and Riley’s (2011) programme was implemented for 40 Year 11-13 gifted and talented students and involved both individual and group pathways. McGuinness’ (2010) programme introduced *learning mentors* for all Year 10-13 students who provided support and guidance to students and parents in relation to student learning. In each programme students, parents and teachers/learning mentors met to develop students’ goals. Evaluations by students and parents revealed that benefits in both programmes included improved relationships between students and teachers and parents and teachers, with parents becoming more involved in their child’s education. The implementation of learning mentors in Year 10-13 also resulted in a 38% decrease in behavioural problems (McGuinness, 2010) while the gifted and talented programme led to increased student empowerment, motivation and challenge (Russell & Riley, 2011). Although neither programme can be directly linked to academic gains, McGuinness (2010) reported that National Certificate of Educational Achievement (NCEA) results improved during the implementation of learning mentors. Although the conception of personalised learning demonstrated in these programmes was effective at improving relationships, further research will be needed to understand whether these benefits lead to academic gains and whether they are effective in non-secondary school settings or for students who are not gifted and talented.

**Breakthrough** is another initiative based on personalised learning (Fullan, 2009). It has been implemented to support literacy development in both Melbourne (Australia) and in the York Region (Canada) and has had a significant effect on learner outcomes. For example, the mathematics, reading, and writing results of York Region schools improved by 10 – 20 % over five years (Fullan, 2009). One of Breakthrough’s key components, personalisation of learning, reflects the previously discussed definition in that it is based on tailoring education to meet students’ learning and motivational needs (Fullan, 2009). In a manner similar to Russell and Riley’s (2011) gifted and talented programme, Breakthrough positions personalisation as both an individual and a collective phenomenon, requiring relationships between students, teachers, parents, and the community (Fullan, 2009). Breakthrough combines this conception of personalised learning with precise teaching and ongoing professional learning (continual professional development immersed in teachers’ daily practice). Precise teaching requires teaching specifically needs of the students (Fullan, 2009). To be precise, teachers must engage in assessment for learning, ascertaining students’ learning and instructional needs, and then sharing this feedback with students (Fullan, 2009). These three components have been combined to develop specific strategies, including: establishing a staff member as a literacy coach, monitoring learner progression through a case management approach, and involving parents and the community in promoting literacy development (Fullan, 2009). Breakthrough is one of the few models of personalised learning that specifies the practices required to achieve it which suggests that this model may be able to achieve consistent positive effects on student achievement.

Prain et al. (2013) also developed a model of personalised learning that proved to be beneficial to students’ education. This model is based around three components: relational agency, a differentiated curriculum, and self-regulation. *Relational agency* is perceived as the interplay of teacher and student agency within the constraints of the education system (for example, national policy) (Prain et al., 2013). A *differentiated curriculum* refers, not to long-term streaming as is sometimes suggested, but to short-term variations in subject matter or pedagogy in relation to specific units and informed by students’ current needs (Prain et al., 2013). Self-regulation occurs when students “take responsibility for what and how to learn” (Prain et al., 2013, p. 665). Because these capabilities are developmental, it initially requires explicit guidance and co-regulation with teachers for students to develop (Prain et al., 2013). Prain et al.’s (2013) model was implemented in the mathematical programme of a Year 7-10 school in Victoria, Australia. Academic performance in this school was well below national averages and surveys showed that learners were disengaged and unmotivated in mathematics (Prain et al., 2013). A differentiated curriculum that provided a range of mathematical experiences was implemented by teams of teachers, working with a consultant, to increase their expertise. Student learning was co-regulated with teachers through shared goal-setting and feedback. Analysis of quantitative and qualitative data show that the outcomes of this three-year study were increased student motivation and self-direction, increased teacher co-operation and improved academic attainment, with numeracy growth exceeding the state average (Prain et al., 2013). The consultant was key to the change of pedagogy in this programme, which suggests that teachers may need expert support to shift to a student-centred approach to education.

Campbell et al. (2007) discussed a concept of personalised learning that stems from Leadbeater (2003) concept of personalisation in the public sector in England (as cited in Campbell et al., 2007). Campbell et al. (2007) argue that this concept does not aim to marketise education and is more socially-oriented that the individualism that it was first misunderstood for. Instead Leadbeaters concept promotes self-realisation with students earning the right to act as responsible co-authors of their education. Campbell et al. (2007) differentiate between shallow and deep levels of personalisation, the first being better access to public services and some limited recognition of user voice with the latter being “a more ‘disruptive’ innovation in which users become ‘designers and paymasters of services’” (Campbell et al., 2007, p. 136). Their study involved identifying the pedagogy of personalised learning in an English and a History class in a sixth-form college in England with a high proportion of gifted and talented students, where teaching had been assessed as outstanding by the Office for Standards in Education. The pedagogy that they identified through observation and discussion with teachers was based on informal but respectful relationships and the co-construction of knowledge as a class, leading to individual learning. Campbell et al. (2007) argue that this co-
construction of knowledge requires considerable subject expertise. This could possibly be extended to professional expertise because both Fullan’s (2009) Breakthrough model and Prain et al.’s (2013) study involved professional development. It is questionable, however, whether this pedagogy specifically led to academic improvements and if it could be transferred effectively into subjects where knowledge is positioned as objective truth, or with younger students, different abilities, or different social backgrounds (Campbell et al., 2007).

**Critiques of Programmes**

Research into personalised learning has not always found positive results. Underwood et al. (2007) investigated personalised learning and technology in 67 English primary and secondary schools, analysing both qualitative and quantitative data. In their study, they defined personalised learning as “the tailoring of pedagogy, curriculum and learning support to meet the needs and aspirations of individual learners, irrespective of ability, culture or social status, in order to nurture the unique talents of every pupil” (Underwood et al., 2007, p. 57). Their study found that personalised learning does not necessarily lead to increased achievement, especially in high-performance schools. At Key Stage 2 of the General Certificate of Secondary Education (GCSE) there was a positive relationship between student perceptions of personalisation and achievement while at Key Stage 3 the reverse was true (Underwood et al., 2007). Underwood et al.’s (2007) study also found that increased choice of learning methods was negatively correlated with students’ investment in their education. They posit that such a finding may be due to poorly motivated learners preferring the predictability and comfort of set work methods over risk-involved novelty. They also suggest that it could equally be due to a pedagogical choice by the teacher who might decide to use less innovative methods to teach so-called difficult students. Underwood et al.’s (2007) study found many inconsistencies in the effectiveness of personalised learning, particularly at the student-level. Further research is therefore needed to identify the specific factors of personalised learning that are beneficial or detrimental to students’ learning (Underwood et al., 2007).

Beach and Dovemark (2009) critique personalised learning in relation to equality. Their study used ethnographic research to investigate the implementation of personalised learning in two Year 8 classes in two secondary schools in Sweden, one predominantly middle-class and the other with around 50% of students whose first language was not Swedish. In their study, personalised learning (individualising in Sweden) is conceived as supporting “the promotion of freedom of choice, private/individual responsibility and personal dimensions of knowledge rather than the acquisition of particular formal knowledge packages” (Beach & Dovemark, 2009, p. 690). This concept of personalised learning easily aligns with competitive market values. Beach and Dovemark (2009) argue that, in practice, personalised learning is influenced by an emphasis on performativity and neoliberalism within the education system and wider society. Their research found that students were evaluated not only on their academic performance but also their attitudes towards education. So-called good students were judged according to neoliberal values, creating the image of a learner as a rational choosing individual who creates their own success by consuming education (often, in this study, by monopolising teacher time). Beach and Dovemark (2009) however, interpret these traits from a different perspective. To them, they are “…destructive (to others’ interests), disruptive (toward egalitarian principles), unreasonable (in their over-consumption of time and resources) and unfair (to other pupils)…” (Beach & Dovemark, 2009, p. 699). Students who exhibited these qualities were generally high-achieving and the Beach and Dovemark (2009) study found that teachers rewarded these traits (unconsciously or not) by expending more time supporting these students. The Beach and Dovemark (2009) research therefore suggests that personalised learning may perpetuate the gap between high and low achieving students.

Beach and Dovemark (2009) also argue that the neoliberal principles conveyed by personalised learning could exacerbate class educational inequalities. Neoliberal values are not universal but particular to upper-middle classes (Beach & Dovemark, 2009). Middle-class identities centre around consumption and thus middle-class students are privileged by the recognition of their class identity (as resource consumers and hoarders of capital) in the classroom. Meanwhile the identities of classes/cultures that value helping one another and interests outside of school are marginalised (Beach & Dovemark, 2009). Thus, dominant cultural and social groups are privileged and existing hierarchies are perpetuated. Campbell et al. (2007) was also concerned that this could be an outcome of personalised learning; however, they did not find evidence in their study to support or deny this concern. Beach and Dovemark (2009) also argue that the concept of private choice that is emphasised in this concept of personalised learning means that self-interest and egotistical calculations over personal return may be the only unifying factor in educational culture, thus threatening democratic values. Because this research is based in Sweden, Beach and Dovemark’s (2009) argument may not be applicable in New Zealand contexts; however, it is worth investigating in this country because New Zealand society is also influenced by neoliberal principles (Carrington & MacArthur, 2012).

**Conclusion**

The literature suggests that a common aim to the concept of personalised learning is tailoring education to meet students’ diverse needs. This focus, however, can be interpreted or extended in multiple different ways, creating tensions between different understandings of personalised learning. One such tension is whether personalised learning is an individualistic or more socially-oriented concept. Campbell et al. (2007) argues that personalised learning involves collective co-construction of knowledge that leads to individual learning, an idea that was reflected in several other studies (Prain et al., 2013; Russell & Riley, 2011). Beach and Dovemark (2009), however, identified an individualistic focus in their study, which supported the emphasis of selfish, neoliberal values. Another ambiguity is the interpretation of a differentiated curriculum which, according to Prain et al. (2013), is sometimes seen in terms of set labelling of student capabilities through long-term streaming instead of short-term differences in curriculum or instruction that support students’ current and ever changing needs. Several researchers have also identified that personalisation can be understood and implemented in deep or shallow ways (Bolstad et al., 2012;


Personalised Learning Pedagogies within Contemporary Schools

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Abstract

Personalised learning is emerging as the way forward for global education in the changing environment of 21st century teaching and learning. This involves the transfer of learning focus from teacher directed toward a more individualised approach, one that places learner needs, abilities, motivations, and desires in the forefront. Research suggests that the common in practice themes of a personalised approach are authentic assessment for learning, a flexible curriculum that is learner centred, the involvement of the community in learning, and the use of information communication technology (ICT) to provide multiple resources and learning platforms. The challenges that exist with this approach are the level of teacher buy in, student unfamiliarity with its processes, and lack of Government support and guidance for schools. This review focuses on case studies as well as primary and secondary research, relating to these common themes and challenges and identifies necessary personalised aspects and exemplars for future implementers.

Keywords: Personalised Learning, Assessment for Learning, Curriculum Flexibility, Community Involvement, ICT, Learning Platforms, Learner Centred, Learner Profiles, Learner Voice, Learner Choice.

Introduction

According to Patrick, Kennedy, and Powell (2013), personalised learning is defined as “tailoring learning for each student’s strengths, needs and interests - including enabling student voice and choice in what, how, when and where they learn - to provide flexibility and supports to ensure mastery of the highest standards possible” (cited in Taylor, 2016, p. 3). This requires instructional models that provide opportunities for the mastery of specific learning competencies, attempted at a student-centred pace, with the support of facilitated assessment that allows for individualised instruction (Taylor, 2016). Although extensive research leans toward multiple interpretations and definitions of personalised learning in theory, the one common element is that personalised learning is learning that is catered to the needs of the individual. But what does this mean in the context of classroom practice? How are schools incorporating student voice and choice, while tailoring for the specific learning needs of a multitude of diverse students? The focus of this literature review is on research pertaining to the common features and challenges that are evident within contemporary primary, middle, and secondary schools that have broken away from traditional learning environments in favour of a more personalised approach. Through researching qualitative data from New Zealand, Australian, English, and American case studies, along with primary and secondary research material, four common features of an implemented personalised learning approach are emerging. These are:

- The use of authentic assessment for learning, and the knowledge of student needs
- A flexible curriculum that allows for student voice and choice
- The involvement of family and communities in the teaching and learning process
- The use of information communication technology (ICT) for learning and the collection of student data

Along with these features are challenges identified in the research, including: the level of kaiako (teacher) buy in through resistance to pedagogical change, the challenges for ākonga (learner) adjusting to a personalised approach, and, on a New Zealand front, a lack of Government support and guidance for school principals. Although this is not an exhaustive review of current literature, nor a review on best practice evidence, it does provide useful information for potential implementers.

Assessment

Creating Learner Profiles

One of the common features of implemented personalised learning approaches to come out of the researched material is the...
value that is placed on identifying the learning interests and characteristics of individual ākonga that enables adequate assessment for learning. According to the Organisation for Economic Cooperation and Development (OECD), one of the key components of personalised learning is the use of assessment for learning that is based on “detailed knowledge of the strengths and weaknesses of individual students” (OECD, 2006, p. 10). In a case study of one United States of America and one Canadian high school, Jenkins and Keefe (2002) found that the diagnosis of ākonga learning characteristics are at the heart of the personalised learning approach. Both schools develop personalised educational plans with all their ākonga, which allows for Learner Style Profiles (LSP), and these are then used as an instrument to help ākonga choose relevant activities from learning guides and appropriate learning environments that have been identified in their profiles (Jenkins & Keefe, 2002). The kaiako then use this information, along with past achievement data and developmental information, to generate personal plan books for each ākonga that are monitored by kaiako for time spent on curriculum areas and progress evaluation. The kaiako themselves collaborate across curriculum areas and departments through linkable databases that detail ākonga profiles and progress reports that allows for the meeting of ākonga learning objectives and goals in accordance with their learning styles and developmental needs (Jenkins & Keefe, 2002). A similar study was conducted in Australia on four Year 7 – 10 regional schools in the state of Victoria that implemented personalised learning focuses (PRAIN et al., 2013). In one school, kaiako from the mathematics department obtained ākonga data from surveys, ākonga interviews, and national tests results to gain a precise snapshot of ākonga achievement, motivation, learning needs, and desires. This information was then used for collaborative consultancy by all members of the mathematics department to establish a pedagogy that would be relevant for the learning needs of the researched ākonga (PRAIN et al., 2013). Although not identical, these methods are valuable tools for vital ākonga information that can be analysed, for authentic assessment for learning to be incorporated.

Authentic Assessment for learning

Throughout the researched material, authentic assessment for learning is utilised to further the learning abilities of ākonga. The OECD describe assessment for learning as assessment that “help[s] learners’ work out how effective their learning was … allow[ing] students to adjust and adapt their learning strategies” (OECD, 2006, p. 111), while also providing pivotal information for kaiako to base learning activities on. Taylor (2016), as part of a paper for her doctoral dissertation, conducted case study analysis of American middle school teachers’ experiences of personalisation. For one school kaiako, assessment for learning was used to gauge ākonga abilities at the start of the year through a “diagnostic assessment” of specific standards that are covered throughout the year (Taylor, 2016, p. 150). This assessment allows ākonga to recognise their unique strengths and weaknesses, so that they can understand and identify what they need to focus their learning on. From that information, ākonga knowledge is assessed, and lessons are adjusted accordingly through a variety of instructional methods, including teacher-led, text and writing based, and hands-on activities (Taylor, 2016). Assessment for learning is also within the schools Jenkins and Keefe (2002) used for their case studies. In one high school, each student is assigned a kaiako that regularly meets with them to provide feedback on test results and completed learning activities. Students take tests when they feel they are ready, with no set schedule to compete against. Learning takes precedence over grades, as kaiako give one on one feedback, while allowing the redoing of their work until it is satisfactory to receive a pass grade (Jenkins & Keefe, 2002). Providing authentic assessment for learning is at the core of personalised learning, but, for individual progress to be achieved, special accommodations and adjustments to curriculum offerings are to be enacted.

Curriculum

Learner voice and choice

At the heart of a personalised learning pedagogy is the amount of ākonga voice and choice that is evident within the proposed school wide curriculum. Parsons & Beauchamp (2012) in their report suggest that for student-centred learning to be produced, providing curriculum choice for ākonga is vital, so that opportunities to “build on individual strengths and achievements, pursue … passions and interests, and learn in ways consistent with their individual learning styles” are enabled (2012, p. 230). From a New Zealand primary school perspective; regarding the provision of learner choice and voice in the curriculum, Howard (2016) investigated numerous schools around the country to identify three common themes surrounding personalised learning: learners at the centre, information and communications technology and communities of Collaboration. Within the theme of “learners at the centre” she identified the need for “a highly-structured approach that places the needs, interests and learning styles of students at the centre” (Howard, 2016, p. 9). She also found that within the case study schools, ākonga developed self-managing skills that allowed for individual choice for what they wanted to work on, and when this would happen. They chose the context in which they were to learn the skills that were being focused on, and could choose how they presented their completed work.

Another qualitative study by Gilmore (2015) also investigated the use of personalised learning in various primary schools around New Zealand, as well as in Scotland. Her findings on learner voice and choice within the curriculum were that some of the researched schools collected learner voice to start each of their annual planning goals, while others enabled learner choice within an inquiry approach that allowed for ākonga to focus on developmental skill sets (Gilmore, 2015, p. 12). Other common elements within the visited schools were the use of must do and can do activities for ākonga, visible learning goals that ākonga were able to self-select from, and a clear vision for both kaiako and ākonga on what learning entailed (Gilmore, 2015, p. 12). In addition to providing learner voice and choice in personalised curriculum development, another common researched theme is the flexible use of such curriculum.

Curriculum Flexibility

Evidence from researched material sheds light on the agreement that educators have toward the need for flexible personalised curriculum. Bolstad et al. (2012), in a report to the New Zealand Ministry of Education, identifies a method for providing curriculum flexibility through supporting ākonga
interests and needs, while offering opportunities to work toward goals for their lives after schooling. They report on a case study of an Auckland high school that applies this method, of which they metaphorically term the Networked Campground that has, as its premise, a goal to develop individual strengths, while placing an emphasis on basic literacy and numeracy skills through systems that allow for personalised pathways for learning (2012, p. 23).

For the school in the Bolstad et al. (2012) case study, the curriculum is used to build strong relationships with ākonga, to ensure that ākonga choose personally relevant and engaging pathways through their secondary years. Support for learning is the primary focus, and is evident in the time table structures that include one day of the week in which personally chosen impact studies are worked on by ākonga, with the other four days broken up into one hundred-minute episodes for specialist subject studies. Within these hundred-minute blocks, two are devoted to ākonga and kaiako mentoring time, and this also allows for space to manoeuvre the curriculum to support their learning needs.

A further case study by Sebba, Brown, Steward, Galton, and James (2007) that investigated 13 English middle schools echoes the use of timetabling to create a flexible curriculum. The schools that were investigated used both collaborative and cross-curricular methods to teach ākonga, by providing time off blocks of timetabling in which real world and relevant open-ended learning challenges are administered (Sebba et al., 2007). This has allowed for both ākonga and kaiako to monitor their individual strengths and needs, and develop these toward enhanced outcomes, which, for one teacher, includes providing accessible and relevant activities that are “more in tune with [student current and] future lifestyles and working lives” (Sebba et al., 2007, p. 25-26). This focus on the lives of ākonga also involves another emerging common thread in personalised learning approaches that have been researched; the involvement of communities in its implementation.

Community

The OECD (2006) state that “partnership and support beyond the classroom play[s] a crucial role in the [implementation] of personalisation … Home-school partnerships, mentoring to work-based learning, [and] a range of community resources act as powerful supports for educational attainment” (OECD, 2006, p. 123). A research project by Bevan-Brown, McGee, Ward, and MacIntyre (2011) on personalised learning approaches within New Zealand schools found that all schools using this approach were also in partnership with strong and engaged communities (Bevan-Brown et al., 2011). The schools investigated were organising ethnic and community support groups with regular gatherings and involving church and business groups, inviting parents to be involved with their child’s learning and assessment through kāiako-ākonga-whānau conferencing, engaging with community leaders in school events and programmes, as well as regular whānau (family) contact through newsletters, blogs, and an open-door policy (Bevan-Brown et al., 2011). Similar community involvement was found in a principal’s research sabbatical report by Wilson (2008). He describes how the ākonga in his school look to the community for expert knowledge to interview, interact with, and visit, and how the community is involved through information evenings for parents, surveys, open nights, parent interviews, and individual ākonga portfolios that are sent home to whānau (Wilson, 2008, pg. 13). One of the cases discussed in their report (Bolstad et al., 2012) identifies an area school in New Zealand that has developed an inclusive, collaborative partnership approach that involves ākonga, kaiako, and the wider community. They describe how the school provides two days a week break from the set curriculum, whereby year 1 – 13 ākonga focus on topics and tailored learning programmes that lead them into the community and surrounding areas, using connections with local businesses and employers for career opportunities. Through primary research, gaining vital skills for these future career opportunities has divulged another common feature of implemented personalised learning; the use of ICT in the classroom.

Information and Communications Technology

Wolf (2010), in a symposium report on ICT use in the classroom, advocates for the use of technology by stating that without it, personalised learning cannot eventuate “at scale” (2010, p. 6). Her report argues that technology enables the tracking and managing of the learning needs of ākonga, provides a platform for access to a multitude of engaging learning activities, and enables opportunities to meet student needs “everywhere at any time, but which are not all available within the four walls of the traditional classroom” (Wolf, 2010, p. 6). The report describes a case study high school in the United States of America that tracks and manages its ākonga through its use of a Big Picture model of learning that requires ākonga to plan a personalised programme of learning with their families that allows two days a week for internships in the community (Wolf, 2010). The report describes the benefits for, and the increased engagement levels from students within the programme through the focus placed on “communications, empirical research, personal qualities, quantitative research, and social reasoning,” allowing for a personalised learning experience beyond the school, emphasising that learning should not and does not just happen within the school day (Wolf, 2010, p. 4).

A case study by Jewitt, Clark, and Hadiithoma-Garstka (2011) on the use and potential of ICT based learning platforms in 12 English primary and secondary schools, reports on the success of the use of learning platforms to provide ākonga with activities that supplement and support their individual learning needs (Jewitt et al., 2011). Kaiako set individual activities on ākonga platforms, used blogs and discussion forums to track ākonga engagement and progress, and uploaded individualised homework tasks that ākonga work through at their own pace (Jewitt et al., 2011). The focus of these platforms is to increase ākonga opportunities for “independent and personalised learning, [whereby] all pupils are able to progress, achieve, and participate in different ways and at their own pace” (Jewitt et al., 2011, p. 343).

Challenges

Data from the mainly qualitative research that has been undertaken in this review has also exposed challenges that schools and ākonga experience while implementing personalised learning. Tolmie (2016), in her Master’s thesis on the
implementation of personalised innovative learning environments in three Auckland primary schools, identified that a lack of buy in from kaiako, through resistance to change, provided evident challenges for researched schools (Tolmie, 2016). Tolmie (2016) noted that due to the multiple levels of communication and collaboration required between multiple kaiako, kaiako resisted the pedagogical adjustments that personalised learning requires. For some kaiako, “taking the leap to teach collaboratively was … scary and one of the biggest initial challenges” to implementation (Tolmie, 2016, p. 72). Tolmie (2016) also identified challenges that ākonga faced in an innovative learning environments. These occurred when ākonga, who had come from more traditional schools, became overwhelmed at the distinct change in pedagogy that personalisation involved (Tolmie, 2016). Other challenges were through ākonga choosing easy activity options that did not extend their abilities. Kaiako countered this by providing work sheets that contained must do and can do activities to ensure progress and development (Tolmie, 2016). Hargreaves (2010), in a Master’s thesis on the perspectives of four New Zealand principals that incorporated personalised learning in their schools, found that a lack of support and direction from the Ministry of Education was a major implementational challenge (Hargreaves, 2010, p. 90). Many of the principals reported that a lack of information about the “desired direction for New Zealand education” from the Ministry of Education had left them in the dark about what future focused goals were needed to move their schools forward, and they stressed that guidance from the Government would “assist principals in developing the research foundations for future [curriculum] decisions” (Hargreaves, 2010, p. 91).

Conclusion

This literature review has focused on the common features and challenges that are evident from case studies and primary and secondary research materials on the implementation of personalised learning within New Zealand, English, and American, primary, middle, and high schools. Four emerging common themes: the authentic assessment for learning, a flexible curriculum, community involvement, and the use of ICT have been identified as necessary for personalised learning to exist. These themes put the learner at the centre of learning that enables individualised pathways and opportunities for ākonga to choose the pace and activities that are best suited for their own learning strengths and needs. For these to be relevant for individual ākonga, kaiako need to provide suitable assessments for learning and obtain a multitude of data that enables systems and learning platforms that are best suited for ākonga progress and development. As research has suggested there are challenges to implementing personalised learning. This is through kaiako being hesitant or uncomfortable with changing their pedagogical practice, ākonga being unfamiliar with a personalised approach, and a seemingly lack of direction and guidance from Government departments. The limitations to this review are that although there are a large number of theoretical approaches and definitions of personalised learning, there exists a lack of case studies that specifically deal with the implementation processes. Another limitation is that, of the case studies researched, a majority deal with a small cross-section of schools. This hinders the ability for this researcher to assess the commonalities on a broader scale. Further case study research on implemented personalised learning practices is needed to enable a more synthesised analysis of best practice approaches.

References


10
How can Teachers put Competency-Based Curricula into Practice?

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Abstract

The current New Zealand Curriculum suggests a new way of thinking about student development in schools. A shift to a more future-focussed curriculum has brought a greater emphasis on supporting students to develop the key competencies outlined in the 2007 document. Consequently, teachers must learn to balance the new competency-based curriculum, with existing demands to develop student academic success. This can be challenging when ways of integrating the key competencies into teaching practices vary depending of the learning context. The reviewed literature suggests principles embraced by early-adopters of the New Zealand Curriculum can be used to direct teachers in leading their teaching focus to assist in developing students’ key competencies.

Keywords: Key Competencies, Implementation, Development, Principles, Personalising Learning, Inquiry Learning, Knowledge.

Introduction

The New Zealand Curriculum intends to ensure all students’ future participation in both the community and the economy (Ministry of Education, 2007). It is hoped that the five key competencies (Thinking; Using language, symbols, and texts; Managing self; Relating to others; Participating and contributing) will play an essential role in achieving this goal. Understanding ways that they will do so, however, can be challenging for teachers who must meet the demands of teaching specific subject content when a strong focus remains on summative assessment. This review examines an assortment of contemporary literature to establish how teachers can incorporate the key competencies into their classrooms to benefit the learning of all students and develop “confident, connected, actively involved, lifelong learners” (Ministry of Education, 2007, p. 7).

Because it remains a challenge for some schools to weave the key competencies into their teaching philosophies and practice, up-to-date findings on successful approaches are difficult to come by. Yet much can be said for earlier studies on the early-adopters of the new curriculum that recognise significant shifts in schools’ perceptions of learning. These shifts have led them to value the key competencies and successfully implement them in their teaching to better develop students’ learning and skills. Many of the findings hint at re-defining teacher and student roles as strategies for implementing the key competencies into practice. Attempts to make the key competencies explicit to students, personalise their learning, and to re-define what knowledge is taught, have brought a change in the way teachers and students work together to develop lifelong skills.

Implementation: Strategies or Principles?

The key competencies have been widely valued by many for their ability to prepare students in becoming lifelong learners who will thrive in our ever-changing world. Yet while many school leaders and teachers recognise their benefits in preparing students, implementing them can be challenging when there is little clarification on exactly how this can, or should, be done. The key competencies were adapted from those expressed by the Organisation for Economic Co-operation and Development (OECD), and in the process were given plain-language titles that minimise the use of jargon (Hipkins & Boyd, 2011). Still, it seems there is little, or no, guidance provided within the New Zealand Curriculum on how to integrate the key competencies with the learning area content that composes the back section, which is the more traditional half of the document (Hipkins & Boyd, 2011). Cowie et al., (2009) provide a possible explanation for this, believing the curriculum implementation is “evolutionary and adaptive, contingent on the people involved, their history together and the cultural, material and structural context” (p. 2). This suggests that perhaps the implementation of key competencies relies on broader principles, rather than specific strategies that may work for some, but not all, learning contexts. As Brough (2008) explained, Dewey’s theories on curriculum integration may assist in developing a direction for key competency
implementation. He stated how Dewey viewed schools as “...miniature democratic communities, where learners work collaboratively in order to solve real-life problems. Through active participation he believed students would develop the skills required to become well-functioning members of society” (p. 16). These views on student-centred pedagogy align with the New Zealand Curriculum’s vision and highlight the importance of positioning students at the centre of teaching and learning.

Making Key Competencies Explicit

Crucial to implementing the key competencies in teaching pedagogy is a strong understanding of learning intentions by students. For students to successfully understand not only what they are learning but why, it is essential that the key competencies are made explicit. As Brough (2008) asserts, the Ministry of Education (2007) advocates that effective teaching occurs when students understand what they are learning, why they are learning it, and how they can use their own learning. A study conducted by Boyd and Watson (2006), found that teachers viewed the key competencies as something they would embed within the curriculum and be explicit about introducing to students. It seemed that the teachers interviewed from six different schools across New Zealand considered that their focus on the key competencies had given them and their students a shared language to talk about motivation, social skills and behaviour and why these were important (Boyd & Watson, 2006). Being explicit about the key competencies had also enabled them to be developed and enacted, as teachers saw a shift in focus from behaviour management towards assisting students to self-manage and understand the importance of the key competencies (Boyd & Watson, 2006). Furthermore, the results showed that students considered their learning to be more successful when their schoolwork was in-depth and cited the exploration of the key competencies. In addition, they found the use of learning intentions, goal setting, and success criteria helped to focus their learning (Boyd & Watson, 2006). This highlights a need for teachers to make the key competencies more explicit to students to support and encourage competency-based curricula within their practice. Twist and McDowall (2010) support this notion when they discuss life-long literacy and the integration of the key competencies and reading. They believe that when the key competencies are integrated into reading programmes, interpretive space is opened up. This means students have more opportunity to make meaning according to the world they bring to the act of reading, rather than merely making meaning according to the world revealed by the text (Twist & McDowall, 2010).

Making the key competencies explicit to students requires teachers to model and help to facilitate the learning of them (Hipkins, 2006, cited in Brudevold-Iverson, 2012). Teachers can have a significant influence on students’ socioemotional skill development, either through explicitly teaching the key competencies or by modelling the key competencies and integrating them into teaching practices (Hattie, 2008, cited in Brudevold-Iverson, 2012). Brudevold-Iverson, (2012) found that the influence of both school and community characteristics on the school culture could impact student’s learning and engagement of the key competencies in many ways. Links between the school and community could further assist in providing students with authentic learning opportunities as they see direct links between the key competencies and their outside worlds (Brudevold-Iverson, 2012). Moreover, when teachers consider how the key competencies might transform existing practices, connections appear between the Effective Pedagogy section of the New Zealand Curriculum and Learning to Learn, one of the New Zealand Curriculum’s principles (Hipkins & Boyd, 2011). This highlights a way for teachers to make the key competencies explicit to themselves through areas of the curriculum that are familiar, as well as to their students.

Personalising Learning

In alignment with the New Zealand Curriculum’s student-centred vision, a common theme throughout the examined studies in implementing the key competencies was the idea of personalising learning. As Bolstad (2011) outlines in her report of the synthesised findings from the New Zealand Council for Educational Research (NZCER) studies of future-oriented education, personalising learning means that learners have time, support, and opportunities to have an input into how their learning is shaped. This means that they tend to be better at describing what they have come to learn about their strengths, weaknesses, interests and motivations as learners and therefore, they can understand how these relate to other contexts of their lives and their ideas about how they see themselves in the future (Bolstad, 2011). Bolstad (2011) ascertains that personalising learning means that students are supported in learning through “authentic, relevant, real-world contexts, where students’ interests, aptitudes and the issues and opportunities within their own communities can form the basis for learning” (p. 84). A key message established from Bolstad’s (2011) findings is the importance of not simply finding better ways to raise everyone’s achievement to an identical level or standard, but to support every person to develop their full potential. Moreover, Hipkins, Roberts, and Bolstad, (2007) assert that students must be encouraged to play an active part in making decisions in learning activities and become actively aware of themselves as learners (an important aspect of the key competency “managing self”). They assert: “More active student involvement in learning is central to the idea of becoming a capable learner, which is the main thrust of the key competencies” (sec. 1, p. 5). This suggests that it is essential for teachers to consider their learners as active participants in their own learning and development of the key competencies.

While clear arguments for the advantages of personalising learning to incorporate the development of the key competencies into teaching practices have been established, Boyd & Watson (2006) outline that inquiry learning is key in supporting students to develop the key competencies. Likewise, Cowie et al., (2009) assert that some schools have encouraged students’ development on the key competencies through greater use of inquiry learning and independent research. Furthermore, Beane (as cited in Brough, 2005) believes that critical inquiry into socially significant issues helps young learners to develop an understanding of themselves and the world, and at times, allows opportunity for social action. It is believed that inquiry-based learning enables students to make use of their personal knowledge and therefore, heightens their ability to develop their skills in participating and contributing and other key competencies (Twist & McDowall, 2010). Specifically, Twist and McDowall (2010) identified that the teachers in their study
were unaware of the power of drawing students’ personal knowledge into reading conversations, and saw key competencies develop as students and teachers learnt how to make use of who they were and what they knew as they made meaning of text. Moreover, Hong’s (2012) research on the practices outlined in schools in South Korea, Australia, and New Zealand suggest more diversified and student-centred instructional methods including self-directed inquiry, project-based learning, group discussions, and presentations should be used to develop a more competency-based curriculum.

A Shift in Knowledge Focus

Since studies indicate that personalising learning acts as a broad principle for weaving the key competencies into classroom learning, questions are raised about the types of knowledge that should be taught to help shift the focus to future-focused learning. It seems that early adopters of the ideas about the key competencies discovered that exploring the key competencies were moving schools away from content-focused learning (Bolstad, 2011). An increasing emphasis was being placed on students developing a wider range of skills and competencies and learning dispositions, and schools valued pedagogies of co-construction with students (Bolstad, 2011). Highlighting this notion of co-construction, in Hong’s (2012) study of the changing nature and role of school curricula, she acknowledges schools that since taking the competency-approach to teaching, have begun to shift their attention to how students respond to their teaching rather than covering content knowledge in textbooks. In the context of New Zealand, teachers in Hong’s (2012) study believed that they needed to revise their curriculum from a content-driven to a more process-driven one to develop students’ key competencies. Hong’s (2012) idea suggests a need for teachers to focus on teaching their learners the importance of valuing their learning process and reflecting on it so they can develop their skills in learning to learn and develop the key competencies.

Some social realist writers have highlighted a world-wide trend for new curricula models to downgrade knowledge (Priestley & Sinnema, 2014). Yet as the key competencies are often seen as developing a new type of knowledge in themselves, perhaps Priestley and Sinnema’s (2014) argument that critics are pointing at an overall shift from specification of disciplinary knowledge to an emphasis on the development of generic skills, highlights a shift in knowledge focus, rather than a development of knowledge hierarchy. As Hipkins et al., (2007) affirm, content-coverage is no longer the single most important factor in developing successful learners (Hipkins et al., 2007). It seems that the key competencies and content knowledge are, in fact, more complementary than oppositional, as without something to teach, teachers cannot develop students’ key competencies (Hong, 2012). Hong (2012) discovered that the schools in her research never totally disregarded or downgraded content knowledge in traditional subject areas, rather they used content knowledge as a tool for students to develop and use various aspects of the key competencies. Thus, Hong (2012) believes: “what competency-based curriculum requires is reforming the way content knowledge is organised and brought to students, not denying its value” (p. 35).

Still, while content-coverage may need to be reduced, this does not mean that curriculum content no longer matters, it means that knowledge will not necessarily always be acquired in a nationally co-ordinated manner simply for its own sake (Hipkins et al., 2007). Instead, students will be taught new knowledge in the form of the key competencies and develop skills to use their competencies in new contexts (Hipkins et al., 2007). Yet to not underestimate the importance of subject-based knowledge, Hipkins, Cowie, Boyd, Keown & McGee (2011), highlight that teachers need a strong knowledge of the nature of their subject as a knowledge-building discipline, particularly if they are going to shift their pedagogical focus from ready-made products of learning to more participatory acts of making meaning. In connecting the school curriculum to develop students’ key competencies, Hong (2012) establishes that it requires a transformative, not additive approach. The key competencies are not seen as a new teaching component, but as an addition onto an existing curriculum (Hong, 2012). This highlights the idea that the key competencies can be considered as new knowledge, and should be balanced out with more traditional content knowledge.

In addition, a shift in knowledge focus has seen changes in assessment, with some schools adopting a more explicit focus on the teacher sharing learning intentions and encouraging personal goal setting to prioritise assessment-for-learning and incorporate the key competencies (Cowie et al., 2009). Yet, while teachers should aim to implement more activities and ideas related to assessment-for-learning to assist learners in developing the key competencies, making pedagogical changes should not alter the intended content or conceptual learning focus (Hipkins & Boyd, 2011). Hipkins and Boyd (2011) argue that when teachers use assessment-for-learning strategies, students may become more involved in monitoring their own progress, yet the targets of that progress may remain as they were. They explain that changes in teaching pedagogy, such as focus on assessment-for-learning, position key competencies as agents of curriculum improvement, but not necessarily as potentially transforming the curriculum that students experience (Hipkins & Boyd, 2011).

Conclusion

The New Zealand Curriculum intends to guide schools in developing students who are well-prepared for the future through competency-based curricula. In doing so, the New Zealand Curriculum has established the key competencies as being fundamental for students to actively participate in society today, and in the future. Teachers have a significant role to play in working to guide students in developing the key competencies. However, doing so can be challenging when a significant focus in schools still lies with high-stakes assessment and subject-based knowledge. Approaches for successfully incorporating the development of the key competencies are difficult to come by, yet as the research in this review has outlined, perhaps this is due to the nature of the key competencies. That is, that they will be approached and developed by teachers and students differently, depending on the learning context.

This suggests that teachers must find a balance between content-focussed learning, and competency development and
avoid regarding one as more important than the other. In supporting this, the reviewed literature suggests that teachers should make the key competencies explicit and place learners at the centre of learning through personalising learning and focus on student’s process of knowledge and competency development. While the reviewed literature has outlined specific principles for developing students’ key competencies from early-adopter schools, further research on more recent findings of the successfulness of these principles would greater develop teachers’ ability to balance both academic, content-focused pedagogy with competency-based curricula.

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Personalised Learning: A Powerful Idea

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Abstract

This brief literature review focuses on criticism of personalised learning and the implications for implementing it in practice. In particular it explores the ideological underpinnings, noting a common thread questioning links between personalised learning and neo-liberalism. In addition power dynamics between students and teachers/schools are discussed, noting that it is easy to unintentionally undermine well intended attempts to give students more say in their education by neglecting the impact of the teacher/school’s presence. Finally, the lack of clarity around personalised learning is considered, particularly noteworthy is how it appears to have impacted the extent and direction of the literature, leaving little concrete data about what it looks like in practice and how it affects student achievement.

Keywords: Personalised Learning, Student Voice, Self-Regulated Learning, Review, Power Dynamics, Education, Neo-Liberalism.

Introduction

This literature review endeavours to garner a cursory impression of the literature surrounding personalised learning. Although personalised learning is of primary concern, student voice and self-regulated learning are also being considered. These concepts may seem similar, but it would be quite possible to have either student voice or self-regulated learning without any personalised learning whatsoever. It would be prudent, at this point, to provide a definition of personalised learning to help expand on this idea, however a precise definition appears elusive (Prain et al., 2012). Here, student voice refers to the practice of giving students a say in their education, while self-regulated learning refers to giving students greater responsibility over their own learning. Note that neither of these requires the student has a say in what they are learning about or that the education is tailored specifically to them, which are both key aspects of personalised learning. Perhaps personalised learning could be seen as a natural, though not necessary, meeting point for the student voice and the self-regulated learning.

The personalised learning movement carries a great deal of weight, as discussed further in this review; however, this review focuses on criticisms of, and practical concerns for, personalised learning. Focusing on the criticisms for this review is an intentional attempt to counterbalance the sheer force of the personalisation narrative. Personalised learning is a compelling ideal that it would be easy to accept without considering carefully, and this review is an attempt to resist this urge. There are three main points drawn from the literature that this review engages with. The first is centred on discussion in the literature around the ideological issues, including the extent to which personalised learning is equitable, how it connects to other ideologies and, a recurring theme, how closely personalised learning appears to align with neo-liberal market based ideologies. The second main point is the role that power discrepancies in the student-teacher/school relationship affects students willingness to express their voice in a genuine way. The third main point is about the “fuzziness” of the term personalised learning, and perhaps as a consequence of this, the lack of specific details backed up by literature about personalised learning in practice. It appears that there has been only a light amount of concrete details about what personalised learning looks like in practice or what kind of impact it has on achievement (Prain et al., 2012).

Personalised Learning

The momentum behind the personalised learning movement is strong. Not only does it exert a strong social force, in some countries, such as the United Kingdom it is embodied in law. Personalised learning is supported by the New Zealand Curriculum in that aspects of its vision may be best achieved through personalised learning, such as the assertion that learners will be “active seekers, users, and creators of knowledge” (Ministry of Education, 2007, p.8) . In addition, the New Zealand Curriculum states on effective pedagogy that “effective teachers ... look for opportunities to involve students directly in decisions relating to their own learning” (Ministry of Education, 2007, p.34). According to Pykett personalised learning has also large
impact on education policy in England (Pykett, 2009). Perhaps most indicative of the force behind the personalised learning movement is Article 12 of the United Nations Convention on the Rights of the Child, which Robinson (2011) argues supports personalised learning. 196 countries are party to the Rights of the Child articles (United Nations General Assembly, 1989), though notably this does not include the United States of America. Robinson (2011) focuses on a particular clause from Article 12 about children’s right to have a say in all matters affecting them, as appropriate to the age and maturity of the child. Robinson appears to interpret this in an extreme way, suggesting that even children as young as four should be viewed as appropriately mature to have such a say. It is unclear where Robinson would draw the line, if at all, though it is noteworthy that the subjects of Robinson’s study held different beliefs on this topic, excluding children aged 4-6 from taking a questionnaire because of an anticipated inability to recognise their own preferences (Robinson, 2011).

Although the idea of personalised learning is a powerful one, it is not without its detractors. Personalised learning has been criticised with regards to its conceptual “fuzziness”, its ideological underpinnings and the assumptions it makes about students (Praîn et al., 2012). A specific complaint that seems to concern at least a few authors (such as Beach & Dovemark; 2009, Hartley, 2009) is that personalised learning appears to be founded on market based neoliberal ideology, however this narrative is called into question by Pykett (2009), Hartley (2009) discussed the apparent similarities between personalisation and the student centered learning movement from the 1960s. This discussion suggests that personalisation separates itself from the student centered learning movement in a market-model that treats students and their families as customers that ought to have a say in the product they are consuming. Hartley (2009) also emphasises that personalisation promotes customisation at the individual level, promoting a more equitable stance than student centred learning, since it must necessarily be tailored to all children.

Beach and Dovemark (2009) investigate two Swedish classes in their eighth year of post early childhood learning within close proximity of each other, but with different socioeconomic status. The investigation focused on what kind of attitudes were valued and led to success. Beach and Dovemark (2009) used their findings to draw a comparison between education and a competitive marketplace, within which consumerism is valued. In this case it is the education, and the teacher’s time, that is consumed. Building upon this analogy they argue that this kind of environment promotes selfishness and neo-liberal beliefs at the expense of other worldviews (Beach & Dovemark, 2009). This conflicts with Hartley’s (2009) suggestion about the equitable nature of personalised learning.

