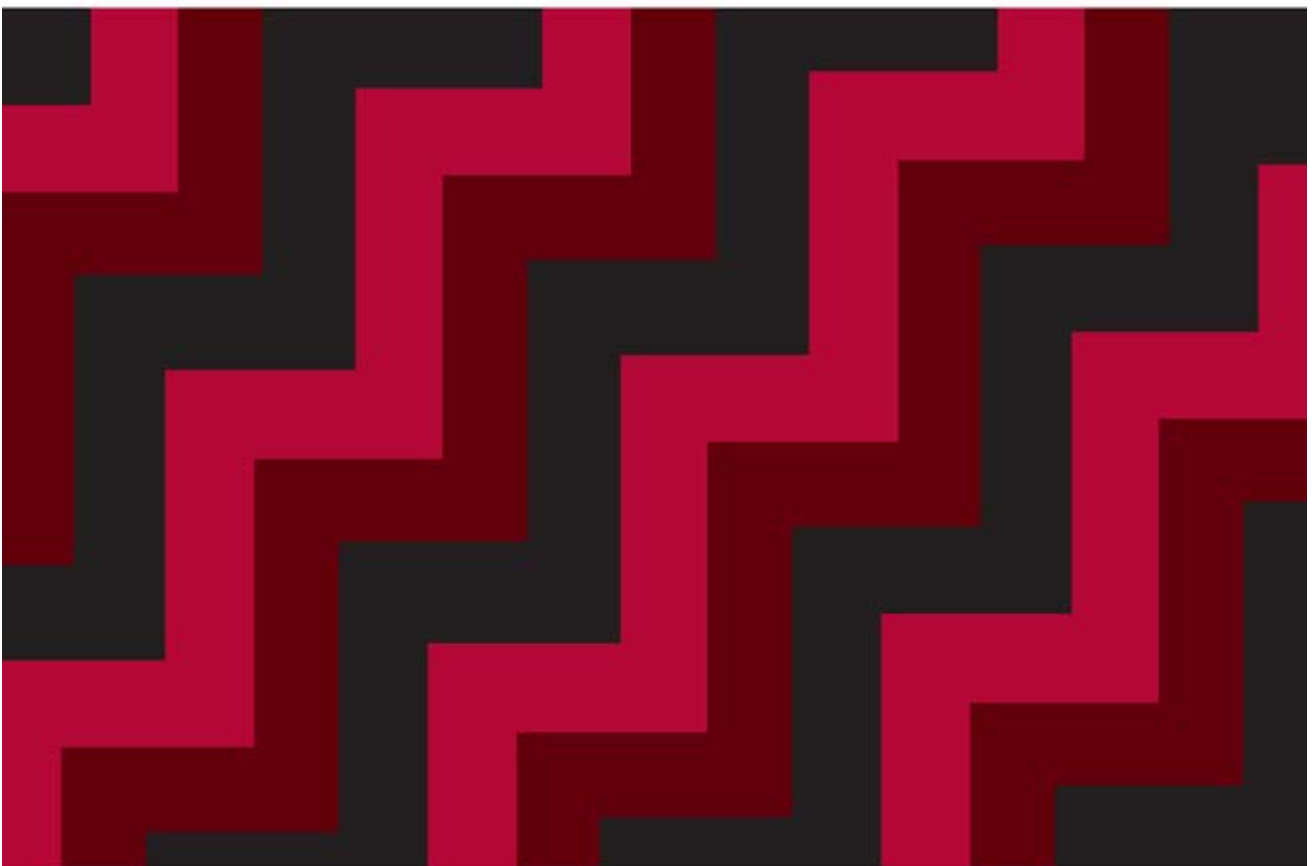


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Journal of Initial Teacher Inquiry

Contemporary Teaching and Learning Issues



Journal of Initial Teacher Inquiry

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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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Editorial

Welcome to the fourth issue of the *Journal of Initial Teacher Inquiry*. The journal is a celebration of inquiry-based research as undertaken by Initial Teacher Education (ITE) students completing the intensive, one-year Master of Teaching and Learning (MTchgLn) programme at the University of Canterbury, Christchurch, New Zealand. The MTchgLn programme *whakataukī* (proverb) resonates the values and aspirations we hope to instill in our ITE students as they embark on their own lifelong educational journeys: *Ahakoā he iti, he pounamu* – Although it is small, it is greenstone.

The programme broadly emphasises professional inquiry, and aims to nurture the important skills of critical analysis and reflection in regards to our student teachers' practice experiences, with the ultimate objective being to support and improve *ākonga* (learner) achievement. Given that pre-service or beginning teachers often have many questions about various aspects of contemporary education practices, as one of their programme outcomes, they are tasked with exploring an area of practice of interest to them, hence, the overarching theme of this journal being *contemporary teaching and learning issues*. In other words, by using a research-informed approach to inquiry, our student teachers need to conduct a critical literature review of a topic in education, typically an aspect that has puzzled them; implies a dilemma of some kind; poses a problem to be solved etc., one which has emerged from their coursework and practice experiences as beginning teachers.

Although the number of articles (seven) in this volume are fewer than in past issues, several contemporary themes are nonetheless represented. The themes follow on from several of those presented in the previous (2017) volume, themes that were drawn from the Bolstad et al. (2012) report. They are broadly organised as follows:

- Equity, diversity, and inclusivity
- Partnerships and relationships
- The role of new technologies

Equity, Diversity, and Inclusivity

In the first article, Marshall looks at gender and sexuality as performed in a way that does not accord with the prevailing heterosexual norms of society. Given that gender and childhood sexuality are socially constructed, it stands to reason that students who do not adhere to particular societal norms may run the risk of being excluded from learning environments, thereby negatively affecting these students' self-identity. An awareness and understanding of queer theory places teachers on a positive trajectory to facilitating a more inclusive learning environment. She presents several approaches that teachers can employ to hopefully promote inclusivity in their classrooms.

Similar to many education systems worldwide today, a cornerstone of contemporary education in Aotearoa New Zealand is the incorporation of Indigenous (Māori) knowledge in what is still an environment predominantly

oriented in favour of Western knowledge. Swan challenges us on this score, by suggesting that the continued silencing of traditional Māori knowledge is tantamount to epistemic racism, which has at its core, the erosion of certain peoples' capacity to be human. What counts as valid knowledge is something we are encouraged to think upon as we read her article. Her article not only identifies challenges, but also considers aspects of how Indigenous and Western knowledge might be better integrated into the education system.

Partnerships and Relationships

Place-based learning (PBL) has an experiential focus, and links teaching and learning to the communities within which education is situated. Kerrigan presents an account of PBL and successful educational outcomes as being a function of strong partnerships, both within schools, and between schools and the wider community. Authentic, real-world learning experiences are key to the success of PBL. To this end, she identifies possible implications for teachers when incorporating a PBL approach into their teaching practice.

The role of parental involvement on student achievement is widely acknowledged (see, for example, Wilder, 2014). Millar tackles this important topic by looking at two different types of parental involvement applicable to Aotearoa New Zealand, the role of socioeconomic status, the challenges faced by minority and immigrant parents (those who are often left behind), family dynamics, and strategies to improve parental involvement across the board. Her synoptic review helps to put into focus a number of key issues in our contemporary understanding of the role parents play in their children's educational outcomes.

Shaw looks at the importance of school-community partnerships in shaping not only successful student outcomes, but also evolving student needs, the latter extending beyond what is typically associated with what happens in the classroom. A future-focused approach to education equips students with the necessary skills, knowledge, attitudes and values for them to engage in lifelong learning as active citizens of their communities. In addition to the types of school-community partnerships, she also considers possible implications of successful partnerships and several key challenges.

The Role of New Technologies

In a day-and-age of rapid technological progress, the importance of information and communications technology (ICT) integration into the classroom practice of (pre-service) teachers cannot be overstated. Hayes presents an account which examines three aspects of pre-service teachers' self-efficacy in this regard: technological, pedagogical, and content knowledge (TPACK) acquired through ITE; schools and school communities playing an important role in the professional development of teachers, especially in lower socioeconomic communities, and pre-service

teachers must nurture an open-minded willingness to adopt and integrate new technologies into their classroom practice.

Lastly, Moratti gives an applied account, by looking at the effectiveness of video games, simulations, and virtual reality in the Science classroom. Given the rapid advancement in technology in more recent times, schools are increasingly trying to incorporate ICT into their respective curricula (e.g., science education). Although there are numerous benefits from this approach, the literature does not necessarily suggest that the incorporation of ICT has advantages over more traditional teaching methods, but that learning gains are more closely tied to the teacher's pedagogical use of technology.

Teaching as inquiry is an important part of one's teaching practice. This is no different for our student teachers and ITE graduates, who demonstrate in this journal compilation, a high level of engagement with topics that have contemporary relevance to the field of education. All seven articles explore important aspects of teaching practice, and model for us the way in which lifelong learning should guide our journeys as teaching professionals. To each of you we say: *Ngā mihi maioha*.