Pykett (2009) works to complicate the issue with regards to personalised learning being a neo-liberal ideal, investigating other possible, conservative, political motivations and links to the de-schooling movement of the 1960s and 1970s. Specifically Pykett links the de-schooling movement to personalised learning in that they both limit government authority on children’s learning, instead promoting child and parental influences instead. Pykett also points out that this has been undermined with recent understandings of personalised learning, because it is being positioned as a tool to create more flexible workers achieved through greater surveillance, which both run counter to the ideas behind the de-schooling movement. She suggests that this appears to stem from a reimagining of the goal of education, that is, to create an idealised worker, rather than to free people from the tyranny of their government (Pykett, 2009). In addition, similar to Beach and Dovemark’s findings, Pykett (2009) points out that personalised learning rhetoric assumes that the child/parent is best informed on their education. Ultimately Pykett (2009) suggests that it is not the case the moral imperative is being leveraged by personalised learning, but rather created in order “to govern citizens through their freedom”.

Netcoh (2017) followed a project in an urban middle school in the United States of America which implemented a personalised learning project called E-time. E-time was dedicated class time where students had a high degree of control over the content and direction of their learning. Teachers and students each ended up struggling with the amount of choice the students should be given. Some students felt they did not get enough choice - teachers expected them to be more rigorous and this interfered with student autonomy. Teachers worried they had stressed the element of choice too much and not presented it as a learning activity. Although some students found the teachers involvement stifling, other students found the choice paralysing or boring, preferring to be directed, reinforcing both Beach and Dovemark (2009) and Pykett’s (2009) concerns about the extent to which personalised learning is well suited to all students. Interestingly, a connection was found between student confidence and their success in E-Time, further reinforcing this concern (Netcoh, 2017).

A concept closely related to the idea of personalised learning is that of student voice. Student voice entails giving students some sort of influence over their education, typically in expressing their interests to those with the power to make changes. This relates to personalised learning insofar as personalised learning entails student directed learning. That is, as long as the learning is not personalised to the student solely by outside forces, such as the teacher, and thus the student gets some say in their education. One concern raised in the literature is that student voice might not necessarily represent their genuine opinions, just because they have had an opportunity to express themselves. This could be because of the subtle power dynamics at play in education.

Robinson (2011) conducted a study in two schools where they gave students opportunity to lead a project changing something about their school. In the primary school students seemed interested in changing how literacy was taught so it might be more exciting, but their teacher intervened, in a way the researchers implied was inappropriate and that they had warned against, overriding the students interests and pushing them in a direction the researchers noted the students did not seem particularly enthusiastic about. Robinson (2011) suggests that we must be aware of power of the position we hold as educators in this process, and that should exercise caution, not only in the actions we take, but also what kinds of communication we consider appropriate if we want to hold a genuine dialogue.

Canning (2016) discusses the role of student voice in tertiary education in the United Kingdom, coming to similar conclusions to Robinson (2011) with regards to how conscious we must be of the role of power disparities in the genuine expression of student’s opinions (Canning, 2016). Although Canning advises a similar kind of caution, the tertiary context leads symptoms presenting in
a different kind of fashion. Canning (2016) uses regulatory capture as an analogy for one of the ways student voice may be undermined in a tertiary context, suggesting that students may use avenues for student voice and activism on behalf of the student body as a career move, undermining the genuine expression of the students, particularly as one is unlikely to cause controversy when they are acting in the interests of their career.

PRAIN et al. (2012) conducted a review of personalised learning literature, gathering a sizeable list of concerns about the field. Many of the concerns flagged I have already discussed, though others include how personalised learning has defied precise definition, how it does not seem to fit well with prescriptive curricula and, with surprisingly little emphasis, how there seemed to be a lack of research on how it is implemented in practice or how successful it is in raising student achievement. Perhaps unsurprisingly, given the lack of definition, the 2012 PRAIN et al. review found that there seems to be confusion as to what personalised learning is, with reports that traditional methods are being used to achieve personalised learning, such as whole class teaching (PRAIN et al., 2012). But perhaps the most powerful concern they raised seems to have gone unnoticed. They cite motivational benefits as a justification for personalised learning, that is, that it will improve the motivation of students; however, later in the same article, when discussing self-regulated learning they suggest that self-regulated learning is achieved insofar as the student is motivated, among other factors (PRAIN et al., 2012). This suggests a possible circular dependency, insofar as there is overlap between personalised learning and self-regulated learning, in order to gain the motivation benefits of personalised learning they must first be motivated enough to achieve self-regulated learning.

WALDRIP et al. (2014) detail in depth a process used to develop a survey about personalised learning, largely consisting of statistical analysis of the survey to ensure its reliability. They found that the questions were statistically reliable, meaning we would expect to find someone taking the survey multiple times to give fairly consistent responses; however, they also employed a discriminant validity test to ensure the survey items were not overlapping conceptually. They found that many of the scores on the discriminant validity test suggested overlap conceptually. They disregard this result because they do not believe there to be any conceptual overlap (WALDRIP et al., 2014). This begs the question of why they applied the test in the first place if they had already decided there was not any conceptual overlap. This survey was utilised by PRAIN et al. (2012) to investigate student’s attitudes towards personalised learning. They found that students generally viewed personalised learning positively, but that there were issues with the extent to which they felt they had agency. Encouragingly PRAIN and colleagues also did a case study of personalised learning in a mathematics context and found it improved motivation and grades of students as well as the collaboration of teachers involved (PRAIN et al., 2012).

I have briefly explored the literature for several potential issues for practitioners, who are implementing personalised learning. While specific strategies for resolving these issues have not been discussed, awareness of the issues helps teachers inform their practice in the way they see best fits to their specific situation. I have demonstrated that practitioners need to be aware of the power dynamics in the school/classroom and the kind impact that they can have on student willingness to express themselves honestly. In addition practitioners need to careful how they manage self-directed learning, so as to scaffold and support students with low confidence as well as modelling self-directed learning approaches and explicitly stating expectations about the focus on learning. Awareness that not all students feel comfortable in the roles required by personalised learning and self-directed learning is also important. Some students may not be as comfortable as others demanding the teacher's time, because it could be seen as selfish in large classrooms. This leads into a final consideration for practitioners, that just giving all students freedom to choose the direction of their learning is not inherently equitable. The teacher may have to consciously, and cautiously, factor for personalised learning favoring students more willing and better positioned to capitalise on the resources available to them.

Conclusion

In this review I have resisted the compelling nature of personalised learning and investigated criticism of it and practical implications. An apparently resonant chord in the literature, that personalised learning is suspiciously similar to neo-liberal market based ideology, was identified. Power struggles, or perhaps more dangerously unwitting oppression of students voice was a significant feature in the literature. Finally, personalised learning was accused of conceptual ‘fuzziness’ (PRAIN et al., 2012). This entails not only a lack of clarity of what personalised learning means, but also how it is interpreted in practice and what kind of impact it has on student achievement. Though this is perhaps not surprising for a movement that an ethical appeal that seems so natural and strong. In spite of the concerns and criticism raised by the literature, it is hard to argue against the notion that students should have a say in something as important to them as their education. An idea this powerful is a dangerous kind of idea that need not be pinned down or solidly grounded to become pervasive.

References


Educating for Diversity in New Zealand: Considerations of Current Practices and Possible Pathways?

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Abstract

This article reviews what the current practices are for educating students for diversity, and what considerations need to be made. New Zealand prides itself on being a diverse and inclusive society with bicultural foundations. Although all people have the right to an education free of bias and discrimination, the experiences of many disabled, minority, or ethnic groups, gender and sexually diverse students, and their families suggest that there is still a long way to go in educating for diversity. This literature review considers approaches to teaching that encourage diversity, and reviews certain factors that may need to be reconsidered by educators if we are to truly appreciate, and educate for, diversity. Through exploring possible pathways, teachers should understand the complex diversity of each student in their class, and how valuing this diversity can provide 21st century students and their communities with a diverse knowledge base, and willingness to work and collaborate with people from diverse backgrounds.

Keywords: Diversity, Education, Aotearoa/New Zealand, Disability, Gender, Culture, Ethnicity, Sexual Orientation, Minority Students, Identity.

Introduction

As part of The Global Education 2030 Agenda, the United Nations Educational, Scientific and Cultural Organization UNESCO (2017, p. 7) defined diversity as “people’s differences which may relate to their race, ethnicity, gender, sexual orientation, language, culture, religion, mental and physical ability, class, and immigration status”. This paper draws on this comprehensive understanding of diversity alongside a range of research, to consider what is being done, and what could be done to educate for diversity in New Zealand.

New Zealand is a multiethnic society with a population who are mostly Pākehā (New Zealand European), with the largest minority group being Māori (Statistics New Zealand, 2015). Following on from high unemployment rates in skilled migrants, and global security threats, the New Zealand Government set out to create a diverse, friendly nation that welcomes and supports all, and celebrates difference (Kolig, 2003, as cited in Simnon-Kumar, 2014). The Ministry of Education (2007) reflects this image for the education system through its principles for educators to acknowledge, consider, and reflect a respect for inclusion, cultural diversity, and the Treaty of Waitangi through the New Zealand Curriculum (Ministry of Education, 2007).

In 2007, the New Zealand Government claimed that it was an inclusive society that led to New Zealand’s prosperity (Department of Labour, 2007), however, the literature reveals that current teaching practices vary widely, with certain schools taking steps to specifically address topics around student diversity (Burford, Lucassen, & Hamilton, 2017), and evidence revealing that many students are still discriminated or excluded, even if unintentionally (Major & Santoro, 2014; Stead, 2014). Current attitudes to diversity are portrayed through school cultures, and the discourse of educators. When these attitudes are negative, students and their families are left feeling unsupported and alone (Purdue, 2009), in contrast to the opportunities that arise for educators who incorporate and value diverse backgrounds and knowledge (Hindle et al., 2011). Through looking at international research alongside New Zealand research, a promising pathway to diversity comes through knowledge of self and students. Taking one’s own identity into consideration, and making a real effort to get to know students, could have a significant impact on student motivation, and student perceptions on diversity (Maged, 2014; Walrond, 2008). Current education on diversity is often based on cultural diversity (Hajisoteriou, & Angelides, 2015), and fails to address the diversity within groups; the people who do not match their given labels, or fit the social norms.

Current Practices and Considerations

Attitudes to Diversity.

To educate and prepare students for diversity, schools and communities must seek to understand how the presence of wider societal attitudes within the school culture and environment assist or hinder an acceptance for diversity. Although children with
disabilities have as much of a right as any other student, many families still find the New Zealand education system discriminatory; it was the negative attitudes, and a lack of understanding shown by early childhood teachers towards disabled students’ learning which caused great stress for parents (Purdie, 2009). These discriminatory and negative attitudes towards diverse students appear to continue through to secondary schools. For example, a Rainbow Youth Workshop in two Auckland Secondary Schools, aimed to promote acceptance and understanding of gender diverse students, reduce the associated bullying, and create a more supportive environment (Burford et al., 2017). The results from student questionnaires in this workshop revealed that many learners felt that their school culture would negatively impact on gender-diverse, and sexually-diverse students. Nevertheless, the students found the workshop to be highly beneficial, and for many, encouraged their desire to support peers who feel victimised or alone (Burford et al., 2017). Sousa and Lima (2017) highlighted how in Brazil, incorporating and valuing knowledge about the diverse ethnicities that make up the Brazilian people, from an early age, could be a vital step in creating cultures of belonging, inclusion and acceptance for cultural and ethnic diversity in the school and wider society. In New Zealand, this can be seen through certain schools that are using Kapa haka Māori (Māori cultural practices and views of the world) and bicultural experiences to implement the curriculum and to educate for diversity. Hindle et al. (2011) demonstrated how, by teaching the arts through the context of a pōwhiri (welcome ceremony), students would experience an integration of dance, drama, and performing for an audience in a familiar context, without following a Western tradition of separating art, music, dance, and theatre into separate disciplines (Anderson, 1996, as cited in Hindle et al, 2011). Such examples of incorporating education, experience, and understanding, reveals a possible pathway to improve attitudes towards diversity.

Attitudes to diversity may be portrayed in explicit or implicit ways through discourse and labels, which highlight difference in both positive and negative ways. The conversations that teachers have with, about, or in front of, their students, the way they respond to situations, and the attitudes that they deem praise-worthy, all contribute to the formation, and acceptance, of diverse learner identities, and the opportunities that students have to test out different ways of being (Major & Santoro, 2014). The term special education, although commonly used, suggests “that there was an education apart from, and different to, the types of education that other learners in schools received” (Bourke, 2006). Whether this has arisen to address the needs of diverse learners, or to support struggling teachers, the assumption that disabled children require a different or special education constructs the idea that children with disabilities are inferior and different from their peers (Bourke, 2006; Purdie, 2009). Because it is often expected that disabled students need special education, similarly students from minority cultures are expected to learn and communicate in English, regardless of their native tongue (Ballam, 2008). Although it may be fair to expect those new to a country to make an attempt at learning about the local language and customs, the literature recognises that such attitudes of expectation to become like the dominant culture fail to value diverse knowledge, experiences, and often result in poor academic or social outcomes (Ballam, 2008). Ballam (2008) also highlighted the need for educators to allow, and therefore normalise, the use of multiple languages within the classroom, and seek ways of representing information not solely through language, so to improve attitudes towards diversity, and better the experience of diverse learners.

Knowledge of Self and Students

Knowledge of self and students is imperative in educating highly adaptable, connected 21st century citizens, who recognise and value diversity (Bolstad et al., 2012). An important consideration therefore, is how our expectations and experiences form our identities, and how knowledge of students provides a platform for understanding diverse approaches to teaching and learning. Walrond (2008) explored Caribbean education philosophy through Caribbean culture and education, and considered it necessary to acknowledge and implement aspects of this when teaching Caribbean Canadian students. The research presented a stark contrast between Caribbean teachers, who would take on an almost parental role, going to student homes to encourage students to come to class, providing assistance, caring for them and their wellbeing, in comparison with the typical Western teacher who says “come to me if you need help” (Walrond, 2008, p. 198). As such, knowing student and community expectations and being flexible in accommodating diverse needs is especially important for teachers from a dominant, able-bodied, and heterosexual Pākehā ethnicity; for such teachers, it is challenging to fully understand the ways in which teaching practice may implicitly discriminate, or negatively impact on learners and their achievement (Major & Santoro, 2014; Stead, 2014). Furthermore, knowledge of prior experiences and expectations for the role of a teacher or student, reveal the importance of a teacher’s need to reflect and inquire into issues within a class, and collaborate with diverse members of the community, so to continually develop an inclusive practice, and actively respond to diverse learner needs (Bourke, 2006; Stead, 2014).

A willingness to understand oneself, and have a genuine interest in knowing students calls for teachers be aware of cultural taxation in their efforts to embrace and educate for diversity. Higher education institutions that fail to address the needs of culturally incompetent teachers, may factor in a Pre-Service Teachers (PST) unintentional cultural taxation due to lack of practical examples. Maged (2014) explored how PST are prepared for meeting the variety of learning needs in New Zealand’s increasingly culturally diverse classrooms. Over the period of a four-year degree, the PST participants revealed that they had only had one compulsory course specifically on cultural diversity; the course lasted one semester and many students found it too theoretical. In this course, a Māori teacher educator acknowledged that people often see him as an expert in regards to working with Māori children, instead of realising that even if a PST is from the dominant culture, they can still address diverse needs showing respect, and making an effort to know all diverse students. Knowing how other students in the class see diverse peers provides a teacher with the agency to frame discussions and activities that address misunderstandings, and educate students for diversity in school and in their communities. Ethnic minority groups and refugees are often portrayed positively, as active citizens who are proud of their cultural diversity, and want to contribute positively and voluntarily to New Zealand society (Simon-Kumar, 2014). This is in comparison with minority
groups such as Pasifika families, of whom over half are represented as living in poverty (Veukiso-Ulugia, 2016), or disabled students who may rely on school resources to determine whether they are able to go to a certain school (Purdue, 2009). Diversity should not mean that such students have to prove themselves as worthy or as active citizens to be able to receive the same inclusive education as their peers; furthermore diversity certainly should not deny any assistance due to lack of an expert person or resource (Purdue, 2009).

Diversity within Groups

A common issue throughout the research is that there appears to be little evidence of educating about diversity within groups. Due to this, many minority groups face perpetuating stereotypes, and a struggle against the dominant social norms. Maged (2014) considered one issue in educating for diversity to be the lack of cultural and ethnic diversity amongst teachers, because this often does not align with the diversity within a classroom. Similarly, it has been recognised that, regardless of background, most students in New Zealand are in schools that represent the dominant mainstream ideas and values, which can significantly marginalise students, and hinder achievement (Hindle et al, 2011). A typical way to educate for diversity in schools is by celebrating different festivals, organising international potluck meals, or listening to music in different languages (Hajisoteriou, & Angelides, 2015). Although there is nothing wrong with including such aspects in school life, this can foster stereotypes and disregard the diversity among all students. Forty students in Cyprus were selected as part of a research on intercultural pedagogical practices in primary schools. Half of the students were Cypriot, and half were immigrants from Europe, the United Kingdom, and Asia. Many of the students interviewed responded to diversity in terms of cultural diversity, and felt discussions around this usually followed up incidents between native Cypriots and immigrants. Immigrant children saw these conversations as positive, however felt that they were teacher-led, and offered little opportunity for them to share their feelings or experiences – which they wanted to do (Hajisoteriou, & Angelides, 2015). Similarly, out of 33 secondary schools participating in Te Kotahianga (a professional development programme to improve educational achievement of Māori students in English-medium secondary schools), 25% of the teachers were considered to be low implementers of culturally responsive pedagogies. These teachers, in largely Māori classes, missed opportunities to incorporate Te Reo (the language of the indigenous population), Māori content, or student perspectives and experiences (Hindle et al, 2011). The resulting contrast between self and other, heightens the likelihood of perpetuating stereotypes in schools. For example, a committee member and parent at a New Zealand early childhood centre questioned the need and appropriateness for a disabled child to be enrolled at a kindergarten even though it was made clear that the child had the right to attend (Purdue, 2009), and for Cypriot children who were friends with immigrants, they felt the need to justify their friendship choices because the school culture made them feel that such friendships were not normal (Hajisoteriou, & Angelides, 2015).

In contrast, Sousa and Lima (2017) revealed how in early childhood education, Brazilian teachers presented a mix of indigenous and Afro-Brazilian musical instruments to the class without specifying which instruments were indigenous, or Afro-Brazilian. The children were able to test out the different instruments, and play along to various songs. It was only after the experimentation that the teachers specifically introduced the instruments, and explained that they are not commonly used instruments because they were made by indigenous and black people. In this way, the children were able to see the value in indigenous and Afro-Brazilian music and instruments, before they were confronted with the knowledge and wonderings around their society’s history of devaluing them.

Being aware of social norms in New Zealand and abroad is important to consider when educating for diversity within groups. In Samoa, there are strict moral codes and traditional Christian-influenced values, which expect young people to uphold the family name, refrain from, and protect younger siblings from, sexual activities before marriage (Veukiso-Ulugia, 2016). Although Samoan migrant families may still hold traditional Samoan expectations for their children, research has shown that the attitudes and behaviour towards sexual health, for New Zealand-raised Samoan youth in particular, is becoming increasingly diverse. A survey of 535 Samoan secondary students revealed these changing attitudes for Samoan youth in New Zealand: 45% claimed to have had sexual intercourse, and two-thirds of these students stated that their first experience of sexual intercourse took place before they turned fifteen (Veukiso-Ulugia, 2016). When teachers do not consider or acknowledge the diversity within groups, and that not every student from a certain group is the same, there is a risk of hindering students’ freedom to test out diverse ways of being. Major and Santoro’s (2014) year-long case study between two classrooms, in two New Zealand primary schools, focused on two nine-year-old children; Beth, a South Korean girl, and Vincent, a Chinese boy. The teacher’s construction that serious, hardworking female students are good and sensible reinforced Beth’s knowledge of South Korean social norms. This caused her to hold the same expectations for herself as a learner in New Zealand and prevented her from being able to experiment with shaping her identity in a different way. In contrast, the strong Chinese values which were enforced in Vincent’s home life did not align with the school expectations for students, and therefore allowed Vincent to be a loud and silly boy when he was at school. As such, it is vital that educators consider their own attitudes towards teaching and learning, and how these may support or hinder educating for diversity in New Zealand classrooms.

Strengths and Limitations

A strength of the literature is that there is a range of New Zealand-based research regarding diversity. New Zealand’s unique bicultural context no doubt contributes to the considerations that are being made regarding to educating diverse learners, for a diverse society.

The evaluation of the Rainbow Youth workshop was beneficial as it provided a student voice in regards to their gender and sexually diverse peers, however this came from secondary students and did not provide a follow up to evaluate any resulting impacts on the school environment and attitudes in the long term. It was not until 2015 that the Ministry of Education added a specific section for gender, and lesbian, gay, bisexual, transgender, intersex and questioning (LGBTIQ) students into “Bullying prevention and response: A guide for schools” and
therefore this may still seem like a new issue for many educators (Ministry of Education, 2015).

Perhaps the most significant limitation, is that the current research divides diversity into specific categories, for example culture, gender, sexuality, ethnicity, disability, and so on; there appeared to be no research which looked at educating for diversity as a whole. Therefore, there is a gap in the research in regards to possible pathways for connecting effective practices and educating for diversity.

Conclusion

This review of literature highlighted a range of contexts both in New Zealand and abroad to connect common practices, and to highlight factors that need to be considered when educating for diversity. The comparison of negative attitudes towards diversity, and efforts to incorporate diverse knowledge in the classroom, calls teachers to consider their own attitudes alongside those of the school and wider community. Through considering the impacts of these attitudes on students, and seeking to normalise, and value the diversity of each child, a possible pathway to educating for diversity can be seen. An important contribution to the literature was the research by Walrond (2008), who examined how western teachers failed to meet the expectations set by Caribbean teachers who provided parental and pastoral care to their students. This can easily be imagined in a New Zealand setting, and highlighted the importance of getting to know students and understanding oneself.

There is a gap in diversity research in regards to educating for a more comprehensive diversity, which is not separated into different categories, for example cultural or gender diversity. However, the various research on different types of diversity is an invaluable resource for creating connections between which practices work, and which factors need to be considered. In this way, when integrated, there are multiple potential pathways to work towards educating for diversity in New Zealand.

References


Gender Equity in STEM: Addressing the Disparities

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Abstract

Despite similar achievement levels, females continue to be underrepresented in Science, Technology, Engineering, and Mathematics (STEM) disciplines. Given the strategic importance of these for New Zealand’s future, ensuring females have equitable access to education and careers in these sectors is vital for upholding diversity and equality. This literature review examines current research on gender disparities in STEM, and identifies three key contexts of gender interest in STEM: developing, maintaining, and retaining. These contexts are aligned to the primary, secondary, and tertiary, education sectors, within which current research on self-concept and self-efficacy, social belongingness, and stereotypes are investigated. A key finding of the importance of physical science exposure and experience for later female vocational interest and retention is identified. This and other outcomes from the literature, provide evidence for potential tangible strategies to encourage increased gender uptake in STEM.

Keywords: Gender, STEM, Self-concept, Self-efficacy, Achievement, Bias, Equity, Education.

Introduction

The importance of science in enhancing and sustaining New Zealand’s future has been shown through the development and implementation of current New Zealand Government initiatives such as the National Statement of Science Investment 2015 - 2025 (NSSI) whose vision is “a highly dynamic science system that enriches New Zealand, making a more visible, measurable contribution to our productivity and wellbeing through excellent science” (Ministry of Business Innovation and Employment, 2015, p.7). However, despite New Zealand’s national push for science, technology, engineering, and mathematics (STEM), women continue to be underrepresented in many of these academic and vocational areas (Ministry of Education, 2016).

A literature review into educational gender differences was commissioned by the Ministry of Education in 1999 to investigate mounting concerns of falling academic achievement rates in boys from 1989-1999 (Alton Lee & Praat, 2000). Interestingly, within science however no significant differences in gender achievement was evidenced at the primary education stage, however by the beginning of secondary school significant gender differences in favour of boys was evidenced (Alton Lee & Praat, 2000). Furthermore, girls attitudes towards science showed decline consistent with international trends (Alton Lee & Praat, 2000).

No updated report has been commissioned since 2000, but current international testing data from PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) shows that there are no significant differences in average science achievement between genders (Ministry of Education, 2017). Therefore, the lack of females in certain STEM disciplines such as the physical and mathematical sciences, engineering, and computer science (Ministry of Education, 2016) cannot be explained by lower achievement levels. A review of current literature provides insight in understanding gender disparities across the primary, secondary, and tertiary sectors.

Developing Interest: Self-Concept and Achievement

Differences persist in early science exposure between the genders, with research from Jones, Howe, and Rua (2000) demonstrating that by sixth grade, boys are more likely to have had higher extra-curricular exposure to physical sciences whereas, in contrast, girls were more likely to have had biological sciences experiences. Prediger (1982) surmised that the RIASEC vocational framework which measures six interest types; Realistic, Investigative, Artistic, Social, Enterprising, and Conventional, has two fundamental dimensions of data-ideas and people-things. Using these dimensions, Lippa (1998) investigated the differences between gender vocational interests in ideas-data and people-things subgroups. Men were shown to
have a greater interest in working with things, compared to women whose preference was people based professions (Lippa, 1998). Whilst some research maintains there are minimal differences between the genders (Hyde, 2005), statistical meta-analyses such as that by Su, Rounds, and Armstrong (2009) continue to assert innate differences in the people-things dimension as a factor in gender vocational interest disparities.

Research by Leibham, Alexander, and Johnson (2013) aimed to further investigate links between early science interest in preschool and later achievement levels at age eight. Interestingly, early interest was shown not to be a factor in predicting later science achievement for boys, however it was related to later achievement levels for girls (Leibham et al., 2013). Furthermore, whilst there were no gender differences in overall achievement levels, subsequent analysis did show that boys achieved higher in physical science and girls higher in biological science (Leibham et al., 2013). Therefore, as discussed by Jones et al. (2000) early exposure of girls to physical science may increase interest and thus achievement levels, and the importance of doing so is that “from the perspective of power, equity, and financial resources, encouraging girls in the physical sciences can open doors that lead away from traditional lower paying jobs held by women” (p. 189).

Despite differences in early preschool interest, Leibham et al. (2013) found no difference in science self-concept between genders at age eight whereby they defined self-concept as “a multidimensional concept that reflects one’s perceptions of relative competence in various domains including social, cognitive, and physical activities” (p. 577). Whilst there were no differences overall, Leibham et al. (2013) did conclude that girls with early interest in science had a higher science self-concept at age eight than boys with the equivalent initial interest. Self-concept, however, was not shown to have a mediating effect on the relationship between early science interest and later achievement, and they therefore concluded that early interest in science raises achievement levels for girls (Leibham et al., 2013). The effects of interest on gender equity in STEM is a common research theme in much of the literature.

Maintaining Interest: Self-efficacy and Social Belongingness

Vocational interest remains a pivotal aspect throughout secondary education for encouraging gender equity in STEM. The leaky pipeline metaphor is used within the literature to describe the phenomenon of high initial student interest in STEM, and the characteristic loss of interest amongst some students, especially women (Sadler, Sonnert, Hazari, & Tai, 2012). As previously identified an early interest in science in girls can be a predictor of higher later achievement (Jones et al., 2000; Leibham et al., 2013), therefore if achievement is equal or higher than boys (Ministry of Education, 2017) we must next examine potential mediating factors which may be affecting the differences in gender vocational interest.

Sadler et al. (2012) identified students shifts in STEM attitudes in secondary school and related vocational interests. In a 6,860 cohort of American students, male STEM vocational interests remained stable throughout secondary education from 39.5% beginning to 39.7% finishing high school (Sadler et al., 2012). In comparison, female student STEM vocational interests were significantly lower and displayed higher attrition from 15.7% at the beginning, reducing to 12.7% by the end of high school (Sadler et al., 2012). Interestingly, retention rates of STEM vocational interest were shown to be higher in females with initial physics or engineering interest and lower in males with biology or earth/environmental science (Sadler et al., 2012), which conflicts with current early science exposure whereby the majority of females had more exposure to biology as outlined by Jones et al. (2000). The links between the retention of females in STEM and early science education were identified by Sadler et al. (2012) as a potential strategy for raising the number of women in later STEM careers.

Research by Tellhed, Bäckström, and Björklund (2017) concludes that consideration of self-efficacy and social belongingness are important in explaining gender differences in interest between STEM and HEED (Health care, Elementary Education, and the Domestic spheres). Tellhed et al. (2017) argue that current literature focuses on levels of participation of women in STEM with little consideration given to the opposing underrepresentation of men in HEED, and in their research they aim to contribute to the study of both disciplines. Self-efficacy is a similar term to self-concept in that both relate to an individual’s competence beliefs; however, self-efficacy has more specificity surrounding a learning area or task (Leibham et al., 2013; Tellhed et al., 2017). Although Leibham et al. (2013) concluded their research showed no evidence for self-concept as a mediator in science interest and achievement in elementary school, new evidence from Tellhed et al. (2017) in Sweden suggests that self-efficacy does in fact act as a mediator for STEM interest in secondary school students.

Furthermore, Tellhed et al. (2017) found that social belongingness was a mediator for both STEM and HEED interest, though the effect of this was strongest on STEM. They argued that social belongingness was particularly important at a high school student age level because student expectations are that they will experience greater social belongingness from their own gender and thus this helps to explain why males are generally more interested in STEM and females in HEED (Tellhed et al., 2017). This was an important novel finding from their research which indicates more consideration may be needed for encouraging more women in to gender minority vocations.

Retaining Interest: Society, Stereotypes and Bias

Females currently outnumber males in attainment rates of undergraduate degrees in New Zealand (Ministry of Education, 2016) but gender disparities remain in the choices of major subject within STEM. These numbers reflect the current literature on differences in gender vocational interest and STEM experiences (Jones et al., 2000; Lippa, 1998; Sadler et al., 2012; Tellhed et al., 2017). Latest available statistics show that of the bachelor degrees conferred on domestic New Zealand students in 2015, males outnumbered females in engineering, mathematics, and computer science, whereas females outnumbered males in health (with particularly significant disparity in nursing) and biological sciences (Ministry of Education, 2016). Ratios of gender within these major subjects supports international trends of differential STEM and HEED interests.

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Diekman, Clark, Johnston, Brown, and Steinberg (2011) argue for a goal congruity perspective where they cite evidence that females are more likely to value communal societal goals, such as working with people, which conflicts with the notion that STEM careers do not facilitate communal goals. These STEM goal affordance stereotypes were, unsurprisingly, therefore shown to be stronger in females than males (Diekman et al., 2011). Furthermore, there was evidence for a causal link between the goal congruity model of communal goals and goal affordance stereotypes and STEM interest, by statistically significant results which demonstrated that by increasing communal goal values, STEM vocational interest was decreased amongst participants, whilst there was no effect on alternative career interest (Diekman et al., 2011). It is important to note however that this causal link was only shown in the small sample size of 64 participants.

Whilst the goal congruity perspective demonstrates links between communal goals and goal affordance stereotypes to STEM vocational interest, the authors highlight that their research should be seen as a contribution to the field and that “a focus on communal processes should not supplant a focus on other critical variables, such as self-efficacy, experience in math and science, or prejudice against women in these fields” (Diekman et al., 2011, p. 913) Furthermore, with consideration to raising levels of women in STEM careers, thought must be given not only to recruitment but also retention (Diekman et al., 2011).

Recent research on self-efficacy, interest and experience have been shown to influence STEM gender interest (Diekman et al., 2011; Jones et al., 2000; Lippa, 1998; Sadler et al., 2012; Tellhed et al., 2017) but the effects of societal influence, such as persistent science and gender stereotypes, has had reduced research.

Research has shown that when there are strong heteronormative gender-science stereotypes, females tend to have lower science identification and vocational interest whereas males display higher science identification and vocational interest when the same gender-science stereotypes are present (Cundiff, Vescio, Loken, & Lo, 2013). Cundiff et al. (2013) showed that implicit stereotyping lead to lower rates of females’ intention to persist in science education, however this result was offset when science identity was accounted for. They suggest that strong identification with science mediates the effect of implicit stereotyping and the intent to persist (Cundiff et al., 2013). Interestingly, gender identity did not have the same mediating effect on implicit stereotyping in either gender and limited results for a potential mediating factor for males self-reported stereotyping where self-report is personal identification of agreement with stereotypes (Cundiff et al., 2013).

There is also evidence to support that gender-science stereotypes may not only influence undergraduate choices (Cundiff et al., 2013) but may also lead to implicit bias higher within tertiary science faculties (Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012). In a sample of university professors of physics, chemistry, and biology from the United States of America (USA), faculty members of both genders displayed implicit bias during a double-blind study where faculty members were presented with applications for a laboratory manager job, the applications had identical credentials whereby the only variation was gender name (Moss-Racusin et al., 2012). Results showed the male application was more likely to be hired, be offered greater career mentoring and a higher starting salary than the equivalent female applicant (Moss-Racusin et al., 2012). Thus for Moss-Racusin et al. (2012) this raised the concerns about the potential negative consequences of faculty bias in the retention of female graduates in STEM post-undergraduate education.

Limitations

Lack of contemporary empirical New Zealand based research on gender equity in STEM remains a limitation; however, current tertiary statistics (Ministry of Education, 2016) support the same trends in gender vocational data which has been identified in the, mostly, USA-centric literature. It is also important to note, that in many of the studies the results showed only the correlation between variables rather than causation, which suggests there may remain unidentified mediating factors influencing the data (Cundiff et al., 2013; Diekman et al., 2011; Tellhed et al., 2017). The methodologies used by researchers, such as retrospective studies (Sadler et al., 2012) or the use of parental survey (Leibham et al., 2013), have the potential to affect the ability to obtain accurate data because answers may be unintentionally skewed and therefore this should also be taken in to consideration.

Furthermore, participants in samples may not reflect the total diversity within populations. For example, many of the studies had samples in which the majority of participants were identified as Caucasian (Cundiff et al., 2013; Diekman et al., 2011; Leibham et al., 2013) and often from urban geographical areas. Considerations of socioeconomic status should also be considered as a potential limitation, such as that identified by Leibham et al. (2013).

Future Research

As previously identified, a current lack of participant diversity identifies potential areas for future research. Diverse samples may include more research on gender interest in STEM within ethnic minority groups, or students from low socioeconomic groups. Furthermore, currently the focus remains on gender as a dichotomous variable rather than a continuous spectrum, therefore increased consideration on a wider range of gender identity experiences in STEM may help to contribute to the current body of literature. Cundiff et al. (2013) also suggests research on strong ‘gender-science’ stereotypes and the potential effects in the underrepresentation of females in STEM.

Conclusion

The issue of continued underrepresentation of females in traditionally male dominated STEM disciplines is decidedly complex and challenging. As educators are facing increasingly diverse classrooms, consideration of limiting factors in achieving equitable access for minorities, such as females in STEM, is crucial for ensuring inclusive education. A common recurring theme was the importance of motivating STEM interest in girls, particularly at an early age. Ensuring equitable access and exposure to physical science may set students on a pathway which enables them to successfully navigate and circumvent the leaky pipeline. As educators, consideration must therefore be made on the potential strategies and pedagogies of how to effectively implement and enact this in the classroom.
Furthermore, there was an awareness throughout the literature reviewed, that an obstacle to achieving gender equity in STEM is not only the ability to recruit more women but also, crucially, how to retain them in the field. To be able to effectively do this the literature suggests it will likely require a societal shift in our embedded stereotypes and practices, as inherent biases remain unchallenged. Examining assumptions and remaining open to reflection of our own values and beliefs, may help to mitigate potential unexamined stereotypes or bias.

Although the issue is complex, the literature highlights the potential areas for intervention and action, which educators may be able to enforce to make meaningful change in STEM uptake rates. Considering the equal science achievement levels in genders, encouraging self-concepts and promoting STEM as a viable career pathway for females should be considered for beginning to address the current vocational disparities.

References


Supporting Pasifika Literacy Education in New Zealand

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Abstract

This literature review identifies the factors influencing Pasifika literacy education throughout a range of primary, intermediate, and secondary New Zealand schools. Literacy achievement outcomes for Pasifika students in New Zealand are increasing; however, Pasifika students are still below-average when compared with other ethnicities like European/Pākehā, Asian, and Māori. The factors that influence Pasifika achievement are the maintenance of home-school partnerships, cultural capital, library use, church influence Pasifika literacy achievement were home-Samoan peoples. The factors identified that were shown to influence Pasifika literacy achievement were home-school partnerships, cultural capital, library access, church-based literacy education, and the classroom environment. Two main conclusions about what teachers can do to improve literacy achievement are drawn from the research: teachers need to establish a positive partnership between the home and school, and teachers need to enact a culturally responsive pedagogy for Pasifika learners.

Keywords: Pasifika, Literacy, Education, Achievement, New Zealand.

Introduction

Literacy education was traditionally viewed as the acquisition of skills such as reading, writing, listening, and speaking. Vygotsky (1978) emphasised that language acquisition is dependent on social interaction and stressed the importance of explicit teaching (Fletcher, Parkhill, Fa’afoi, & Taleni, 2008; Taleni, Parkhill, Fa’afoi, & Fletcher, 2007). In a post-Vygotskian era literacy is seen as a social construction where critical literacy and sociocultural approaches need to be acquired (Cullen, 2001). In the past many Pasifika students in New Zealand were shown to be disengaged and underachieving in literacy at school (Alton-Lee, 2003). The Programme for International Student Achievement (PISA) statistics for 2015 (OECD, 2015) reveal that while there has been an increase in Pasifika achievement in reading, writing, and mathematics since 2013, Pasifika students are still underachieving in all three areas compared with their European/Pākehā, Asian, and Māori counterparts (OECD, 2015). Taleni et al. (2007) found that ethnicity alone does not account for these statistics but ethnicity combined with low socioeconomic status does. Pasifika peoples is a term used to refer to all peoples from a range of unique cultural backgrounds: such as peoples from Samoa, Tonga, Tokelau, Niue, and the Cook Islands (Taleni et al., 2007). The largest sub-group of Pasifika peoples in New Zealand is Samoan. This literature review refers to Pasifika peoples and has a particular focus on Samoan peoples. The factors identified that were shown to influence Pasifika literacy achievement were home-school partnerships, cultural capital, library use, church-literacy education, and the classroom environment (Allen, Taleni, & Robertson, 2009; Alton-Lee, 2003; Dickie, 2010; Fletcher, Greenwood, & Parkhill, 2010; Fletcher, Parkhill, & Fa’afoi, 2005; Fletcher et al., 2008; Fletcher, Parkhill, Taleni, & O’Regan, 2009; Spiller, 2012; Taleni et al., 2007; Wilson, Madjar, & McNaughton, 2016). One conclusion from the literature is that teachers can maintain home-school partnerships focused on student learning and enact culturally responsive pedagogy in order to improve Pasifika achievement in literacy (Allen et al., 2009; Alton-Lee, 2003; Fletcher et al., 2009; Spiller, 2012; Taleni et al., 2007). This literature review focuses predominantly on the factors that influence achievement for under-achieving Pasifika students in New Zealand but there is also research that examines the factors influencing high Pasifika achievement in literacy which is cited in this review (Fletcher et al., 2008; Parkhill et al., 2005).
additional cultural contexts students are situated in. Home-school partnerships that focus on student learning proved to have positive effects on student learning outcomes (Alton-Lee, 2003). Fletcher et al. (2010) is a small qualitative study involving thirteen parents across six New Zealand schools which explore parental perceptions of children learning to read in schools. In Fletcher et al. (2010) all thirteen participants agreed that having a rapport with the teacher and the school was important. A limitation of this study was that the six schools included were identified by literacy stakeholders as schools with effective reading practices (Fletcher et al., 2010). The school was also decide 5 which indicates that the socioeconomic area the school is situated in is relatively affluent. Fletcher et al. (2009) found two challenges when attempting to establish a home-school partnership: schools found it difficult to get parents to acknowledge their role in the home-school partnership and Pasifika parents did not have enough time to be involved. The study found that in three schools many adults in Pasifika families tended to be working in low-paid shift work or working multiple jobs, and were without the support of their extended family, which they would have had back home (Fletcher et al., 2009).

Fletcher et al.’s study (2010) is a qualitative study which explores teachers and parents’ views of factors that support or hinder literacy education for Pasifika students. The strength of this study is that throughout the research process matai (Samoan chiefs) were consulted to co-construct the meaning of evidence used. A weakness of this study, however, was that the principals of each school selected the staff who participated in the study; thus principals could have chosen teachers who were more culturally responsive. In comparison, Allen et al. (2009) is a qualitative study that explored the journey of five teachers (from primary, intermediate, and secondary schools) who went on a trip to Samoa to find out more about their Samoan students’ culture and background to help them as teachers in the classroom. One teacher found that Samoan every family member was supported and cared for, and this made her reflect on the different context Pasifika families are exposed to in New Zealand (Allen et al., 2009). Taleni et al. (2007) elaborates on the context of New Zealand: theirs is a qualitative study that surveyed 37 Pasifika students from a range of four different primary, intermediate, and secondary schools in the South Island. These schools were in the 1 to 5 decile rating and were identified to have a large number of Pasifika students. Taleni et al. (2007) found more than 50% of students said that they did not have enough time nor space to do their homework due to the fact that they had to look after younger siblings and cousins. In addition to this, fewer than 20% of students reported that their parents could read (Taleni et al., 2007). Fletcher et al. (2009) found that parents’ abilities in reading influenced their children’s reading at home as well. A limitation of Taleni et al. (2007) is the reliability of findings because children were selected as interview subjects which raises questions about the reliability of children’s perceptions. Home-school partnerships are an integral part of supporting literacy education for Pasifika students.

Cultural Capital

The notion of cultural capital posits the view that if a student has values that are consistent with school norms and values then the student is more likely to be successful compared to those whose cultural dispositions differ (Bourdieu & Passeron, 1990). Alton-Lee (2003), Fletcher et al. (2010), Fletcher et al. (2009) and Taleni et al. (2007) all identify this notion of cultural capital as a factor influencing the success of Pasifika students in literacy education in New Zealand schools. This is problematic because Pasifika peoples have their own set of cultural values and beliefs which may not directly coincide with the school’s dominant culture. Taleni et al. (2007) found that over 60% of participants preferred to read stories about Pasifika peoples, however, in school the reading material provided was predominately about European peoples. Cultural capital can be understood in relation to socioeconomic status. Wilson et al. (2016) completed a study that looks at the achievement rates of secondary Pasifika students in 34 secondary schools across New Zealand and examines teacher practices of teaching literacy. Wilson et al. (2016) found that opportunities to learn were significantly decreased if families were situated in a lower socioeconomic area versus living in a higher socioeconomic area. The Wilson et al. (2016) study is a sizable study of 34 schools from a range of decile ratings. However, a limitation of the study is that 34 schools entered the study between 2011 and 2012 and there was not a check for possible variations in findings between the schools that entered in the two different years. The studies mentioned above found that generally schools with a high percentage of Pasifika students tended to be lower in decile (Alton-Lee, 2003; Fletcher et al., 2009; Fletcher et al., 2010; Taleni et al., 2007). Cultural capital is important to Pasifika literacy education because the amount of cultural capital Pasifika students have can hinder their literacy development in New Zealand schools.