Mark Millin and Mistilina Sato

Associate Editors

References

- Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012). Supporting future-oriented learning and teaching: A New Zealand perspective. Wellington, New Zealand: New Zealand Council for Educational Research Press. Retrieved from <http://www.educationcounts.govt.nz/publications/schooling/109306>
- Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377-397. <http://dx.doi.org/10.1080/00131911.2013.780009>

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Equity, Diversity, and Inclusivity – Queer Theory: Gender Diversity and the Notion of Childhood Sexuality

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Abstract

Social inequalities in society are being filtered down into education, limiting the possibility for inclusion, equity, and celebration of diversity for all students (Bolstad, Gilbert, McDowall, 2012). One area of inclusion that limits students getting an equitable opportunity in education is that of those who perform gender and sexuality against the heteronormative society. My literature review looks at why teachers need to be aware of the social constructs of gender and childhood sexuality. Both of these elements are socially constructed, and have implications for many students' self-identity. By understanding and implementing approaches of queer theories and other teacher practice strategies, learning environments will become more inclusive, equitable and diverse for all.

Keywords: *Gender, childhood sexuality, heteronormativity, identity, inclusive education*



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Introduction

Gender, heteronormativity and children's sexual identity are areas of our society that often have implications for our classrooms (Duke & McCarthy, 2009). However, throughout my University of Canterbury Master of Teaching and Learning qualification, which focuses on equity, diversity and inclusivity, this topic was not necessarily explicitly addressed or acknowledged within our lectures. Therefore, for my educational peers and I to teach in effective learning environments, these areas need to be informed and addressed so we can construct a curriculum around a culture of belonging that acknowledges the fixed constants of gender and sexuality (Duke & McCarthy, 2009). These three areas intertwine within Western society in education, and young primary students are modelled into acting their gender based on sexuality. Therefore, the conception of childhood innocence is produced out of heteronormativity and gender performativity societal ignorance. The Ministry of Education states that the New Zealand Curriculum applies to "all students irrespective of their gender or sexuality" and "the term students is used throughout in this inclusive sense" (Ministry of Education, 2007, p. 6). Thus, the need to be inclusive of all students is part of the curriculum we teach, and is an essential aspect for teachers to understand. Yet it is an area that still needs some comprehension among many teachers (Blaise & Taylor, 2012). Queer theory is a concept that gender and sexuality are intertwined, and have damaging effects on students. Blaise and Taylor (2012) encourage teachers to analyse gender and sexuality through a queer theory lens to promote students' exploration of gender. By using queer theory alongside other teaching strategies, teachers can facilitate a more equitable, diverse and inclusive environment. The early childhood curriculum, *Te Whariki*, is constructed to filter into the New Zealand Curriculum as the two curricula are built to work

alongside each other to help facilitate students' learning (Ministry of Education, 2007, 2017). Therefore, some of the articles used in this literature review are based around early childhood education (ECE) as the working theories children learn in ECE centres, influence their behaviours and attitudes in a primary setting (Sylva, 2010).

Gender Limitations Implications

Gender norms, stereotyping, and expectations construct a student's self-identity (Blaise, 2010; Blaise & Taylor, 2012; Duke & McCarthy, 2009; Rands, 2009). Blaise and Taylor, 2012 analyse the debate of nature versus nurture when considering the teacher's role in gender play, and whether a student's adoption of gender is based on their biological sex or their socialisation. Many teachers believe that students naturally gravitate towards gendered resources. However, Blaise's (2010) nurtured perspective of gender, reiterates that children determine how to act like either a female or a male based on social influences. Media, teachers, parents, resources, and activities influence students to perform their gender in specific ways, or else they encounter being 'othered' and patronised (Blaise, 2010; Blaise & Taylor, 2012; Rands, 2009; Duke & McCarthy, 2009). Therefore, as a teacher, we influence students to behave in different ways based on their biological sex, by using statements like 'boys will be boys' or assuming only girls create gossip. Blaise and Taylor (2012) analyse the way these influences impact students' gender expression, forming the concept of gender performativity. Furthermore, perceiving gender as a verb, with students acting their gender, is based on making sense of what it means to be a 'boy' or a 'girl'.