Library Use

Bourdieu and Passeron (1990) refer to the importance of students and families having access to social and cultural resources. Alton-Lee (2003) found that limited access to library resources was a barrier to learning for low-achievers in New Zealand. This is supported by Taleni et al. (2007) who found that student access to libraries was a critical resource for students and their families. Taleni et al. (2007) reported that fewer than 50% of low-achieving Pasifika students used the library. In comparison, the Fletcher et al. (2010) study found that most parents used the school and community libraries, no matter what reading ability their child had. Fletcher et al. (2008) focused on the factors influencing Pasifika students’ achievement in literacy. The researchers interviewed achieving and high-achieving Pasifika primary students about their literacy education. Fletcher et al. (2008) found that all the achieving and high-achieving Pasifika students belonged to the community library and visited it regularly whether with their parents, peers or themselves. Fletcher et al. (2005) found that the addition of Information Communication Technology (ICT) use was important to School A in the study; a specialist in ICT was employed as a teacher to help students with their use of technologies. The limitation of the study was that it was a small (only two Christchurch schools were involved) (Fletcher et al., 2008). Pasifika students who have regular access to a library are more prepared to success in literacy education in New Zealand schools.

Church Literacy Education

Many Pasifika students in New Zealand experience their out-of-school literacy education from the Church (Dickie, 2010). Dickie (2010) examines the out-of-school literacy experiences of
14 Pasifika students. The study focused on whether Church-based literacy helps or hinders Pasifika students’ literacy education. The students were trained as junior ethnographers to document their own out-of-school experiences with literacy. A limitation of this method is that students may not be able to recognise all the times where they were using literacy outside of school or students could manipulate the material to make it look like they were doing more literacy than they actually were or vice versa. The two main types of church literacy education identified in the study was reading passages out from the Bible with accuracy and taulolo which is reciting passages from the Bible on White Sunday in Samoan or English (Dickie, 2010). Pasifika church literacy education also involves the comprehension of texts, because is very important that students understand what they are reading (Dickie, 2010). Although memorisation of a text is important, students are encouraged to offer their own explanations about what the passages mean to them (Dickie, 2010). One hindrance of church literacy education that was identified in the study was that students were taught not to question the Bible, and therefore students are not exposed to critical literacy skills. Fletcher et al. (2009) states that questioning the Bible is like challenging fa’asamoa (traditional Samoan knowledge), therefore it is not encouraged. Fletcher et al. (2005) study supports Dickie’s (2010) argument that Church-based literacy education that does not involve critical literacy is a hindrance for schools: because students are unable to question the Bible this could be counterproductive for the development of critical literacy skills.

**Classroom Environment**

New Zealand school practices and Samoan school practices differ: for example, in Samoa children are taught to respect the teacher, not to talk back directly to the teacher, and are told what to do (Fletcher et al., 2009). In contrast, New Zealand encourages collaboration, discussion on contemporary issues and the development of critical literacy skills (Ministry of Education, 2006). The Taleni et al. (2007) study found that over 60% of students wanted a quiet room over a noisy room at school because it was easier to concentrate. Spiller’s (2012) qualitative study identified the effects that the classroom environment had on students: researchers followed a group of Year 9 Pasifika students across a range of their classes and found that they displayed a wide range of behaviours in different classroom contexts. A limitation of the study was that it was a small sample in that only one school was involved in the study. Spiller (2012) found that when Pasifika students displayed poor behaviour in their classrooms, teachers blamed Pasifika values. Teachers in the study additionally held the view that Pasifika parents do not support their child’s learning, however, it has been found that one of the main reasons for Pasifika people migrating to New Zealand is for their children’s education (Spiller, 2012). Therefore, teacher assumptions about Pasifika students can be dangerous and affect what Pasifika students experience in the classroom which can ultimately impact upon achievement.

**Supporting Literacy Development**

_Establishing home-school partnerships_

Studies by Allen et al., 2009; Dickie, 2010; Fletcher et al., 2010 and Spiller, 2012, identify teachers establishing and maintaining home-school partnerships as something that teachers can do to support literacy education for Pasifika students in New Zealand. Fletcher et al. (2010) states that teachers and schools can facilitate relationships between parents and school in a number of ways: for example teachers can invite parents into their classrooms, have individual discussions, parent interviews, and talk through school reports. In the Allen et al. (2009) study teachers said that they would try to make a larger effort to contact families, participate in cultural activities and to organise activities that would attract Pasifika families, now that these teachers saw the power of relationships particularly in Samoan culture (Spiller, 2012). Dickie (2010) found that it would be beneficial for teachers in Church sites to know what is expected of students at school regarding critical literacy education. In addition, Fletcher et al. (2009) found that teachers and schools needed support when breaking down language barriers; the employment of a Pasifika liaison officer that could liaise with the school and Pasifika families would benefit Pasifika students in their literacy education. Implications for practice identified included a strengthening of home and school communication and to put adequate structures in place for this to happen (Fletcher et al., 2010).

_Culturally Responsive Pedagogy_

Teachers should also incorporate culturally responsive practices in their teaching because it is shown to enhance student learning outcomes (Alton-Lee, 2003; Alton-Lee, 2003) found that when learning was made relevant to students’ lives, cultural practices were valued, and when new information was linked to student experiences student learning outcomes were improved. Spiller (2012) states that teachers need to make sure they can support literacy development by going over basic literacy and comprehension skills where required. Taleni et al. (2007) found that teachers need to find “culturally appropriate resources and contexts for learning.” (p. 66). Allen et al. (2009) found that teachers started to acknowledge students’ prior knowledge, to use basic Samoan and Pasifika languages in their classroom, and they found and made culturally appropriate resources. Similarly, Spiller (2012) identified that teachers in the study found that Pasifika students wanted their lessons to be active which included discussions, videos, and games. The study also found that teachers need to be respected and know how to manage the classroom because a noisy classroom disrupted student learners (Spiller, 2012). Therefore, teachers need to be self-reflective and examine how their beliefs may impede upon Pasifika students’ learning (Spiller, 2012), and to enable a culturally responsive pedagogy. In these ways teachers are able to respond to Pasifika students’ literacy education needs effectively.

**Areas for Future Research**

There appears to be a lack of research on Pasifika literacy education in higher decile schools. Taleni et al., (2007) state that they had difficulties finding higher decile secondary schools with an adequate number of Pasifika students to research. This could be due to the fact that in higher decile schools (ranging from 5-10) there is a significantly lower proportion of Pasifika students (Wilson et al., 2016). Across this decile range 11 out of 34 schools had an average of 7% Pasifika students in total (Wilson et al., 2016). These findings appear to remain largely the same for
primary and intermediate schools (Fletcher et al., 2009; Taleni et al., 2007).

References


Streaming of Classes, Social Comparison, and Students’ Self-Concept

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Abstract
Whilst there is an abundance of varied research on the benefits and drawbacks of course-by-course streaming, there is agreement in the literature on the value of a student’s positive self-concept. This analysis consolidates the findings of a number of primary research papers on the effects of independent course streaming in secondary school mathematics on students’ self-concept. Although conclusions vary, the role of social comparison is widely accepted and the subsequent Big Fish Little Pond Effect (BFLPE) and associated contrast and assimilation effects prove to be dominant concepts. To what degree these dictate a student’s self-concept is debated but the majority of literature is in support of some degree of contrast effect: that is, a student’s academic self-concept is negatively related to the average achievement of their peers. In a streamed context, that puts those most at risk the lower achieving students in all streams.

Keywords: Streaming, Self-Concept, Mathematics, Big-Fish-Little-Pond Effect, Course-By-Course Streaming, Social Comparison.

Introduction
Streaming – and similar practices, also known as ability grouping, setting, or regrouping – refers to the grouping students based on academic achievement in an attempt to create more homogenous groupings (Chmielewski, Dumont, & Trautwein, 2013). Although there is an abundance of research on the perceived benefits and disadvantages of streaming classes, this analysis is written in an effort to consolidate the effects of streaming on student self-concept, with a particular focus on the literature that is based on research in mathematics classrooms. While drawing from a range of research, conclusions and implications will be focused on within-school, course-by-course streaming, where students are streamed in respect to separate subjects independently.

Mathematics is a dominant domain in research on course-by-course ability grouping, perhaps due to it being a more commonly streamed subject (Ireson & Hallam, 2009). In an Australian context, Forgasz (2010) states that mathematics carries authoritative performance connotations and has strong influence on conceptions of achievement, which is similar to the arguments of Bonne and Johnston (2016) and Chui et al. (2008). This suggests that mathematics, as a subject, may have stronger effects on self-concept.

Academic self-concept can be described as how one perceives his or her capabilities (Chmielewski et al., 2013; Chui et al., 2008). Specifically, mathematics self-concept is referred to “as an individual’s belief regarding his or her present capability to solve a given set of mathematics problems” (Bandura, 1986, as cited in Bonne & Johnston, 2016, p. 20). Researchers have alluded to the importance of clarifying concepts of academic self-concept from that of the more global self-concept or self-esteem (Chmielewski et al., 2013; Marsh, 1987).

The research question asked is how, through social comparison and the subsequent effects, does course-by-course streaming of mathematics, affect secondary students’ academic self-concepts in the subject and what are the implications for those practising in the education sector, with particular reference to New Zealand education documents.

Review of Literature
Even though positive self-concept in itself is desirable, studies have also shown strong, positive links to motivation, effort, and
subsequent achievement (Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Valentine, DuBois, & Cooper, 2004). Generally, and specifically, in mathematics, findings hold that self-concept can also have longer term effects on outcomes, such as aspirations and course selections (Ireson & Hallam, 2009). This is an interesting and noteworthy link to the claims that streaming in itself can also affect long term outcomes by locking in lower achieving students because future options are likely to be curtailed (Forgasz, 2010).

Supporters of streaming practices (Guill, Lüdtke, & Köller, 2016; Preckel, Göts, & Frenzel, 2010) refer to the benefits of teachers being able to cater to individual student needs, while the contrary argument, including that from New Zealand research, raises the issue of educational inequality (Homby & Witte, 2014; Macqueen, 2013; Oakes, 1985; Turner, Rubie-Davis, & Webber, 2015). In reference to education in New Zealand, Anthony and Hunter (2017, p. 77) advocate heavily for more flexible, heterogeneous grouping practices with the belief that “over reliance on ability grouping practices are counter to equitable pedagogical practices for diverse learners”. These are practices that New Zealand’s Ministry of Education are pushing for with documents such as The New Zealand Curriculum (Ministry of Education, 2007) and Tātaiako (Ministry of Education, 2011). They discuss the confusion and conflict that is created when other Ministry of Education initiatives, such as the Numeracy Development Project (NDP) openly support the use of ability grouping (Ministry of Education, 2008).

Social Comparison and Frames of Reference
Researchers agree that a student’s academic self-concept is shaped by social comparison (Chmielewski et al., 2013; Chui et al., 2008; Ireson & Hallam, 2009; Liem, Marsh, Martin, McInerney, & Yeung, 2013; Liem, McInerney, & Yeung, 2015). The relative frame of reference used in the research of student self-concept is varied, with older studies primarily using measures of whole school academic achievement (Marsh, 1987; Marsh & Parker, 1984). It is now largely agreed that the frame of reference taken most into consideration by students is the more prominent one, in this case being those in their immediate class or stream environment (Ireson & Hallam, 2009; Liem et al., 2013; Liem et al., 2015). In their studies, Liem and colleagues discuss and investigate what is known as the local dominance effect which theorises that, even if it is less representative, people tend to base self-evaluations on the most local frame available (Zell & Alicke, 2010). However, this was only somewhat supported because Zell and Alicke concluded that stream-average achievement was the most salient frame, when class-average achievement should have been the most accurate predictor if strictly following the effect of local dominance. Liem and colleagues’ research was justifiably motivated, because prior to their study, support for the local dominance effect was largely based on laboratory evidence with a lack of application to naturalistic school contexts (Liem et al., 2013; Liem et al., 2015). The generalisability of their findings is discussed in following sections. Chui et al. (2008) also explored a smaller school context in the United States, 170 students from one school, and found that students “most frequently compare themselves with other students who perform similarly to them” in the same stream (p.125).

While specifically investigating frames of reference across English and mathematics, Liem et al. (2015) also raise the notion that students’ mathematics self-concepts appear to correspond to their actual proficiency in the subject. This was supported by evidence of achievement in the form of a nation-wide, standardised Primary School Leaving Examination (PSLE) compared to self-concept measured by a self-description questionnaire. They concluded that due to mathematics being a subject with more definite solutions and evaluation standards, students then rely on the task-based criterion standards as a more accurate frame for self-evaluation. This is an interesting factor to contribute towards the research of students’ frames of reference in opposition of social comparison.

Contrast vs. Assimilation Effects

The theory on the development of academic self-concept refers to two mechanisms which affect the result of social comparison within ones’ frame of reference – contrast and assimilation effects (Marsh, Chessor, Craven, & Roche, 1995). The contrast effect refers to a student comparing and contrasting their own achievement with that of their groupings average. If conforming to a contrast effect, the student will have a lower self-concept when those around them have a higher achievement average, and the same student, a high self-concept when the group average achievement is lower (Chmielewski et al., 2013). On the other hand, where upward comparisons make a student feel confident and positive about their own abilities and therefore improve their self-concept, it is the assimilation effect at play (Chmielewski et al., 2013; Chui et al., 2008). Therefore the assimilation effect results in students’ academic self-concepts being positively affected because they are “basking in the reflected glory” of the members of their high achieving group (Chmielewski et al., 2013, p. 928). There is less consistent evidence for the solidity of assimilation effect, particularly as the only evidence in reference to streaming refers to upward assimilation, that is, comparison with higher-achieving students raising ones’ academic self-concept as described above.

By way of an international comparison of Programme for International Student Assessment (PISA) data, Chmielewski et al. (2013) observed that “students in course-by-course tracking have the highest level of exposure to students in other tracks … and are thus constantly reminded of the relative status of their track”. They then concluded from their analysis that when streamed in this way assimilation effects outweigh that of contrast, and students in higher mathematics streams had higher mathematics self-concepts and those in lower streams, lower self-concepts (pg. 932). Ireson and Hallam (2009) reached similar conclusions in their study, conducted across 23 secondary schools in England, a sample that was not included in Chmielewski et al.’s (2013) international comparison.
In comparison, some literature argues and agrees that, when controlling for achievement, the influence of contrast effect outweighs that of assimilation, resulting in what is known as big-fish-little-pond-effect (BFLPE) (Marsh, 1987). This is defined as “equally able students have lower academic self-concepts in high-ability schools than in low-ability schools” (Marsh, 1987, p. 280).

**Big Fish Little Pond Effect**

From their sample of Singaporean students, at a level equivalent to intermediate school in New Zealand, Liem and colleagues found evidence of the BFLPE (Liem et al., 2013; Liem et al., 2015). Their data showed that students in higher mathematics streams did not show more favourable mathematics self-concepts in relation to their peers in lower streams. In their 2013 study, findings indicated that students in the higher stream had lower mathematics self-concepts than those in the lower stream, providing evidence towards a dominating contrast effect. The entirety of their sample, 4,461 Grade 7 – 9 students (age 12-14), were from nine Singaporean schools which reduces the generalisability of their study. However, because all schools followed the same national streaming and assessment policies, they had uniform, comparable measures across every school and stream, which reduced the effect of confounding variables. The education environment in which these studies took place could be described as competitive with emphasis placed on academic success (Liem et al., 2015).

As well as findings about frames of social comparison, Chui et al. (2008) contribute interesting conclusions towards the academic discussion on self-concept. Although they found that higher stream students had higher self-concepts than their lower stream counterparts, which aligns with a dominant assimilation effect, after controlling for grades, stream placement no longer affected students’ self-concepts about their mathematics ability. That is, they suggested that in mathematics, a student’s grade is the influencing factor on self-concept as opposed to the stream in which they were placed subsequently. With this said, the single American school in which this study took place consistently performed highly in mathematics which suggests for this sample, grades were a significant factor in self-concept. Although also not highly generalisable, this study brings forth valuable future research questions in terms of controlling for grades.

In contrast with the theories of contrast and assimilation, after finding that students tend to compare themselves with those doing better than them, Chui et al. (2008) suggested students do not submit to either of these effects as a form of social comparison. A key conclusion they deduced from their study, which included directionality of student comparison, is that because across-stream comparisons are rare, this should alleviate researchers’ concerns that lower stream students have lower self-concepts because they are comparing themselves to higher stream students. Chui et al. (2008) stand by it being other factors that account for this, such as grades, teacher practice, and labels.

**Limitations**

The use of standardised, one-off testing appears to be a favourable measure of student achievement in studies of streaming and self-concept. For example, the Organisation for Economic Cooperation and Development (OECD)-developed PISA mathematics assessment (Chmielewski et al., 2013), the Maryland School Assessment (MSA) (Chui et al., 2008), GCSE examinations (Ireson & Hallam, 2009) and PSLE (Liem et al., 2013; Liem et al., 2015), many of which were self-reported. As I have already noted this has the potential to allow researchers access to a directly comparable measure across their sample, but using measures, such as high-stake national examinations, could influence a student’s association between their own achievement and self-concept. Other researchers have attempted to broaden their use of achievement indicators by using measures such as self-reported Grade Point Average (GPA) (Marsh, 1987) or a Cognitive Abilities Test in correlation with teacher-assigned school mathematics grades (Preckel & Brüll, 2010).

Another recurring reservation raised by multiple researchers, but as yet not addressed, is the complexity of reference groups students use. Such reference groups are known to be “far more complex” than those based simply on class peers or stream achievement (Chmielewski et al., 2013, p. 950). Examples raised are other peer groups, parent influence, previous achievement, teacher influence, and variance in teaching practice between streams (Chui, et al., 2008; Liem et al., 2013; Liem et al., 2015). Although Marsh (1987, p. 804) used achievement measures of the whole school to measure against student self-concept, he recognised that in a high school setting “older students have a broader perspective from which to evaluate their own academic ability” – not just their immediate classmates. He suggested that this would result in a smaller BFLPE but also that it would account for the variance in research results. This, in combination with studies taking place in a multitude of different countries with different streaming policies and practices, could further account for variations in research. It is through efforts such as controlling for grades, as discussed earlier, that researchers are attempting to control these extraneous variables (Chui et al., 2008; Preckel & Brüll, 2010).

It appears there is a balance for researchers to manipulate between sample size, common achievement measures, and uniform grouping practices when constructing samples and methodology. From this information, future research should include those whose aims are to broaden their achievement indications, strive to use actual grades obtained from official records, and investigate how other potential factors (for example teacher interaction or labelling) interact with social comparison and the self-concept of students in different streams.

**Implications**

Between 2003 and 2012, the self-concepts (self-beliefs) for mathematics of 15-year-old New Zealanders declined (Ministry of Education, 2015). The OECD, an organisation that New Zealand is part of, maintains that the “development and
maintenance of positive academic self-concepts is one of the key objectives of educational systems worldwide” (OECD, 2003, as cited in Liem et al., 2015, p. 104). This illustrates a potential slippage between objective and outcome. Those in support of BFLPE can conclude that those most at risk are the low achievers in all streams (Liem et al., 2015).

There is agreement amongst researchers that there is a need for teachers to downplay the undertaking of social comparison amongst students in the classroom (Chmielewski et al., 2013; Liem et al., 2013). Even if students are constantly reminded of their ability grouping, educators in mathematics can endeavour to promote positive academic self-concepts by focusing on criterion-based assessment, putting less emphasis on competition and developing a supportive classroom environment that appreciates the unique strengths of each individual. In their study based in New Zealand classrooms, Anthony and Hunter (2017) compiled the statements of 102 primary mathematics support teachers and suggested that it is through-mixed ability classes that students can be allowed to listen to and support each other, valuing individual strengths.

Boaler (2013) connects the concept of ability grouping to students’ beliefs about potential and mindset. She contends that generally, grouping practices can communicate damaging fixed ability mindsets. It is important that ability is promoted as something that can improve with effort and, specifically in mathematics, that mistakes are opportunities for growth. Bonne and Johnston (2016) connected this idea of mindset and student self-concept to teachers’ deliberate use of intervention in the form of pedagogical strategy. Although their study was also conducted in a small number of New Zealand primary schools, students in mathematics classes where teachers made micro-interventions, with the intent of increasing students’ mathematics self-concept, such as making student progress explicit, indeed showed an increase in growth mindset belief, academic self-concept, and achievement. Even though Bonne and Johnson (2016) didn’t have control over how the intervention was enacted in each case, they stand by the finding that micro-interventions, in the form of pedagogical strategy, resulted in these increases and this perhaps has implications for all teachers.

In their research Anthony and Hunter (2017) found that although New Zealand teachers are being prompted to rethink the largely unquestioned ability grouping practices, there is uncertainty around change. While these observations were only from a select number of primary school teachers, they contributed in a valuable manner from a select number of primary school teachers, they contributed in a valuable manner to understand how the intervention was enacted in each case, as they have control over how the intervention was enacted in each case. They give examples of professional learning support, exemplars of practice, and whole-school leadership.

Conclusion

This literature review shows some of the connections between independently streamed mathematics classes and students’ academic self-concept in the subject. Although research is inconclusive, perhaps due to variations in statistical analysis, ability grouping practices, sample locations or other confounding variables, the concepts of BFLPE as well as contrast and assimilation effects are dominant. There is agreement in the literature that academic self-concept is shaped through social comparison, but to what extent and the outcomes of such is debated. A common finding amongst the research evaluated in this paper was evidence and extent of BFLPE. That is, a student’s academic self-concept is negatively related to the average achievement of their peers. However overall, students in higher mathematics ability streams perhaps show higher academic self-concepts due to there being some accuracy and correlation between said self-concept and their proficiency in the subject. It is suggested that in order to foster positive academic self-concept, teachers’ practice should incorporate less emphasis on competition by appreciating the unique strengths of each individual student and their capability to learn.

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Exploring Unequal Power Relations within Schools: The Authenticity of the Student Voice

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Abstract

The literature examined within this review criticises the validity of the current student voice work and initiatives occurring within schools. The authenticity of student voice comes into question as the various unequal power relations within school environments leaves students inferior to teachers and school leaders. This creates a significant implication for minority students, because they are unable to analyse critically the current school environments. In order for schools to become a more supportive working environment, teachers and school leaders need to release the power they currently hold and be open to a new pedagogical structure developed by a variety of students.

Keywords: Student voice, Power, Participation, Students as Researchers, Student Silence, Relationships.

Introduction

The New Zealand Curriculum aims to ensure all school students become “connected, actively involved, lifelong learners”, who are empowered by their peers and teachers (Ministry of Education, 2007, p. 37). Student voice projects and initiatives within school educational reforms have been tipped as a successful way to improve all students’ schooling experiences, particularly those who struggle to connect with the current system (Mitra, 2004). Many schools, particularly within New Zealand, have developed opportunities, such as student councils, to create opportunities for students to incorporate their views (Bourke & Loveridge, 2016). These opportunities emphasise the importance of engaging students in school decisions to help improve the educational outcomes and achievement of all students (Lodge, 2005). Typically, student voice projects actively involve students in the facilitation and management of the educational system, where their views and conflicts are given equal weight with those of leaders within the school (Robinson, 2011). Numerous educational inquiry tasks within New Zealand incorporate some shape or form of student voice within them (Education Review Office, 2014); however, it is difficult to find schools that explicitly restructure school policies, practices, and assessments due to the empowerment of student voice. Furthermore, many teachers understand the importance of student voice, yet fail to successfully enable students to voice their opinions within the teaching and learning process. Teachers often feel that student voice projects and initiatives contend with the expectations of school and curriculum leaders, thus try to avoid fully implementing these (Bourke & Loveridge, 2016). The misalignment of student voice combined with prehistoric school structures, creates an imbalance in power between students and school leaders at various levels, which constrains the extent of students becoming actively involved and connected (Robinson, 2011).

The current literature and research on the containment of the effectiveness of student voice due to power imbalances appears to be limited within the New Zealand context. For this reason, this critical literature review will focus on a number of case studies undertaken in various contexts throughout the United Kingdom, as well as a single case study in New Zealand. These case studies are particularly important when addressing the limitations felt by many minority students within the New Zealand education system (Bishop, 2003); particularly when addressing the cultural mismatch in achievement currently observed within New Zealand schools (Nusche, Lauveault, MacBeath & Santiago, 2012). Through explicit revision of these case studies, this review will examine a number of ways that school teachers and leaders exercise their power, both implicitly and explicitly, to ensure students remain inferior education participants (Sellman, 2009). This paper focuses on the various types of power currently displayed within schools, why student voice is not accurately acknowledging all students, and how student voice can become more effective.
What is Power?

The word power is often associated with one’s ability to influence another less dominant individual’s opinion, behaviour and values (Vlčková, Mareš, & Ježek, 2015). Power within the current educational context represents the struggle between unequally positioned individuals, which renders one individual as powerful and the other as powerless (Nelson, 2017). Sellman (2009) describes this relationship in terms of a transactional process, whereby teachers are in control of curriculum links and teaching styles, and students are oppressed receivers of selected information. Because of this, power continuously operates through differing forms of pedagogy that regulate and control students’ freedom and choice within educational spaces (Nelson, 2017). Furthermore, the repetitiveness of this transactional process throughout students’ education journey, creates a “culture of silence” (Friere, 1971, as cited in Robinson, 2011), meaning that students often refrain from questioning or rebelling against the norm. Power within education is therefore continuously remade through education processes and relationships to ensure that the rituals of school environment remain stable (Nelson, 2017).

Unequal power relationships within educational institutions are likely to have an impact on student voices in numerous ways. These relationships reduce the honesty of student opinions and feelings, as students say what they think teachers want to hear, rather than what they instinctively feel (Robinson & Taylor, 2013); meaning that schools are not hearing the true opinions and needs of students. In all cases examined within this study, the education leaders, teachers, and staff were committed to ensuring students could voice their opinion in an effective manner within the school environment. However, as examined in this review, it appears that educational institutions exerted their power, both visibly and invisibly, by determining the nature, implementation, and outcomes of projects. It is, therefore, important to consider the implications of teachers’ and school leaders’ choices, especially with a particular focus on the impact this has on students’ freedom.

Authoritarian Power

The institutionalised roles developed within society and educational practices often causes an asymmetrical relationship between many school leaders, teachers and students (Mitra, 2008). Robinson and Taylor (2013) argue that the pre-historic norms of teachers, whereby teachers were held accountable for students’ learning creates a power imbalance between students and teachers. This potentially causes students to perceive student voice projects in a way that does not actively allow them to selectively address the norms and practices that may be impacting on their ability to progress and achieve. Instead, students tend to address minor issues, as they trust that teachers are doing their job and are selecting the best options with regards to the major pedagogical issues (Robinson, 2011). Therefore, numerous student voice projects whereby students selected the topic to focus on, critiqued something that was irrelevant to pedagogy and assessment. This negatively impacts students’ ability to successfully address and implement changes that will identify and contest the current teacher superiority in schools.

Design Processes That Silence Students

The complex processes within schools typically make it difficult for teachers to recognise how their decisions and choices create a dominant culture that can implicitly and explicitly silence students’ voices (Robinson & Taylor, 2013). Furthermore, it is often difficult for many teachers to understand the procedures required to actively include student perspectives that will initiate effective changes (Sellman, 2009). Teachers are typically unaware of the numerous oppressive micro-processes that students experience when voicing their opinion (Robinson & Taylor, 2013). Many of the participating teachers in the research asked for volunteers, whereby students are granted the choice whether they will participate or not (Nelson, 2017; Robinson, 2011; Sellman, 2009). On the surface, a volunteer system seems free of any student biases and appears to encourage all students to participate. This system displays a hidden unequal power, whereby students who fit the culture, which the school enforces upon them, are significantly more likely to volunteer than others (Robinson, 2011). The academic nature of these projects further implies to students with social, emotional, or behavioural difficulties that they will not be successful in helping the school. Furthermore, many teachers emphasise the academic nature of student voice initiatives by selecting students who are seen as capable and engaged, implying to other students that they are not academically smart enough to produce effective change to the school environment (Robinson & Taylor, 2013). Therefore, volunteer and teacher selection creates a skew within the data of student voice initiatives, whereby the results obtained continually favour the dominant culture of teacher superiority already present within the schools (Sellman, 2009).

Students who volunteer, or who are selected, to voice their concerns or ideas about school policies and practices are often asked to do so in a room that already holds some sort of hidden power. The neo-liberal nature, already displayed within schools, makes it difficult for students to question the ideologies, beliefs, and norms (Robinson & Taylor, 2013). Robinson (2011) discussed the difficulties of accurately engaging students in these initiatives due to the prior history of unequal power relations and silencing within school classrooms and staffrooms. The rooms chosen typically encourage a transactional process, which ensures the teacher is the most powerful individual in the room (Sellman, 2009). The selection of these rooms by teachers and school leaders ensures that students only question those ideas that they know teachers will approve of (Nelson, 2017). This implicit regulation by adults within school environments to actively regulate social interactions between more powerful students ensures that these students resist questioning the unstated values, norms and beliefs of the school, and adhere to the school culture enforced upon them (Robinson, 2011). This, therefore, makes it difficult for students to develop a connection with the school that enables them to create a democratic working environment, that ensures all students are empowered.

Idiosyncratic Power and Misalignment of Values

The pressure placed on students, who participate within these projects, often reinforces the idea that they must fulfil this opportunity to a predisposed level (Robinson, 2011). This is often
influenced by many teachers and school leaders showing disagreement about the effect that these projects can have (Morgan, 2011). Although some of the research examined did not look at teachers and leaders’ preconceptions, those that did found that many teachers questioned the value of such projects, making it difficult to include students in a more authentic way (Sellman, 2009). This preconception may never be communicated to the students; however, due to previous authoritarian styles within schools, students are likely to feel disempowered when given these opportunities. This desultory commitment by all teachers with relation to student voice projects, encourages the idiosyncratic nature of power to exist (Nelson, 2017). The idiosyncratic nature of power emphasises to students that they should not hold any views about curriculum values, and instead conform to the pedagogy of the classroom teacher. This creates a difficult situation for many students, who are often unaware of the nature of these projects, especially because teachers typically do not address this. Within the research examined, no teachers explicitly identified the nature of the project to students (Nelson, 2017; Robinson, 2011; Robinson & Taylor, 2013; Sellman, 2009). Nor did they identify the ability for students to re-examine the processes of pedagogy they currently experience within schools. This failure to address teachers as learners and students as facilitators of school improvement, makes it difficult to identify the success with which student voice projects may have on the positive shift towards a democratic school environment (Nelson, 2017).

Students perceived impairment to fully grasp the concept of these initiatives, is often evident in their inability to focus their attention on meaningful discussions that question classroom and school spaces (Nelson, 2017). When students genuinely wanted to articulate an idea they felt needed addressing, they often struggled to conceptualise the idea in a purposeful manner that encouraged discussion (Sellman, 2009). Furthermore, teachers and researchers failed to help guide students to explicitly examine their thoughts, feelings, and emotions with their peers. Instead, guiding questions often reinforced pedagogical and institutional power relations previously developed, whereby students listened to the adult and replied with the expected answer (Robinson & Taylor, 2013). This ensured discussions were based around ideas the teachers expected students could address, rather than those that involved higher-order thinking (Robinson, 2011). Teachers typically used scaffolding to constrain the ideas and discussions students produce to ensure students remained the inferior participants within the education system.

**Explicit Barriers**

The activities involved to address student conflicts within classroom pedagogy and school practices often fail to progress further than the peer activities schools provide (Mitra, 2008). When students willingly engage to review in a critical manner the normalisation of unequal power relations currently occurring, they often feel further disempowered by the explicit silencing of adults within the school (Robinson, 2011). Students are often eager to present their ideas and findings to school peers, leaders, and teachers to ensure that schools become a more inclusive environment; however students are rarely granted the opportunity to present these findings in a meaningful way. Typically, students who are given this opportunity to present their issues with teachers, often felt teachers perceived the students to be dissatisfied, further disempowering their ideas (Sellman, 2009). Furthermore, these projects are rarely granted with importance, thus there is typically long gaps between student meetings and student presentations, resulting in a loss of interest from students involved. Thus, the current nature of schools to prioritise teachers’ ideas above students’ ideas, makes it difficult for students to stand up and display behaviours that do not conform to the culture of the school. Instead, students who have previously queried the ideas, concepts, and behaviours of schools, are typically classed as students with behavioural issues who are actively silenced (Robinson & Taylor, 2013).

Furthermore, students who present their findings to an audience and are granted the opportunity to change school norms, are quickly informed that changes are only temporary (Robinson, 2011). Thus, students are further oppressed by student voice initiatives to ensure that teachers and school leaders are viewed as the dominant figures who make the permanent changes observed in the school. This ensures students remain spectators while teachers are empowered to sustain their choice-making role within the school environment (Robinson & Taylor, 2013). For this reason, although the nature of these student projects was to increase the student voices and enable all students to connect with school culture and curriculum, students were instead limited by teachers’ and school leaders’ comfort zones.

**Power imbalance - the Student Voice?**

The current reform within the education system to engage students in the facilitation of school system appears to have reached a stalemate, as teachers and school leaders often fear that students will harm school morale (Sellman, 2009). The literature has highlighted several key points about current issues within the facilitation and implementation of student voice projects. To implement a successful democratic environment, teachers need to review their application of group work, to ensure that students build supportive relationships with their peers to allow comprehensive discussion to be developed (Mack, 2012). Teachers also need to work with students in an explicit way to recognise the dominant school culture currently at play, and the ways they can dismantle this through supportive engagement (Robinson & Taylor, 2013). Thus, to create successful student councils, teachers need to acknowledge students’ power, and how they can use this to break down the current complex interactions. Furthermore, schools need to be willing to recognise all students as equals, and try to develop students’ identities to help break these power imbalances. In this way, students who previously have been disengaged by the school culture and curriculum are empowered to give feedback to ensure they are challenged critically, within a positive learning environment (Sellman, 2009). The ability for schools to allow students to challenge the unequal power relations through student empowerment will improve teacher-pupil relationships, and through this, learning becomes a way of negotiating and working together, rather than facilitating a transfer of knowledge (Robinson & Taylor, 2013). The key, therefore, to schools developing an effective democratic environment, begins with teachers releasing some of their own power to help empower their students and build effective working relationships (Robinson, 2011).
Conclusion

The current educational reform within New Zealand recognises the importance of the student voice and engagement with regards to school practices, policies, and assessments. This literature review, along with the research examined, has recognised the current unequal power issues within schools that are affecting the success of student voice projects. Although schools’ intentions are generally positive, it appears that the prehistoric nature of education within the western world is affecting students’ abilities to negotiate and to discuss their concerns, feelings, and ideas about the school environment (Robinson, 2011). Further research about how school leaders and teachers can break down these barriers would provide researchers and educators with practical methods on how to ensure students experience a positive learning environment. Student voice research needs to speak more explicitly with students about how they feel about the micro-processes at play, as there is currently still a large amount of presumption within this research about how students truly feel.

References


Rethinking Learner and Teacher Roles: Incorporating Student Voice and Agency into Teaching Practice

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Abstract
An increasing interest in the restructuring of teacher and student roles, with the aim of strengthening engagement, has influenced a focus on student agency in education research. Student voice involves learners and teachers sharing a narrative and working in partnership with one another to increase learning outcomes and inclusivity (Cook-Sather, 2014). Because this concept is relatively new, student voice is often perceived and implemented in a variety of differing ways. This literature review examines the current use and perspective of student voice in education and draws on a range of studies to investigate how the roles within student voice are understood, and the impact these have on effective teaching practice. In addition, the constraints brought forth by the multiple perspectives found within student voice are identified. Further recommendations for research include a focus on how these roles can be supported to best enable student agency, with the aim of producing positive learning experiences.

Keywords: Learner, Teacher Role, Student Voice, Agency, Teaching Practice, Engagement, Learning.

Introduction
The development of a new curriculum in Aotearoa New Zealand (Ministry of Education, 2007) and a growing interest in 21st century learning has influenced what Cook-Sather (2006, 2014) describes as a “cultural shift” that repositions students as partners in educational practice. This concept redefines the power relations found within education and now there is an understanding that students’ perspectives in learning should be valued and utilised to inform the improvement of teaching and learning practices, rather than viewing students as passive recipients. A fundamental characteristic of this shift is student voice and agency (Ferguson, Henreddy & Draxton, 2011). This recognises that learners have the ability to shape and make decisions regarding their education in ways that adults cannot anticipate (Mitra, 2003). The research indicates that liberal democratic countries, including the United States of America (USA), the United Kingdom (UK), Australia, and Aotearoa New Zealand, have become world leaders in student voice initiatives (Sargeant, 2014). As a result, this literature review draws on research from these countries because each has recently focussed on adapting education policy and culture to better support the restructuring of teacher and learner roles. Student voice is typically enacted in research and practice through the invitation of learners to share their opinions, experiences, and knowledge of schooling to improve learning outcomes and create inclusive relationships (Cook-Sather, 2014). Through the collection and inclusion of students’ perspective and ideas, teachers, researchers, and policy makers can gain a better understanding of how students make sense of learning and develop capacities to influence improvement. Although, as Cook-Sather (2014) highlights, recent research offers contested and varied understandings of the definition and enactment of student voice in practice and policy. This critical review therefore, focuses on how current literature understands the roles within student voice.

The Role of Teachers
An increasing number of teachers and researchers are acknowledging the benefits of consulting learners in educational decisions. Robinson and Taylor (2007) found that the acknowledgement of students as partners in learning has adapted teaching practice to better support students’ learning and achievement. This shift in teaching practice and pedagogy has changed the teacher role from leader of learning, to facilitator of learning, where they are able to identify initiatives that enable the student voice.

Mitra and Gross’s (2009) research found that when learners were provided with the capacities to engage their voice and make decisions about their learning, motivation, and engagement grew.
While their first case concentrates on discussing conditions that either created or diminished feelings of belonging, the second case emphasises initiatives where learners could collaborate with adults to address problems. The students discussed that teachers needed to focus on trust and collaboration to ensure learning was relevant and interpretable, and this promoted the creation of youth-adult partnerships at the school. Students responded positively to this adaptation, and although they noticed that a conservative teacher took longer to become comfortable with the idea, students recognised that the teacher was now “more open with us…She lets us voice our opinion more and it’s not just her word and that’s it” (Mitra and Gross, 2009, p.532). This highlighted that when teachers aim to enable egalitarian partnerships, learners felt comfortable participating and enjoyed the sense of agency the evolution of student-teacher roles brought.

Similarly, an earlier study by Mitra (2003), found that increasing student voice through the sharing of teacher roles benefited learning and improved the teacher’s ability to meet student needs. In this research, the focus was again on partnership, with Mitra (2003) undertaking a quantitative study of a high school in the USA. One hundred students participated in semi-structured interviews and observations and the data were used to build a framework towards further empowering student voice. The students detailed a desire to actively use their voice and have greater control over their learning. This feedback was used to develop a two-pronged strategy, one that was split between teacher focused activities and student focused activities. Here, students and teachers had the chance to lead learning at different times. The findings suggest that changing the structure of teaching to encourage and support agency better can be achieved through the communication and analysis of student feedback and providing the opportunity to learn from one another. This data further implies that a shared approach to leadership is beneficial for creating democratic classrooms, which better supports both parties (Mitra, 2003). This reinforces the idea of teachers as partners and facilitators of learning. Although this case is careful in selecting a diverse range of student participants, increasing the sample size for greater empirical evidence could strengthen the connections between role sharing and improved learning outcomes.

An approach that shifts away from this sharing role, is the change in teacher training and professional development. This is a response to the New Zealand curriculum (Ministry of Education, 2007) and links to the corresponding changes in education practice. Instead of focusing on researchers work to determine how student voice can be utilised, the literature also implies that teachers should be working towards activating student voice. The focus of Davison, Sinnema, Taylor and Mitchell’s (2016) research was to determine how student voice could be included through contemporary teaching practices in New Zealand. The study found teaching as inquiry, exit passes, inclusive class discussion and surveys as practices that successfully increased student voice. The data were collected in two secondary schools and teachers who participated were part of professional learning groups within their schools. The focus of the learning groups was uncover how student voice inquiries could be used to improve learning outcomes. The inquiry concluded that to improve comprehension and work quality, teachers needed to modify their classroom practice towards increasing student-teacher partnerships. The findings revealed that ākonga (learners) valued the opportunity to listen to and teach one another, and have the teachers research practices that best suited their learning needs. Implications were noticeably positive, as several inquiries associated changes in student interpretation and understanding to the increased partnerships. This in turn influenced the teacher’s appreciation and investment in student voice practices (Davison et al., 2016). Interestingly, the areas of improvement identified by teachers responded to the unease others had felt around the loss of power and authority, which has been a limiting factor in previous research.

Similarly, a small scale qualitative study in the UK sought to discover how student voice could support the construction of preservice teacher identity after recognising student agency as a key practice in the formation of teacher identity (Kidd, 2012). This ascertains that teaching philosophies should be centred around listening to learners. The research established that to promote speaking with rather than for learners, reflective and reflexive practices are required. The findings indicate that teaching philosophies should be framed around learning to listen to promote authentic partnerships, and in addition to previous literature, that being reflective allows teachers to conceptualise better and respond to what students say. The role of the teacher here is not only creating a shared narrative, but taking time to reflect on the effectiveness of student voice efforts with the aim of modelling best practice and using research to guide this process. Although Kidd (2012) acknowledges the anxieties teachers have in locating voice in educational contexts that differ from their own, in applying the reflective lens these concerns became manageable. The size and singular context of the study may limit the validity of these findings.

The Role of Students

The emphasis on collaboration in student voice research signifies that ākonga have a role as equal partners. Although teachers may still be required to introduce and scaffold these relationships, students also have a responsibility to participate.

In existing literature restructuring roles has solely been placed on teachers (Kidd, 2012; Mitra, 2003), as it is often perceived that students are unfamiliar or uncomfortable working alongside adults. In contrast to this, Rector-Aranda and Raider-Roth (2015) consider the role of students as active and honest contributors working beside adults. The USA study, described as having an action research stance, used qualitative methodologies to uncover how students exercise their agency and voice in an online simulation based environment. The research had a focus on intentional involvement, considering how students demonstrated and responded to their roles as honest participants. The study was particularly interesting because it used the computer based activity to allow anonymity when gathering and sharing student voice. This was found to be especially effective for middle school students discovering their role, with students commenting on their ability to “express their own ideas and opinions” (Rector-Aranda and Raider-Roth, 2015, p. 260) without fearing teacher resentment. This suggests that the student role is not only to be in partnership with teachers, but in addition, to be authentic, which in this case was best modelled through anonymous feedback. The negotiation of authentic tasks and contexts of the simulation found that students felt they had the capacity to think, act, and
The Role of the School

In this critique, it is possible to see that schools as institutions, are powerful players in enabling or constraining student agency because they can hold teachers and students to account. For student voice to be enacted in education, the school has a duty to respond to the evolution of 21st century learning and be flexible in constructing themselves in ways that can support student voice initiatives (Cook-Sather, 2014).

Three qualitative studies from New Zealand and Finland identify that the role of the schools is to create and craft optimal learning environments to enable student voice practices (Bourke and Loveridge, 2016; Robinson and Taylor, 2007; Sahlberg, 2007). Schools are asked to produce these environments to create a climate where learners feel comfortable voicing their perspectives, and consequently, teachers can use this information to positively adapt practice. The school environment that supported student voice in Robinson and Taylor’s (2007) study had heightened use of interactive teaching, discussion, and investigation alongside more opportunities for ākonga to play a role in and use digital technologies. These structures bring forth the idea that schools need to provide physical spaces to activate student voice. The data imply that a school structure that works to assist student agency practices offers support for teachers to research and adapt. It was found that these influence increasingly positive learning outcomes for students. This study is influential because it is contextually bound to New Zealand and discusses the wider issues of power, equity, and culture that are often suppressed.

Furthermore, a finding from Sahlberg’s (2007) study suggests that government and education sectors should place emphasis on increasing schools’ flexibility and creativity. The research states that in doing so, schools are provided with the capacity to create policies that encourage creative decision making, and thus, easily incorporate student agency. Because both of these studies include a singular country, the conclusions remain relevant only to their specific context. It may be difficult to connect these findings because the educational system and policy in these countries are different. As a result, further research into a variety of frameworks is required to strengthen these conclusions.

This theory is reinforced by Bourke and Loveridge (2016) whose explorative mixed-method research, including seven schools and 49 students in New Zealand, uncovered that a school’s role is also to embrace change to better suit and interpret student voice. The results emphasised that innovative or modern learning environments provided ākonga with greater choice and diversity. The teachers did comment on tensions associated with curriculum and community constraints, but when supported by the school itself, could influence student agency. This correlated to a significant improvement in intended student outcomes and achievement (Bourke and Loveridge, 2016). Although this study is recent and recognises the growing interest and use of innovative learning environments, again the sample size and singular context requires expansion. These studies highlight that the role of schools is to respond to innovative practices, and implement structures that enable teachers and students to benefit from role restructure.

Limitations of Student Voice

The literature reviewed highlights a key limitation within the definition and interpretation of student voice work. Cook-Sather (2006, 2014) has produced two lengthy analyses of leading research to consider how student voice can be best collected and adapted into teaching practice. The inquiry found that the majority of existing research only examines verbal voice, thus limiting inclusivity and not revealing the authentic perspective of all learners.

The 2006 Cook-Sather study considers the premises of existing student voice work, and concluded that research attempts to find a monolithic student voice, instead of legitimising each student’s perspective. To overcome this problem in that study Cook-Sather clarify the shared and diverse range of commitments associated with student voice, and constructed a framework that requires consideration into the quality of voice collection. This suggests understanding voice in terms of bodily presence and text, as opposed to exclusively verbal explanations. The practices identified to achieve this range from interviewing, focus groups, and anonymous surveys to oral, written, and visual responses. This diversification of student voice incorporates multiple methods of collection and uses of student agency, and answers to the complexities of individual subjectivities that had not yet been considered in research. Cook-Sather (2006) conclude that subsequent research needs to focus on diverse participation as the basis of authentic student voice implementation, and to consider multiple methods of collection.

This idea is supported by Simmons, Graham, and Thomas (2015), who asked students to imagine, draw, and discuss their ideas. Their study found a correlation with multiple methods and authentic perspectives, revealing that it is most effective to collect student voice through a variety of approaches.

Cook-Sather’s more recent study (2014) investigated the trajectory of student voice in current educational research. In

speak as constructive partners, redefining the student roles as they participated in promoting change. The researchers, however, do suggest that the success may be limited by the ability for children to role-play and anonymously deliver feedback. This implies that learners were not actively changing their roles, and as a result, further research into similar initiatives is required to overcome this restriction.

This idea is supported by Ferguson et al., (2011). Their mixed-methods study interviewed 38 students within the USA and focused on how students perceived their environment and how this information could be used to improve teacher practice. A correlation was found between students being motivated to share responsible and authentic feedback and feedforward, especially those who were thought to have a difficult time with learning becoming more successful. The teachers in this study commented that the data from learners were useful because it was inclusive and honest. Ferguson et al., (2011) concluded that students being motivated to provide feedback increased the efficiency and use of student voice. Although the sample size and acknowledgment of the positive benefits of student voice for so-called difficult students are valid, the context and purpose of the interview was not explained by researchers. This meant students continued to be recipients of teacher directed change. As a consequence, additional research is needed into how providing learners with context can improve student voice outcomes.
response to the previous analysis, Cook-Sather (2014) explain that researchers have begun to incorporate student voice, not to support their own claims, but to create space for students to make claims of their own. This is achieved through the implementation of various and less traditional methods of collection, suggested in earlier work (Cook-Sather, 2006). Although, student voice has become increasingly inclusive, Cook-Sather (2014) highlight that further limitations surrounding the understanding of terminology have arisen. The review found that a singular definition of student voice does not exist, and thus, teachers and researchers continue to have differing perspectives which negatively impacts the effectiveness of student agency. This is attributed to the confusing terminology between pupil voice in the UK and Australia and student voice in the USA. To invalidate this shortcoming, Cook-Sather (2014) determine that the basis of student voice should be understood through student agency. This encompasses having the capacity and power to make choices, as opposed to simply having a say. It is implied that this will better align research and draw valid cross-contextual findings. Because much research applies student voice and student agency interchangeably, this critical review also employed this approach.

**Conclusion**

The evolution of 21st century learning and the creation of shared narratives has influenced adaptations in teacher-student roles. The results of this critical literature review emphasise that incorporating the opinions of learners into education is a complex process, but has been found to increase the quality of educational experiences for teachers and students alike. The research establishes the role of teachers as facilitators, students as authentic and honest participants, and schools as adaptive institutions to promote student agency and allow student voice to be heard effectively. Additional research is needed to establish how students can further extend their agency and reduce teacher directed change (Ferguson et al., 2011). This would equalise the student-teacher partnerships and create an all-encompassing framework for student voice. Further limitations of the literature discussed include the small sample sizes and singular contexts, that could have limited the efficiency of the findings. A future direction could be to look at how teachers, students and schools could be better supported in their unique and interconnected roles (Mitra and Gross, 2009).

**References**


Citizenship Education: The Need and the Unknown

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Abstract

This literature review explores the findings of citizenship education from a range of international perspectives. The growth of citizenship education and reasons for citizenship education becoming a priority for democratic societies will be used to form contextual background information. The role of teachers' beliefs, practices, and pedagogical discourses are investigated in the first section, with the impact on the teaching and learning of citizenship education explored in the second section of this review.

Keywords: Citizenship Education, Democracy, Citizenship, Participation, Active Citizenship, Moral Development.

Introduction

Over the past two decades rhetoric in political, social and educational circles of the growing trend of politically disengaged, and alienated youth populations in western countries has increased. Political engagement is a foundational pillar of effective and stable democratic societies, and public policy has recognised the potential impact of the disengaged population (Biesta & Lawy, 2006). There is not a clear consensus on what has led to the levels of political disengagement. Some academics believe the neoliberal political shift of the early 1980s may have a significant impact on political engagement (Ribeiro, Rodrigues, Caetano, Pais & Menezes, 2012).

Citizenship education has been developed and implemented as a response to the growing trend of disempowerment and disengagement in many youth populations, and as a means of developing social cohesion within the wider population (Biesta & Lawy, 2006; Willemse, ten Dam, Gijsel, van Wessum & Volman, 2015). Although there is consensus within the political and educational fields on the need and implementation of citizenship education, there is limited concluding evidence or theoretical frameworks for defining citizenship education (Goren & Yemini, 2017; Willemse et al., 2015).

As a result of an undefined theory, there is a range of terms, which are commonly used within the literature and are used interchangeably. Some of the terms used in the articles include global citizenship education, values education, and critical citizenship. For the purpose of this review, citizenship education will be used predominantly. Citizenship education is founded in the roots of democratic practices and participation, which forms the beginning of citizenship education (Biesta & Lawy, 2006).

Conflicting Perspectives

There is not one specific model or definition for citizenship or citizenship education, and as a result, conflicting perspectives have developed across different geographical and political boundaries (Eidhof, ten Dam, Dijkstra & van de Werfhorst, 2016). The notion of citizenship education has deep political ties. This first section explores a range of perspectives and theoretical models for citizenship education from across many differing western contexts.

Eidhof et al. (2016) used political theories to develop a consensus of citizenship education goals across Western Europe. They identified the role schools play in supporting the development of civic and citizenship understanding in young people. The preface of Eidhof et al.'s (2016) research identified there is a consensus of ideas underpinning citizenship education but also how differing political ideologies required different emphasis.

Eidhof et al. (2016) used the 2008 European Value Survey to analyse citizenship education outcomes in the Netherlands, Belgium, Germany, Sweden, and Finland. This research explored the possible positive correlation between higher levels of education and engagement in citizenship education. Common goals for citizenship education was to: stimulate and sustain democracy; share and inform students of certain societal values and norms; support equal rights; and resolve personal, public, and political affairs in a nonviolent manner. Eidhof et al. (2016) identified that goals were critical for sustained practice of democracy and for all citizens to be active within democratic societies. There are general citizenship outcomes agreed upon by Eidhof et al., (2016) which were consistent across all five
countries: higher levels of education associated with higher political engagement, higher support for democracy as a political system, higher support for equal rights of migrants, and higher voting turnout. The consistencies between these countries emphasise the common goals of citizenship across different political landscapes and educational contexts.

Conversely the conflicting citizenship education goals identified by Eidhof et al. (2016) were grounded in four specific political theories: liberal individualism, liberal communitarianism, egalitarian communitarianism, and conservative communitarianism. Each of the four theories have specific ideals for citizenship education because they all shared the same purpose to adequately prepare citizens to participate within a specific political paradigm. 

Oxley and Morris (2013) developed one theoretical framework for defining citizenship education with the aim of separating different perspectives of citizenship and different citizenship education goals. Their framework identified two key types of citizenship education, cosmopolitan and advocacy types. Within each of the two types are four subareas, which each have an individual focus. Oxley and Morris (2013) developed this framework to support researchers with a theoretical perspective to compare and contrast citizenship education from different and complex contexts, by using a consistent and reliable framework.

The framework developed by Oxley and Morris (2013) was used as an analytical tool in Goren and Yemini’s (2017) review of empirical studies on global citizenship. The purpose was to identify and map the current academic discourse related to citizenship education. Goren and Yemini’s (2017) divided current empirical studies into geographical location and analysed the commonalities between research projects.

Common citizenship education outcomes varied between regions, which reflected the individual needs of the geographical location. In the United States of America, goals were focused on ensuring their position as a global leader, compared to Europe, which was focused on developing common citizenship after the formation of the European Union (EU); this was completely different to the Asia-Pacific region who focused on preparing students for global communities and markets, and developing increased ties with western countries (Goren & Yemini, 2017). It is important to note the European research is consistent with findings from Ribeiro et al. (2012) in recognising the sociopolitical factors which influence citizenship education and the outcomes for students.

The Rise and Role of Non-Governmental Organisations in Citizenship Education

Beista and Lawy (2006) argue that teaching citizenship is not enough and that young people are required to learn about democracy. They argued young people are unaware of their role within society and how to be active citizens within their communities, and that this can be attributed to a lack of voice and political knowledge. As identified earlier, young people have become disengaged and alienated with democracy and politics. As a response to this potential crisis of democracy across many western countries, there has been a doctrine from policy makers and researchers to increase citizenship education (Ribeiro et al., 2012). Europe has seen an increase of non-governmental organisations (NGOs) facilitating, developing curricula, and delivering citizenship education alongside, and for, teachers in schools. Ribeiro et al. (2012) explored the role of NGOs delivery of citizenship education in Eastern European countries through surveying NGOs involved in delivering citizenship education. Following the survey, Ribeiro et al. (2012) undertook a policy analysis to identify common themes within education policy.

The survey of NGOs identified how citizenship education was a key aspect of their service and is active in providing citizenship education at all levels of education across Europe. It was identified that NGOs view it is the role of schools to provide citizenship education to students, and that teachers are not adequately prepared to teach citizenship education effectively. As a result, NGOs take a significant role in delivering citizenship education in school institutions (Ribeiro et al., 2012). The research critiqued the over-emphasis on the transition of knowledge about citizenship rather than creating opportunities for students to actively engage and excise their citizenship.

Another challenge identified in Ribeiro’s et al. (2012) research was the impact of citizenship education in new and developing democratic societies. The NGOs identified the challenges and struggles with implementing effective citizenship education in countries with authoritative political history. This was associated with culturally ingrained value of conformism and submission between citizens and the state, which made critical citizenship problematic.

The policy analysis identified how, for all 20 EU countries, curricula had citizenship education as a major priority but the implementation varied between countries. The number of hours dedicated towards citizenship education varied from non-prescribed to four hours per week (Ribeiro et al., 2012). Civic education was a common theme within the curricula for the majority of the countries involved in this research. Ribeiro et al. (2012) identified how the application of citizenship education manifested into a cross-curricula approach for primary and lower secondary education. Common themes of educational policy identified though this research focused on: commitment to democratic state, knowledge of human rights, active participation in the democratic process, respect for diversity, and responsibility (Ribeiro et al., 2012).

The findings of this research project were consistent with other comparative studies on citizenship education. Torney-Purta, Lehman, Oswald, and Schultz (2001) was one of the comparative studies, which identified the precarious state of citizenship education across Europe. This notion is contributed to the range of attitudes and implementation of citizenship education across Europe. Torney-Purta et al. (2001) and Ribeiro et al., 2012 both identified the fragmented nature of citizenship education, policies, and curricula. It was identified in Ribeiro et al., 2012 that further research was required to explore the role of citizenship education in promoting common goals across different sociopolitical contexts.

Building on the research and findings of the previous study, Ribeiro, Caetano, and Menezes (2016) carried out in-depth research into the role and vision of NGOs in England and Portugal that continued to deliver citizenship education within the school sectors. This research recognised the role of curricula guidelines, which emphasise community engagement as an important aspect of citizenship education. This is underpinned by John Dewey’s idea that “life, within and beyond schools, could provide significant learning experiences” (Dewey, 1916, as cited
in Ribeiro, 2016, p. 654). Ribeiro et al. (2016) identified how this notion reflects the role and creditable impact of NGOs in delivering high quality citizenship education in school contexts, as they provide a context and connection to broader society for citizenship education. This was identified as a key aspect of the NGO vision of citizenship education and was recognised within the research as an identified strength with the delivery of such content. Ribeiro et al. (2016) recognised that NGOs are not neutral in their delivery of citizenship education and therefore their assessment of citizenship education is biased by nature. Although Ribeiro et al. (2016) recognised the bias within the delivery of citizenship education, they still argue the positive influence NGOs have and how they meet an identified need within school and curricula.

Ribeiro et al. (2016) identified critiques of current involvement of NGOs in England and Portugal in the delivery of citizenship education. This was similar to Ribeiro’s et al. (2012) findings, where citizenship education was too narrowly focused on teaching and developing students and young people’s understanding of institutionalised democracy, the election process, public and government institutions, and political parties. They also identified that a significant focus was on respect for rules, and developing values and responsibilities of good citizens. Curricula and implementation of citizenship education lacks critical thinking, questioning, and actions resulting in social justice (Ribeiro et al., 2016).

Even with conflicting views and opinions towards citizenship education, academics and policy makers cannot decide on specific outcomes for students. The research concludes with an emphasis on the importance of citizenship education in preparing students and young people to engage in their communities, societies as a whole, and as global citizens. Goren & Yemini, 2017 identified a disconnect between the theory and the practice of citizenship education while Eidhof et al. (2016) suggests schools and teachers find it hard to implement effective citizenship education in the current paradigm of conflicting ideas and opinions. They advocated for specific and concrete citizenship education goals to support an effective implementation in school and curricula.

Teachers’ Role in Citizenship Education

This section explores teachers’ beliefs and epistemologies, pedagogical discourse, and teachers’ professional development in citizenship education.

The first area to address in the teachers’ role in citizenship education is to understand teacher’s personal epistemologies and the impact of these on teaching practices for moral development in students. Lunn Brownlee, Scholes, Walker, and Johansson (2016) identified how personal epistemologies acted as a filter for knowledge and beliefs, and as a result can influence a teacher’s perception of teaching and learning. A common epistemology identified though this research is the idea of evaluativism, where teachers viewed knowledge as created rather than received from others (Lunn Brownlee, et al., 2016). This mind-set requires critical evaluation from a range of perspectives when creating knowledge. Another common personal epistemology was towards evaluativism where teachers are demonstrating some aspects of evaluativism but it was not clear how teachers would evaluate information in the process of constructing knowledge.

Teachers operating within a towards evaluativism epistemology would demonstrate an increased awareness towards information, having multiple perspectives but would deeply explore these ideas. The implications for teaching practice, based on these personal epistemologies were varied, as teachers identified a range of strategies to best support the moral development of their students. Lunn Brownlee, et al., (2016) associates a broad range of common practices in citizenship education. These were direct instruction, role modelling moral behaviours, and consequences by the external reinforcement of behaviour.

Lunn Brownlee, et al., (2016) identified how complex the relationship between personal epistemologies and teaching practice are, and how they support moral understanding in students. The research identified no connection between personal epistemologies and an influence on teaching practices for teaching of citizenship education. Lunn Brownlee, et al., (2016) identified the implications for professional development for teachers would need to recognise the value in developing critical reflection as an important teaching aspect of moral education.

Contrasting research by Sim, Chua, and Krishnasamy (2017) explored the conception of citizenship in social studies teachers in Singapore. The pedagogical approach to citizenship education in Singapore was reflective of character-driven citizenship, which is focused on developing a good person with high morals. The majority of the teachers in this study identified with this approach to citizenship education and said their role was to provide good moral guidelines to their students. The teachers taught and promoted the state’s dominant values without critical reflection and, as a result, reinforced the status quo. The research identified the political landscape of Singapore and the civic requirement not to challenge the state or government (Sim et al., 2017). Active community participation was not a common theme within Singapore citizenship education, but rather a focus that ensures the continued success of the state. This comes at the impact on personal rights to ensure the collective good is upheld. This notion was reflective of the participants’ teaching practice, pedagogy, and the context of citizenship education. This paradigm reflects the critique of citizenship education which lacks critical thinking, questioning, and social action which was identified in Ribeiro et al., (2016) and Ribeiro et al., (2012).

Contrary to the popular approach to citizenship education, a small minority of teachers in Singapore identified with critically reflective citizenship, which involves a deep understanding of political awareness, and a belief in justice and equality. This approach requires teachers and students to understand and support both the systematic structures and relationships of society and the role an individual plays in society. This approach is in contradiction to the Singapore Ministry of Education’s curriculum framework for citizenship education (Sim et al., 2017).

Willems et al. (2015) identified teachers’ confidence in teaching citizenship education was lacking, and teachers lacked clear concepts of what citizenship education looked like. This is consistent with research coming from Europe, which found a lack of transparency between different implementations of citizenship education, policy, and curricula (Eidhof et al., 2016; Ribeiro et al., 2016; & Ribeiro et al., 2012). Willems et al.’s (2015) research explored and supported teachers developing a citizenship education curriculum in both primary and secondary education contexts. Willems et al. (2015) found through engagement in
citizenship education curricula development teachers increased their awareness of specific citizenship education goals and implicit pedagogical practices within their teaching. Participants within this project identified the following specific citizenship education concepts: active participation (both in school and the wider community); developing understanding of respect; developing social behaviour; developing critical thinking; improved respect of cultures; and ability to deal with diversity. These key concepts are in line with the common education goals identified in Eidhof et al. (2016).

Molina-Girón (2016) frames a different pedagogical approach to citizenship education, one which emphasises multiculturalism as a key factor in this Canadian research. The pedagogical approach outlined in Molina-Girón (2016) bases citizenship education on the recognition of the students varying backgrounds. Teaching practices are focused on identifying an issue-based approach and supports students’ development of an understanding of civic content while exploring the frictions and conflicts within democracy. Although this research identified a pedagogical approach that frames citizenship education differently from other research, it remains grounded in a Dewey’s view of democracy (Molina-Girón, 2016). This foundational paradigm to democracy is consistent with other researchers and their findings into the state of citizenship education from around the world (Molina-Girón, 2016; Ribeiro et al., 2016).

Limitations and Future Research

The majority of research used within this review identified some common limitations of current research. The first limitation was there are limited theoretical frameworks or perspectives on citizenship education and this makes comparisons between research significantly more difficult (Eidhof et al., 2016; Lunn Brownlee, et al., 2016; Ribeiro et al., 2016; Ribeiro et al., 2012; & Willemse et al., 2015). Although Oxley and Morris’s (2013) theoretical framework was used in Goren and Yemuni’s (2017) review, this framework remains contested within the education research field. Further research is required to identify concrete citizenship goals or values to support policy, curricula, teachers, and initial teacher education programmes.

Conclusion

Citizenship education is a growing trend across different education contexts around the world due to an increased rhetoric by policy makers and educationalists, of disengaged young people in local communities and democratic political systems (Ribeiro et al., 2016; Willemse et al., 2015). This rhetoric has resulted in citizenship education as a priority of many developing and established democratic societies, because it is seen as a tool to maintain democratic values and increase acceptance of diversity (Molina-Girón, 2016; Ribeiro, 2016). A review of current literature has identified the assorted approaches and perspectives on citizenship education and how these impact on the teaching and learning of citizenship education for students. The limited research confirms there is a greater need for developing consistent frameworks for citizenship education as a means for improving both the teachers understanding and curricula documents, which support the notion of active citizenship engagement in young people’s communities and wider society. The current literature agrees on the requirement for citizenship education to be based within the school boundaries, but to also extend into the local community which provides a rich learning context with meaningful opportunities for students to engage in social action. Social action is the optimal outcome for citizenship as it moves away from learning about democratic institutions and civic duties.

The role of teachers’ epistemologies and beliefs has been explored and it was identified that they play a limited role in shaping citizenship education practices within the classroom. It was discussed how teacher’s limited teacher confidence and understanding of citizenship education played a more significant role in citizenship educational outcomes for students and this stemmed from limited experiences in initial teacher education (Willemse et al., 2015). Teachers who are engaged and involved in citizenship education curricula development increased their understanding and confidence of teaching citizenship education (Willemse et al., 2015).

References

Implementing Cooperative Learning: A Consideration of Barriers and Enablers

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Abstract

Cooperative learning (CL) is a pedagogical practice that has been shown to benefit students’ social and academic abilities, yet it is not widely implemented in schools. This literature review explores current research on CL implementation in primary and secondary school settings in an endeavour to discover some of the barriers that keep teachers from implementing it in their practice. Three main barriers, discussed in this review, are teachers’ understanding of CL, students’ social skills, and time and organisation requirements. To counteract some of the perceived barriers of CL, enablers to CL have also been explored. Enablers discussed within this review include pre-service and continuing teacher CL training, teacher collaboration, and student social skills development. These enablers can help to counteract some of the perceived barriers in order to facilitate greater implementation of CL in the classroom.

Keywords: Learning, Barriers, Enablers, Teachers, Students, Time, Social Skills, Understanding, Training, Collaboration.

Introduction

For teacher and learner roles to change, teachers need to start changing some of the pedagogies that they are using in everyday practice. Cooperative learning (CL) is a teaching pedagogy that shifts practice from more traditional teaching methods to a context where students have more control of their learning. In CL, students work together in groups to jointly construct knowledge through cooperative interactions. When implemented correctly it strengthens students’ academic and social skills (Brown & Thomson, 2000).

While there has been extensive research on the benefits of CL, there has been less research on why, despite the known benefits for both students and teachers, CL is not being successfully implemented, or implemented at all, within many classrooms. This literature review seeks to summarise this research on the barriers to implementing CL, while also exploring some enablers to CL. It refers to recent literature with a focus on primary and secondary contexts.

First, a summary of CL is presented, including the critical elements for its success, the benefits of implementation and current implementation rates. Next, three identified barriers to CL implementation (understanding of CL, students’ social skills, and time) are discussed. In an attempt to counter these barriers, three enablers are explored (CL training, teacher collaboration and student social skills development) that could encourage teachers to use CL. Finally, the relation of the research to the New Zealand context is discussed.

Cooperative Learning

CL is a teaching method in which students work together to gain a greater understanding of a topic. It is a student-centred pedagogy where the teacher’s role changes from being the deliverer of information, to facilitating students’ learning, as they gather their own knowledge and create their own meanings.

Johnson and Johnson (2009) outline five critical group elements that are necessary to ensure that a CL task is most effective: positive interdependence, individual accountability, actions promoting interaction, appropriate social skills, and group processing. When these five elements are all achieved group members experience the greatest benefits. These include academic benefits, like higher achievement levels and more metacognition, and social benefits such as gaining group working skills, greater self-esteem and more positive peer relationships (Jolliffe, 2015).

Despite the extensive research supporting the use of CL and praising its benefits, CL is generally under-used in schools.
Barriers to Cooperative Learning

Teachers’ understanding of CL

Teachers’ understanding of CL and various CL structures varies greatly within the teaching profession. Some teachers have had no exposure to or specific training on CL, whereas others have a wealth of knowledge, having participated in CL professional development and used it extensively in their own teaching practice. Hennessey and Dionigi (2013) argue that teachers’ knowledge of CL affects their ability to implement it successfully. Their qualitative study on 12 Australian primary school teachers, investigated teachers’ understanding of CL and the believed factors affecting implementation. Half of the 12 participants had limited knowledge of CL, four had general knowledge and two had expert knowledge. Firstly, they found that teachers’ limited understanding of CL was a barrier to successful implementation because it meant that they did not include the five critical elements (Johnson & Johnson, 2009) necessary for success in their teaching. For example, one teacher believed that she needed to have a high-achieving student leading the group to help less able students achieve, which negates the positive interdependence and individual accountability elements of CL. Importantly, it was these teachers, with limited knowledge of CL, that identified several barriers to implementing CL. These included the age of the students, student behaviour and giving students more control and independence. Teachers with greater understanding of CL did not identify these factors as barriers and instead were able to employ teaching techniques within their CL structures that eliminated these factors from being barriers.

Even teachers who have had explicit training in CL can find using CL structures in their lessons difficult. A New Zealand study by Dyson, Colby and Barratt (2016) investigated using CL structures to teach physical education in primary schools. Participants were 12 teachers from four schools, who all received specific CL professional development as part of the study. They also had support from university faculty and graduate students who provided them with modelling and planning of CL physical education lessons. This study revealed that although these teachers had knowledge of CL, and had used it in some subjects, they had not used it in physical education before and often did not know how to adjust CL structures to that curriculum area. They needed further understanding of what CL was and what it looked like in the subject area of physical education to be able to successfully implement it.

Students’ social skills

While student social skills can develop greatly during CL tasks, the initial social skills ability of students has been identified as a challenge to successfully implementing CL (Dyson et al., 2016). Some students do not develop essential social skills at home (e.g., cooperation, respect and listening) providing difficulties for these individuals when relating to others. In Dyson et al., (2016), teachers identified this issue, with one teacher citing that social skills was the top challenge for implementing CL. These teachers believed social skills were hugely important and, without them, the CL structures they were trying to implement simply broke down. They recognised the importance of developing student social skills at an early age, and noticed that when students had developed sufficient social skills early in schooling it made it easier for them to implement CL structures in later years.

Abrami et al. (2004) found from their CL implementation questionnaire that it was the teachers who believed their students had the necessary social skills (or could easily acquire them) to make the activity successful that implemented CL. These teachers did not use CL if they thought it would lead to behaviour problems, indicating that behavioural issues made implementing CL too difficult. The authors also found that teachers were more interested in developing their students’ social skills than academic skills through CL structures, perhaps due to the recognition that their social skills needed improvement.

Gillies and Boyle (2010) explored the perceptions of 10 Australian middle school teachers who implemented CL over a period of two school terms. These teachers all recognised the importance of having appropriate social skills within a CL task. Of the 10 teachers, some explicitly taught the social skills necessary for working in cooperative groups (e.g., through lessons examining successful cooperative groups), while others had more general discussions with their classes to prepare them (e.g., discussing everyday respectful social behaviours). However, teaching these specific social skills requires thought and time, and as a result it can often be neglected, meaning that groups are not able to function to their highest potential.

Time and organisation requirements

Another challenge that teachers face when implementing CL in their classes is the time involved. Firstly, time and organisation is required by the teacher to get CL structures prepared. Teachers from the study of Gillies and Boyle (2010) cited the time and work required to find suitable tasks, resources and set up group organisation as challenges to implementing CL structures.

Secondly, time spent on CL in class was also a challenge. Teachers reported having difficulty managing time related to setting up and implementing CL learning in their classes (Gillies & Boyle, 2010; Buchs et al., 2017). Often, considerable time is needed to first introduce students to CL structures and their...
required roles and behaviours (Dyson et al., 2016), including teaching social functioning skills, mentioned above, so that they can effectively cooperate. Fortunately, Buchs et al. (2017) found that teachers found this preparation of their students relatively easy.

However, although time requirements are generally identified as a challenge in implementing CL, research by Abrami et al. (2004) found that time was not a major factor that affected whether teachers used CL or not. This may be because they placed value in CL, despite the time requirements, and were relatively confident in it being successful.

**Enablers to Cooperative Learning**

*Initial and continued training in CL*

Lack of knowledge of CL appears to play a large role in why CL is not widely implemented. Therefore, it is important that teachers receive training on CL and how to integrate it into their curriculum areas. Hennessy and Dionigi (2013) believe that repeated and deep exposure to CL is necessary for both pre-service and in-service teachers so that they can effectively implement it into their teaching programme. Therefore, the first step in ensuring that teachers use CL, and use it effectively, is to provide a pre-service education context where student teachers can improve their knowledge and work on the skills needed for implementing CL. For example, 105 pre-service teachers in Belgium showed self-evaluated improvement in their CL skills (e.g., providing organisation, social and metacognitive guidance) over several practical lessons they taught (Ruys, Van Keer & Aelterman, 2011). Surprisingly, prior exposure to theoretical CL knowledge had no impact on these skills. This highlights that while it is important to have a basic grounding in CL theory, opportunities to implement CL in practical teaching settings are most important.

Once pre-service teachers have received (hopefully comprehensive and practical) training in CL learning, it is important that they continue to receive support in teaching CL structures throughout their teaching careers. Abrami et al. (2004) suggest that continued training throughout a teacher’s career may be essential to refine CL strategies and skills, as well as to adapt teaching to a specific institution’s environment, thus ensuring that teachers continue to implement CL.

Similarly, teachers must feel positive about CL to implement it. Research in Spain by Saborit, Fernandez-Rio, Estrada, Mendez-Gimenez and Alonso (2016) investigated this factor. The 990 primary and secondary teachers in their study had completed a year-long CL training programme consisting of weekly professional development. This training focussed on conditions for success, different classes and subjects, and gave teachers new techniques as well as feedback on their practical implementation. The researchers found that, after completing the training, teachers had a strong positive attitude towards implementing CL, as well as to changing their practice through a CL pedagogy. This was also found by Gilles and Boyle (2010) where teachers participated in CL workshops before the study and came away with positive attitudes towards implementing CL in their classes. Finally, Abrami et al. (2004) found that the teachers who frequently used CL in their classrooms were those who felt like they had been provided with good training.

Therefore, it is important that CL professional development is high-quality and effective so teachers feel like they have the ability to implement CL in their classrooms.

**Teacher collaboration**

Teacher collaboration is incredibly important for teachers’ continued implementation of CL. Jolliffe (2015) examined how teacher cooperation affected CL implementation, as in this study there was a supportive network of teachers and facilitators. These networks provided both emotional and practical pedagogical support for teachers. All members collaborated and were working together for mutual benefit. In this study, the support the teachers got from their learning community gave them the confidence to use CL. It also enabled them to develop their skills in CL, form shared resources and have valuable discussions, all while feeling trust and support from the group.

Dyson et al. (2016) also identified the impact of collaboration in their study. Teachers were supported by a group consisting of university staff, graduate students and other teachers. The group met regularly to discuss practice, share resources, and teachers were supported by a critical friend (faculty member) who also modelled lessons for the teachers and scaffolded their learning. It enabled teachers to persist with using CL structures in their classrooms as their colleagues supported them in overcoming initial difficulties. This positive outcome is consistent with Abrami et al. (2004) who believed that creating mutually supportive communities for teachers to discuss their CL teaching would increase the likelihood that CL would be implemented.

Farrell and Jacobs (2016) also discuss teacher reflection groups. They suggest that groups of teachers reflecting on their practice operated using the critical elements of CL, therefore these teachers were experiencing group cooperation situations similar to their students. This could increase the quality of reflection which in turn should increase the quality of CL teaching. Furthermore, when teachers experienced their own success from participating in CL groups, they were able to see the benefits of their students learning in the same way and therefore they were more likely to use CL. Moreover, this belief in cooperation, and the support from the reflective group, meant that teachers were more likely to persevere with CL teaching practices when they encountered barriers towards CL teaching.

**Student social skills development**

Another practice that could make CL seem more accessible to teachers is developing students’ social skills. Having interpersonal and small group skills is one of the critical elements outlined by Johnson and Johnson (2009) for CL to be most beneficial. Therefore, it is important that students possess these social skills before undertaking CL activities so that they can gain the most from them.

A study by Golub and Buchs (2014) investigated the effects of social skills training given prior to a CL task. Participants in the study were 32 grade six students from the French-speaking area of Switzerland. Half the students were given a social skills preparation intervention before a paired CL task. Results showed that student pairs who had received the intervention were more attentive and supportive of each other, and asked more questions, although no difference in learning outcomes was found. This confirms that, with additional social skill support, students can function more effectively in a group setting, likely resulting in
fewer behavioural issues that could impede learning and require teacher intervention.

A study by Baines, Rubie-Davies and Blatchford (2009) showed the positive effects that a social skills training programme had on a group. In their study, 31 groups received a skill development condition (social, communication and group work skills) while 29 groups acted as controls. Groups who received the social skills training condition functioned better as a group, displaying increased positive behaviours like engagement and sustained, thoughtful discussion. They also displayed fewer negative behaviours like refusal to participate and off-task talk. This demonstrated that by implementing social skills development programmes before teachers introduce CL structures to their class, students are better prepared to participate in CL appropriately. Therefore, students are more likely to benefit from the CL task and teachers are likely to have fewer behavioural issue to deal with, making the task run more smoothly. This could lead to teachers feeling more positive about implementing CL as there would be less need for them to intervene because of social issues. Instead, they could focus on facilitating the deeper learning that can occur through CL.

The New Zealand Context

A limitation of this review was the lack of research from New Zealand, with only one recent research article on CL from the New Zealand primary and secondary school setting (Dyson et al., 2016). While this is a limitation, it also identifies a research gap. The skills involved in CL align with values identified as a core component of the New Zealand education system. For example, skills gained in CL relate to the key competencies in the New Zealand Curriculum (Ministry of Education (MoE), 2007). For example, thinking skills, relating to others and managing self are all aspects that link directly to CL pedagogy. CL also aligns with Tātaiako competencies (MoE, 2011), with ako – learning from one another – being at its heart. Therefore, it is important that more research is undertaken on CL effectiveness and implementation in New Zealand school settings. Additionally, teachers in New Zealand must overcome any perceived barriers to implementing CL for the benefit of all their students. Specifically, they must seek to receive high-quality and practical CL training, collaborate with other teachers in their CL practice and teach their students the requisite social skills for CL tasks to run smoothly.

Conclusion

This literature review has explored cooperative learning and uncovered some of the barriers teachers experience when implementing it. The barriers of understanding CL, student social skills and time costs were examined. Then, the potential enablers of CL training, teacher collaboration and social skills development were considered in the hope that engaging in these would lessen the challenges teachers face when implementing CL. If teachers are able to take on these practices for CL, then maybe they will feel more confident in adopting CL into their personal pedagogies for the benefit of all students.

References

Growth Mindset: Trend or Real Science?

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Abstract

The following literature review begins by answering the question, “growth mindset: trend or real science?” It answers this question with a brief history of how, in the 1970s, the idea of “attribution of failure behaviour” from researcher Carol Dweck (1975) evolved to the well-known concept of growth mindset today. The discovery that the brain is elastic and intelligence can be grown led researchers to wonder the ways in which mindset could be manipulated to improve outcomes in education. The research then follows a path of growth mindset interventions in primary schools and parent guided settings as well. Finally, the review addresses cost effectiveness of growth mindset interventions and potential challenges of the studies.

Keywords: Growth Mindset, Fixed Mindset, Status, Intervention, New Zealand, Cost Effective, Elementary, Primary, Stereotype Threat.

Introduction

The concept of self-theory and its role in behaviour has been discussed in the psychological community for over forty years. Carol Dweck published a seminal work in 1975 that would become the catalyst for a great deal of future research. In a small study, she found that subjects with learned helplessness, who also had the attribution of failure behaviour modification, had greater success at overcoming failure, or at least maintaining results, when they were taught that their effort could make a difference in completing a task. Subjects without the attribution of failure behaviour modification continued their downward slope of reaction to failure. In essence, if children believed the failure to be about their ability or out of their control, they continued to fail (Dweck, 1975). From this research, many studies have been born. The work has evolved steadily from attribution of failure to entity/incremental theory to today’s well known growth mindset theory. This literature review provides a brief history of how growth mindset came to be and how researchers are studying its importance and use with regard to students and families.

Brain Plasticity

A research study performed on adult London cab drivers discovered that the brain can indeed grow in adult years. Researchers used magnetic resonance imaging (MRI) to test trainee taxi drivers attempting to acquire the knowledge before and after their three to four year coursework learning the city’s layout. The results found that grey matter in the posterior hippocampus was increased in those successfully completing the course. There were no changes or growth in candidates who did not complete the course. The memory profile of successful candidates was also changed, but it was at the expense of other working portions of the brain. In short, the taxi drivers expanded and grew their brain through intense learning (Woollett & Maguire, 2011).

Theory of Intelligence

Beliefs are fixed or malleable. Multiple researchers have studied this concept and come to the same conclusion—at any age we can train and grow our brain. An entity belief suggests that one cannot change the amount of intelligence that is possessed. Conversely, incremental belief suggests change in intelligence is possible with effort. Earlier work by Dweck zeroed in on helplessness, but this work brought clearer vision and understanding to individual mindsets. Entity belief and incremental belief reflect the extent to which an individual perceives control over the attributes of a given situation. When entity, or fixed, attributes are at a high level, subjects find control possible but, at a low level, control is not possible. Beliefs are fixed or malleable. Multiple researchers have studied this concept and come to the same conclusion—any age we can train and grow our brain. An entity belief suggests that one cannot change the amount of intelligence that is possessed. Conversely, incremental belief suggests change in intelligence is possible with effort. Earlier work by Dweck zeroed in on helplessness, but this work brought clearer vision and understanding to individual mindsets. Entity belief and incremental belief reflect the extent to which an individual perceives control over the attributes of a given situation. When entity, or fixed, attributes are at a high level, subjects find control possible but, at a low level, control is not possible and outcomes are thought to be negative or just chance. When incremental or growth attributes are at a high level or a low level, subjects find control is possible but at a low level it requires effort; and belief in internal control (Dweck & Leggett, 1988). Dweck and others continued the research and refined this concept to what we know today as growth and fixed mindsets. This research exploded onto the psychological and educational scene in 2007 with the popular...
research-based book: *Mindset, the New Psychology of Success*, and Dweck’s amazing TED Talk (Dweck, 2014); *The Power of Yet*. People range on a spectrum of mindsets from fixed/stable to growth/malleable. People with a *fixed mindset* tend to think of their intelligence as unchanging and unmodifiable, and therefore any work done is predetermined; they already know whether they will succeed or fail. People with a *growth mindset* assume that with effort and intention they can change their intelligence; the outcome of the work is unknown and therefore they are more willing to try. The result of a growth/malleable mindset is that people are likely to attempt more tasks and thus experience more success overall. Without mindset intervention, people tend to remain stable and unchanging in their current, natural mindset (Dweck, 2014).

**Growth Mindset Intervention**

*“Stereotype Threat”*

Decades of research led to Dweck defining the theory of fixed and growth mindsets. Since then, many studies have applied the theory to the education setting: primary, secondary, and tertiary alike. This research has shown that a growth mindset can act as a powerful antidote to stereotype dynamics that otherwise hinder academic performance. *Stereotype threat*, a circumstance that can be explained as a problematic situation where individuals are, or feel themselves to be, at risk of conforming to stereotypes about their social group. This is explained by Aronson, Fried, & Good (2002, p. 114) as,

> in situations where a stereotype about a group’s intellectual abilities is relevant - taking an intellectually challenging test, being called to speak in a class, and so on - Black students bear an extra cognitive and emotional burden not borne by people for whom the stereotype does not apply. This burden takes the form of a performance disruptive apprehension, anxiety about the possibility of confirming deeply negative racial inferiority- in the eyes of others, in one’s own eyes, or both at the same time. Importantly. It is not necessary that a student believe the stereotype to feel this burden

A study by Aronson et al. (2002) found that racially diverse students that succeeded in the education system and made it to university were more likely to fall behind or fail compared to their White/European counterparts with similar grade point averages. This was attributed to the concept of stereotype threat. “Education is the surest route to social equality, the academic underachievement of Black Americans tends to be regarded as both an educational and a social problem” (Aronson et al., 2002).

With a clear understanding of the damaging effects of stereotype threat on a person’s mindset, researchers saw a possible link to growth mindset, and wondered if it represented a solution. This critical work by Aronson et al. (2002) on stereotype threat involved a mix of Black and White college student subjects writing letters to at-risk middle school students. The college students were split into two groups with one group being encouraged and manipulated to write letters with a malleable/growth orientation, and the second simply a control group writing uplifting letters. In addition to the growth mindset orientation, subjects were also shown a video with vivid animation and neuron growth. The results were encouraging and found that a small degree of intervention—just three sessions—created a change in mindset, higher grades and greater enjoyment in the academic process at university for the Black students in the study. This study helps illuminate that mindset can affect achievement of students at all levels of education, from primary through university, by recognising that even those who are succeeding in education can be held back by deeply ingrained ideas.

Understanding this effect is meaningful because, in countries with diverse student populations—like New Zealand—combating stereotype threat effectively could meaningfully change student performance. Many countries invest a considerable amount of money in public education. New Zealand spent NZD 13.2 billion on education in the 2016 fiscal year (Treasury, 2016). Around the world, nations are becoming more and more diverse with immigrants entering countries by land, sea, and air every day. Understanding that no country is exempt from the threat of stereotypes of their citizens within a racially diverse community means ensuring that public money is not wasted. New Zealand, with people from several different countries, is no different.

**School Interventions in the Primary Years**

Numerous research studies involving mindset interventions have been conducted in primary classrooms across the globe. For the purposes of this literature review, four studies of differing methods have been chosen for examination. The research covers a wide range of subjects: low, middle, and high socioeconomic status, varied languages, different countries (Denmark, United States and New Zealand) and multicultural diversities ranging from ages seven through twelve. Researchers used a variety of strategies: parental intervention by watching a video about mindset (available in ten different languages) and then reading to their children (Andersen & Nielsen, 2016); teacher incorporated micro-interventions within lessons (Bonne & Johnston, 2016); mentoring with embedded education messages and restricted websites with embedded messages (Good, Aronson, & Inzlicht, 2003); use of Brainology®, a growth mindset intervention programme, (Schmidt, Shumow, &ackar-Cam, 2017); and, changing the messaging within a popular educational video game (BrainPOP®, 1999-2017) to be growth mindset related (O’Rourke, Haimowitz, Ballweber, Dweck, & Popovic, 2014).

Three studies that utilised in-school interventions are: Good et al., (2003), Bonne and Johnston (2016) and Schmidt et al., (2016). Good et al. (2003) from the United States of America sought to help reduce stereotype threat by changing student mindsets with the help of mentors from local colleges. Bonne and Johnston (2016), from New Zealand, attempted to change mindset through everyday micro-messaging in class by teachers. The third, Schmidt et al., (2016) used Brainology® (2017), a growth mindset programme developed for grades 6-9, and was taught once a week for six weeks to the test group. The interventions in all three studies occurred during school hours on school grounds and with different populations, but they all tested a similar central hypothesis—that growth mindset interventions will raise student achievement.