Rands (2009) inquired into the impact of gender performativity on transgender students in education, who

perform as the opposite gender to their biological sex. Transgender students are often left out of the inclusive educational system, due to gender privilege and oppression. Rands (2009) explains cisgender privilege as the vocabulary we use, such as directing the students to make a 'boys' and a 'girls' line, undermines transgender students participating in the instruction, through outing the students as being 'abnormal'. The Gay, Lesbian, and Straight Education Network (GLSEN) (2009, cited in Rands, 2009) showed that, statistically, almost all transgender students had been verbally harassed and more than half faced physical abuse by their peers, creating an unsafe environment where transgender students are inhibited in their learning if their safety is constantly being under threat. Therefore, teachers need to critically reflect on their imprint on children's gender development (Blaise & Taylor, 2012). Teachers need to consider that any form of gender stereotyping reinforces students, schools, and society to act within a heteronormative environment.

Hyland (2010) supports this argument of gender impacting female empowerment within schools, as society gives males hierarchy to 'perform' gender in a dominating form. Treating all forms of gender differently, creates oppression from an early age, by limiting students' ability to explore their identity development and learning effectively because of the limitations of gender performativity. The Education Council's (2015) *Graduating Teacher Standards* states that the responsibility of professionals is to have a range of knowledge around pedagogy, human development and learning. Thus, the Ministry of Education gives teachers the responsibility to acknowledge implications aligned with the social construction of gender, which has a relevant theoretical basis for shaping teacher actions and language across students' development and learning.

The Notion of Childhood Sexuality

Students' sex education, knowledge and identity is a controversial topic amongst teachers and families (Blaise, 2010; Blaise, 2013; Blaise & Taylor, 2012; Duke & McCarthy, 2009; Geasler, Dannison & Edlund, 1995). Childhood sexuality is perceived by teachers and families as an oxymoron, especially for children under the age of eleven (Geasler et al., 1995). Blaise (2013) conveys the implications for children's sexual identities, and how moral panic erupts when children are represented as sexual human beings, alarming adults to paedophilia discourses. Davies and Robinson (2010), and Surtees (2008, cited in Blaise, 2013) looked at how parents and educators shut down or avoid children's expressions of sexuality, due to the threat of distorting childhood innocence. However, by stereotyping children as being asexual, innocent, and naïve puts children in vulnerable situations, causing anxiety for when children do express sexual interests, and potentially increasing elements of negative childhood sexuality outbursts (Blaise, 2013).

When researching early childhood centres, Blaise (2010) found that sexual conversations/discussions about kissing the opposite sex were had and acted out amongst children, but this subject was considered taboo for children around adults, as kissing was only 'appropriate' for marriage. Another boy in the study impersonated Spiderman's girlfriend's walk, depicting her sexuality and his sexual desire. These examples show that

children are sexual human beings who need to be educated on what healthy sexuality looks like. However, sex education for junior students is often pushed to one side by teachers because of the uncomfortable atmosphere and lack of knowledge. Furthermore, teachers do not want to feel responsible for teaching children sex education against parental wishes. Therefore, the responsibility for sex education and openly discussing sexual discourse falls on families to do so with their children (Geasler et al., 1995). But, parents on average are only conducting one basic conversation to support years of development instead of addressing children's questions as they appear.

Geasler et al. (1995) conducted a study of twenty-eight parents' limitations when it came to teaching their children sex education. Parents feared the age of the child and appropriate content for their maturity level; discourses of childhood innocence and indirectly stereotyping children as asexual were evident throughout the study. Social factors such as the influence of the media and our sexualised society were common fears that parents felt children were overly exposed to. The gender of both the parents and children determined the comfort level of parents openly supporting children to explore their sexual identity. Furthermore, children who engaged in genital stimulation or masturbation was accepted more by mothers and supported more in boys. But, when girls participated in genital stimulation, the reactions of families were that of disgust and leaving the room. These findings show how gendered norms are placed on children from a toddler age (Blaise & Taylor, 2012). With families negating responsibility for guiding their children through sexual education, teachers need to be more supportive of parents.

Heteronormativity in Schools

Heteronormativity creates an inequitable environment based on society's assumption that all students, families, and the community are heterosexual (Blaise, 2010; DePalma & Atkinson, 2010; Duke & McCarthy, 2009; Rands, 2009). Heteronormativity is a social-cultural bias that reinforces heterosexual expectations and gender roles (MacArthur, Higgins & Quinlivan, 2012). Furthermore, Edmunds (2016, cited in Astall et al., 2016), evaluated how schools have unsafe environments for students due to teachers promoting heteronormative norms. Gunn and Surtees (2011) analysed the inclusion of thirty-three same-sex parents within an early childhood centre. The emergent common themes of homophobia, exclusion, and heteronormativity were promoted because of teacher ignorance. The results of this study showed the complications of being a diverse family unit, as children faced homophobic bullying and parents were forced to be discreet due to the commonly mistaken identity of being, for example, their child's aunt or grandmother. However, this study also showed the importance of relationships, as some teachers recognised and discouraged heteronormativity by supporting diverse families.