The results of the three studies were consistent. Student achievement and perception of control was elevated by
intervening with lessons and messaging about incremental or growth mindset. The information gleaned from these studies found that even small amounts of intervention were enough to produce results. Moreover, these results seem to hold across diverse groups of subjects (including high and low socioeconomic status, male and female subjects, and high priority learners) and across diverse curriculum areas (mathematics, reading, and science).

Beyond the findings that growth mindset-oriented interventions matter, further studies suggest that timing of those interventions also matters. Schmidt et al., (2017) found that the Brainology® intervention had greater influence over 9th grade subjects than 7th grade subjects. The researchers suggest there are a few possible developmental explanations for this: 7th grade students may be more optimistic, more realistic/accurate reflections of self-assessment occur as students age, and there is an “increased desire for independence and autonomy that often occurs as children move through adolescence” (Schmidt et al., 2017, p. 597).

Findings from these growth mindset research studies are especially important considering current trends affecting primary education. The underperformance of minorities and those of low socioeconomic status is present in nearly every nation. In the United States of America: “Each year, statistics from state-wide and national tests reaffirm the disturbing pattern of underachievement. For example, compared to white and Asian students, black students (sic) receive lower grades and have higher dropout rates at practically every level of schooling” (Good et al., 2003, p. 646). In these cases, the ability of a growth mindset can counteract a stereotype threat and it represents a path for boosting performance of minority student populations.

Likewise, application of mindset interventions could be promising when it comes to addressing various problems associated with timing. For example, New Zealand invested a substantial amount of time and money into Numeracy Development at the turn of this century, only to find an initial jump and then a stall in student achievement. Mindset intervention might be used to reverse the stall, or could be used pre-emptively to prevent stalls in similar programmes in the future. Further, 15 year olds from New Zealand showed a decrease in self-efficacy and achievement in the last 15 years (Bonne & Johnston, 2016). “Children tend to become increasingly self-critical in their assessment of their abilities across early adolescence in a variety of domains…Additionally, as children move through their adolescence their motivation for academic activities tends to decline” (Schmidt et al., 2017 p.585). Mindset interventions applied at this critical developmental stage could yield significant results.

Parent Intervention

Mindset interventions show promise in non-academic settings, as well. A study in Denmark conducted by Andersen and Nielsen (2016) attempted to show how parental mindset affects their own child’s reading ability. The results, as predicted, found that parents with a fixed mindset were less able to help their children and parents with a growth mindset were more able to assist them. Over the treatment period, the intervention had a greater effect on fixed mindset parents. Like other studies, this study found that small interventions—encouraging parents to read to their child and using growth mindset messaging—had a positive impact.

Cost Effective Solutions

Combining parent and school mindset interventions is a cost-effective solution for confronting the achievement gap between children of low and high socioeconomic backgrounds. Meta-analysis revealed that effective feedback interventions are a valuable tool for fostering success in students (Dietrichson, Bøg, Filges, & Jørgensen, 2017). This was noted specifically when addressing the concept of parent mindset in relation to their child. Understanding and intervening in the parent mindset led to a progression in reading levels. “From the perspective of public expenditures, engaging parents in reading with their child directly is much cheaper than increasing the time that the child spends with teachers in school” (Andersen & Nielsen, 2016, p. 12113). While not explicitly stated in the other research, it is clear that growth mindset methods require few physical items to be purchased and are a budget friendly intervention requiring only verbal and mental skills to be changed or altered to fit into a school curriculum. O’Rourke et al. (2014) studied growth mindset messaging within the popular academic game, BrainPOP®. In this research, growth mindset messaging “teaches the growth mindset directly through the game’s narrative, feedback, and incentive structures” (O’Rourke et al., 2014, p. 3341). Schools can use the current technology and curriculum, altered with growth mindset messaging, to see academic gains. The research suggests growth mindset interventions are low cost but can produce a big change for large student populations. Therefore, growth mindset interventions can be considered a viable option for any classroom, regardless of budget, that aims to improve student attitudes towards academic study.

Potential challenges

The interventions all attempted to tackle the issue of student achievement from different angles and found similar results. Growth mindset interventions are, in general, a simple and effective way to raise student achievement. Although each study did present its own unique set of challenges, these are mostly outweighed by the benefits of a mindset intervention. For example, Bonne and Johnston (2016) used micro-interventions within the classroom in their research. They found that while this approach was harder to control for in a study, they believed teachers would be more likely to sustain it over a long period of time. In contrast, the Good et al., (2003) study used a more intensive intervention by bringing in mentors from a local college, over the course of a year, and required dedicated class time. These kinds of intensive interventions are less likely to be sustained, due to time and resource requirements. The two larger studies, Andersen and Nielsen (2016) and O’Rourke, et al., (2014) were challenged by a bulk of diverse data in that they had difficulty attributing the results conclusively to the intervention. However, the data strongly suggested positive results and therefore more research was further warranted. Their study findings were still positive and suggested the growth mindset approach is a necessary tool for teachers and parents.

A further open question is how long mindset interventions endure. Despite researchers referring to the effect as lasting, one is left to wonder how students would maintain a growth mindset
in the face of life altering events, such as a death of a close family member. This question is not addressed specifically in these studies, but is a possibility for further research.

A gap in the research that was not addressed is teacher mindset. Given what has been studied and discovered to date about the importance of student and parent mindset, it seems important to study the effect of teacher mindset as well. Research could revolve around the idea of teacher perceptions of his or her students’ abilities. Research could also be applied to the teacher’s mindset of his/her own subject expertise and associated teaching capabilities. For instance, if a teacher were not skilled in mathematics or science as a student, does s/he believe s/he can teach that subject effectively as an adult? How would this mindset affect the classroom learning? These questions are possible inquiries for future study.

Conclusion

It took decades for the concept of growth mindset to emerge. With a handle on the idea of fixed and growth mindsets, researchers turned their focus to questions like “What are the pros and cons of mindset?” and “How can our students benefit from what we know?” The studies were all learner-centred and hypothesised that intervening with a growth mindset programme or messaging would raise achievement and engagement. Researchers found that the mindset of students of all ages, ethnicities, and socioeconomic status can be positively affected by small or large interventions. This is significant because the outcome of education is something all citizens have a vested interest in. This research is promising for the future of education because it is cost effective and can be implemented at one of the most basic levels of education—in the classroom, teacher to student. Moreover, in the interest of individualised learning, messages can be tailored to fit any student group’s learning needs, through whole class messaging, individual intervention, or even through gaming and technology. The opportunities for growth mindset intervention are endless.

References


Student Wellbeing in Educational Settings

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Abstract
Ensuring that all our children and young people are of sound wellbeing in the 21st century is of growing importance in educational settings. This literature review explores a range of primary studies to examine the contributing factors to student wellbeing in an educational setting. Student wellbeing is becoming increasingly significant when assessing school effectiveness as wellbeing directly influences social, emotional, and behavioural outcomes, as well as academic achievement. The studies examined established that classroom settings are a major site for wellbeing development. Classrooms need to be safe, supportive, and respectful learning environments to foster high levels of student wellbeing. The studies examined identified that student wellbeing is influenced by the teachers own wellbeing. If teachers have a perceived lower wellbeing, this will have a flow on effect to students, negatively affecting their wellbeing. Furthermore, the studies have highlighted the impact teacher-student relationships have on student wellbeing. It is suggested that supportive teacher-student relationships promote and develop student wellbeing effectively. In summary, this literature review reflects the significance of creating teaching and learning environments that promote student wellbeing for future health.

Keywords: Wellbeing, Student, Teacher Role, Teacher-Student Relationships, Classroom.

Introduction
Across the world, education settings are key sites for providing teaching and learning experiences that aim to facilitate children’s and young people’s academic competencies. Traditionally, when assessing school effectiveness, it was only cognitive factors, such as academic achievement, that were taken into consideration (Van Petegem, Aelterman, Van Keer, & Rosseel, 2007). However, over the past decade the fascination for purely cognitive factors of school effectiveness has taken a progressive transformation. Education providers now have a responsibility and commitment to their students to provide teaching and learning experiences that facilitate student wellbeing.

Wellbeing
The wellbeing of students has become a significant factor when assessing school effectiveness because of the increasing number of students who display aggressive, non-compliant, and resistant behaviours in education settings (Poulou, 2017). These behaviours have resulted in problems with student discipline and classroom management (Schonert-Reichl, 2017). Furthermore, there is a persistent increase in the number of students who are experiencing mental and emotional disorders and these can have long term detrimental outcomes (Kidger, Gunnel, Biddle, Campbell, & Donovan, 2009). For this reason, student wellbeing is a significant factor in how students learn, behave, and function within educational settings and communities, as well as an output factor when assessing school effectiveness. The role of education providers, especially that of teachers, has changed to providing students with wellbeing support, to the same level as academic support. Educational settings are moving away from asking who is the problem? to what is the problem? (Murray-Harvey, 2010).

The aim of this literature review is to examine a range of studies that have explored student wellbeing. In particular, unpacking wellbeing in educational settings, what the teacher’s role is in promoting and developing student wellbeing, and subsequently how teacher-student relationships influence student wellbeing.

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wellbeing and learning are interconnected; you cannot have one without the other. Wellbeing is central to learning: learning is central to wellbeing. Holmve-Sable’s (2014) study concluded that student wellbeing reflects the quality of education received. A range of studies discovered that student wellbeing is a key component to produce successful educational outcomes (Murray-Harvey, 2010; Van Petegem et al., 2007) with Anderson and Graham (2016) concluding that students with higher wellbeing achieve greater academic success. Furthermore, Anderson and Graham (2016) state that students with higher wellbeing in the classroom setting also improve their sense of agency, communication, self-esteem, confidence, community engagement, self-fulfilment, better health status, and reduced exclusion from school. Educational settings are paramount to the promotion of student’s wellbeing while at school and in the future.

Teacher Role

It is long established that teachers can influence and make a difference to students’ lives and contribute to their wellbeing. This can be fostered through developing the whole child so student wellbeing needs are respected and supported in a safe and responsive educational setting (Holfve-Sable, 2014; Schonert-Reichl, 2017; Van Petegem et al., 2007). As a result, the role of a teacher is challenging and demanding with accountability measures, heavy workload, diverse range of students needs and behaviours, time constraints, and occupational stress (Kidger et al., 2009; Martinez, 2016; Poulou, 2017). Kidger et al., (2009) and Schonert-Reichl (2017) have identified these factors as reasons for teacher burnout, emotional exhaustion, lower job satisfaction, and low sense of accomplishment. Furthermore, they have been the main determinates in lowering teacher’s wellbeing. Schonert-Reichl (2017) adds to this idea by identifying teachers own personal and professional emotional and social level of competence is associated with differing levels of teacher wellbeing. Kidger et al., (2009) believes that many teachers often have unmet wellbeing needs in educational settings that hinder their ability to then meet student wellbeing needs and be a positive role model. It is clear from the studies that there is flow on effect from teacher wellbeing to that of student wellbeing (Kidger et al., 2009, Schonert-Reichl, 2017). Teacher wellbeing forms the basis for relationship building with students, and provides a psychologically secure learning focused classroom (Poulou, 2017). When teachers have lowered wellbeing they are unable to unable to fully support and respond appropriately to their students’ needs, and therefore, they are unable to do their job effectively (Kidger et al., 2009). The flow on effect of this is evident in student wellbeing as there are often increased difficulties within the classroom. Kidger et al., (2009) and Schonert-Reichl (2017) identified such difficulties as emotional distress in both students and teachers, and students exhibiting higher levels of externalising problems, interpersonal problems, and internalising problems (Kidger et al., 2009; Schonert-Reichl, 2017). Teachers with lower wellbeing need to act and make a conscious effort to receive support and training to develop their emotional and social abilities and skills so they can become effective and resilient teachers (Poulou, 2017).
research. Kidger et al., (2009) established that teachers have previously ignored addressing student wellbeing as they often felt burdened by it, lacking in the appropriate knowledge for managing certain issues and they believed it took time away from academic work. However, the 21st century teacher must explicitly promote and develop student wellbeing in today’s classrooms because the rising number of children and young people with emotional, mental, social, and behavioural disorders cannot be ignored. Teachers must promote wellbeing to ensure that they are helping to raise healthy children and young people who can participate in the future and have decreased risk of being disconnected from their community (Durlak et al., 2011; Kidger et al., 2009; Martínez, 2016). Yet Schonert-Reichl (2017) has identified there is still a mismatch between the teacher’s job requirements and their personal and professional capabilities, resources, or needs. Many teachers have identified that their current role has placed them in situations where they feel underprepared, unconfident, and unsupported to manage student wellbeing in an effective manner (Kidger et al., 2009; Martínez, 2016; Schonert-Reichl, 2017). This highlights the importance for teachers to receive and engage in training and professional development. Kiger et al., (2017), Poulou (2017) and Schonert-Reichl (2017) have communicated that teachers need training and professional development in all stages of their careers, because it raises their confidence levels, develops their skills and abilities, increases their knowledge, and ultimately positively influences student wellbeing. When teachers are engaging in training and professional development, they will reflect, observe, and receive feedback on their own practice and this will encourage them to examine their personal and professional ideas, values, and beliefs through a critical lens (Martínez, 2016; Van Petegrem et al., 2017). When teachers can reflect on their own practice, it becomes easier to see how they influence their students and student wellbeing (Murray-Harvey & Slee, 2007; Poulou, 2017; Van Petegrem et al., 2017).

Teachers have significant power in the classroom and educational setting to develop and promote student wellbeing. Holfve-Sable (2014) identified that teachers can act on low and negative student wellbeing by understanding their flow on effect to students and by creating a safe, supportive, and orderly learning setting that promotes good social relationships. Teachers can educate students to improve and manage their wellbeing by relieving stress, managing their anger, dealing with social interactions, forming strong adult-child relationships, and being involved in their own decision making (Anderson & Graham, 2016; Poulou, 2017). Teaching strategies to promote student wellbeing include constructive feedback and supportive instructional communication (Murray-Harvey, 2010). Furthermore, Durlak et al. (2011) identified that it was likely that the school environment, teacher practices and expectations, and student-teacher relationships will contribute to developing student wellbeing. Additional research from van der Kaap-Deeder et al., (2017) emphasises that teachers must provide higher levels of autonomy to students so that they become more motivated in their learning. Van Petegrem et al., (2007) suggests that the best style of teaching to promote student wellbeing is dominate-cooperative. This type of teaching style is tolerant yet disciplinarian as it gives students structure with flexibility (Van Petegrem et al., 2017). Holfve-Sable (2014) reinforces the dominate-cooperative teaching style to improve student wellbeing. This type of teacher creates a positive and stimulating environment that is fun, enthusiastic, mainly task-oriented, and considers the physical and emotional needs of individual students (Van Petegrem et al., 2017). Van Petegrem et al., (2007) and Holfve-Sable (2014) highlight the importance for current teachers to move away from the traditional authoritarian style of teaching, to ensure they are positively influencing student wellbeing in the classroom.

**Teacher – Student Relationship**

Developing and maintaining meaningful relationships between teachers and students in the classroom is a significant component to fostering student wellbeing. Teachers have substantial responsibility in ensuring that these relationships are formed and then continue to be a source of support for their students. Schonert-Reichl (2017) identified that a teacher’s own competence shapes the nature of the relationship they have with their students. Poulou (2017) adds to this by stating that it is teachers perceived emotional intelligence that shapes the relationship between student and teacher. But, as Murray-Harvey and Slee (2007) indicated, relationships are bidirectional, meaning that both teachers and students have a part to play in maintaining the relationship.

Teacher-student relationships affect student wellbeing as the daily closeness the two parties share affects whether their needs have been recognised and somewhat satisfied. Anderson and Graham (2016) has suggested that it is a vital human need to be recognised, and that it is inseparably bound with wellbeing. From the studies in this review, the relationship between teachers and students has been identified as being inseparable from student wellbeing. The study conducted by Murray-Harvey and Slee (2007) identified that when teacher-student relationships are supportive, students experience higher levels of wellbeing. Whereas, if they are in a stressful relationship, students experience lower levels of wellbeing. This emphasises the need for teachers to engage in supportive teacher-student relationships. Anderson and Graham (2016) suggested that teachers can be supportive through conversation and listening so that the students feel their unique voice is important and therefore can participate. Murray-Harvey (2010) reinforces the importance of communication in teacher-student relationships. Van Petegrem et al., (2007) suggest that for teachers to be a source of support in the relationship, they need to be understanding, cooperative, and tolerant, and are there to help students when help is needed. In addition to this, Anderson and Graham (2016) highlighted the importance of students being genuinely heard and listened to in teacher-student relationships to promote student wellbeing. Murray-Harvey (2010) identified that females reported that their relationship with a teacher is more supportive than what males reported. Furthermore, Murray-Harvey and Slee (2007) established that students feel primary school teachers are more supportive than secondary school teachers. Teachers need to be aware of this, and ensure that they are supporting every child in their classroom. Supportive teacher-student relationships should not be seen as additive value to the quality of wellbeing, but as an essential part of achieving student success (Murray-Harvey, 2010).

Having supportive teacher-student relationships has numerous positive outcomes for students learning and need
satisfaction. It has been found in many studies in this review that when teacher-student relationships are supportive, students are more motivated, engaged and persistent to learn, which increases academic performance (Murray-Harvey & Slee, 2007; Schönert-Reichl, 2017; van der Kaap-Deeder et al., 2017). Murray-Harvey and Slee (2007) report that when students are in supportive teacher-student relationships they are less likely to report symptoms such as apathy, depression or aggression. They also suggest that supportive relationships reduce victimisation and bullying of students. Furthermore, when teachers and students share a supportive relationship, students are less likely to engage in risky behaviours (Holfve-Sabel, 2014; Poulou, 2017). From this, it is hoped that student emotional, mental, social, and behavioural disorders will decrease. Building supportive, and reducing stressful, teacher-student relationships is key for teachers in ensuring they are developing and fostering student wellbeing.

Conclusion

This literature review has identified the significant need for educational settings to explicitly promote and develop student wellbeing. The review has found that students with higher wellbeing tend to have greater social and emotional competence and greater academic achievement. The role teachers play in influencing student wellbeing is incontestable. Teachers must create a safe, supportive, and respectful classroom, where the students are genuinely being listened to. Teachers need to understand that their own wellbeing does have a flow-on effect to their students. Therefore, teachers must also develop their own wellbeing competence to perform their job effectively. Teachers should develop a dominate–cooperative teaching style that allows freedom yet discipline when students need it. Teachers also need to consistently engage in training and personal development to gain the knowledge, skills, and competencies to effectively manage and develop student wellbeing in the classroom. Teachers, and students, need to be mindful of the relationships and level of connectedness they share. In addition, they need to engage in a supportive relationship to foster higher levels of student wellbeing. In summary, it is the role of the teacher that has significant influence on promoting and developing student wellbeing in an educational setting that is crucial for them to be productive citizens.

References

Mental Health and Wellbeing in New Zealand Education

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Abstract

This literature review examines the current findings of mental health and wellbeing research in New Zealand education systems. Māori adolescents, and those from lower socioeconomic groups, are disproportionately affected by mental health and substance abuse disorders. Current mental health and wellbeing support systems in New Zealand are grouped according to the three-tier approach, focusing on the severity of need of the adolescents, with school supports including a combination of these systems. Secondary school counsellors are used for early intervention, with primary and intermediate schools lacking government funding to provide this support currently. The findings discussed support the relationship between academic achievement and mental health in adolescents. Current research has found that depressive symptoms for adolescents were 2-3 times higher in poverty groups compared to students not experiencing poverty. Adolescents (15-24 years) had the highest rate of suicide, accounting for one in three deaths in 2013, with rates of suicide in Māori adolescents persistently higher than non-Māori. Research has found that offering free counselling can be used as an effective method for reducing mental health symptoms and concerns for both Māori and lower socioeconomic adolescents. Caring relationships between parents, schools, and community have been found to be important factors influencing happiness among adolescents. This review has identified not only a lack of New Zealand research focusing on mental health and wellbeing in adolescents, especially those from Māori or lower socioeconomic groups, but also a clear need for funding to provide school-based counselling services for primary aged adolescents.

Keywords: Mental Health, Wellbeing, Anxiety, Depression, School Support Systems, Socioeconomic Factors, Adolescents, New Zealand.

Introduction

Mental health and substance use disorders are the leading global cause of disability in adolescents aged 10-19 years (Erskine et al., 2015; Simpson, Wicken, Duncanson, Adams, & Oben, 2016; WHO, 2014). The number of adolescents suffering from recognised mental health disorders is 20% in most developed nations (Clark et al., 2014; Fortune et al., 2010). In New Zealand, Māori adolescents and those from lower socioeconomic groups are disproportionately affected (Crengle et al., 2013; Simpson et al., 2016). New Zealand youth (aged 15-19) have the highest suicide rates in the Organisation for Economic Co-operation and Development (OECD). New Zealand also spends less than the OECD average on young children, despite international evidence that shows spending on young children is more likely to result in positive outcomes (OECD, 2009). Research has shown that mental health disorders during adolescence are often associated with a range of negative outcomes. These can include: increased anxiety, anger, bullying, unhappiness, depression, educational underachievement, and suicide (Chan et al., 2017; Clark et al., 2014; Cushman, Clelland, & Hornby, 2011; Fergusson, Horwood, Ridder, & Beautrais, 2005).

Current Support Systems

The current New Zealand mental health and wellbeing support systems include a range of government agencies with services, initiatives, and policies, which are designed to support the mental health of adolescents. These support systems are delivered through: schools, District Health Boards, non-governmental organisations (NGO’s) and community based groups (Macklem, 2011; New Zealand Mental Health Commission [NZMHC], 2012).

Government Support

The support systems provided can be loosely grouped according to the severity of need they are designed to address using the
three-tier approach. This approach has been widely adopted in health literature and policy development (Macklem, 2011; NZMHC, 2012). Tier 1 focuses on promoting wellbeing for all young people and has a preventative focus. The supports in this tier include: regulatory environment; The New Zealand Curriculum; Education Review Office (ERO) Wellbeing Resource, Positive Behaviour for Learning (PB4L), and professional frameworks (ERO, 2016; Health Select Committee, 2016; Ministry of Education, 2007, 2015; NZMHC, 2012).

Tier 2 is designed to respond to issues of young people and to resolve the issues where possible. The supports for Tier 2 include: School Guidance Counsellors, social workers in schools, PB4L, School based health services, and Resource Teachers. These include: Learning and Behaviour (RTLBs), Family and Crisis Counselling, Gateway Assessments, SPARX (self-help e-therapy tool), and Youth One Stop Shops (Health Select Committee, 2016; Ministry of Education, 2015).

Tier 3 responds to a crisis and aims to prevent a situation from worsening. These supports are targeted at individuals, based on their specific needs. These include: Child and Adolescent Mental Health Service, Intensive Wraparound Service, Regional Health Schools, Fresh Start Programmes, Traumatic Incident Teams, and Crisis counselling and helplines (Health Select Committee, 2016; Ministry of Education, 2016, 2017).

School Support for Students

The current school supports for students in New Zealand include a combination of Tier 1, 2, and 3 systems. For example, the Education Council of Aotearoa New Zealand has recently released an update to the Code of Professional Responsibility and Standards for the Teaching Profession called Our code. Our Standards. In Section 2.1, Commitment to Learners, it states “I will work in the best interests of learners by promoting the wellbeing of learners and protecting them from harm” (Education Council, 2017). Along with this, the Vulnerable Children Act (2014) 6 (a) for improving the wellbeing of vulnerable children, requires measures aimed at “improving their physical and mental health and their cultural and emotional wellbeing” (New Zealand Government, 2014).

Secondary school based counsellors are used as early intervention in childhood mental health issues in New Zealand. However, the current ratio of counsellors to students in secondary schools is often 1:1,000, when the ratio should be 1:400 to work in an effective manner (New Zealand Association of Counsellors [NZAC], 2017). The New Zealand Association of Counsellors (NZAC) recommends that the Government should be looking to employ counsellors in primary and intermediate schools in order to provide more co-ordinated and consistent school-based support for all students (Cushman et al., 2011; NZAC, 2017). Other ways in which schools in New Zealand currently support student mental health and wellbeing, are through: The New Zealand Curriculum, PB4L, social workers and RTLBs (Health Select Committee, 2016; Ministry of Education, 2007, 2015).

Mental Health and Wellbeing in Schools

A study by Lambert et al. (2014) looked to determine possible factors which could be associated with happiness among New Zealand adolescents. They used data from the Youth’07 Health and Wellbeing of Secondary School Students in New Zealand survey of 9,107 students and found caring relationships with parents, schools, and the community to be important factors for happiness among adolescents. Similarly, Clark et al. (2013) also identified that positive connections to family and schools are important indicators of student wellbeing. The studies by Fleming et al. (2014) and Clark et al. (2013) also used the same Youth’07 survey to determine trends and changes in the mental health of New Zealand secondary school students. The study by Fleming et al. (2014) investigated the self-reported mental health changes between 2007 and 2012 and found a slight decline, with an increased number of students reporting low mood, depressive symptoms, self-harm, emotional symptoms, hyperactivity, and peer problems in 2012, compared to 2007. In contrast, the study by Clark et al. (2013) found that there had been improvements in the health and wellbeing of New Zealand adolescents between 2001, 2007, and 2012, using three national health and wellbeing surveys as well as comparisons with international estimates. There was, however, little change in self-rated general health or depressive symptoms which agrees with the findings of Fleming et al. (2014). There was no change or continued poorer health status compared with other developed nations, with New Zealand continuing to rank poorly for suicide rates (Clark et al., 2013).

Unlike the studies described above, Cushman et al. (2011), did not use the national health and wellbeing surveys of New Zealand secondary schools and, instead, surveyed 318 New Zealand schools in order to determine teachers’ perceptions of mental health issues and the strategies schools had in place to address this. Unlike the studies described above, the survey was not limited to secondary schools and included primary and intermediate schools, using a random number generator to select the participants. The findings supported research that has found there is a definite relationship between academic achievement and mental health (Cushman et al., 2011).

Socioeconomic Risk Factors

Denny, Lewycka, et al. (2016) examined indicators of socioeconomic deprivation among New Zealand secondary school students, using a national adolescent health survey and found that depressive symptoms were 2-3 times higher in the poverty groups compared to students not experiencing poverty. In addition, students experiencing poverty, and living in affluent neighbourhoods, reported higher levels of depressive symptoms (Denny, Lewycka, et al., 2016). Correspondingly, Clark et al. (2014) identified that most mental health interventions are adult focused, with few demonstrating appropriateness for youth of Māori, Pacific, or lower socioeconomic communities. Furthermore, using an intervention method that offered free counselling was found to be an effective strategy to reduce mild to moderate mental health symptoms and concerns, especially for Māori and lower socioeconomic adolescents (Clark et al., 2014). Both studies highlight a clear need for an increase in research around adolescent mental health promotion and intervention in New Zealand. These findings are reinforced by both Clark et al. (2011) and Denny, Lucassen, et al. (2016) who found there is a scarcity of literature regarding New Zealand Māori adolescents, sexual minority students, and mental health outcomes.

Family connection has been demonstrated to reduce the risk of suicide attempt for Māori adolescents; however, it was found that it did not moderate the relationship between depressive
symptoms and suicide attempt (Clark et al., 2011). In New Zealand, Māori adolescents do not have equitable access to healthcare and equitable health outcomes compared to non-Māori adolescents. Conversely Denny, Lucassen, et al. (2016) found that sexual minority students (defined as gay, lesbian, bisexual, and transgender [GLBT] individuals) were more likely to report higher levels of depressive symptoms and suicidality than their heterosexual peers. Their results found that schools play an important role in providing safe and supportive environments for male sexual minority students. Their findings therefore support the inclusion and implementation of both general and specific school mental health and wellbeing education strategies.

The highest rate of suicide in 2013 was in the adolescent age group (15-24 years) accounting for one in three deaths. Over time, adolescent suicide rates for adolescents of Māori ethnicity, have been persistently greater than rates for non-Māori (Ministry of Health, 2016). In 2013, the highest rates of suicide were male adolescents (15-24 years), especially Māori adolescents and those living in the most deprived socioeconomic areas. However, higher rates of intentional self-harm hospitalisations were recorded in females, especially adolescents (15-24 years), Māori and European ethnicities and those living in neighbourhoods of high socioeconomic deprivation (Ministry of Health, 2016). It is, therefore, clear from current research, that the identification of risk factors is necessary for effective screening, referral, and treatment of suicidality among New Zealand adolescents (Chan et al., 2017; Clark et al., 2013; Clark et al., 2011; Crengle et al., 2013; Denny, Lewycka, et al., 2016; Denny, Lucassen, et al., 2016).

**Strengths and Limitations**

The findings discussed above have several strengths and limitations. For example, the use of national health and wellbeing surveys, by many of the studies discussed in this review, has meant that the resulting research provides contemporary information for a large, diverse, and random nationally representative sample of New Zealand secondary school students (Clark et al., 2013; Clark et al., 2011; Denny, Lewycka, et al., 2016; Denny, Lucassen, et al., 2016; Fleming et al., 2014; Lambert et al., 2014). In comparison, the study by Cushman et al. (2011) surveyed 318 schools and found that they were representative of a wide range of geographical locations, school types, and decile levels in New Zealand. Studies like the one by Clark et al. (2014) add to the small amount of research around effective mental health interventions in primary care and community settings, especially for Māori adolescents and those from lower socioeconomic backgrounds. This study provided a relatively simple and cost effective intervention by exploring the use of facilitated access to free counselling for youth with mild to moderate mental health concerns.

It is important to highlight some of the limitations of these studies. Most studies have highlighted the difficulty in exploring causal associations with cross sectional design methods. In the study by Clark et al. (2014) the mental health concerns and stressors may have resolved themselves without intervention. Similarly, it is not possible to attribute the improved outcomes of this study as a direct result of the intervention. The sample sizes, in the surveys of the studies discussed, are a limitation because they may reflect the views of the sample rather than the entire New Zealand school and student population. It is also important to highlight that the research discussed in this review is focused on New Zealand secondary schools and secondary aged students. The exceptions are Cushman et al. (2011), who looked at both primary and secondary schools and Clark et al. (2014), who used a referral based service for any young person aged 10-24 years with mild to moderate mental health concerns.

**Future Research**

There are currently large gaps in the research around effective mental health interventions in primary care and community settings, particularly among Māori adolescents and those from lower socioeconomic backgrounds. There is also a lack of New Zealand research focusing on the relationship between mental health and wellbeing and student achievement, even though international research has shown that there is a fundamental relationship between mental health and student learning (Cushman et al., 2011). The studies have also highlighted that policies are needed which address household poverty alongside the reduction of socioeconomic inequalities of New Zealand adolescents. There is clearly a need for ongoing monitoring and evidence-based accessible interventions that focus on preventing mental ill health and on promoting mental health and wellbeing. The mental health of New Zealand secondary school students requires further attention, with clear statistics around youth suicide supporting this. There is also a growing need for funding to provide primary school based counsellors and to increase the training made available to professionals, both in initial teacher education and professional development for in school teachers.

**Conclusion**

The mental health of students is a major factor affecting their ability to learn and their resulting academic outcomes and therefore an integrated collaborative approach is required (Clark et al., 2013; Cushman et al., 2011). This review of current literature has found that there has been no change or a continued poorer health status in New Zealand adolescents compared with other developed nations. Many of the studies identified positive connections to family and schools as being important indicators of student wellbeing. Most studies found that the strategies used were focused on responding to issues of concern, rather than the use of proactive and preventative approaches. Currently, secondary schools use counsellors to provide support to students with mental health and wellbeing concerns, while primary and intermediate schools rely on less qualified school based and community support systems due to a lack of Government funding. This has highlighted a clear need for an increase in government support and funding for primary aged students with regard to in school counselling. Research has found that offering free counselling can be used as an effective method for reducing mental health symptoms and concerns for adolescents. Caring relationships between parents, schools, and the community have been found to be important factors influencing happiness among adolescents. Research discussed in this literature review is focused on New Zealand secondary school students due to the lack of literature and significant research gaps regarding primary aged students’ mental health outcomes. Current findings support inclusion and implementation of both general and specific school mental health and wellbeing education strategies, with a stronger
focus for funding on a preventative rather than reactive systems needed. Research also highlights the need for effective screening, referral, and treatment of suicidality in New Zealand adolescents. This review has therefore identified a current lack of New Zealand research focusing on mental health and wellbeing in adolescents.

References


What Effects do Innovative Learning Environments have on the Teacher-Student Relationship?

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Abstract

Innovative learning environments (ILE) are a global educational movement away from classical ideas of education and learning to an attempt to create more holistic, physically open, technology-rich, collaborative, and learner-centred environments that prepare learners for the 21st century. With these new environments comes enthusiasm and challenges, as well as criticism and unease for ākonga (students) and teachers, surrounding how learning and the teacher-student relationship will be enacted. Teacher-student relationships are shown to be vital for good learning outcomes that align with the New Zealand Curriculum. The physical developments of environments made for innovative learning have brought about exciting opportunities as well as criticism and tensions as to how teachers and learners will relate to, and navigate, the dynamics of new ways of teaching and learning. This literature review explores literature that sheds light on these new challenges and ideas around teacher-roles and relationships and Innovative Learning Environments.

Keywords: Innovative Learning Environments, Teacher-Student Relationships, Teacher Roles, Student Roles.

Introduction

The Organisation for Economic Co-operation and Development (OECD) proclaims that the innovative learning environment (referred to by some as an ILE) is an international response to the need to align education with the key twenty-first century element of innovation (2013). An OECD report evaluating 40 case studies on ILEs around the world, illustrates how innovation in learning environments can be employed. The ideas within the report have influenced and are aligned with the vision, principles, values, and key competencies expressed in the New Zealand Curriculum (NZC) exhibiting an internationally recognised shift towards 21st century teaching pedagogy in Aotearoa New Zealand (Ministry of Education, 2015).

The definition of a learning environment can be extended to include, not just the physical locality of learning but, as Fraser, McRobbie & Fisher (1996) describes, the climate or atmosphere in the classroom connected to the behaviour of students and teachers. Teachers navigating this new learner-centred environment require fresh insight into how to best approach, facilitate, and support future-focused ākonga (students) learning. The physicality of new innovative learning environments has been targeted by the New Zealand Ministry of Education through a re-focus on property funding as they require “a portfolio of well-maintained schools supporting a modern education system that produces skilled people who can contribute towards a productive economy” (Ministry of Education, 2011, p. 3). Through examination of international and New Zealand based research and case studies, this review explores how the role of the teacher-student relationship in Innovative Learning Environments can best be enacted.

The Teacher-Student Relationship

Hattie (2012), through extensive research, asserts that one of the most powerful influences in learning is teachers, that they need to be “directive, influential, caring, and actively and passionately engaged in the process of teaching and learning” (p. 18). The NZC outlines the importance of “creating a supportive learning environment” as a part of effective pedagogy (Ministry of Education, 2015), and because of this, the importance of relationships between teacher and learner cannot be ignored. As new pedagogy and teaching practices develop, the need to review the role of teacher-student relationships increases. Teachers work to create and guide learning in ILEs and so the relationship they have with student is of great importance. The OECD outlines seven principles for ILEs. Three principles in particular are “ensuring learning is social and often collaborative … being
highly attuned to learner motivations and emotions … [and being] acutely sensitive to individual differences” (OECD, 2015, p.12). These principles acknowledge the importance of a connected, close, and thoughtful relationship between teacher and learner in ILEs, as well as of the learners to each other. This aligns with O’Hara’s (2005) study of transcendent teacher-student relationships, which is when teacher and learner interact beyond traditional roles, in that, the teacher knows each of the learners’ strengths individually, and is passionate, compassionate, and encouraging throughout the learning process.

It has been found that an absence of these caring relationships with teachers is a key factor for student school dissatisfaction, failure and dropout (Bernstein-Yamashiro and Noam, 2013, p. 17). This means that creating and maintaining teacher-student relationships is vital to ensuring students settle into new ILEs well. In their written narratives, one researcher recalled their safe classroom environment and believed that they “thrived in the atmosphere of encouragement and respect” that the teacher had created in the classroom (O’Hara, 2005, p. 333). O’Hara’s research illuminated that when the teaching-learning roles are reciprocal, learning is enhanced and made more meaningful because all parties are involved in the pedagogical process. Abbiss (2015) claims this teacher-learner relationship reciprocity will be a significant shift in this movement towards ILEs, as the environments stimulate collaboration and openness in which traditional teacher roles are shifted and modified. Teachers must be open to becoming facilitators of learning rather than leading and controlling all aspects of learning and the environment.

Technology and Learner-Centred Learning

This idea of facilitation is supported by Cornelius-White’s (2007) meta-analysis of learner-centred teacher-student relationships. Learner-centred education is in line with the ILE principles laid out in the OECD of recognising “the learners as its core participants” and being “acutely sensitive to the individual differences learners” (2013, p. 16). It means that learners, as a whole, are the most important part of their learning and the learning environment. In this context, according to Cornelius-White, the teacher’s role becomes facilitator for this holistic learning (2007). This connects with the NZC as it explains the importance of “facilitating shared learning” in its section on effective pedagogy (2015). Cornelius-White continues and explains that this facilitation of learning requires teachers to incorporate flexibility in their teaching methods, genuine care of ākonga, and utilise of human and material resources (2007, p. 114).

An important resource for teachers in these environments is technology. As discussed earlier in this literature review, ILEs are a reaction to a need for a 21st century education, and so it is obvious that the use of technology plays a large part in the learning environment. Helping to encourage innovation and collaboration (Magen-Nagar & Steinberger, 2017; Mulkahy & Morrison 2017). Benade, Gardner, Teschers, & Gibbons (2014) discusses challenges teachers may face in being able to provide flexibility of learning in regard to technology if they, themselves, lack competency in modern digital and other technologies. Benade et al.’s (2014) New Zealand research findings illuminated the fact that “21st century learning is shifting the focus of schooling away from knowledge that must be imparted to students” (p. 55). With the innovative 21st century context our teaching and learning requires a set of skills and competencies that empower digital citizens (Benade et al., 2014). It is no longer enough to be efficient in teaching just curriculum subject knowledge. For teachers who are not as competent with technology, these new practices may leave them out of their comfort zone and limit their ability to facilitate the learning of their students sufficiently. It could also create a divide in the relationships they have with their students because their credibility as teachers could be questioned (Benade et al., 2014, p. 55). If open, caring, and reciprocal relationships are created between teachers and learners, perhaps this technological incompetency can be overcome as student can take on the role of teacher, while the teacher continues facilitating the learning of the student (O’Hara, 2005).

Physical Innovative Learning Environments and Relationships

The physical enactment of ILEs are beginning to be seen around New Zealand. The Ministry of Education (2011) describes this new infrastructure as helping to facilitate “flexible, open and adaptable teaching spaces” (p. 7). New structures show a movement away from the factory-like models of schools, to reflecting the modern, social, flexible, and constructivist 21st century work place (Charteris, Smardon, & Nelson, 2017; Magen-Nagar & Steinberger, 2017; Mulkahy & Morrison, 2017). Charteris et al. (2017) argue that this is a move from disciplinary control to a society of control, meaning the teachers role is no longer to direct learning completely. Students are expected to have more responsibility over their own learning and the teacher’s role is to facilitate and guide the student.

To assist the flexibility and social nature of ILEs, openness has been a large theme within the designs of these spaces (Deed & Lesko, 2015). As seen in Deed and Lesko’s (2015) study these open spaces have been found to make teachers who are used to a more traditional single celled classroom uncomfortable as they try to adapt their practice in the physical environment. The 2011-2013 Deed and Lesko study looks at staff reaction to new school buildings in Victoria, Australia. Many concerns and anxieties that teachers identified were directly linked to the open plan nature of the space; these concerns and anxieties include key constructs of organisation, conformity, order, and control (Deed & Lesko, 2015). The perceived effect the physical space, in which teaching and learning happens, has an impact on the ideas teachers have around teacher-student roles and relationships, and already shows a rupture within teacher perception of how to teach. Removal of the familiar physical boundaries that a single celled classroom provides caused unease among the teachers. Deed and Lesko go on to explain that the teachers’ memory and experience in conventional classes is what gave them validation of their approaches to teaching, as traditional space came with tried-and-true routines and interactions between teacher and learner. Moving around furniture and locking doors became the first reaction to this unease showing the need for control in the new environment (2015, p. 223). Mokhele (2006) states the importance of arranging the classroom in a manner that every learner can be seen is to help management of learners, but this is possibly unrealistic in new physical learning spaces because they
are large, with differing furniture layout and created to promote “self-surveillance, self-regulation, and self-management” (p. 223). These ideas line up with what has been outlined in the NZC’s vision for confident, connected, actively involved lifelong learners (Charteris et al., 2017; Ministry of Education, 2015). This makes visible a tension between the physical space of ILEs and teachers feelings of control in relation to students.

This unease of teacher relationship roles is echoed in Deed, Lesko and Lovejoy’s (2014) study by a starting teacher who was appointed to teach a self-directed learning class in an open-plan learning area within a high school in Victoria, Australia. In an interview after her first class, the teacher predicted her position would be as facilitator rather than of traditional teacher as she was “having less of a direct influence” on learners (p. 376). She states that her personal challenges revolve around doubting her own knowledge, not knowing in what ways she was meant to be supporting the students and how she would keep students motivated when their learning needs differed, and thus how her relationship with the students would develop. These challenges display a disconnect between the pedagogical theory of ILEs and teachers’ awareness of how to best enact this in the physical environment. It also shows there is obviously a gap in teacher knowledge about how best to approach the role of teacher in ILEs.

Charteris et al.’s (2017) study which interviews principals from New Zealand, also illuminates that the teacher’s central role as an embodied presence has been shrunk considerably within these environments. There is a tension between spaces set up to create independent learning, and the necessity of building strong teacher-student relationships as the ILE’s can function with “governance from a distance” (Charteris et al. 2017, pg. 815). The possibility that ikonga may slip into the nooks and crannies of the new physical environment, making it hard for teachers to moderate and engage the student in learning has been highlighted by Charteris et al’s study (2017, p. 815). It opens up a dialogue that, not only teachers, but students may struggle to adjust to the 21st century ILE.

Mulcahy and Morrison’s (2017) study explores this idea of issues with student adjustment to ILEs further, with two differing interviews of students in an Australian ILE. Although one student enjoyed the comfortable, cooperative nature of the ILE, another student found communication an issue as the environment was “too noisy”; he could not hear the teacher and he preferred a quiet space to work (p. 755). His comments indicate he may prefer an instructional learning environment where the teacher is central and there are special borders in place to help direct learning (p. 755). Mulcahy and Morrison argue that this student is a student whose personal learning needs are contrary to how the ILE pedagogy functions, as he favours a more direct, instructional relationship with his teacher, rather than a large social environment in which he must navigate his own learning. Through this case study, Mulcahy and Morrison challenge how these new learning spaces work for the diversity of every learner and in what ways they may benefit some learners more than others (p. 756). This suggests that if learning is truly learner-centred, what the learner sees as their ideal environment for learning must be taken into account and not a one-way-suits-all approach.

Conclusion

Both teachers and students need to be prepared to work and learn within new learning environments that are technology rich and physically flexible to reflect work-spaces of the 21st century. It is, therefore, crucial that supportive, reciprocal and genuine teacher-student relationships are formed as these are shown to be vital for positive student learning outcomes. The research analysed shows teachers being disconnected, and feeling discomfort in the physical innovative learning environment, as it changes the dynamics of teacher and student roles and relationships. This literature review has shown that guidance and teacher education is required to create cohesion in new environments. It has also highlighted the need for more research in relation to how to best facilitate the learning of students in innovative learning environments, who the environments work for and how they can be further utilised to support all students learning. As innovative learning environments are becoming a massive development in future of education in New Zealand, more knowledge and understanding around how they best operate for students and teachers is vital.

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Abstract

The use of out-of-school partnerships can enhance student learning and motivation in science secondary school education, whilst also helping students to relate concepts taught in class to their applications in real-life. Partnerships are most successful when there are beneficial outcomes for all parties involved. Benefits resulting from secondary school outreach programmes with organisations, scientists, and universities, were investigated. There are many positive outcomes from participating in outreach, an overarching one being an increased interest in science by the student participants, with an impact not only the students themselves, but also on the teachers, universities, and science professions, as student interest can be linked to participation. Science literacy, content knowledge, and skills can also be developed through outreach, as can insight into industry applications of science.

Keywords: Partnership, Outreach, Science, Out-Of-School Partners, STEM, Professional Development, Secondary Education.

Introduction

Successful learning does not only happen within a classroom, so why is it that the dominant location for secondary school education? For many years educational theorists have identified that teaching and learning is not just a case of teachers giving out information and the students absorbing the knowledge. The importance of learning through guided participation in experiences and finding sociocultural relevance in these experiences was identified by Earnes and Coll (2012). This idea builds on concepts of learning and is greatly developed by Vygotsky, as well as by foundations laid by other theorists including Dewey, Rogoff, and Piaget (Barker & Buntting, 2016). Using activities and experiences different from the classroom norms could be a way to help the disconnect between the scientific theory students are taught in the classroom and the students’ perception of scientific applications in real-life, as identified in Vennix, den Brok & Taconis (2017).

Partnerships between secondary schools and out-of-school science experts, such as Science Centres like the East Coast LAB in Napier (Earthquake Commission [EQC], 2017), are beneficial to all parties involved, thus they should be developed as a reciprocal and collaborative practice (Ngai, Cheung, Ngai, & Chan, 2010). It was also suggested these relationships should be built based on common interests, where all parties involved can combine their skills and resources to accomplish more together, and create something “new and valuable” (Ngai et al., 2010, p. 172). Outreach is one way that the gap between science theory and application in Secondary schools could be bridged (Vennix et al., 2017). The concept of outreach explains that an activity is used to bring information to people, where awareness for the use of science in job fields can be increased through the partnership with organisations, universities, scientists, and research facilities (Vennix et al., 2017).

This article explores the use of out-of-school partnerships and outreach to give New Zealand secondary school students the opportunity to participate in learning experiences that are led by subject experts or are experiences outside of the classroom, in order to build connections to real-life applications of science in STEM (science, technology, engineering, mathematics) fields. It also looks at the impact of these partnerships on the professional development of the secondary school teachers involved. The opportunities looked at for this article are: the use of outreach organisations, out-of-school partnerships with universities, and out-of-school partnerships with scientists.
Partnership with Outreach Organisations

Outreach programmes and Learning Experiences Outside the Classroom (LEOTC) can be used to support secondary students in making connections between the curriculum content taught in the classroom and the practical applications of this in real-life science and industry. There have been four main reasons identified by schools for using such programmes: programme compatibility with the New Zealand Curriculum, their ability to provide hands-on experiences, expert resources and staff, and provide life experiences to the students (Hipkins et al., 2002). Studies have also confirmed that these experiences are most beneficial if they are used to support and enhance classroom science learning, where these experiences can offer valuable and motivational opportunities to students (Hipkins et al., 2002, Vennix et al. 2017).

Programmes offering outreach and LEOTC, can be set-up in many different ways. Hodder (2010) identifies types of outreach through science centres to include: open-ended laboratory experiments, such as science fairs and techniques, and interactive exhibits with predetermined learning and outcomes. These centres can also be included under the umbrella of LEOTC services, along with museums, zoos, observatories, and galleries, which are informal learning environments that provide experiences complimentary to what the students are learning in the classroom (Hipkins et al., 2002). Other outreach experiences include: guest lessons by experts in research, visits to industrial laboratories and other work environments, as well as projects or assignments that are developed with industry professionals that look at work or problems in the company’s field (Vennix et al., 2017). The programmes offered by these services can be grouped into three levels: short programmes (the most common), medium/ more intensive programmes, and long-term or extensive programmes (Hipkins et al., 2002). Research into the success of these programmes does not seem to suggest with any clarity that they increase the understanding and motivation of students for science education Hodder (2010).

Hodder (2010) explores the use of science centres in New Zealand and internationally, and claims that there is no clear evidence that these LEOTC centres have positively influenced the popularity of science for students. The article suggests that the intention of these centres was to increase scientific literacy to enable the public to make informed decisions on issues with a scientific basis, as well as a goal to increase enrolments and participation in declining science fields. A study by Otrel-Cass that is discussed in Hipkins et al. (2002) also suggests that evidence to prove success of these programmes is often unclear. This claim was based on the results of their study as they were unable to pin-point whether the source of the learning on a topic was related to the outreach, classroom, or other learning taking place. There was, however, an example in the article that has been seen to benefit what they refer to as exceptional students in science. The CREST (creativity in science and technology) programme, in which students undertook their own research/projects with support from an out-of-school mentor with experience in the appropriate discipline (Hodder, 2010), allowed students to have an understanding of the complexity of real-world issues and how to solve them. The CREST programme also helped students to develop skills in investigative inquiry, and build scientific knowledge that extends further than the school science curriculum (Hodder, 2010). These skills have all been deemed as important for student success in science, because they cover important aspects of the nature of science (Gluckman, 2011). This programme was also beneficial for the school teachers involved, because they were able to develop contacts with experts within science fields, and extend their knowledge and skills in science, especially for teaching investigation (Hodder, 2010). Research by Thomas (2012) and Vennix et al. (2017) suggests that there are considerable benefits to using outreach programmes to promote the understanding of science disciplines at a secondary school level. The benefits were not only for the school students but also for the secondary school teachers and the service provider of the outreach. Examples of benefits for students are that science content knowledge can increase, as can the use and understanding of technology (Thomas, 2012). The motivation of the student to study science can also increase (Thomas, 2012), which is beneficial to not only the students, but their teachers, outreach providers, and science industries, because motivation is linked to student success in the area. In the study carried out in Thomas (2012), the results showed that there was a significant increase in knowledge after the outreach laboratory activity, and that the level of acquired knowledge at the end was the same regardless of the amount of preparation and background knowledge the students had prior to the programme. This second finding is interesting as it is contradictory to statements from Hipkins et al. (2002), where it is suggested that in order for successful learning on an outreach trip there needs to be scaffolding of the experience in the classroom as well.

Vennix et al. (2017), explores the use of STEM outreach to motivate secondary school science students, emphasise connection between class knowledge and the outside world, and teach important skills for the work force. These are referred to as 21st century skills and include competencies like flexibility, teamwork, communication, and problem solving (Vennix et al., 2017). The article suggests that long-term problem based activities, and hearing scientists’ perspectives were the most positive outreach experiences for students. Evidence from the study indicated that both the students and teachers found the outreach experience very positive; however, teachers often rated the sessions more highly than students. Three were aspects identified for a successful outreach programme were that students need: autonomy (to feel that they have a say in doing the activity), the relevant skills, and be able to establish relationships with the other people involved in the outreach. The study also showed that short-term and lecture based activities were often similar to classroom practice and were not as successful as outreach, which was vastly different from what students did in their normal class (Vennix et al., 2017). The teachers in this study gained from outreach experiences too, where they could explore new contexts and ideas for how to relate the science curriculum to the science work force.

Partnership with Scientists

Organising opportunities for high-school students and scientists to engage in conversation, is one way for students to learn about what people with jobs in science fields actually do, and relate this to what they may be learning in a science classes. Otrel-Cass, Campbell, and Wilson, (2012), suggest that there is a trend both within New Zealand and internationally that school-aged children and teens decide early on if they think they are
capable of participating in science, and as a result many students decide not to have science as part of their formal secondary school education. It has been argued that because of this, connection between science and society needs to be made to empower students to understand socioscientific issues (Otrell-Cass et al., 2012).

Café Scientifique events are one way in which partnership between scientists and secondary schools can be used to enhance interest and engagement in science fields. Café Scientifique for teens, and Junior Café Scientifique are examples of informal settings where students and scientists can talk together about science, current science issues, and the implications for people’s lives (Otrell-Cass et al., 2012). Having science related conversations accessible to students, and other members of the public is important for building scientific literacy and understanding, in order for citizens to make informed decisions on science related topics. One of the successes of these conversations is that due to the informal and social arrangement, the participants can often have their questions answered (Mayhew & Hall, 2012), while another is that trust for the scientists can be developed (Otrell-Cass et al., 2012).

Otrell-Cass et al (2012), completed a small case study in two New Zealand secondary schools which adopted Café Scientifique style events organised by students at the schools. The findings suggested that the success of the Cafés depended on the atmosphere of each event, where smaller more relaxed environments that were different from the classrooms were better than larger events where the discussions tended to reflect more of a lecture-style. The Junior Café allowed for students to explore science ideas without the pressure of assessment, with students having ownership of the events being crucial to their success.

The Café Scientifique high-school programme looked at by Mayhew and Hall (2012), found benefits of running a teenage programme for both the students and the scientists involved. These benefits included increasing science literacy and awareness amongst the teens, as well as developing realistic perceptions of what scientists do, and the complexities and motivations that might influence them. The latter may help teens to think more critically about and evaluate the information that they see. Effective communication by the scientists to the teenagers was a key focus of the Mayhew and Hall research, with the initial scientific literacy of the teens reflecting that of general populations. This café programme identified key skills for the scientists when presenting to public, including how to know your audience, and some scientists also noted the experience was helpful for gathering information for their own research.

Partnership with Universities

Out-of-school partnerships between secondary schools and universities can be used in many ways to harness a connection between the sciences taught in class to the applications they have in various professions. The format of these partnerships can result in benefits for all parties involved, from the secondary school pupil and teachers, to the university faculty and their students. Partnerships with universities can be used to give secondary school students a taster of university life (Smith, Kindall, Carter, & Beachner, 2016). It can expose them to professions and fields that are offered at higher/ tertiary educational facilities, and can build interest and motivation of the students which may expand the diversity within sciences fields.

There have been many studies into university-secondary school partnerships being used to support interest in STEM subject areas. A reason these partnerships may be common is that often teacher education programmes do not prepare preservice teachers to apply technological and pedagogical content knowledge (TPACK) in their classes (Osler II, Bull, & Eaton, 2012), thus support from experts to apply this in the secondary classroom could be beneficial. Partnerships can be used to develop students’ knowledge in the areas lacking, as well as having the potential to support professional development of secondary school science teachers in these areas. Research carried out by Osler II et al. (2012), and Habash and Suurtamm (2010), are examples of how partnerships between universities and secondary school science departments may work, as well as what the results of such partnerships may be.

The Learning laboratory initiative partnership between North Carolina Central University and a local school is an example of using the expertise and resources available at a university (Osler II et al, 2012). This gave secondary school students the opportunity to use current and new technologies related to STEM subjects, as well as the opportunity for secondary school teachers, to develop skills and content knowledge in STEM areas (Osler II et al, 2012). The aim for this partnership is to use the technologies to provide a positive impact on secondary school student performance in STEM subjects. An engineering and mechatronics outreach programme through the University of Ottawa, in Canada, is another example of a partnership working to improve secondary school students understanding and awareness of STEM subjects, in order to connect the mathematics and science taught in schools to real-life applications in the field of engineering (Habash & Suurtamm, 2010). It was identified in this article that ways in which to strengthen career choices in STEM fields, such as engineering, included: influence of parents, providing related career information, and through high school science and mathematics courses. With these in mind the programme works to target a wide range of students to increase the pool of potential students interested in careers in the field.

This particular programme involved outreach in the form of information sessions and web-based resources, along with having the students from the universities engineering course present their engineering projects to the high school students. These presentations helped develop interest amongst high school pupils but also helped the engineering students to explain engineering concepts in a meaningful way for non-experts. Feedback was collected by a survey each year of the study, with 97% of the high school students saying that listening to the presentations gave them a better understanding of applications of mathematics and science in real-life contexts, and 72% said that the presentations enhanced their interest in science and mathematics (Habash & Suurtamm, 2010). The results of this study showed that outreach was an effective tool for encouraging the connection between high school mathematics and science to real world applications, and for building understanding of what the professional fields are that use these applications. The study also highlights the significant help outreach activities can offer to support high school teachers to meet the educational challenges for their students (Habash & Suurtamm, 2010).
Conclusion

Although studies may not be able to prove that outreach activities are solely responsible for increases in knowledge and motivation in science fields, there is strong evidence that students involved in outreach have interest, motivation, and experience in science concepts and their uses in real-life and industry (Habash & Suurtamm, 2010). Secondary school partnerships with out-of-school experts can enhance the science education that students receive as well as provide learning experiences for secondary teachers and other parties (e.g. university students, science industry). These experts can belong to myriad of places including organisations, businesses, universities and other research institutes, and in order for the partnership to be sustainable these experts must also gain something from the experience.

Partnerships with specialised outreach organisations can benefit secondary school students and teachers by improving pupils’ abilities in inquiry, scientific literacy, and 21st century skills, as well as increasing their content knowledge and understanding of real world issues. Teachers can extended their knowledge and skills, especially for scientific inquiry and relating science to the work force. Partnerships with universities also enhanced these aspects, along with sometimes being used as a teaching tool for the university students as well. Outreach can help to expand diversity within science professions by giving all students a taster. Platforms like a Café Scientifique allow scientists to practice communicating science ideas with non-experts while giving the students insight into what the scientists did, current scientific issues, and some opinions on them.

Although there is still opportunity for research into many areas around out-of-school partnerships for secondary science education, there are many studies to support using them to enhance students’ science knowledge and their ability to connect this with real-life applications.

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Making Connections in the 21st Century: Does Digital Technology Foster School-Home Relationships?

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Abstract

The digital access divide is dropping in countries in the Organisation for Economic Cooperation and Development (OECD), however some issues remain with the implementation of digital technology in schools. This literature review examines barriers to collaboration in the home-school relationship in the context of digital technology. Common themes include a continuation of traditional school-home relationships of a top-down approach in communicating with parents. This has implications for school-home partnerships and suggests that cultures around this relationship should be carefully re-examined to allow for increased parent voice in participating in and engaging with their child’s learning. Acknowledging and responding to diverse information literacy competencies may be one way schools can improve genuine partnership and collaboration with parents, although more research should be done on understanding nuances in technical issues attached to the technology such as connectivity and access, as well as sociocultural differences of perceptions and attitudes of digital competency (Kong & Li, 2009).

Keywords: School-Home Partnerships, ICT, Students, Collaboration, Equity, Information Literacy, Education.

Introduction

Digital Technology and Education

In the last few decades, education has been transformed by changing ideologies of the role of schools, and the purpose of education, teaching, and learning. One factor that has dramatically influenced teaching and learning in the last decade is digital technology. Digital technology has encouraged changing the role of teachers and students (Parsons & Adhikari, 2016), and has allowed more inquiry based learning activities. Implementation of policies which support e-learning in education is complex, and has challenges (Kong & Li, 2009). Structural issues of digital technologies include digital technology access and connectivity, such as wireless infrastructure (Parsons & Adhikari, 2016).

For countries in the Organisation for Economic Co-operation and Development (OECD), a major emerging trend is uneven usage and comprehension of digital technologies. Adhikari, Scogings, Mathrani, and Sofat (2017) note that the digital divide has evolved from a digital access divide to a digital literacy divide. Digital access is defined as the “division between those with access to digital technologies and those who do not” (Adhikari et al., 2017, p. 291-292), while digital literacy can be defined as the competencies which allow you to use digital technologies (Hatlevik and Christophersen, 2013). Digital technologies as a tool to support learning in the education context has implications for relationships between ākonga (learners), whānau (family), kaiako (teacher), and schools. In the New Zealand context, the government has provided an “E-learning strategy” document which guides schools in their adoption and integration of digital technologies in their local communities (Ministry of Education, 2014). The language of the New Zealand Curriculum reflects this anticipated goal through its vision and principles, for example, encouraging young people to “seize the opportunities offered by new knowledge and technologies”, to be “connected”, and “future-focused” (Ministry of Education, 2007, pp.7-9). In addition, from 2018, “digital technologies” will have a distinct place in the New Zealand Curriculum learning areas (Ministry of Education, n.d).

Partnerships, relationships, and digital technologies are amongst the key issues facing education in the 21st century (Bolstad et al., 2012). In this review, there has been an effort to restrict results to recent empirical research to improve the relevance of the findings for schools, teachers, families, and those interested in education. It has been suggested that access,
function, and usage of digital technologies is uneven across users (Grant, 2011). It is this emerging understanding of the digital divide which has implications for education partnerships between teachers, school, families, and students.

Digital Access Divide

Geographical research has helped inform educational practitioners regarding the existence of the digital access divide in New Zealand. Census data from 2006 demonstrates that Māori, Pasifika, and people from low socioeconomic households may have less digital access opportunities, due to the lack of a computer at home (Greenbrook-Held & Morrison, 2011). This research can be critiqued due to its reliance on one question as a proxy for digital access, and the research is now outdated. Even so, research outside of New Zealand has suggested that following accelerated production and distribution of technologies, poverty, sociocultural, and language differences in communities might constrain access to digital technologies (Lenhart, Purcell, Smith and Zickurol, 2010, cited by Heath, Maghrabi, and Carr, 2015, Zhao, Lu, Huang, & Wang, 2010).

One strength of these findings is that they demonstrate that differences remain in who may own or access different digital technologies. In addition to acknowledging differences in access, it has been argued that some of the key issues emerging around use of digital technologies at school is information literacy (Kong & Li, 2009; Zhao et al., 2010). Differences in information literacy have implications for how digital technologies might be used for equitable communication and learning. Diverse information literacy skills and knowledge across schools, students, and communities might mean that assumptions are made about information literacy and usage. These assumptions may mean families experience exclusion in communicating with schools and raises tensions in the school-home relationship.

Quantitative research into digital competence unevenness found that cultural capital as indicated by language integration and home valuing of education was correlated with digital competence (Hatlevik & Christophersen, 2013). This appears to be linked to the socioeconomic, cultural, and language differences outlined earlier in this section; however, it should be noted that due to prescriptive modes of answering online surveys, other explanations of this relationship are possible (Hatlevik & Christophersen, 2013). This research highlights factors which might explain differences in information literacy and digital competency, and how they might represent socioeconomic inequalities, which consequently has implications for the equitability of digital technology usage in education. The rest of this article explores differences in the way digital technology is experienced and perceived in education, focusing on how it affects the school-home relationship, and potential responses to address challenges identified.

Digital Technologies and the school-home relationship

Shared Vision and Communication

Effective communication is the centre of a close relationship between schools and homes, which is important for encouraging parents to be active in the school-home relationship. Digital technology can facilitate communication and collaboration in third spaces through learning platforms (Grant, 2011). This supports students to have greater agency in their learning, and allows information to be communicated between formal and informal spaces (Parsons and Adhikari, 2016).

Heath et al. (2015) propose that active parent involvement positively influences student’s learning outcomes. The importance of parental involvement was found to be highly valued in the school-home relationship, which was a vision shared by parents and teachers in the study by Olimstead (2013). This suggests that schools in engaging with parents and whānau in the 21st century should incorporate appropriate digital tools to facilitate communication and collaboration between home and school.

Kong and Li (2009) found that schools in Hong Kong were active in creating strategies to engage parents in understanding Information Technology (IT) in the school, and encouraged parents to “instil the proper principles, values, and attitudes in IT use into their child/children” (Kong & Li, 2009, p. 280). Schools engaged parents by organising IT in education seminars, with “talks on teaching children how to use information properly” becoming increasingly popular (Kong & Li, 2009, p. 279). Two-way collaboration in schools is distinguished from broadcasts which tend to be one-way. Examples of meaningful two-way communication include online surveys and parent focus groups, which can inform communication preferences (Heath et al., 2015, p. 369).

Kong and Li (2009) suggest parents value choosing digital resources to support their child’s learning beyond what the teacher provides, and that in a collaborative partnership approach, schools could offer seminars on trends in IT such as time management, privacy, ethics, and etiquette to “prevent them from becoming victims of the information society” (Kong & Li, 2009, p. 281). In a collaborative partnership model, it is essential that there is balanced input from both partners in constructing common goals, including open and responsive discourse in addressing challenges perceived with IT in education. Whilst this study identified parents’ concerns, it was less clear whether this knowledge was already being sought by schools involved, and responded to, and if it were, how universal this type of responsive partnership might be beyond the case-study.

Communication in education needs to be engaging and allow parents to respond and interact. Olimstead (2013) cites Epstein’s (1985) “spheres of influence” which proposes that maximum parental engagement can occur when there are shared activities between the school and home dimensions because these engender authentic partnership. The risk of not communicating well may lead to the misalignment of IT understandings, adoption, and practice between the school and parents, which leaves parents dissatisfied (Heath et al., 2015). This research is limited by context, with diverse schools and communities sampled, which introduces subjective results. It does, however, seem likely that the misalignment and alignment framework of expectation and communication is useful in explaining why it is important to maintain the school-home relationship. Grant (2011, p. 296) supports this in his research of English schools, explaining that despite idealistic attitudes of improved communication between the school and the home, digital technologies can, at times, leave teachers and parents dissatisfied. It should be noted that these schools had limited adoption of digital technology to communicate with parents, which might partially explain some of these parent’s feelings. This demonstrates that beyond the
addition of a communication tool of digital technology, IT might bring new challenges to communication which are felt by parents and whānau, who may have distinct preferences and information literacy skills that are different from schools.

**Digital Literacy at Home**

Parents are a key part of school relationships and community (Kong & Li, 2009; Selwyn, Banaji, Hadjithoma-Garska, & Clark, 2011). Digital technologies have changed the spaces which might be used for learning, including the home. In informal spaces, students can access lessons, resources, and homework tasks by connecting through the Internet or file-sharing (e.g. Bluetooth). Digital technology may facilitate greater accessibility of where and when learning may happen, although significantly, digital technology alone does not break down differences between household Internet access and capabilities. Digital technology may dissolve physical barriers between the home and school learning environment. One issue identified by Grant (2011) is the differing funds of knowledge between school and home. These differences might generate dominance of school-knowledge in learning at home at the expense of home knowledges. The funds of knowledge discussion lend itself to supporting the concept of inequities of digital literacy (Hatlevik & Christophersen, 2013).

Digital technology can facilitate involvement of parents in students learning (Kong & Li, 2009). Parents may support their child’s access and usage of digital technologies, from providing practical access to digital technology and connectivity, to assisting with intangible supports like encouragement of safe attitudes towards IT (Kong & Li, 2009). Whilst Kong and Li’s (2009) survey reported that parent’s perceive themselves as important stakeholder’s in information literacy education, there may be a slippage between parent ideals and their experiences of being (un)involved as collaborators. Similarly, research by Grant (2011) found that whilst parents felt digital technologies would be useful tools of communication, this was yet to be developed at their schools. Parsons and Adhikari (2016) suggest that parents may feel excluded from their child’s learning due to perceived gaps in digital literacy skills of their own, which may hinder communication or helping with homework tasks.

To further the theme of parental support in digital literacy, Zhao et al. (2010) show that parents can assist with their child’s Internet self-efficacy, by providing a computer in the home for exploratory internet skill and behaviours to develop. Another important space for these behaviours to develop was internet cafés. This research is limited by context, because China has relatively low penetration rates of internet in homes, and it uses internet self-efficacy as a proxy for information literacy, which may limit its generalisability. The study nevertheless is important in developing an understanding of where and how young people are developing skills and confidence related to digital technologies.

**The Role of Perceptions**

**Parents With Less Agency**

Research demonstrates that there are different perceptions of digital technology usage between teachers and families. Parsons and Adhikari (2016) suggest that digital literacy as a form of agency may dictate perceptions of the role of IT in the classroom and in the collaborative relationship between home and school environments. They also found that teachers have more agency in the school-home partnership, with teachers, in general, feeling more positive towards IT (Parsons & Adhikari, 2016). In the research by Parsons and Adhikari (2016), only one parent identified an issue in equity of usage regarding affordability of connectivity, whilst it was more common for parents to identify feelings of inadequacy about their own digital literacy skills. This led them to feel excluded from their children’s learning. These findings were limited to the context of one secondary school in New Zealand.

Digital technologies allow for learning platforms to be used and accessed by the school, family and child for learning and communication (Selwyn et al., 2011). In a study involving 6 secondary and 6 primary schools in England, Selwyn et al. (2011) discuss discrepancies between how parents and teachers viewed the effectiveness of learning platforms. Whilst both groups agreed on the usefulness of increasing visibility of learning and parental participation in learning (e.g. through homework activities), parents were far less likely than teachers to utilise all of the opportunities and resources from the learning platforms. This suggests that “schools were using Learning Platforms to augment ‘top-down’, broadcast delivery of information, communication, and homework resources to parents, with limited opportunities provided for reciprocal contact” (Selwyn et al., 2011, p. 321). Differences in usage between parents and schools IT skills and adoption of digital technology suggests that whilst digital technology might be used to communicate and collaborate between schools and parents, currently there are barriers in communicating with digital technology as partners in education, with the home appearing disadvantaged in the school-home relationship.

Olmstead (2013, p. 32) identifies two main barriers for parental involvement with the school, namely language barriers (for all Spanish-speaking parents of the sample surveyed), and work and family commitments (46.6% parents surveyed). Surveys indicated that both teachers and parents valued the use of technology in communicating with parents was very important, although interviews suggested that individuals felt that the impersonal nature of emails was limiting (Olmstead, 2013). This mixed-methods approach was useful in identifying both trends in parental and teacher value of parental engagement with school, and issues faced by minority groups (e.g. Spanish speaking parents) within those surveyed. This has significance for affecting the school-home relationship, particularly for minority groups who may be less confident with the language medium preferred by the school. Olmstead’s 2013 study illustrates the spaces where communication, using digital technology, might be improved to engage effectively with diverse families.

**Concerns of Information Technology**

Kong and Li (2009) suggest there has been a shift in parental concern towards information literacy from access to usage. Exposure to risks when accessing the Internet, such as pornographic websites and sharing information with strangers were concerns identified by more than 78% of surveyed parents, yet, more parents (89%) demonstrated concern about the length of time spent on the computer on online games. (Kong & Li, 2009). Similarly, in a New Zealand case study, parents were concerned with emerging misbehaviours attached to digital
technology (Parsons and Adhikari, 2016). apprehension is also reflected in the findings of the case-study by Adhikari et al. (2017), where initial concerns from a Bring Your Own Device (BYOD) policy at a New Zealand school were centred on availability and affordability.

Visibility of Digital Competence

It appears that digital literacy has complex implications for teacher-student perceptions and relationships, which impact assessment (Paino & Renzulli, 2013). Teacher perceptions of digital competence were positively correlated with their evaluation of student academic achievement, independent of factors such as socioeconomic status (Paino & Renzulli, 2013). The case-study of Adhikari et al. (2007, p. 300) also demonstrates some evidence for teachers linking information literacy to critical thinking, although this may be affected by personal bias and not reflective of the general attitudes of the school.

Limitations

The research was empirical and focused on how digital technologies might contribute to collaboration between school and home. Many studies cautioned against generalisability due to the contextual nature of the case-studies (Grant, 2011), however broader studies involving larger sample sizes (Hatlevik & Christophersen, 2013) and those conducted in the New Zealand are most likely to be useful for those interested in New Zealand education.

With the imperative of how parents, students, and schools experience digital technologies in education, a limitation of the review is that it may decontextualise findings. For example, differences within each group were not reviewed; age, ethnic or gender differences of each group were not considered. Further research into understanding these differences would be helpful to schools in considering communication strategies with parents, however findings may mean that funding and strategies are needed at both local and national levels to support schools in adopting collaborative partnerships with communities using information technology.

Implications

Kong and Li (2009) conclude from their research that there is scope for a collaborative home-school model for the development of information literacy through initiatives which empower parents to support their child’s information literacy at home. One example Kong and Li (2009, p. 282) give is the use of “school-based e-platforms for parent-parent sharing purposes”. Later research by Selwyn et al., 2011) further examines schools which use learning platforms as a way of engaging parents, however this seems to be less collaboration focused, and more as a tool to enhance student’s learning visibility at home. One area of future research is to reduce parent’s feelings of helplessness in managing fostering information literacy on their children at home (Kong & Li, p. 282). Selwyn et al. (2011) re-iterate the theme of mutual efforts in communication between parents and schools, with research suggesting that learning platform technologies may be at risk of perpetuating traditional models of (dis)engagement.

Perceptions featured significantly in the literature reviewed. One implication of perceived gaps in digital literacy which Parsons and Adhikari (2016) state is that parents perceived exclusion and alienation as stakeholders in education (Parsons & Adhikari, 2016), which likely has negative consequences for the home-school relationship and learning. A solution offered by Kong and Li (2009) is the development of community and home information literacy projects.

Conclusion

It appears that the presence of digital technologies in supporting school-home relationships is inconsistent. A significant trend identified in the literature reviewed, is that digital technologies may not always be used to communicate effectively or appropriately with parents, which has negative consequences for the school-home relationship. Whilst it has been recognised that a close school-home relationship supports learners (Olmstead, 2013), research demonstrates that digital technology can disempower parents as partners in education, with some left feeling alienated and excluded from meaningful communication with schools (Kong & Li, 2009). Differences in perceptions of digital competencies and information and knowledge sharing between the home and school were common barriers for effective partnership (Heath et al., 2015, Parsons and Adhikari 2016, Selwyn et al., 2011). In several of the articles reviewed, it was uncommon for schools to actively seek out an understanding of communication media and preferences from families, although some schools have visions of mutual responsibility between family and schools in nurturing information literacy in students (Kong & Li, 2009, p. 281). To address information literacy development in the home and school, research has suggested a collaborative approach should be used to encourage parental participation and engagement with the school to support their child’s learning of information literacy (Kong & Li, 2009). Strategies to encourage parental involvement with digital literacy include school-led activities that include parents and seminars about trends in information technology (Kong and Li, 2009).

This vision is explicit in addressing new challenges of digital technology and actively engaging parents, although further research would be needed to investigate the presence, development, and usefulness of a similar model in the Aotearoa New Zealand context. A possible research direction in examining this digital partnership may to understand dynamics between the school-home relationships in communities as digital tools may modify, or exacerbate existing power relations between these groups (Paino & Renzulli, 2013; Selwyn et al., 2011).

Grant (2011, p.300) advises that “digital technologies themselves provide a useful topic or starting point for schools to understand and connect with children’s out-of-school learning”, which supports the findings of this review, which has identified some key characteristics of home-school relationships in the context of digital technology, and their challenges. Although digital technologies in schools are a focus in the New Zealand Curriculum and government education strategies to equip young people to be skilled and competent as 21st century citizens, it is important to acknowledge the legacy of unequal communication and engagement between the home and school, and respond in an authentic way to address concerns about digital literacy.
References


Relationships and Partnerships: The Role and Influence of Spirituality and Religion in Schools

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Abstract

This literature review examines the role of religion as a platform for inclusive and community-based education in the twenty-first century. It is evident from the research that there has been a growing interest in understanding religion in education in the past decade. The focus on spiritual and religious beliefs of school leaders has identified the factors that influence school ethos to create a sense of community between school leaders, staff, students, and wider community. Faith-based schooling may have implications for teachers, who identify as homosexual, because they feel the pressure to pass on the faith that contradicts their own identity. The issues surrounding those of minority beliefs were explored through the discourse of acculturation, in particular assimilation. The focus of this review takes into consideration the student relationships between school and religion, the impact of respect from peers, the implications on students and teachers seeing religious education as a challenge, and the controversy and imbalanced nature of religious minority schools.

Keywords: Religion, Spirituality, Beliefs, Education, Acculturation, School Leaders, Diversity.

Introduction

Partnerships and relationships within schools and wider communities have influenced the nature of future-focused education in New Zealand (Bolstad et al., 2012). The increased importance of diversity and inclusive education for all ākonga (learners) has been at the forefront of building relationships between schools and communities in regards to creating a sense of connectedness in future-oriented learning (Bolstad et al., 2012). However, considering the New Zealand Curriculum, the values page states that “diversity is found within our different cultures, languages, and heritages” (2007, p. 10). Although the New Zealand Curriculum is considered a conceptual document, to enhance ākonga educational experiences the interpretation of diversity needs to become broader and open for all ākonga. Samu (2011) takes on the interpretation of diversity as one that does beyond race, gender, and class, to redefine diversity as including ethnicity, sexual orientation, age, language, and disability. However, to enhance ākonga educational experience, diversity can also include religious and spiritual beliefs.

This literature review examines the strengths, challenges, and implications for teachers and ākonga who must navigate religious and spiritual beliefs, as well as their relationships with others in their school communities. The focus of the literature review will cover two topics; the first being school leaders’ spiritual beliefs and that influence on school ethos. Secondly, the perspective of ākonga from minority beliefs and issues surrounding acculturation and assimilation.

Religion and Spirituality in 21st Century

Because this literature review is focused on religion and spiritual beliefs, a breakdown of the terminology is needed to clarify understanding. Religion, in this review, is a formal and structured institution and/or community, which holds a sense of belonging by a group of people (Magaldi-Dopman & Park-Taylor, 2013). Whilst religion holds a community-based group of people, spirituality reflects individual feelings and beliefs, which exceed religious connections (Magaldi-Dopman & Park-Taylor, 2013). Spirituality lends itself to thoughts that are individual and subjective to what a person may believe, in comparison to traditional organised religion (Magaldi-Dopman & Park-Taylor 2013).

In the globalised generation of the 21st century, diversity is increasing throughout all communities and, with that, more diversity in religious and spiritual beliefs are being introduced into classrooms. Tawhai (2008) states that it is essential that we teach our students the value of diversity of others, just as it is...
important to teach the value of each student’s own culture, language, and heritage.

**Role of Spirituality in School Leaders**

Through the integration of holistic principles in education, the barriers between school and their wider community can be dissolved by understanding that students are individuals, who bring with them their own cultural background, life experiences, and belief systems. However, to develop an inclusive environment for all members of the school community, this understanding should be extended out to school leaders and teachers. Magaldi-Dopman and Park-Taylor (2013) comment that traditional training saw school leaders and teachers separate their professional and personal lives; where their values, beliefs, and identities are separate within their professional space. This separation challenges the principles of inclusion and holistic views of students.

**Perspectives on Spirituality in Leadership**

Woods (2007) explored the influential position of school leaders in Britain, to understand how spiritual experiences can have an impact on school ethos, as well as the approach to religion in a school’s hidden curriculum. A survey conducted in Britain, based on the Hardy Question¹, found that 76% of adults had experienced a spiritual influence in their life (Woods, 2007); however, out of the head-teachers researched, only 49% believed that spirituality was important to them, yet these beliefs were not solely from individuals of an organised religion.

Religion has a growing interest in education research internationally, there has also been interest in school leaders and teachers views on spirituality and religious beliefs in New Zealand. Gibson (2014) researched the spiritual experiences of school leaders and teachers of state schools in New Zealand. With a focus on spirituality, most of the participants saw spirituality as a social construct, that is, it is something that is influenced and shaped by life experiences and those around you, that allows you to make sense of the world (Gibson, 2014). The qualitative, multiple-site case study involved the principal and three teachers from each of three state primary schools in New Zealand.

Although Woods (2007) found that 49% of the participants view spirituality as an important aspect to their lives and school leadership, Gibson (2014) identified that all principals researched consider spirituality an important aspect to their leadership. Gibson (2014) suggests this may be influenced by New Zealand’s pluralistic society, where our cultural beliefs are interwoven with western and traditional Māori understandings and values.

**Influence on School and Wider Community**

Many of the head-teachers Woods (2007) researched brought attention to the aspect of guidance, or an inner-voice when it came to dealing with stress and difficult times, especially in regards to families and the community. Gibson (2014) noted the acknowledgement from the participants that spiritual perspectives allowed principals to sustain and strengthen the relationships between staff members, pupils, and the wider community. Gibson (2014) also identified that participants believed that their spirituality was "filtered and fitted” through a self-managed critical reflective process” (2014, p. 527) into the school environment to support an inclusive, relational community. An example of this process of filtering and fitting, was given by principals in the study who integrated Māori cultural aspects into their practice during special school occasions (e.g. waiata [Māori song] and karakia [Māori prayer]). By doing so, the integration and acknowledgement of indigenous religious and cultural practices as part of school traditions allowed for the relationships between school and wider community to become cohesive. Woods understanding of the role of spirituality for school leaders is that “good leadership draws on deep roots. One such root is spiritual experience” (2007, p. 152).

**Implications**

As Gibson (2014) and Woods (2007) suggest, the strengths of school leaders in state schools has positive influences on the ethos of their school culture and wider school communities. This has implications for those who may not believe, or may not fit into religious ideas of special character schools. The research of Fahie (2017) considers the experiences homosexual teachers face in Irish Catholic primary schools. From the outset of the research, it was clear that many lesbian, gay, and bisexual teachers were anxious to participate, but only eight originally agreed to be a part of the research; however, the number grew to 23 when those participants asked other lesbian, gay, and bisexual teachers to join (Fahie, 2017). A common theme throughout the research was a feeling of entrapment, and a need to “pass on the faith” (Fahie, 2017). One interviewee stated that they felt teaching about the Roman Catholic faith was disingenuous; “How can I teach the Catholic religion in schools when the same religion says that I am a pervert? What about the gay kids in my class or the children of gay parents?” (Fahie, 2017, p. 17). This brings into the light the implications of passing on a faith that does not align to the lifestyle and moral values the teachers hold. However, only a small sample of the interviewees saw that teaching religion with this mindset was inappropriate, and should be reserved for parents to teach their children about religion (Fahie, 2017).

**Acculturation and Assimilation**

As I have examined the research surrounding the influence of leaders and teachers views on spiritual and religious beliefs in school contexts, a consideration for the challenges of acculturation and assimilation of students from other religious beliefs is needed to understand the implications of religious studies in schools. Acculturation is a change in a group of people or society, that is composed of two dimensions; the first is the maintenance of cultural identity, and second, is the willingness to engage with a new community of people (Lustig & Koester, 1996). This can be simplified into the idea of their willingness to fit into a new societal context, through physical, biological, and social changes (Lustig & Koester, 1996). One specific type of acculturation that I examined in the literature for this review is the

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¹ Hardy Question: “Do you feel that you have ever been conscious of, and perhaps influenced by, some power, whether you call it god or not, which may appear to be beyond your individual self or partly, or even entirely, within your being?” (Woods, 2007, p. 136).
process of assimilation; this is where a person sees that holding on to their previous cultural norms and values is unimportant, because it is seen important to take on the cultural norms and values of the new society (Lustig & Koestner, 1996). However, as New Zealand’s push towards future-focused education, and inclusive and diverse pedagogical practices continues, there are many implications of ignoring acculturation and assimilation of cultural diversity.

Minority Religious Education in Finland

Zilliacus and Holm (2013) researched compulsory religious education in Finland. The basic education system, in conjunction with The Freedom of Religion Act allows all students in Finland to have lessons on their own religious beliefs, however, out of the eleven religious curricula, a student may wish to opt-out and attend an ethics class instead (Zilliacus & Holm, 2013). The research was conducted from semi-structured interviews from 16 primary school students, seven teachers, and a principal. Zilliacus and Holm (2013) found a common theme of connectedness from the students. Because the religious classes were not confined to year groups, the student participants suggested a sense of familiarity and togetherness with their school peers, as the class sizing for Orthodox religion, Islam, Roman Catholic religion, Judaism and ethics were between 6-7 participants (Zilliacus & Holm, 2013). In regards to teaching, this allowed for personalisation and intimate sessions, where variations to teaching practices could be experimented with – for example, field-trips, role-playing, and potluck meals (Zilliacus & Holm, 2013).

Student relationship between school and religion

It is suggested that schools are the most influential spaces for acculturation to occur, as they are the point of contact for many people within the community, or as Neins, Mawhinney, Richardson, and Chiba (2013) state, a “socialising agent”. A school context constructs social norms through school events, hidden curriculum, and religious education that influence all of those apart of the wider school community (Neins et al., 2013). From the research conducted by Neins et al. (2013), the understanding of students’ sense of identity, religious experiences, and perspectives on religious education, the common theme of religious faith was central factor to a sense of belonging in their wider community. The research also shed light onto immigrant students, showing how religion was as important to their identity as their culture and ethnic identity. The research of Magaldi-Dopman and Park-Taylor (2013) suggested the importance of holding on to their religious beliefs as an immigrant, to give a sense of guidance, a code of ethics and behaviour, and a sense of protection for those in a new and unfamiliar environment.

Respect from Peers

In regards to acculturation, many of the students in Neins et al.’s (2013) research, saw that respect from their peers was an integral aspect of feeling a part of the whole school community. One student referenced his peers respecting his faith by also abstaining from food whilst he was fasting for religious reasons; when asked from the interviewers, he said that it made him feel that they were real friends as the attitudes and behaviours of the peers allowed for diversity and inclusivity of those of different beliefs (Neins et al., 2013). Many of the student participants within Zilliacus and Holm’s (2013) research into the Finnish religious education system talked about how their separate religious or ethics classes made them feel as part of a whole.

Although the students and teachers did not mention any discriminatory instances, some students, specifically from Islam, Orthodox, and Judaism classes remained silent to their peers when asked about their religious classes (Zilliacus & Holm, 2013). The research suggested this silence was connected to already established stigma and prejudices towards other minority religions, and an awareness of their difference from the rest of their peers (Zilliacus & Holm, 2013).

Challenges for Teachers

Although school communities hold many strengths in regards to religious and spiritual beliefs, they also hold many challenges. As suggested by Neins et al. (2013), students felt there was a sense of belonging within their peer group, some participants stated that the respect that came from teachers felt as if they were influenced by education policy, rather than a show of personal values (Neins et al., 2013). The research from Magaldi-Dopman and Park-Taylor (2013) examines the barriers between state and church in education, specifically looking into the relationship between curriculum and teacher impact on students. Magaldi-Dopman and Park-Taylor (2013) suggest that the bias of teachers must always be explored, because the curriculum often overlooks religious discrimination; for schools that silence religious beliefs, learners are left at risk to become marginalised, isolated, and discriminated against by their peers.

In regards to the research in Finland’s compulsory religious education or ethics classes, there appeared to be some criticisms from the teachers. Due to the small number of the classes, many of the teacher participants found the lessons to be superficial and lacking in potential for the older students (Zilliacus & Holm, 2013). One Jewish teacher noted that a full education in Judaism required that more than just religion to be taught, that it also needs traditional and language, which is an education that one teacher noted, could only be learnt from the family or a Jewish school (Zilliacus & Holm, 2013).

Religious minority school controversy

Just as many immigrant students, and children of minority religious beliefs, face many challenges in their school communities; so too there are many religious challenges. The research of Allen and West (2011), who explored religious and social differences in the composition of faith and secular secondary schools across England, suggests there is a relationship between faith, school, and socioeconomic advantages, where parents who wish to send their children to a faith school are influenced by the area in which they live. The research found that those who attended faith schools were from the higher socioeconomic status of their communities, and often of the Roman Catholic and Church of England faith (Allen & West, 2011). This raised questions as to where do parents of lower socioeconomic status and from minority religious beliefs send their children who they want to be educated with their religious beliefs and values (Allen & West, 2011).
Gulson and Webb (2013) research into the imbalanced controversy surrounding the provision of government-funded Islamic schools in Sydney, Australia, found a common theme of islamophobia, that is, an ambient fear within the white Christian community. In a post 9/11 world, Gulson and Webb (2013) noted that assumptions created a need for boundaries and a management of difference. The White Australian immigration policy was seen as a reference point to marginalise those who had not assimilated into the “Australian ways” (2013, p. 636) and who were seen as “just one step away from being radicalised into terrorists” (2013, p. 636). Gulson and Webb (2013) suggested that resistance to assimilation, caused the wider community to mark schools of other religious beliefs as the enemy within, who “take over the suburbs, cities, and schools one at a time” (2013, p. 637).