Duke and McCarthy (2009) looked at thirty-one relevant articles that analyse the reinforcement and reproduction of heteronormativity within early childhood centres and schools. Their study found that in forty-five percent of the articles, teachers did not feel comfortable acknowledging diverse lesbian, gay, bisexual, and transgender (LGBT) learners; five articles found the schooling environment showed no positive

LGBT whanau representation; four articles found that students who contested the foundations of heteronormativity, often experience verbal and physical abuse. These findings show how the biased opinions of professional teachers negatively impact the identity of LGBT students in a heteronormative schooling system.

DePalmer and Atkinson (2010) support the complications of institutional heteronormativity that filters into primary school education. Sexuality within primary schools is a controversial topic because teachers fear including LGBT individuals – in person or in character – as this might signal being supportive of teaching particular sexual discourses to students at a young age (DePalmer & Atkinson, 2010). Thus, the popular belief that children do not feel sexual desires, or do not have the ability to comprehend diverse relationships, creates a society where only being heterosexual is encouraged. Heterosexual couples are depicted across the curriculum, without the exposure to LGBT individuals, families, and communities, creating the stigma that LGBT people are ‘abnormal’, whilst the heterosexual matrix, depicting masculinity, femininity, and heterosexuality are promoted as the only representation of ‘normal’ development in society (Blaise & Taylor, 2012). Hyland (2010) acknowledges that reinforcing the dominant heteronormative culture gives power to the privileged cisgender and heterosexual groups of students, families, and communities while undermining the groups that are affected. Whether directly or indirectly using language and actions that reinforce heteronormativity, it results in undermining students’ ability to express their diverse identities.

Unpacking Queer Theory

Queer theory awareness needs to be facilitated towards teachers when considering gender and sexuality (Blaise & Taylor, 2012; DePalma & Atkinson, 2010; Loutzenheiser & MacIntosh, 2004). Blaise and Taylor (2012) define queer theory as the ‘marriage’ of gender and sexuality discourses. Butler (1999, cited in Blaise & Taylor, 2012), analyses the association between ‘natural’, ‘normal’, and heterosexual sexuality, and how they influence gender performativity thereby impacting children’s identity development. Although the assumption can be made that queer theory is only for LGBT teachers, families, or communities, queer theory is not the promotion of a queer sexualisation, but instead critically analyses the foundation of oppression in the form of gender and sexuality discourses (Blaise & Taylor, 2012). Queer theory, similar to the notion of childhood sexuality, makes teachers often feel unconformable with classifying students as understanding sexuality as discussed above. Thus, in order to normalise childhood sexuality, teachers need to nurture a healthy sense of self amongst their students, and analyse children’s gender construction through a queer theory lens, instead of holding the viewpoint that there is a ‘normal’ characteristic that is considered appropriate for biological male or female students. For example, Blaise (2005, cited in Blaise & Taylor, 2012) examined the impacts of gender, heteronormativity, and sexuality, and how girls formulated their identity around looking beautiful, showing the heterosexual matrix as regulating girls to focus on their gender performativity by always looking ‘presentable’ with the use of makeup, which imposes an expectation on females.

Loutzenheiser and MacIntosh (2004) present gender performativity as fluid, therefore, implying it can be altered through the teacher’s actions, language and indirect messages, which in turn means students’ working theories and ideas about queer citizenship can be questioned. Boldt (1996, cited in Blaise & Taylor, 2012) emphasises the need for educators to firstly teach with a reflective queer theory viewpoint in mind. In other words, for teachers to critically analyse their imprint on students, a queer theory perspective is needed, with reflection about how our stances on gender and sexuality influence the different ways we treat boys and girls. For instance, when reflecting on our teaching pedagogy, we can determine the implication for our ako and change our practices to be more inclusive. DePalma and Atkinson (2008, cited in DePalma & Atkinson, 2010) reiterate the importance of reflection through their *No Outsiders project* of teachers using queer theory in practice. Gender oppression for the biological sexes, heteronormativity, and complications around children’s sexual identities arose, when teachers reflected on their prejudices and the effect this had on their students. Through using a queer theory perspective and questioning children about their gender performativity, teachers found they gained confidence in creating a classroom environment where heteronormativity played less of a role (Blaise & Taylor, 2012). Therefore, by taking action and reflecting on your stance as a teacher, a knowledge and application of queer theory promotes a more diverse, equitable and inclusive learning environment.