Conclusion

A focus on understanding religion and spirituality in our globalised generation sees the need for redefining diversity to include different religious and spiritual beliefs. The notion that students and teachers must leave their cultural and religious beliefs aside in the school and professional context has been rejected with the developing features of future-focused education. However, in regards to the role of spirituality and beliefs as a driver in school communities, a sense of knowing about those in the school community allows for diversity and inclusion for all people. The influence of spirituality in school leaders had strong implications for homosexual teachers in faith-based schools, specifically in Irish Catholic schools. This led to teachers having a sense of entrapment in regards to passing on the faith in regards to beliefs and values that contradicted their own identity.

The issues surrounding acculturation and assimilation were seen through the relationships between school and religious identities. Through promoting the concept that schools are a space for socially constructed ideas, a sense of belonging for students of minority religious beliefs were solidified and strengthened through peer relationships and mutual respect. However, many of the students of minority beliefs saw the need to maintain silence about their religious beliefs, so as not to appear different from the norm. In regards to teacher and student relationships, many students felt the respect for their beliefs was forced by teachers through policy, rather than through inclusive pedagogical practices. Although the research saw religious studies for students as being prominently positive for their relationships within their community, many teachers saw teaching religious education as challenging. The common theme for teaching religion was that they saw the selected curriculum to be limited; that a whole education in religion could only be accessed at home.

Although this review only touches upon some of the challenges and strengths religious education can bring into a school, there too are many areas that still need thoughtful consideration, specifically as emerging teachers in a future-based and globalised community.

References


The Effect of Mentor Teachers on Initial Teacher Training and Emergence as a Beginner Teacher

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Abstract
Since the 1990s there has been a strong movement towards mentoring induction programmes for both pre-service training and beginning teachers who are in their early years at a school. Despite the high uptake of this practice, the exact definition and nature of mentoring remains controversial. Several types of mentoring, with potentially contrasting goals exist and these can affect teacher outcomes, students and the positioning of teachers in society. Mentoring programmes also have effects on pedagogical practice, instructional effectiveness and the commitment beginning teachers feel towards teaching. Mentoring programmes are shaped by a number of interconnected issues, including dispositions of mentors and mentees, mentor training, the context in which mentoring occurs and societal expectations. Although the broad uptake of mentoring programmes appears to indicate that these programmes are beneficial, empirical evidence on the effect of mentoring is limited. The literature supports the assertion that mentoring helps reduce beginning teacher turnover, increase job satisfaction and raise student achievement. However these issues are not necessarily those novice teachers are most concerned with and few articles examine ways in which novice teachers can best utilise mentoring for their learning.

Keywords: Mentoring, Collaboration, Induction, Education, Beginning Teachers, Mentor, Novice Teacher, Practice.

Introduction

Context and Factors Beyond the Control of Novice Teachers
Teachers must pass through several stages of training and enculturation before attaining expertise in their craft. Teacher expertise is generally accepted to proceed through at least three distinct phases; pre-service, induction and ‘experienced’, although the boundaries between these are blurred to some extent (Ingersoll & Strong, 2011; Vikaranam, Mansor, & Hamzah, 2017). Teachers at each stage will be referred to as pre-service, beginning, and experienced teachers for the purposes of this review. Novice teachers will be used in cases referring to both pre-service and beginning teachers. It is also noteworthy that not all teachers will progress through to the last stage – teacher retention rates are relatively low (internationally, as many as 50% of teachers leave in the first five years), and teaching is increasingly seen as a short term career (Ingersoll & Strong, 2011). These labour market forces have a dramatic effect on the way teachers must be trained, which is demonstrated clearly by the United States of America (USA) statistics; before 1990 teachers had a modal experience of at least 15 years, which has decreased to 1 year of experience in recent years (Ingersoll & Strong, 2011). This trend has a dramatic effect on teaching as a profession, as the effect of teacher expertise on learning is well documented (Hattie & Clinton, 2004). Even amongst teachers retained in the profession, the impact of the first year of teaching is high, and may cement undesirable practices unless positive intervention occurs (Kuzmic, 1994).

In order to compensate for these issues, teaching programmes have been radically modified in recent years. Mentoring was essentially non-existent pre-1980, and is now common in both pre-service teacher training and beginning teacher induction into schools (Hobson, Ashby, Malderez, & Tomlinson, 2009; Organisation for Economic Co-operation and Development, 2005). In New Zealand mentoring became commonplace and “comprehensively resourced” from 1985 (Langdon, 2011). Its introduction appears to have been an attempt to enhance the uptake of expert skills by novice teachers. Despite this, the effect of mentoring is not always clear as there are a large variety of mentoring archetypes with different goals, purposes and outcomes (Kemmis, Heikkinen, Fransson, Aspfors, & Edwards-Groves, 2014). Three clear patterns of mentoring were evident and advocated for at the policy levels of different countries;
mentoring as support, mentoring as supervision and mentoring as collaborative self-development. It was also noted that peers can serve as a kind of mentor, with benefits that may support more traditional mentoring (Lu, 2010). These forms of mentoring are not mutually exclusive, and it is unclear which is favoured in New Zealand. In a review of selected studies, Lu (2010) identified mentoring practice as a highly political undertaking, suggesting that the exact type of mentoring received may be beyond the control of pre-service or beginner teachers (Kenmis et al., 2014).

School level effects of mentoring may also be beyond novice teacher control, but are likely to have a major impact on professional ability and perception of the teaching career. A major tension at this level is the tendency for mentors to teach in ways that enculture students into schools, rather than enhancing specific skills that lead to quality teaching (Cameron, 2007; Langdon, 2011). Unsurprisingly, school principals appeared to have a major effect on the culture of mentoring within their school, which was attributed to their level of resourcing and holistic view of the school (Roberson & Roberson, 2009). This was evidenced in a cross-case analysis of seven New Zealand case studies, which found that principals “high expectations of staff” were perceived as a strong contributor to a culture of learning within the school (Langdon, 2011). In this study, school culture appeared to cause teachers to perceive practices such as reflection, use of research and collaborative development more positively. This had benefits for beginning teachers who felt more confident, able to engage with literature and more able to experiment with classroom practice Conversely, unsupportive school cultures led to the opposite effects, and tended to isolate novice teachers, harming their professional development. Despite these rather large effects on their development, novice teachers are unlikely to be able to significantly alter school culture, particularly during pre-service mentoring (Langdon, 2011).

A mentor’s personal experiences, disposition, past training and experience are likely to affect the mentor – mentee relationship. Interaction with mentors thus results in a relatively unique experience of pre-service placement and induction into teaching for every novice teacher. It is likely that the diversity of mentoring systems has evolved due to societal, school and policy architectures unique to various countries and education systems (Pennunen, Bristol, Wilkinson, & Heikkinen, 2016). While this is not necessarily problematic, it makes the systematisation of good mentoring practices difficult, except on a highly conceptual scale. This diversity also stands in stark contrast to the highly systematic training received by pre-service teachers in many countries and has led to a “haphazard” structure of mentoring practices (Aspfors & Fransson, 2015). Perhaps due to this, mentor perspectives may vary significantly from pre-service training courses, as they are shaped by mentor experience and the educational contexts they have operated in (Aspfors & Fransson, 2015; Wang, Odell, & Schwille, 2008). This is challenging as mentors may pass on their own experiences to mentees, rather than offering solutions that fit with the latest educational research, vision or curriculum goals (Organisation for Economic Co-operation and Development, 2005).

While mentor training and disposition may be beyond novice teacher control, an understanding of an individual mentor’s backgrounds and approaches may aid novice teachers. Given that novice teachers formative experience is a “trial by fire” or “sink or swim” challenge (Ingersoll & Strong, 2011), increasing the ability of novice teachers to control their fate at this early stage could have important effects. Two key issues likely to be relevant to novice teachers are: the benefits of a mentor-mentee relationship, and the agency novice teachers have to support the potential of a mentor-mentee relationship.

Challenges Facing Novice Teachers

Although it is widely agreed that novice teachers face a range of similar challenges, the exact nature of these challenges is inconsistently reported. Veenman (1984) reviewed 83 studies from different countries that explored the perceived problems of beginning teachers in their first years of teaching. Veenman identified lack of resources, unclear goals, difficult work, conflict and reality shock as challenges while also suggesting a range of classroom issues (such as behaviour management) as needs of beginner teachers. The majority of the studies reviewed were based on survey data or interviews, and it was noted that there was some variance in the severity or type of challenge reported. A lack of resources and goals can likely be addressed by spending time with mentors on unit or lesson planning, and this practice appears relatively common (Fletcher & Barrett, 2004). Work difficulty may be more challenging for a mentor to resolve, as tensions exist between school achievement requirements and the realities of novice teaching (e.g. 56% of novice teachers feel they should not be required to operate at the level of experienced teachers, yet teachers are assessed on student achievement) (Fletcher & Barrett, 2004; Stanulis & Floden, 2009). Behaviour management is often perceived as a key need by beginner teachers, and it seems like early mentor intervention (first week of teaching) may be able to help novice teachers establish effective classroom management (Stanulis & Floden, 2009).

Overall, the importance of these findings may be that consistently identified challenges can be more effectively targeted by mentors or novice teachers as part of their professional relationship.

While the challenges and perceptions of novice teachers are relatively well researched, the evidence on how mentoring actually affects novice teachers is less clear. Survey based studies show that novice teachers perceive mentors as being an important emotional support, with collegial support often being also highly placed (Algozzine, Greetes, Queen, & Cowan-Hathcock, 2007; Marable & Raimondi, 2007). However, it is difficult to elucidate the exact elements of mentorship that caused teachers to feel supported and it is possible that supportive school or peer environments have similar effects to mentoring that confuse these results (Langdon, 2011). Findings from a study of teachers employed over a 10-year period within districts in New York State (Algozzine et al., 2007) suggests that highly specific induction activities are more likely to be perceived as useful by mentees, though this does not necessarily mean that they lead to effective teaching. It appears clear though that support is important in both mentee perception of teaching and job commitment, which is important to administrators concerned with teacher retention. The effects of mentoring on novice teacher instructional practices are less clear. While novice teachers perceive that their practices have improved, empirical studies have found conflicting evidence on this (Richter et al., 2013). Where positive effects were found, they demonstrated increases in teacher effectiveness when intensive mentoring was available (Stanulis & Floden, 2009). This indicates that the structure of
mentoring is likely to be important in determining its effects on novice teachers.

**Novice Teachers Affecting a Positive Mentoring Experience**

Given the potential importance of mentoring relationships to retention, wellbeing and achievement, it is in the best interests of novice teachers to understand how to maximise the effects of mentoring. This is particularly critical given the extremely steep learning curve of teaching as a discipline. While the contexts of learning to teach may be largely beyond the control of novice teachers, there are several elements they can use to their advantage. Firstly, novice teachers can modify their own misconceptions about mentoring and refocus their efforts on accessing the most beneficial types of knowledge from their mentor (Clark & Byrnes, 2012). Secondly, novice teachers can attempt to create constructivist mentoring relationships that facilitate more beneficial learning (Richter et al., 2013). Finally, novice teachers can engage in peer mentoring or collaborative activities, to supplement traditional forms of mentoring or “fill in gaps” that their mentor may not address (Lu, 2010). These steps can dramatically enhance the effectiveness of teacher training and induction, and may restore novice teacher’s agency over their learning during this challenging part of their careers.

Novice teacher perceptions can have dramatic effects on the type of help they seek from mentors, and what information they retain or identify as being useful. The perceptions of what is useful may be contrary to learner centred practices that benefit students, and are often more to do with novice teacher confidence in the classroom (Clark & Byrnes, 2012; Langdon, 2011). Beginning teacher’s perceptions of their class have been well studied, and tend to focus on behaviour management, student motivation, task differentiation, assessment and relations with the school community (Veenman, 1984). Taken together, these tend to lead towards more authoritarian teaching that is less effective at promoting student’s achievement. These can also lead novice teachers to seek or accept tricks of the trade from their mentor. While these tricks often appear to be expert tools, evidence suggests that they act as short term fixes that can lead to the establishment of automatic practices that are not learner centred. An awareness of this tendency may allow beginning teachers to seek true expertise as opposed to quick fixes.

More recent research has identified perceived self-efficacy as a major factor in novice teachers stress levels and commitment to teaching while also uncovering a level of naivety in their perceptions of teaching and ability to change their teaching community (Tynjälä & Heikkinen, 2011). Seeking increased support and knowledge of real possibilities from mentors may be a way to use this partnership to overcome the problems inherent in these perceptions. In their review, Tynjälä & Heikkinen (2011) also identified a troubling dichotomy in novice teacher’s perception of success; approaches that led to problem solving that facilitated learning and those that led to reduction of problems via automated solutions were both perceived as being successful. Modern teaching approaches, such as Teaching as Inquiry (Ministry of Education, 2007), appear to be specifically aimed at preventing the second outcome. Use of such tools may be useful in helping novice teachers avoid automatic knowledge from their mentor, whilst acquiring true expertise.

Working with a mentor to construct a mutually beneficial approach to Teaching as Inquiry and learning can be an effective tool on practicum and during induction. Mentoring of certain types has clear benefits for the practice of both mentor and mentee (Hobson, Ashby, Malderez, & Tomlinson, 2009). A constructivist approach to the mentor-mentee relationship is recommended as being the most beneficial, even in countries with vastly different educational systems, such as the US and Finland (Richter et al., 2013; Tynjälä & Heikkinen, 2011). Richter et al., (2013) in their study of 700 novice German mathematics teachers identified two major types of mentor-mentee relationship; transmissive and constructivist. Constructivist style relationships caused beginning teachers to experience higher enthusiasm, job satisfaction and teaching efficacy, whilst lowering emotional stress. It could therefore be considered important to the beginner teacher to be able to identify and establish elements of this style of relationship with their mentor. Intriguingly, components of this relationship appear counterintuitive from a beginning teacher’s perspective. For example contact time with mentors was significantly reduced in constructivist relationships, while reflection and experimentation were reported more frequently than in transmissive mentoring relationships (Pennanen et al., 2016; Richter et al., 2013). Placing emphasis on these elements of the relationship may therefore be useful for novice teachers seeking to get the most out of the induction period, and may help shift mentors towards constructivist practice if they are not already engaged in it.

Peer-collaboration is a powerful alternate form of mentoring that can supplement traditional mentoring. While seldom officially supported, with the exception of Finland (Kemnais et al., 2014), peer mentoring can be highly effective, particularly when guided by an experienced observer (Lu, 2010). Peer coaching has been demonstrated to provide collegial support and facilitates reflection, which can help pre-service teachers become more student-focused in their teaching (Ovens, 2004). Ovens (2004) used survey and interview data with 12 final-year physical education students and found a positive perception of peer mentoring, despite the reported increased workload required by peer collaboration processes. Participants also reported feeling that their learning about teaching was increased considerably and that it focused learning on the quality of their teaching. These perceptions are remarkably similar to those reported as being desired from more traditional forms of mentoring (Pennanen et al., 2016). Collegial support was also perceived as the most important support in situations where official mentoring was absent (Marable & Raimondi, 2007). Peer collaboration can therefore be a powerful tool for novice teachers, and may be a way to effectively supplement traditional mentoring in New Zealand.

**Conclusion**

**Use of Mentoring**

Mentoring of novice teachers is a useful practice that is perceived positively by novice teachers. While the literature has a large focus on retention, the recent trend has been to examine other factors to attempt to determine elements of effective mentoring. While this review attempted to focus on mentee’s ability to have agency over their mentoring, it is interesting that there appeared to be little guidance on best practices in this area. This area may be a useful focus for future research, particularly given the evidence from Finland on the benefits of constructivist
focused mentoring and culture. Overall, mentoring appears to benefit both novice and mentor teachers, and is positively perceived by both. Controversy remains over the sociopolitical effects on mentoring and it seems there is some difficulty in changing existing structures, as well as in importing effective practice from elsewhere. The diversity of systems and practices across teaching systems has also made it difficult to generalise good mentoring practices and this remains a challenge for the research. A focus on the beneficial effects of working at an individual level may allow mentors and mentees to construct more effective relationships despite the prevailing environment. This is important for beginning teachers as it returns agency to them, and may enable them to uncover more relevant expert knowledge from their mentors as part of an inquiry cycle.

References


Using Technology to Support the Nature of Science in the Classroom

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Abstract

The purpose of this literature review is to investigate how technology can be used to encourage the presence of the nature of science in a science classroom. Within the concept of the nature of science there is a strong focus on scientific inquiry which is the basis of a lot of the literature, but other aspects of the nature of science, such as providing meaning to content outside of the classroom are also covered. The promotion of the nature of science in a science classroom is a popular topic within the science education community, as student engagement and interest in the school subject continues to steadily decrease. The reviewed literature took a range of views into consideration to outline the beneficial links between the use of technology and having the presence of the nature of science in a science classroom. This review also discusses issues of economical and functional access to technology as well as the importance of correct implementation within a science education context.

Keywords: Scientific Inquiry, Nature of Science, Technology in Science, Science Education.

Introduction

The nature of science is commonly referred to as the why of science education (Gallagher, 1991; Osborne, Collins, Ratcliffe, Millar, & Duschl, 2003). The essence of the nature of science is to provide opportunities for students to independently investigate scientific concepts and to see the subject as a socially valuable knowledge system (Ministry of Education [MOE], 2007). Students learn how scientific ideas are communicated and how they are linked to everyday situations. Despite a drive from governmental forces to include it in policy documents (MOE, 2007), there is still a disparity between legislation and classroom practice. In the last two decades, there has been a significant shift with regard to how science is taught in classrooms and how students perceive and relate to the subject. Previously, science teachers were regarded as the more knowledgeable other in all instances and the student was always considered to be the learner. These categorisations were very strict until recently when the ideas of scientific inquiry and the nature of science became more prevalent in curricula discourses (Sheffield, Dobozy, Gibson, Mullaney, & Campbell, 2015).

In trying to promote the nature of science, the scientific community have developed many tools, such as teaching as inquiry projects and the integration of local communities with curricula. One of the most successful facilitators of this promotion is the efficient and effective use of technology in the classroom (Goh, Chai & Tsai, 2013; Williams, Nguyen, & Mangan, 2017). With the ever-growing presence and impact of digital technologies in children’s lives outside of the school context there has been a global push for education systems to adapt to this changing context. Many schools in developed countries are now transitioning towards modern learning environments and adopting a Bring Your Own Device policy. Digital technology provides countless opportunities for students to further their learning and engagement in any subject, if the technology is used responsibly and in the correct manner; science is no different (Guzey, & Roehrig, 2009). As student interest in the subject continues to dwindle, the integration of technology is helpful for promoting the values that the nature of science upholds.

Effect on Scientific Inquiry

One of the main ideas behind the nature of science is scientific investigation and inquiry, because it allows students to pose and find the answers to inquisitive questions which are not related to curriculum content. Technology is a key facilitator of this process as it empowers students to gain deeper understanding than the prescribed right answer (Williams et al., 2017).
Teacher Belief in Student Agency

Williams et al. (2017) focused their two-year case study on developing the skills of an in-service teacher with minimal technology or scientific inquiry background. One of the main points which came from this study was the effect that the teacher’s attitude had on the effectiveness of the implementation of technology in the inquiry process. The teacher’s beliefs were a critical factor for effecting change in their pedagogy and their role in the classroom. The participant in the study mentioned that if he believed in the students’ ability to work independently, then technology provides a reassurance to teachers as they relinquish control of the students’ learning. This was supported by the research conducted by Karamustafaoğlu, Çakir, and Celep (2015), which found that those teachers with a positive attitude towards the inclusion of technology were generally considered to have an expert and delegator teaching style. Karamustafaoğlu et al. (2015) argued that these attitudes correlated with a teacher who is confident in their own content knowledge and in the student’s ability to expand their own. This is instead of a formal authority teaching style which is linked to the more traditional idea surrounding concrete teacher and learner roles by a transmission of facts. The research done by Dana, Zembal-Saul, Munford, Tsur & Friedrichsen (2001) also aligns with this argument, as they concluded that one of the main reasons why the inclusion of technology is minimal is because of teacher personality.

Access to Information

One of the more obvious benefits to technology within the scientific inquiry process is the ability to access information that would have been previously unavailable, such as online databases and research journals. The case study run by Sheffield et al. (2015) focused on teacher education students and the importance placed on Technological Pedagogical and Content Knowledge (TPACK). The study showed that the confidence of pre-service teachers to integrate technology in inquiry increased dramatically when information communication technology (ICT) was deliberately integrated into their own teacher education programme. The intentional exposure meant that teachers were more aware of the multiple avenues to access and present information and were more likely to promote the use of databases, and the like, within their own classes. In the year-long study undertaken by Guzey and Roehrig (2009) they reiterated to the participants (in-service teachers) that the National Science Education Standards in America encourage the use of a variety of technologies to make the most of the vast quantities of valuable information which young scientists now have access to. Sheffield et al. (2015) state that the extensive access to information online allows the articulation of a problem, the examination and shaping of a problem, researching, and finally presenting a solution. Going through this process is typical for an inquiry process and allows learners to ask those inquisitive questions which endorse the idea of the nature of science in a classroom.

Opportunity to Collaborate

Technology adds an extra dimension to collaboration in a classroom, because now class discussions are not restricted to the physical walls of the class or the timing of the lessons (Dana et al., 2001). With the ability to communicate online, with the right guidance, a community of learners can productively engage with one another at any time, on any topic. Many students may be technologically literate in some respects, for example social media, but they may struggle to use technological tools to enhance their scientific inquiry. Creating an online community of learners allows students to enhance their ability to use technology in a way which engages them with topics that interest them. Even if those topics are not always directly linked to the science curriculum, the discussions would undoubtedly uphold the values of the nature of science as students strive for further understanding. Goh et al. (2013) undertook a knowledge building approach to teaching in a school in Singapore instead of the traditional transmission of facts. They found that knowledge building integrated with technology was effective in supporting interactive learning activities and enhancing social dynamics within a class. In this study, Goh et al. (2013) used a knowledge forum as the mediating technology to collaboratively improve the students’ ideas as well as synthesising group knowledge. Being able to collaborate successfully with fellow students is a key pillar of the nature of science within many science education documents and the New Zealand curriculum (MOE, 2007) is no exception.

Relevance to the Real World

Technology has the potential to help students make links between their studies and understandings to problems and situations outside of both the classroom and the prescribed curriculum. For instance, technology can be used to simulate an experiment that would otherwise have been impossible to observe (Dana et al., 2001). Traditional limitations, due to access of supplies or safety concerns, can sometimes prevent students from connecting with a full range of knowledge. Dana et al. (2001) outlined how the use of technology allows control of one parameter at a time, which might not be possible in real time. One of the main foci of the nature of science is being able to relate the content of the curriculum to real world problems and life outside of the classroom. The case studies of four in-service science teachers by Guzey and Roehrig (2009) showed how over time, the teachers moved away from being the permanent more knowledgeable other. The incorporation of technology into their practice meant that the students could research aspects of the curriculum from a multitude of avenues. As each student related the learning to facets of their own lives, it opened the possibility to co-construct knowledge as the teacher takes on the learner role. Williams et al. (2017) mentioned that technology allows the student to take responsibility for their own learning as they find answers to their own questions. Their two-year study showed the progression of the teacher and the students, as their respective roles within the classroom became less distinguishable. As the students became more intrigued by how they could use technology to relate content to the real world, the knowledge within the classroom became increasingly co-constructed.

Ching, Joyce and Chin-Chung (2013) reviewed many case studies of the effective implementation of TPACK into general education. Almost all of research that was taken into consideration yielded positive results in enhancing teachers’ ability to integrate ICT into their practice. From the perspective of the students, the results suggest that the effective use of ICT in any subject provides opportunities for the student to relate problems to the real world. Ching et al. (2013) go on to mention how these opportunities to find meaning in content on a personal
level are a key building block in engaging and maintaining student interest. The knowledge building approach which Goh et al. (2013) undertook, brought to light that many students have misinformed views of the nature of science, such as how it can be related to curriculum content. Their research found that if these views are left unchecked, this may impair the student’s ability to appreciate the role science plays in societal progress. In comparing their results to a control group, they also stated that technologies help students to find science interesting, comprehensible, and relevant to daily life. The teacher in the Williams et al. (2017) case study raised an interesting point that the answers that technology can help us find are not always straightforward or what one might expect. When one of his students brought this up in class, the teacher replied saying that sometimes life does not always reveal answers how we might perceive them and that it takes time and effort to make meaning from new knowledge. This was an interesting link to be made between the use of technology in a scientific inquiry and the real world, which supports the main values upheld by the nature of science.

**Barriers to Successful Implementation**

There are many barriers to the successful implementation of technology in science which the literature alluded to through quantitative and qualitative research. When undergoing a scientific inquiry, the technology is typically used as a tool to assist with the students’ ability to research, collaborate, and present their information. The case study conducted by Williams et al. (2017) demonstrated that if the ability to use the technology is hindered, such as unreliability with a school network, then very unsuccessful and unproductive lessons can occur. Williams et al. (2017) went on to say that this unreliability meant students were forced to use personal devices such as cellphones, which slowed down the inquiry process immensely because students became more distracted. Following on from this idea of access is the fact that some schools and communities do not have the economic support to provide technology to students or to their children (Maeng, Mulvey, Smetana, & Bell, 2013). Some classrooms are a single computer environment, which is a huge potential barrier to trying to include technology in a whole class inquiry.

While investigating the attitudes of teachers towards technology, Karamustafaoglu et al. (2015) found that even though very few teachers would dispute the benefits that technology can provide to education, their own beliefs would hinder them from effectively integrating technology into their practice. This was not necessarily a characteristic of age, but generally those teachers who had been in the teaching profession for longer were less likely to willingly learn how to successfully use technology as a learning tool. This finding was elaborated on further by the research done by Maeng et al. (2013) as they analysed pre-service teachers TPACK knowledge in comparison to in-service teachers. The lack of familiarity with content knowledge and pedagogical approaches of in-service teachers is one of the main reasons why there is a lack of inclusion of processes such as inquiry and the use of technology to facilitate this. This point was also covered by Dana et al. (2001), when they identified one of the main challenges to effective implementation of technology was the ongoing challenge of teaching TPACK effectively to teachers. They go on to say it is not only a challenge to teach TPACK correctly but to reach as many in-service teachers as possible, so there is not a divide in TPACK knowledge between pre-service and in-service teachers. Dana et al. (2001) emphasise the importance of preparing new teachers for facilitating the change to happen from within the school, because the lack of training of current teachers continues to be a hindrance.

The values of the nature of science can sometimes be perceived as very time consuming (Osborne et al., 2003; Goh et al., 2013) and classes (especially those undergoing National Certificate of Educational Achievement (NCEA) are already extremely pressured to include all the necessary content for the required assessments. Even though the use of technology has been proven to open and diversify the scientific inquiry process its use means that time becomes more of an issue (Dana et al., 2001). Maeng et al. (2013) alluded to this in their study as teachers expressed their frustration with the current emphasis on preparing students for standardised assessments.

**Future Implications**

Reflection, by students, teachers and teacher educators, both individually and with peers, allows the refinement of information technology supported inquiry practices (Williams et al., 2017) and the values of the nature of science to be clearly identifiable in a science classroom. Karamustafaoglu et al. (2015) argued at the end of the results of their case studies that science teachers should continually reflect on their practice if they are to continue to improve their practice. They also found that those teachers who reflected frequently were more aware and open to trying varying teaching styles and resources (Karamustafaoglu et al., 2015). Guzey and Roehrig (2009) said that the varying degrees of development the teachers showed with regard to their understanding and inclusion of TPACK, was in part to do with the degree of reflection taking place. The teacher’s pedagogical reasoning affected their own ability to enact in their classrooms what they had learnt from their educator programmes. Ching et al. (2013) analysed 225 critical reflections of in-service teachers where they found that only 13% of these teachers were facilitating students learning with technology as opposed to from technology. If science teachers become more aware of their pedagogies and teaching styles, while also reflecting on literature, then features of the nature of science will find their way into the science classroom. Once a teacher can acknowledge the importance of the nature of science, then the use of technology is a natural facilitator for lecturing, demonstrating, and inquiry (Maeng et al., 2013). One of the teacher reflections from the Maeng et al. (2013) case studies said, “science and technology are increasingly intertwined, and this relationship is a natural one to foster”.

**Conclusion**

The purpose of this literature review was to analyse how technology can affect the presence of the nature of science in a science classroom with a number of factors being identified. One of the key aspects of the nature of science is scientific inquiry and the ability of learners to ask and to engage with curious questions that they are interested in. Technology allows learners to ask these questions of personal interest, as it provides avenues for them to be answered. Many case studies recorded the benefits of technology in facilitating collaboration both with peers and the
community, as an online community or forum base was incorporated into the inquiry. With the effective and responsible use of technology there are also excellent opportunities for the student to express agency. Under the guidance of a teacher, technological tools allow students to research, collaborate, and present their inquiry in a more individualised manner. Another main pillar of the nature of science is finding meaning to curriculum content and then linking these new understandings to real world situations and societal problems. Technology has the ability to control experimental parameters which might not be possible within a science classroom context, allowing explicit examples to be drawn upon. While analysing the literature a number of barriers to the successful implementation of technology were recognised. These included but were not limited to: time constraints associated with such a task when preparing students for assessments, the economic issue associated with ensuring all students have equal access to technology, and the lack of TPACK that current in-service teachers possess. In terms of future implications, this review focused on one particular aspect which was reflection. This needs to be on behalf of the students, pre-service, in-service, and teacher educators to ensure that everything is being done to incorporate the values of the nature of science into the science classroom, and in many cases, this will be aided by technological tools.

References


Integration of ICT in the Mathematics Classroom

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Abstract

Students and teachers now have a wider access to information communication technology (ICT) than before but the presence of ICT in the classroom does not equate to improved student outcomes. For the successful integration of ICT the role of the teacher is critical, because it is the teacher who decides when, where, how, and who, will use ICT. Evidence from the literature examined is that there are a range of factors affecting Teacher ICT integration of mathematics in the classroom. This review identifies some of these factors and recommends areas for future research.

Keywords: ICT Integration, Teacher ICT background, Student Outcomes.

Introduction

In the past 20 years there has been a significant increase in information communication technology (ICT) investment in education, so students and teachers now have a much wider access to ICT than before (OECD, 2015). The reason for the investment is the belief that introducing ICT will improve teacher productivity, student outcomes, and prepare students for a world where technology is an important part of life. Governments have also mandated the importance of ICT in education. The New Zealand Ministry of Education Curriculum declares that “Our vision is for young people ... who will seize opportunities offered by new knowledge and technologies” (Ministry of Education, 2015, p. 8).

Recent research has shown that teacher integration of ICT into mathematics classroom has an impact on student outcomes (Hegedüs, Tapper, & Dalton, 2016). The availability of technology in classrooms alone does not improve student outcomes. It is the teacher’s decisions on how to integrate ICT into the mathematics class room that will either improve or hinder student outcomes. Given the importance of the teacher in integration of ICT in the classroom, the literature has developed a range of theoretical frameworks to understand ICT integration by mathematics teachers.

The objective of this literature review is to analyse some of the factors affecting teacher ICT integration of mathematics in the classroom identified by the literature. The literature can be classified into three paradigms: micro models, factors related to the teacher and technology; macro models, environmental factors; and integrative models that combine teacher beliefs and background with elements of the micro and macro models (Olive, 2011).

The Technological Pedagogical Content Knowledge (TPACK) framework focuses on the knowledges required by teacher (Mishra & Koehler, 2006). Instrumental orchestration describes the processes used by teachers to gain ICT competency and develop competency in their students (Ruthven, 2009). Instrumental orchestration and TPACK fall within the micro model of classification through their focus on teacher and student use of ICT. The Practitioner Model of Computer (PMC) uses model analyses and external factors, including the working environment, resource system, activity structure, and curriculum script (Ruthven, 2009), and it is an example of a macro model.

The sociocultural framework and Technology Acceptance Model (TAM) are examples of integrative frameworks. The sociocultural framework describes interaction between the teacher’s Zone of Proximal Development (ZPD), Zone of Free Movement (ZFM), and Zone of Promoted Action (ZPA), (Goos, 2010). The TAM is built on the interaction between instructional, curricular, and organisational factors, affecting the teacher’s integration of technology (Okumuş, Lewis, Wiebe, & Hollebrands, 2016).

The studies in this review were chosen to demonstrate the efficacy of each theoretical paradigm and shed light on the factors that influence mathematics teachers on ICT integration.

Micro Factors

The TPACK framework for ICT integration was introduced by Mishra and Koehler (2006). The model has three elements Pedagogical Knowledge (PK), Content Knowledge (CK), and
Technical Knowledge (TK). Pedagogical knowledge refers to the knowledge of the teacher of how to teach, content knowledge describes what is taught, and technical knowledge is the teacher’s knowledge of technology. Combinations of three domains produce Pedagogical Content Knowledge (PCK), Technical Content Knowledge (TCK), and Technical Pedagogical Knowledge (TPK). TPACK is at the centre of PCK, TCK, and TPK, and represents the amalgamation of all three knowledge into teacher practice (Stoilescu, 2014). TPACK provides a means of understanding the use of technology in the classroom by providing a way to understand the development of instructions before they are used in the classroom.

Teachers whose ICT integration is consistent with TPACK, are committed to innovate their practice and pedagogy through technology, support students and their colleagues to understand the value of technology, and understand the value of technology in class management and assessment (Grandgenett, 2008). Guerrero (2010) conducted a study of Barbara, an experienced Californian secondary mathematics teacher, whose practice showed the applicability of TPACK. Barbara viewed her role as delivery of the curriculum and preparation of her students for a world where technology played a significant part. Her teaching practice emphasised collaborative learning, where technology enabled students to access content and carry out their own enquiry.

The integration of TPACK in secondary mathematics classroom contexts was explored among 280 secondary mathematics teachers in 123 secondary schools in urban and rural New South Wales, Australia (Handal, Campbell, Cavanagh, Petocz & Kelly, 2013). The study determined the level of TPACK in a 30 question written survey called TPCK-M. The questions were designed to identify the nature and magnitude of the teacher’s TCK, PCK, and TPACK, and to identify how instructional, curricular, and organisational factors affect ICT integration in the context of the TPACK model. From this study authors concluded that although teachers had fairly good standards of technological skills across the mathematics domain (TPCK-M) teachers needed to be trained in the use of innovative learning technologies because this was inhibiting the use of them in the classroom. (Handal et al., 2013). The transfer of TPACK to the classroom was a complex process, as teachers revealed that student ability, curriculum, and pressure to deliver were among factors affecting ICT integration in the mathematics classroom (Handal et al., 2013).

Archambault and Barnett (2010) were critical of the TPACK framework, specifically questioning its validity and applicability. In their study of 596 online teachers from the United States of America they found it challenging to separate out the different domains of the TPACK framework and noted that “TPACK creates boundaries…and already ambiguous lines drawn between pedagogy and content knowledge” and they gave the results of the survey they conducted as supporting evidence of this (p. 1658). Understanding the components and their interaction for each teacher was difficult.

Instrumental Orchestration

The instrumental orchestration framework describes ICT integration through the lens of the processes used by the teacher to acquire ICT competence and to develop the ICT competence of their students. Initially, the teacher is a novice in the use of ICT (for example, the use of graphics calculators). During a process known as instrumental genesis (Ruthven, 2013) the teacher develops the capability to use the technology and include it within their pedagogy. This process is described by Ruthven as an instrumental approach where the “tool and person co-evolve so that what starts as a crude “artefact” becomes a functional “instrument” and the person who starts as a naïve operator becomes a proficient user” (2013, p. 7).

Instrumental orchestration describes the strategies used by teachers to orchestrate student integration of ICT, where the students instrumental genesis is within a continuum from novice to expert. Teachers employ a range of strategies to promote student ICT capability. Instrumentation orchestration was described in a study carried by Drijvers, Doorman, Boon, Reed, and Gravemeijer (2010). The context of the study was the trialling of an application designed to produce a graphical representation of a function as an input-output device. Teachers in 29 eighth grade classrooms in one Belgium and nine Dutch schools participated in three research cycles. The study identified a range of instrumental orchestration strategies including: technical demonstration, explain the screen, link screen-board, discuss the screen, spot and show, and Sherpa at work. Technical demonstration is the demonstration of technical features by the teacher. Explaining the screen refers to the teacher explanation of technique and mathematical context. Linking screen-board is the link between the representation on the screen and other media (including textbooks). Discussing the screen is the teacher led discussion about what the screen is showing. Spot and show is the use of an example of student work using the application to provoke discussion in the class. Sherpa at work is the situation where a student is selected to demonstrate their work on the screen (Drijvers et al., 2010). The forms of orchestration were related to traditional teacher practice, suggesting that teacher integration of Digital Mathematics Environment (DME) (and other forms of ICT) is evolutionary and follows a process of teacher acquisition of competence in ICT and subsequent development of strategies to facilitate student use of technology (Drijvers et al., 2010).

Macro Factors

Practitioner Model Of Computer (PMC) Use

The use of PMC in school mathematics is designed to take a holistic view of the factors associated with the successful integration of ICT in the mathematics classroom. The PMC model was developed through group discussions with seven group interviews with mathematics departments in the first half of 2000 (Ruthven & Hennessy, 2002). Studies of graphics software in the United Kingdom (Ruthven, Deaneey, & Hennessy, 2009), and use of the Class Response System (CRS) by Swedish mathematics teachers have investigated the applicability of the PMC (Gustafsson, n.d.).

During construction of the PMC model, teachers identified the following as factors affecting ICT integration: working environment, resource system, activity structure, curriculum script, and time economy. Working environment describes impact of ICT integration on the physical environment for teaching, in some cases ICT integration required moving the students to a computer laboratory, resulting disruption and loss of time. Resource system refers to the coordination between ICT
tools and other resources in the lesson. Curriculum script refers to the change in organisation of lesson delivery due to the inclusion of ICT. Time economy describes the reduction in time required for student learning attributed to the integration of ICT (Ruthven, 2013).

In the context of the PMC framework Ruthven et al., (2009) studied how two English mathematics teachers integrated graphics ICT effectively into their classrooms. Initially the teachers demonstrated the software to their students and explained the mathematical context of the results. Both teachers encouraged their students to explore the software, enabling them to build confidence in their use of the software and have fun. By removing the task of producing the graphs from the learning task enabled the teachers to focus on the conceptual issues associated with the lesson. Students preferred the software to the traditional pen and paper and became more engaged with the content. The study showed benefits from the software accrued when teachers included software mediated learning tasks into their lessons, supported students to explore and understand the software, and then changed the structure of their curriculum script to include the software based tasks for students (Ruthven et al., 2009).

The PMC framework was applied to a sample of secondary school mathematics teachers in Sweden. The teachers had received the CRS, a system designed to enable teachers observe student responses simultaneously. Participants in the study received training in the CRS system, and were given tasks designed to promote classroom discussions and student learning. The study showed that the PMC framework captured a substantial part of teacher reasoning concerning technology integration. Most of the teacher responses fell within the framework. However, the framework did not discuss the impact of the student attitudes and behaviours on the process of the CRS integration. For example, some teachers had difficulty when students responded to a question without waiting for others in the class (Gustafsson, n.d.).

**Integrated Models**

*Sociocultural Framework for Understanding*

Sociocultural theories view learning as an interaction between societal and environmental factors within and outside of the classroom. This interaction promotes understanding of the factors effecting integration of technology into the mathematics classroom (Goos, 2010).

The sociocultural framework for understanding technology integration in secondary school mathematics is an adaptation of Valsiner’s zone framework (Valsiner, 1997). Valsiner’s zone framework extends Vygotsky’s concept of ZPD to the ZFM and ZPA. The Zone of Proximal Development (ZPD) describes the gap between current and potential capabilities of learners that can be traversed with appropriate support. The Zone of Free Movement (ZFM) refers to constraints that affect the ways an individual can interact with their environment. And the Zone of Promoted Action (ZPA) describes the efforts of an experienced learner, who is developing new skills. In the context of the sociocultural framework, the ZPD refers to mathematics pedagogy, pedagogical beliefs concerning technology, and experience in working with technology. The ZFM describes ICT access and support at school, perceived student attitudes and ability, curriculum and assessment requirements. And the ZPA includes university education, practical teaching experience and professional development courses (Goos, 2006).

The efficacy of the sociocultural framework in understanding the interactions between pedagogy, teacher backgrounds and beliefs, school structure, and institutional frameworks was analysed through classroom episodes and professional development experiences of teachers (Galbraith & Goos, 2003), a study of lead teachers in the integration of ICT into mathematical practice (Goos & Bennison, 2008) and pre-service teachers at Queensland University (Goos, 2005). The studies showed that the interaction of all three zones had an impact on the integration of ICT into the classroom. Teachers with a strong ZPA had developed ICT confidence and competence through pre-service training, attending professional development courses, and assistance from colleagues and professional associations. The desire to promote student mathematical understanding through technology, constructivist pedagogy, and real world application were identified as elements of a strong ZPD. Support from departmental and school leadership were elements associated with a supportive ZFM. The studies (Galbraith & Goos, 2003; Goos, 2005; Goos & Bennison, 2008) showed that teachers from schools with poor ICT resources could overcome this through their desire to embrace technology (ZPA) and support student learning (ZPD). However, teachers from schools with rich ICT could retard the ICT integration through a lack of desire to embrace ICT in their practice (Goos & Bennison, 2008).

**Technology Acceptance Model (TAM)**

The Technology Acceptance Model (TAM) was initially developed for use in industry to identify the willingness of workers to incorporate new technology, based on perceptions of usefulness and ease of use. Perceived usefulness is the improvement in performance from new technology, perceived ease of use refers to the reduction in effort resulting from the introduction of the new technology. Factors affecting ICT integration by mathematics teacher can be classified as: instructional, curricular, and organisational (Handal, Campbell, Cavanagh, Petocz, & Kelly, 2013). Instructional factors include teacher’s belief of the value that ICT will bring to student learning. Curricular factors describes the effort made to align ICT with curricula and other resources. Organisational factors refer to the actual and perceived support for ICT integration. The three factors link the context of industry to the classroom where the teacher is making decisions about ICT integration on the basis of its perceived usefulness and ease of use (Okumus et al., 2016).

Stols and Kriek (2011) use the TAM model to investigate the integration of dynamic mathematics software into 24 South African Grade 10-12 mathematics classrooms. The study used TAM, Theory of Planned Behaviour, and Innovation Diffusion Theory to identify teacher beliefs concerning integration of dynamic mathematics software. Data collected in the study was modelled using stepwise regression analysis that was through partial least squares. Results of the study showed that teacher beliefs concerning the perceived utility of dynamic mathematics software and their proficiency in using the software were the most significant factors in explaining actual and intended use of the software (Kriek & Stols, 2011).

**Conclusion**
Integration of ICT by mathematics teachers has been demonstrated to significantly impact student progress. The role of the teacher in deciding when, how, and where to use ICT will determine whether its use will facilitate student learning of mathematics. The literature on the adoption of ICT integration has shown that the factors affecting ICT integration fall within three paradigms: interaction between the teacher and technology (micro model), interaction between teacher, technology and the environment the teacher performs (macro model), interaction between teacher beliefs, ability to improve ICT competence, and their environment (integrative model) (Goos & Bennison, 2008; Okumuş et al., 2016).

References


What Constrains Teachers From Using ICT to Support Teaching as Inquiry?

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Abstract
Government reports indicate that many New Zealand schools have few supports for teaching as inquiry. Recent developments in Information and Communication Technology (ICT), however, appear to provide new tools which could support several aspects of teachers’ inquiries, such as digital portfolios and online collaboration platforms. This literature review investigates what barriers there might be for ICT to support teaching as inquiry, primarily in a New Zealand setting. It challenges the prevailing notion that teachers’ failure to recognise the potential of technology is the single most critical missing strategy for inquiry development, and shows that a variety of other factors continue to have significance in the literature. The implication of this review is that a variety of strategies appear to be required to support teachers in using ICT for an inquiry approach to teaching, rather than a one-size-fits-all approach.

Keywords: Teaching as Inquiry, ICT, Technology, Digital, Integration, Constraints.

Introduction
In their synthesis, Bolstad et al. (2012) identified four linked strategies needed to support educational information and communication technology (ICT) innovations: inspiration, enabling tools, ICT capability, and support for innovation (Bolstad et al., 2012, p. 56). Of these, the authors identified that inspiration was the most limited at the time, because “there is still insufficient knowledge about how ICT-related thinking and practice can be more consistently connected with the ‘big-picture’ ideas about future-oriented learning” (Bolstad et al., 2012, p. 57). In the same year, the Education Review Office (ERO) reported that teaching as inquiry needed to be better supported (2012). ERO identified the following four forms of existing teacher inquiry: collaborative inquiry, self review, documented personal reflections, and reflection in action (Education Review Office, 2012, p. 16).

Focusing on the New Zealand school system, the aim of this literature review is to assess the evidence that within this four-strategy model, inspiration is the most significant constraint to the greater adoption of ICT systems to support inquiry-based teaching, and determine the ongoing significance of the other linked strategies. A variety of New Zealand and international studies are evaluated, encompassing both broad surveys and case studies of practice.

Evaluating Surveys of Teachers
A very large survey of Chinese primary schools used a path model to find a variety of correlations between “internal teacher variables” and teachers’ adoption of ICT (Sang, Valcke, van Braak, Tondeur, & Zhu, 2011). The path analysis consisted of multiple regressions to find statistically significant direct and indirect causal links in their data. The internal variables the researchers examined included such factors as pedagogical beliefs and ICT motivation. A key finding of this study was that often, teachers who used ICT for one purpose would use it for others also – for instance, teachers who used ICT in planning lessons or for student management, would more commonly be willing to integrate ICT into their classroom activities. Evaluating discrepancies with other international literature, the researchers suggested cultural factors may have been significant also, such as a general aversion to constructivist principles. This may suggest New Zealand’s more multicultural teaching profession could have more diverse challenges in integrating technology to support teaching as inquiry. The authors were cautious about generalising their study, however, because despite the large sample size of 820 teachers, it was not enough to draw significant correlations for the context of China, let alone other countries such as New Zealand. The study suggested that among the teachers surveyed, the variables affecting teachers’ support for integrating technology had a direct effect on how much they used
technology for all purposes, including activities supporting elements of teaching as inquiry.

Many of these correlations have been supported across cultures. Inan and Lowther’s (2010) study also used a path modelling approach based on a similar survey of 1,382 Tennessee public school teachers, to determine factors related to teachers’ professional and classroom uptake of ICT. Although the study did not investigate correlations with different purposes for ICT use individually, it found a variety of direct and indirect correlations with ICT use overall. The most significant correlations with ICT use were computer proficiency, overall support, and teacher readiness. This finding suggests that teachers surveyed needed not just to support and be supported in using innovative technology to conduct teaching as inquiry, but also that many teachers felt they lacked the proficiency with ICT to do so, which may be linked with the ICT capability strategy.

Other large international surveys have given more support to non-individualistic factors, including the technology used and the organisation itself. In Meneses, Fabregues, Rodriguez-Gomez and Ion’s (2012) study, 1,405 teachers in Spanish primary and secondary schools reported on their professional use of the Internet outside the classroom. Their study concluded that there was a strong significant correlation between teachers’ ICT capability and using the Internet to support teaching. It also found a weaker correlation between ICT capability and using the Internet for management tasks. In addition, the study used a digital divide approach to attempt to measure how these are affected by differential access to technology. From this they concluded that organisational development and technological factors, such as the level of Internet access, were significant predictors of how much the Internet was used by teachers outside the classroom. This indicates that along with ICT capability, the provision of enabling tools and schools’ support for innovation had some effect on teachers’ usage of ICT to support activities like teaching as inquiry.

More modestly-sized surveys in the New Zealand context have yielded information about how our local context may differ from international evidence. Ward and Parr (2010) found that in four well-resourced and ICT-committed New Zealand secondary schools, there was little correlation between pedagogical and professional ICT use. Although skill level in using ICT was not significantly correlated with pedagogical uses of ICT in the path analysis, it was significantly correlated with professional preparation, and personal uses of ICT by the teachers in the study. This was also the only factor that was broadly correlated, even though the authors found several other factors to be significant for specific uses of ICT. Consistent with international research, the authors found that these factors included a variety of personal variables, such as teacher readiness. Because the study was set in schools that had a significant existing investment in ICT, it is plausible that the sample may be skewed towards more inspirational environments. In this study, the level of teacher participation in professional development, where some of this inspiration could be assumed to be taking place, was correlated with ICT use for lesson preparation, but not core professional use. The bias in the sampling of schools with better ICT supports may explain why no evidence was found that the factors barriers to use or teacher perception of disadvantages were statistically significant antecedents for any type of ICT use, in contrast with international research. Overall, the study provides evidence that the New Zealand teachers who are more skilled in using ICT, tended to use ICT for professional purposes more, such as teaching as inquiry.

Both Ward and Parr’s (2010) New Zealand survey and Inan and Lowther’s (2010) survey from the United States of America identified identical strategies as being missing – namely, support for innovation and ICT capability. The support for innovation strategy was additionally supported by evidence from researchers in China (Sang et al., 2011) while a study from Spain identified the ICT capability and enabling tools strategies to be significant (Meneses et al., 2012). Ward and Parr (2010), however, only found statistically significant evidence from New Zealand that the enabling tools strategy was missing in the pedagogical use of ICT, but not professional use. All surveys examined identified the importance of recognising a variety of obstacles in different contexts. None provided specific support for the inspiration strategy.

Survey data provides a broad overview of correlations in current practice; however, it is limited in establishing causality, the direction of causality, and any underlying or confounding variables not considered by the researchers, among other factors. Qualitative case studies, therefore, provide more information on these factors in specific instances.

Evaluating Examples of Practice

Communities of practice, facilitated through tools such as learning management systems or other forms of new media, provide an important set of case studies for evaluating how new media can facilitate collaborative inquiry, as well as providing a digital record for review and reflection.

In one recent review of an Australian university business school’s three largely-failed attempts to introduce a learning management system, which had as its primary intention the improvement of teaching ideas and practices, the authors observed three key obstacles. These were that technology was not fit for purpose, that teachers did not trust how the technology was being used, and time-jealousy, that is, the time spent engaging with the digital system would not yield commensurate rewards (Houghton, Ruutz, Green, & Hibbins, 2015). Among the specific issues raised were concerns about confidentiality, performance management, time taken to engage with the platform, lack of immediately positive outcomes for students, and the ease-of-use of the system – some of which touch on the teachers’ and organisations’ support for innovation. Although set in a tertiary context, and set in another country, it would seem to challenge Bolstad et al.’s (2012) statement that the “types and quality of ICT tools” used in New Zealand settings are a strategy that has been accomplished already with “better infrastructure and access” alone. Rather, interviews with teachers conducted by Houghton et al. (2012) suggested that the systems’ designs were at fault to an extent, highlighting the importance of the enabling tools strategy, Teachers’ use of ICT tools to support teaching as inquiry is constrained by both access to and quality of those tools.

The applicability of these findings to a New Zealand school context can be partially assessed by its parallels to the ERO report (2012), which found many of the same factors applied to schools’ systems for teacher inquiry. It did not, however, review how many of these systems were specifically ICT-based. Although Houghton et al. highlighted the need for “spontaneous” inquiry
ERO suggested that systems often failed to support “reflection in action” (2012, p. 25). Likewise, when teachers had a “lack of trust” in the system in Houghton et al.’s (2015) study, the ERO found “contrived inquiry” to be the result (2012, p. 25). These findings suggest that other helpful systems for teachers to conduct inquiries are not available to be implemented in schools, or that schools are not supporting such systems.

An argument could be made for more decentralised communities to support teaching. One review of three online communities for professional learning – two set in an Australian context and one international website – found that almost two-thirds of the teachers in these communities used them for professional development, with the remainder primarily accessing some form of emotional support (Duncan-Howell, 2010). The study showed that although teachers’ typical professional development took the form of traditional courses, those teachers who engaged in these online communities typically gained a lot of additional development by taking part in the group, such as by sharing thoughts or collaborating. The need for “practical and authentic” (Duncan-Howell, 2010, p. 338) professional learning was highlighted as a key need by the teachers involved with the survey, and generally agreed to be an advantage of the learning communities surveyed. Members indicated that they had used the tools to improve their teaching practice (Duncan-Howell, 2010, p. 337); however, it is unclear to what extent this was a result of these learning communities facilitating professional and critical inquiry, as opposed to merely copying another teacher’s strategies or ideas.

Because the systems were non-institutional, trust was less of an issue, and the technology appeared fit for the purposes of those who were members of the communities, including a range of primary teachers, secondary teachers, and other staff. It is unclear how this would suit the needs of all teachers and staff, however, as the study identified a clear learning-method preference as being dominant in the communities: namely, needing “broader social interaction that can be provided from within their workplace” (Duncan-Howell, 2010, p. 332). Interestingly, time was listed as both an advantage and disadvantage of participation in these communities. Overall, the study suggests that for those people who were successfully integrated into these communities, teachers saw potential in using technology to facilitate their development – which also highlights the importance of the inspiration strategy. In addition, the design of the tool and the dispositions of those using it could be helpful factors to support teaching as inquiry for those teachers. There is little evidence on the uptake of such technologies in a New Zealand context. The 2012 ERO report did not generally assess such inter-school resources for inquiry, but rather focused only on school-level supports.

Levin and Wadmamy’s (2008) longitudinal study of six Israeli teachers, consisting of experimental workshops, interviews, and observations, confirms (on a qualitative level) that the integration of ICT can be “a source of inspiration and professional renewal” for teachers (Levin & Wadmamy, 2008, p. 258). The authors determined that the source and nature of the technological processes being engaged with had an ongoing developmental impact on how teachers adapted technological tools for their professional and pedagogical needs. Each of the teachers represented a unique and complex developmental pattern, both supported by and supporting a process of teaching as inquiry. Although the study was set a non-New Zealand context, it provides further evidence that with the right personal and professional development, which Bolstad et al. (2012) refer to as ICT capability or support for innovation, teachers can use ICT as effectively for teaching as inquiry. A limitation of this finding is that the teachers had some existing motivation to use ICT, having signed up to a longitudinal professional development programme. The divergences in how each of the educators developed together with ICT, when considered with the scattergun antecedents discussed in Ward & Parr’s (2010) survey, provide further evidence that the strategies that should be employed to support ICT use in teaching as inquiry are as complex and unique as the teachers themselves. Levin & Wadmamy (2008) discuss how this idea echoes constructivist learning pedagogies, and in turn, challenges professional development leaders to consider the vast range of influences on an individual teachers’ environment, rather than offer a one-size-fits-all prescription for involving ICT systems to support teaching as inquiry.

Though examples from practice in a New Zealand context are scant, there is evidence that many schools have used digital tools such as Google Docs positively to develop teacher inquiries, especially to support the achievement of priority learners. In one case study, three primary schools developed a shared inquiry based around the Pasifika principle of talanoa (sharing ideas) as well as the “spirals of inquiry” framework, that leads to improvements in achievement for the priority learners (Ministry of Education, 2016). This process enabled teachers to work with “less isolation, increasing the power of their inquiry” while drawing on both Pasifika values and evidence-based practice approaches to support learners (Ministry of Education, 2016). Evidentially, this highlights the need for the inspiration strategy, as well as inter-school shared values as useful supports to facilitate the use of this technology for teaching as inquiry.

Discussion of Findings and Limitations

Some general conclusions can be drawn from this body of evidence. First, there are sources of inspiration for how ICT can be used, as well as why it should be used, and that at least some teachers appear to find these helpful. This can be seen in literature such as the Ministry of Education’s (2016) case study as well as Duncan-Howell’s (2010) online communities of practice. It remains unclear to what extent such effective tools are adopted among teachers in New Zealand, but there is little evidence that teachers are not willing to draw on such resources.

Second, there is some evidence that a wide variety of personal, organisational, and technological factors can potentially influence an individual teacher’s use of ICT for teaching as inquiry. Levin and Wadmamy’s (2008) research suggests a need to treat each teacher’s interaction with changing technology as a personal, ongoing journey, rather than assume any specific fix. This is supported by the wide range of correlations found in surveys conducted within New Zealand and internationally. Several significant correlations between the use of ICT for teaching as inquiry and factors unrelated to inspiration-based strategies continue to be identified as significant in the literature.

Almost every piece of literature reviewed highlighted a need for meaningful professional development to allow teachers to see not only the potential of ICT for teaching as inquiry, but also to
be confident in their ability to use it fully and authentically in their specific teaching contexts. Where tools to facilitate inquiry have been implemented by institutions, evidence exists, such as in the reports by ERO (2012) and Houghton et al. (2015), that they have often provided more of a contrived inquiry based on time-jealousy, as opposed to a critically reflective environment for inquiry.

Therefore, although this review has found a significant body of support for the four elements of Bolstad et al.’s framework of ICT integration strategies, there is clear evidence in the literature that when this ICT is integrated to support an inquiry approach to teaching, their weighting of the various aspects of the model should be treated with caution. Where the literature has identified issues with inspiration, this has almost universally been closely linked with a lack of support, capability, or functionality of the ICT tool. It is therefore important not to identify any particular solution to the challenge of improving teaching as inquiry practices in New Zealand schools, but rather to consider a holistic approach, one that is based on the complex and evolving interplay of relevant factors. One key limitation of this study is that most relevant literature in this field draws on evidence from overseas. Where studies have been conducted in New Zealand that have investigated how teachers use ICT for teaching as inquiry, they have often focused on individual examples of practice or school contexts. Broader studies are needed to assess how the New Zealand education system’s overall culture contributes to how teachers use ICT, including understanding why New Zealand’s teachers might appear to be more discriminating in the purposes for which they use ICT compared with international studies. In addition, with the fast-changing pace of technology, it is likely that the nature of the technology itself has developed significantly over the period of the studies being reviewed. More ongoing research into how teachers are using technology, especially to support teaching as inquiry in New Zealand, would likely yield further insight into this phenomenon.

References


Implementing e-Tools for Assessment

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Abstract
This literature review explores the challenges and strengths to both teachers and students in incorporating e-tools into assessments. There is conflicting research surrounding the validity between paper and computer-based assessments, which will remain a problem in determining appropriate future practice; however, research also points to possible benefits in using e-tools for both teachers and students. For teachers, e-tools ease the burden of management and marking of assessments, allowing them to focus on providing quality formative feedback. Students are more motivated and engaged in assessments when they have opportunities to interact with formative feedback, which creates a positive assessment experience. Digital assessment can be challenging for teachers who feel they do not have institutional support behind them or those who face technical difficulties in proctoring examinations. Some students also find digital assessment to be a negative experience, particularly when taking numeracy-based assessments. With conflicting research surrounding the transition from paper to computer-based assessments, various strengths and challenges for teachers and students, and an apparent gap in the integration of research into the New Zealand Ministry of Education’s assessment documents, more research may be needed to inform future digital assessment practices in Aotearoa New Zealand.

Keywords: Digital Assessment, E-Tools, E-Assessment, Computer-Based Assessment, Paper Assessment.

Introduction
Technology has become an integral part of our lives over the last 20 years, transforming almost every facet of human communication and interaction. With the increase of technology use in everyday life, schools all over the world have to grapple with how to integrate e-tools into the classroom and curriculum in an appropriate and effective manner. The New Zealand Curriculum’s vision for young people is that they are “effective users of communication tools” and “will seize the opportunities offered by new knowledges and technologies” (Ministry of Education, 2007, p. 8). It is, therefore, imperative to understand the benefits and challenges of bringing e-tools into the classroom. The purpose of this literature review is to explore the particular challenges and strengths associated with implementing e-tools into assessments. Assessments offer opportunities for students to consolidate their learning and to share their learned knowledge with their teachers. Assessments are also integral to understanding academic achievement and to monitoring student progress throughout the years at school.

The New Zealand Ministry of Education demonstrated initial interest in understanding how to implement technology effectively in assessment by commissioning a literature review (Leeson & Hattie, 2009) to inform the 2009 Directions for Assessment in New Zealand (DANZ) Report (Absolum, Flockton, Hattie, Hipkins, & Reid, 2009). However, there is a gap in the integration of the research on e-assessment in the DANZ report; although Leeson and Hattie’s work was commissioned for the report, none of the research is mentioned in the final DANZ report. The word “technology” appears only once and is used in the context of forming valuable partnerships with parents and families rather than in reference to assessment as such (Absolum et al., 2009, p. 29). Likewise, the Ministry of Education (2011) Position Paper on assessment includes only one small segment on incorporating e-tools into assessment (p. 23). It is evident that more critical research into the strengths and challenges of digital assessment needs to be analysed further and integrated into government documents.

This literature review examines the conflicting research surrounding the validity of computer-based assessment compared to traditional paper format assessments in secondary and tertiary contexts. In addition, this literature review consolidates research on the benefits and challenges for both teachers and students of using e-tools in assessment.

http://hdl.handle.net/10092/14635
Transitioning From Paper to Computer-Based Assessment

Traditional assessment practices have consisted of using pen and paper to demonstrate student knowledge by writing essays, solving equations by hand, or physically circling multiple choice answers. Though students today are considered “digital natives” (Prensky, 2001) in terms of using e-tools, there remains a concern that computer-based assessments will advantage certain students and disadvantage others. In particular, the transition from paper to computer-based assessment could disadvantage students who do not have much familiarity with computers or word processors.

Research has found that less experience with word processors can become a disadvantage for students when completing computer-based writing tasks, with paper assessments eliciting higher quality responses (Chen, White, McCloskey, Soroui, & Chun, 2011). Likewise, students who are comfortable with digital word processing could be at an advantage in an assessment, as “a greater fluency and comfort with the materials of composing appears to impact students’ performances on high-stakes essay exams” (Withaus, Harrison, & Midyette, 2008, p. 16). Schroeders and Wilhelm (2011) mediated this challenge by exploring how measurement of comprehension skills in English as a foreign language is affected by test medium. Their carefully designed investigation ensured motor skills requirements were comparable across paper and computer assessments, which meant the “rank order of participants was not affected by test media” (p. 865). Even so, they strongly caution that the findings of their study cannot, and should not, be generalised for other assessments, because they carefully designed the test media for their particular assessment, and there is “no theoretical or empirical framework that guarantees that measures would be invariant across test media” (Schroeders & Wilhelm, 2011, p. 866). Across the board, these studies suggest that the transition from paper to e-assessment is more complicated than originally anticipated, requiring careful design and manipulation of the assessment to ensure valid and fair results.

Although these studies find great issue with the validity of digital assessments compared to paper assessments, the New Zealand Qualifications Authority (NZQA) has forged ahead with digital assessment trials and pilots in order to determine whether the test medium has an effect on National Certificate for Educational Achievement (NCEA) examinations in New Zealand secondary schools (New Zealand Qualifications Authority, 2016; New Zealand Qualifications Authority, 2017; Johnston & Paki, 2017). In evaluating the results in the 2014 and 2015 Electronic Mathematics Common Assessment Tasks (e-MCAT), there were minimal differences in student results, suggesting that “the mode of assessment was irrelevant to the outcomes” (NZQA, 2016, p. 11). In looking at results from the 2016 trials and pilots, there was no evidence of disadvantage to any student who took their NCEA examination in a digital medium (NZQA, 2017). There were, however, some differences in the results’ distribution in favour of those who completed the assessment digitally. This was attributed to the fact that students could opt into the digital medium in the trials and pilots, so more digitally able students may have intentionally opted for the digital option, which positively affected their performance. This explanation connects back to previous research that computer familiarity (or lack thereof) will have an impact on student performance for digital assessments (Chen et al., 2011; Withaus et al., 2008).

Although the NZQA pilots and trials sound promising for the future of digital assessment, possible limitations should be noted. Johnston and Paki (2017) conducted a psychometric and statistical analysis on the results to ensure validity of the research, concluding that there were sufficient results to form a reliable analysis, but noted that there were four times as many students taking the paper examinations as the computer-based examinations. The distorted proportion of students taking the paper assessment over the computer-based assessment is a limitation of the study, and future replications and trials should include a more balanced split between media in order to gather better information. In addition, almost all student survey responses were too low to draw valid conclusions regarding student satisfaction and experience with digital assessment (NZQA, 2017). This is a limitation in being able to provide formative feedback on the benefits and challenges for students in transitioning from paper to computer-based assessments, and should be mediated for future NZQA trials and pilots. In looking at current research that examines the validity and reliability of the medium of assessment, there still lies a tension in how to appropriately and effectively transition from using paper assessment to computer-based assessment in New Zealand schools.

What are the Benefits?

Teachers can Provide Quality Feedback Through e-Tools

Further research will be needed to determine best future practice in assessment validity, but current research does identify benefits and challenges to students and teachers of using e-tools for assessments. In particular, digital assessment can assist teachers in the management and marking of assignments by making marking more efficient. Markers of the eMCAT assessments in the Digital External Assessments Prototypes (DEAP) project found online marking to be more favourable and efficient than traditional marking (NZQA, 2016). In addition, using e-tools can support administrative tasks, such as “accepting assignment submissions, managing deadlines, recording submission details, dealing with safe and secure storage; managing the distribution of assignments to markers and facilitating the communication within the marking team” (Heinrich, Milne, Ramsey, & Morrison, 2009, pp. 471 – 472). If teachers use e-tools to assist them in the administrative side of assessment, they are able to use their freed-up time to provide quality feedback on the assessments themselves (Heinrich, Milne, Ramsey et al., 2009; Heinrich, Milne, & Moore, 2009). Teachers found that using e-tools supported them in providing timely and continuous feedback to students, which could lead to higher student achievement and engagement (Heinrich, Milne, & Moore, 2009). Overall, teachers found e-tools beneficial in both the marking and the management of assessments.

Empowering Personalised Learning in Students

Research has shown that using e-tools for assessment can also have benefits for students. Educational-technology initiatives and projects have found that providing personal learning devices (such as PDA’s or tablets) to students can improve student motivation, engagement, and attitude towards learning (Somekh...
et al., 2007). Student motivation in using e-tools can be extended to benefits for assessments, particularly for formative assessments. If students have the opportunity to read formative feedback on an assessment, e-tools can provide greater motivation for students to take the time on assessments and correct their mistakes (Jiao, 2015). E-assessment tools create an archive of student work, allowing them to re-read feedback. This ability to go back to the feedback from previous assessments gives students the opportunity to “close the gap between their current and desired performance” (Heinrich, Milne & Moore, 2009, p. 182). Likewise, the implementation of the e-assessment program, eTutor, for students in an engineering course “motivated students in independent learning and resulted in improved performances” (Jiao, 2015, pp. 14-15). However, Jiao (2015) and Heinrich, Milne, and Moore’s (2009) research makes clear that implementing e-assessment alone does not increase student motivation, but it must be used in conjunction with providing quality feedback, so that students find value in reading comments and correcting their mistakes.

Evidence has also shown that, for certain assessments, students find digital assessment to be a more positive experience than paper based assessment (Jiao, 2015; NZQA, 2016; NZQA, 2017). In surveys given to students at the end of the engineering course, “70% agreed or strongly agreed that eTutor increased their learning interest and helped them study the unit content” (Jiao, 2015, p. 12). Students felt satisfied partly because of the benefits mentioned above and also the facility to resubmit their assessments. Students also felt that digital assessment could play to their digital strengths, which gave them more confidence in the examination. Although survey results were remarkably low for the NZQA trials and pilots, students who did respond to surveys found the e-assessments to be positive experiences because they “were more confident using a keyboard, that they liked the word count and timer, and that the instructions were easy to follow” (NZQA, 2017, p. 16). Many students in the survey results claimed that taking a digital assessment was a more positive experience than paper-based assessment because of the assistance of a word processor to type out responses instead of handwriting, making their work easier to read and edit before submission (NZQA, 2017). In essence, implementing digital assessment can lead to added benefits for students when used effectively. In incorporating digital assessment to classrooms and the curriculum, students are provided with more immediate opportunities for formative feedback and the ability to go back to their assessments and correct their mistakes, making the assessment a more positive experience.

What are the Challenges?

Discrepancies In Student Experience

There is a discrepancy between the benefit of e-assessment tools for students depending on the type of assessment. For writing-based assessments, students generally found digital assessment to be a positive experience, with most NCEA Media Studies and Classics respondents “agreeing or strongly agreeing that they found undertaking the examination digitally was a positive experience” (NZQA, 2017, p. 16). However, as noted earlier, the majority of respondents taking numeracy-based assessments, like the 2015 eMCAT examinations indicated that the digital medium of the examination “felt worse or much worse” than taking the examination through a paper format (NZQA, 2016, p. 19). Likewise, student feedback on the benefits and limitations of eTutor showed that some still preferred to receive paper feedback. Because most engineering assessments are numeracy-based, some students wanted to receive specific feedback on their errors in calculation or parameter, which was not possible through eTutor (Jiao, 2015).

Even students who generally found digital writing assessments to be positive had to mediate new and unfamiliar challenges. The NCEA English Level 1 Pilot in 2016 had many technical difficulties with locking out students before they began the examination, which created a more unpleasant and stressful experience for some students (NZQA, 2017). In addition, the students who responded to surveys experienced more distraction due to the sound of typing from other students (NZQA, 2017). The introduction of digital assessment can present specific challenges for students based on the type of assessment and cognitive processes required for the assessment. The discrepancies in student experiences with e-assessment show that teachers must be very careful when designing and planning digital assessments and should think about whether the assessment will benefit all students in the classroom.

Technical Difficulties and Lack of Institutional Support

The challenges for teachers surrounding the use of digital assessment are both similar and different from those of the students. When students experience technical difficulties in examinations, as with the NCEA English Level 1 Pilot, teachers and supervisors are also placed in a very difficult position in monitoring the examination and trying to help students solve the technical issues. Of those teachers who administered the English digital examination and responded to the survey, the majority agreed or strongly agreed that “digital examinations were more difficult to manage than paper-based examinations” (NZQA, 2017, p. 21). Some teachers felt that the technical difficulties in the examination meant teachers had to keep a close eye on all students’ computers, which made students feel more nervous and disoriented (NZQA, 2017). This difficulty in managing technical problems can be a source of tension for teachers who are considering using digital assessment in their classrooms.

In addition to mediating technical issues, teachers also face challenges when they do not have appropriate institutional support from schools to help them implement e-tools in the classroom. Teachers need support from their institution to help teach them about the options for e-tools, as well as give them a voice in what kind of tools may be used for assessment in the classroom (Heinrich, Milne, Ramsay, et al., 2009; Heinrich, Milne, & Moore, 2009). With this kind of support from their working environment, teachers will “take some ownership over their e-learning system,” which will lead to higher quality assessment strategies (Heinrich, Milne, Ramsay, et al., 2009, p. 476). Introducing e-tools into a teacher’s classroom requires institutional support from colleagues, students, and the entire school environment. One teacher found the lack of institutional support troubling, saying, “there should be a central investigation as to what a good tool is or what some good tools are and then it should be provided centrally” so that teachers are not struggling to implement e-tools on their own (Heinrich, Milne & Moore, 2009, p. 181). Qualitative research and interviews with teachers has shown that they face different challenges with implementing...
e-tools from those of students, but with strong institutional support, some of these challenges can be mediated.

Conclusions

In examining the literature on the subject of implementing e-tools for assessment, it is clear that there needs to be further research done on how to mediate validity and reliability challenges between paper and computer-based assessments. Teachers need to understand that computer familiarity and experience with digital tools may affect the students’ ability to take assessments digitally. Therefore, all assessments must be carefully and consciously designed not to advantage or disadvantage any particular group of students (Schroeders & Wilhelm, 2011).

Overall, recent literature on the subject of digital assessment shows its effectiveness in providing benefits for both students and teachers to improve their learning and management of assessment. However, there are still challenges in student experience and supporting teachers in the implementation of digital assessment that will need to be addressed and fixed in future classroom spaces. Although this is a new and challenging area of education, there are ways to mediate digital challenges in order to benefit students and teachers alike, as long as assessments are carefully constructed, take students’ computer familiarity into account, and allow for quality feedback to be provided to students.

References


New Technology, Gamification and Future-Focused Education

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Abstract

In this literature review the role between new technology and future-focused education is examined critically. There is an emphasis within global education initiatives towards promoting an increase in digital access within learning environments. This review analyses the context of this access and assesses how some studies describe the impact towards developing digitally literate learners. The development of technology and media within society has led to a variety of innovative practices that could be implemented within the curriculum; this review provides some examples of studies conducted around these new learning modes.

Keywords: Future-focused learning, Digital technology, BYOD (Bring your own device), Digital literacy.

Introduction

Digital technology is a fixture within modern society that all learners would have interacted with at some point within their lives. It is, therefore, clear that educators have to understand how the current system is encouraging digital access within schools and, furthermore how this system could be innovated to incorporate a future-focused approach to teaching and learning. New Zealand schools are embracing the importance of providing digital access, but this literature review seeks to understand just how much the current system reflects the learner experience outside of the learning environment and the ways we can adapt the curriculum to reflect this understanding. This discussion around the digital divide in education is important because it highlights the discourse between digital access at home versus at school. An important skill that is discussed here is digital literacy – the ability to learn and develop an understanding through digital texts and media. The studies within this review focus upon how learners currently understand this concept and how it is or can be taught within schools.

Understanding Digital Access

The range of digital literacy knowledge amongst New Zealand learners can only be understood by first understanding digital access amongst learners of a variety of socioeconomic backgrounds. In Hartnett’s (2011) two-phase study on the digital divide within New Zealand 787 Year 12 students were surveyed in regards to whether they had access to a computer at home, the Internet connection at home and if they owned a cell phone. This study then progressed to a collection of follow-up semi-structured interviews to gain a qualitative understanding of how learners interacted with this technology and how their schools reflected the type of digital access they were accustomed to. The study sampled schools from a range of deciles, with about 5 to 6 schools per decile.

Hartnett’s (2011) study showed that there was a significant amount of digital access amongst all learners who were surveyed. From the survey it was determined that 92.2% of all learners had access to a computer, 87.9% of learners had access to an Internet connection at home and 92.5% had access to a mobile device. Hartnett’s findings demonstrate that those without digital devices tend to come from a low socioeconomic background; however, despite this it is still worth noting than an overall majority of learners have access to a wide variety of digital devices. In the interview phase of the study there is an example of what this digital access meant at the time of this study for learners of differing socioeconomic backgrounds, with learner 23 from a low decile school stating “she [Mum] uses it [the laptop] every single day too, we take turns...it’s actually shared a lot”, which contrasts greatly to another interview with student 21 from a high decile school stating “she [Mum] uses it [the laptop] every single day too, we take turns...it’s actually shared a lot”, which contrasts greatly to another interview with student 21 from a high decile school stating “we [including the student’s brother] both have a laptop and we both have a smartphone” (Hartnett, 2011, p. 647).

This equity divide and how digital technology is used by New Zealand learners is worth noting when thinking about why we should be implementing new technology into the curriculum.
learners, regardless of their socioeconomic backgrounds indicated that this technology is already an aspect of their lives at home. The curriculum within schools needs to reflect this access learners are constantly being exposed to; if their learning reflects what they are familiar with then, according to a constructivist view, an increase in engagement would come from all learners. Hartnett’s study also uncovered how New Zealand learners from all socioeconomic backgrounds felt at the time of the study about the digital access that they have while at school. Student 2 from a low decile school states that “a few classes have better technology but in the few, it’s still kind of old”, while Student 19 from a high decile school describes the relationship between technology at school and at home as “disjointed” and says that “you know there’s not enough computers to go around at school” (Hartnett, 2011, p. 647). There is evidence that access to technology is not the same at school as it is in learners’ home lives. The education system could benefit from extending access within schools and begin investigating how digital literacy can be explored within the learning environment.

Although this literature review will be questioning how digital technology and literacy can enhance the curriculum it is worth noting that a lot of the literature gathered on new technological practice is primarily from the United States of America. It is, therefore, important to get a general understanding of digital access in the United States of America as well to see the similarities between New Zealand and American households. The study performed by Common Sense Media (2013) delivers details about digital access in 1,463 United States of America households. The study found that 96% of the households have a television set with approximately a third of the children within the study having a television in their own bedroom and access to online streaming services. In relation to mobile devices 75% of learners in the United States of America had access to some form of electronic device, with some 72% having used such a mobile device for a media related activity. Interestingly 63% of those surveyed use mobile devices for playing games and nearly a third of those surveyed use mobile devices to read, a major increase from the 4% in 2011; however, despite the increase in e-reading it is still less common than a mobile device being used to watch video, play games, and use apps on. Furthermore the parents of the children were the ones surveyed, meaning that this data has the potential for inaccuracies and is not a complete representation of learners’ access. This data provides a context for the literature to come and links strongly back to New Zealand contexts as well. It is noteworthy that digital technology has a significant presence within the family home across a range of social contexts. As educators we must consider how this use of technology in the home can correlate to how we use technology in the learning environment.

**Digital Technology is Reshaping Literacy**

Literacy is a very broad term that encompasses the ability to read, write, to understand, and evaluate language. This idea is so fluid because it no longer can simply apply to reading and writing skills; rather the definition has expanded to encompass oral and digital literacy too. Digital literacy is a growing medium that is expanding alongside digital access; this is why it is important to understand how being digitally literate can benefit learners. Jesson, McNaughton, and Wilson (2015) performed a study examining whether by creating digital learning environments with a one to one access to a digital device would learners’ reading and writing skills be improved. The study centred around six Auckland primary schools that were each in the lowest decile and had a significant proportion of Pasifika and Māori learners. These schools are members of a cluster that originally had seven participants but has since grown to twelve schools; in 2011 these schools developed an educational trust to implement the one to one digital device model. Jesson et al. (2015) measured student achievement in relation to reading and writing skills, critical literacy skills, and increased knowledge of multi-model texts. The study itself is broken into two phases. The first phase was around profiling, in which the success of the digital learning environments are assessed through standardised testing accompanied by learner and teacher interviews. The second part of the study related to implementation of redesign, in which results are gathered to assess whether the information from the first phase has improved the digital learning experience. The first phase showed that overall learners were not meeting expectations in relation to their reading and writing levels; however, it was noted that there was progress expected in reading between the February 2012 and November 2012 observation period. Furthermore a benefit of the qualitative component of this study highlighted that teachers, observers, and learners all noted an increase in engagement and a decrease in behaviour management. This higher level of engagement allowed students to develop the ability to compare “multiple digital sources to enable synthesis and evaluation for higher levels of comprehension and more advanced writing.” (p. 214). The second phase highlighted that students were still advancing in their reading skills at an expected rate; while writing skills were “at an average rate significantly greater than expectation” (p. 216). The second phase also saw an 11% increase in the teaching of critical literacy skills as a result of the digital learning environment model. This digital learning cluster has enabled a group of learners to engage with literacy in a manner that has heightened not only their comprehension, but their ability to interact with literacy critically.

Charles, Burt, and Williams (2010) provide a case study of an Auckland primary school and describe some effects that are comparable to Jesson et al.’s (2015) observations in their focus schools. The significant difference is that Charles et al. (2010) are United States of American academics visiting Point England Primary School, a decile 1A primary school, to perform qualitative observation; whereas Jesson et al. (2015) used a mixture of quantitative and qualitative data sourced through years of observation and analysis. Charles et al. (2011) was given access to quantitative data gathered by Point England Primary School and included this research into their case study. This digital learning environment has increased learner writing scores “[having] risen by an average of four times the expected growth in one year for students in years 4 through 10” (Charles et al., 2010). Furthermore, observations of a sample group of 27 learners from Point England Primary School, who engaged in podcasting within their classroom, saw improvement in their attitude towards reading and standardised testing confirming an increase in reading ability. From Charles et al. (2010) and Jesson et al. (2015) it becomes clear digital learning environments which
enable learners to have constant access to a digital device can improve reading, writing, and critical literacy skills.

The digital learning environments that have been discussed thus far have shown that providing access is a great aid to learners. It must also be noted that it is how this technology is used and engaged with that can have a significant impact upon learners. Currently schools focus on a number of methods that can enhance the digital literacy experience; however, there are some activities outside of the classroom that learners engage with which provide potential for literacy development skills. Black’s (2009) critical ethnographic study of three learners highlights a different way of perceiving digital literacy learning. The ethnography participants comprised an English language learner and two others from transnational backgrounds, all of whom engage in online fan-fiction writing. The three learners studied all wrote fan-fiction based on the same television show and had come to communicate with another online and in-person. Because of this the three have developed a globalised platform from which to reciprocally read and peer review one another’s work. Black (2009) noted that these three writers would self-identify as novices or English language learners within their works, creating a platform within which the reader might become the expert and provide feedback. Significantly the fan-fiction forum provided outlet for the three learners to experiment with language; not only were they developing their knowledge of English literacy but they would use the platform to express their own transnational identities, writing in Japanese, Mandarin Chinese, and Romanised Mandarin. This use of language was seen as additive elements of writing; and the online forum provided the three learners with a space to develop, explore, and present their transnational identities. Black’s (2009) ethnographic study is important because it acknowledges the ways priority learners, such as English language learners, use technology outside of the learning environment and presents the potential of exploring new contexts for digital literacy. Through the use of online forums the learners were able to “critically engage with the linguistic, cultural, and ideological materials” (p.423), lending them agency over their own learning. The Black (2009) ethnography is a demonstration of the ways in which we can use the digital learning environments, described by Jesson et al. (2015) and Charles et al. (2010), in new ways that enhance the development of collaborative and critical literacy skills.

The Future of Learning

Future-focussed pedagogy must respond to the increase in digital access by engaging with technology in new ways. Aliagas and Margallo (2017) studied how the use of interactive storybook apps enhanced the reading comprehension skills of children within four different Spanish families, where the children ranged from 18 months – 5 years of age. The study itself is framed as an ethnographic study in which data of the effectiveness of the app-based storytelling was gathered through observation, recording, and interviews. In Case 2 Aliagas and Margallo (2017) note that Chloe, the subject of the case, uses the _theatre_ function of the app to recreate the story of Snow White and the Seven Dwarves; this function allows the learner to position marionettes on the screen to act out important scenes within the story. Although Chloe’s mother would read the story aloud, Chloe would be interacting with the mobile device to construct a visual representation of what would happen next. As the story progressed, however, Chloe took ownership of the storytelling, “shifting from the role of storyteller to that of an author.” (p. 49). In Case 3 Lucia, the subject of the case, read The Stolen Stars; a choice based game in which there were consequences to decisions made. This led to an experience in which Lucia would walk away from the device out of concern or try to delegate the responsibility of decision-making to her father. This reaction was brought out of the feeling of ownership of her reading and decision-making; with support she advanced the story-telling process. Lucia’s interactive experience showed how an immersion with the first-person narrative, combined with agency over the storytelling process, led to heightened engagement. This ethnography (Aliagas & Margallo 2017) challenges the read-aloud early literacy skills model; instead positing the idea that immersion within a digitally interactive story is a more engaging means of developing early literacy skills. While this ethnography only details a collection of select case studies, there is evidence to show how digital technology can be utilised to support emerging literacy skills.

Dezuanni, O’Mara, and Beavis (2015) present another application for interactive game-based learning in the form of the popular video game, Minecraft. These researchers observed the implementation of Minecraft into the curriculum of an all-girls middle class Anglican school in Australia, with the target group being eight to nine year olds. Beyond observation data, Dezuanni et al. (2015) also have a focus group of eight learners who they interview to ascertain the effects of video game learning. Learners were able to develop safe social spaces both within the learning environment and in the virtual space of the Minecraft server; learners wished to “become recognisable to each other as knowledgeable Minecraft players.” The ability to take risks or problem-solve becomes a significant element of the class mentality; learners who display these qualities are positioned as a class expert. The interviews highlight that learners need to develop certain language skills to communicate effectively about the game; furthermore they must also develop an understanding of acquisition, programming, and creation in order to gain the full benefits of the more complex aspects of the game. Learners will develop an understanding of resources and design models, as well as gameplay strategies, which can enhance their experience and this leads to the development of digital curatorship skills. As learners gather these digital resources and skills Dezuanni et al. (2015) conclude that Minecraft holds the potential to allow students to become learners.

Aliagas and Margallo (2017) and Dezuanni et al. (2015) provide a positive example of future-focussed learning at a younger age, however once the curriculum begins to branch out into specific subject areas there are further alternatives and possibilities for how technology can be engaged with. There is an argument for video games being used to assist with science-based learning, presented by Marino et al. (2014), as well as Israel, Wang, and Marino (2016). Marino et al. (2014) examined 57 students with learning disabilities from four middle schools, with the intention to critically examine whether the use of video games in the science curriculum enhanced learner achievement. The resulting levels of engagement in the science-curriculum classes has grown noticeably and learners even express that they play the games at home, even sharing these experiences with their families. Although this study did not show any change in learner achievement, there was a clear increase in engagement and
collaboration with learners stating “that they appreciated the variety of options not typically included in science instruction” (Marino et al., 2014). The later study by Israel et al. (2016) is in fact a continuation of the Marino et al. (2014) study and it even using the same science-based games for the learners to trial. In later study three middle schools are used with roughly 366 learners surveyed and observed; the data once again being a blend between quantitative and qualitative. The study presented similar results as the researchers found that learners were more engaged with video game-centred activities.

Akpinar & Aslan (2015) is also focussed upon how game-based activities can support learning within his curriculum area; with the argument that probability mathematics can be taught through teaching computer programming. This study focussed upon 18 fifth grade and 12 sixth graders; the school itself did not judge learners based upon ability so there was a range of individuals within this focus group. Progressive Achievement Tests (PATs) were collected one week before the first digital programming activity; learners would then be progressing towards using the programming tool: Scratch. The Scratch sessions would be broken up with *30 min of hands-on Scratch programming instruction and 50 min of developing games* (Akpinar & Aslan, 2015). The activities then progressed towards learners being given four different programming tasks over a 5 week period that led to the final post-test assessment. At the end of the study the PAT scores were compared using both Cohen’s d values and Wilcoxon signed rank test to evaluate the change in student achievement. As a result of the intervention learners now had a predominantly positive achievement rate, when prior they had been working below the national average.

**Conclusion**

The rising number of households with digital devices provides a convincing case for one to one digital access within schools; learners voice a need for a greater connection between technology use at home and at school. The implementation of one to one digital initiatives within school has proven to have a positive effect on reading and writing skills for learners. There are also further ways of expanding our way of perceiving digital literacy that can aid learning. Furthermore the process of interactive apps, video game-based learning, and computer programming are new initiatives that have proven to heighten learner engagement and, in some instances, achievement in Science, technology, engineering and mathematics (STEM) subjects. Digital technology stands to provide a lot of benefits to education but can only be implemented effectively through learner self-belief and taking some risk.

**References**