Teaching Strategies

In order to facilitate a more inclusive learning environment, teachers need to be made aware of strategies that contest widely held views or stereotypes about gender, heterosexuality, and the oppression of childhood sexuality (Blaise, 2010; Blaise & Taylor, 2012; Duke & McCarthy, 2009; Rands, 2009). Three approaches can be adopted. Firstly, to create a culture of belonging within the classroom, one needs to analyse the heteronormativity within the learning environment (Blaise, 2010). By critically examining the students’ behaviours, actions, and language they use, one can acknowledge the everyday heteronormativity and gender performativity that influences the students. Documenting the students’ knowledge helps to understand where students are at and what one needs to work on as a class together. By recognising the significance of gender and heteronormativity in the classroom, one can engage in healthy conversations about these issues. Secondly, relationships are a significant factor in helping promote gender and healthy sexual development, while challenging heteronormativity (Duke & McCarthy, 2009). Geasler et al. (1995) found that parents want guidance in educating their children about sex and sexuality, thus, the need for teachers to create trustworthy, reciprocal and honest relationships with parents so that they can have conversations openly. Blaise and Taylor (2012) examined how discussions with students about their families, and how their aunt might be queer or their father might be a nurse, breaks down stereotypes. When students can relate to someone in their lives who does not live within the stereotypes of gender or heterosexuality, students can better comprehend their actions or language to be offensive, thus, the need to have a meaningful relationship with students. Reciprocal relationships allow teachers to openly challenge students’ gender performativity and heteronormative actions, and

answer their sexual questions while educating families' and co-workers' fixed theories of oppression (Duke & McCarthy, 2009). Thirdly, having literature that debunks sexist stereotypes as having strong male and female roles while challenging homophobia is essential (Duke & McCarthy, 2009). When teaching healthy sexual development, teachers need to use the correct terminology for male and female sexual organs as well as letting the children have access to human anatomy books. Duke and McCarthy (2009) also recommend answering students' questions about sexuality and sex without embarrassment or discretion, but rather being open and honest. Furthermore, teachers should not be alarmed when students show interest in masturbation or genital stimulation, as they are just expressing an interest in sexuality. Duke and McCarthy (2009) emphasise the importance of gender privilege being taught alongside other advantages (e.g., white privilege), so too heteronormative oppression should be acknowledged with as much authenticity in order to create a respectful environment for all.

Conclusion

It is important to consider gender, heteronormativity, and childhood sexuality as areas to acknowledge within the teaching environment. The New Zealand Curriculum reiterates the responsibility of teachers to deliver an inclusive curriculum to all students, despite gender and sexuality. However, this is a challenging implication due to the power of gender performance and heteronormativity (Ministry of Education, 2007). Although Blaise and Taylor's (2012) account of queer theory is located within an ECE context, their findings are still relevant to a primary setting because children's experiences with heteronormativity influence the way they perform their gender, being active participants in their own gender development. Therefore, there is a need to challenge students' working theories of what it means to be a 'boy', 'girl', or gender diverse at all ages. Gender is mostly nurtured and socially constructed because teachers and other social forces influence students' identity development (Blaise, 2010). For example, living out of gender norms such as being transgender, puts a student at risk of bullying through verbal and physical abuse (Rands, 2009). Heteronormativity is based around a social-cultural bias that reinforces heterosexuality in influencing gender roles (MacArthur et al., 2012). Gunn and Surtees (2011) found that diverse LGBT families had to be discreet about their lives due to homophobia, bullying and exclusion. Duke and McCarthy (2009) and DePalma and Atkinson (2010) showed that teachers felt uncomfortable acknowledging LGBT individuals, families, and communities for a range of reasons, but ignorance creates implications for diverse students showing the real effects of heteronormativity. Childhood sexuality is perceived as negative due to adults seeing children as asexual, innocent and naïve. However, shutting down children's sexual expressions creates anxiety and potentially increases the incidence of negative sexuality outbursts, meaning the need for teachers to address children's sexual working theories (Blaise, 2013). Geasler et al. (1995) show that teachers need to support parents to discuss and support their children's sex and sexuality education. Queer theory helps teachers to reflect on their perspectives of gender and sexuality, and the impacts their teaching identity has on their students' development, as well as teachers using a queer theoretical lens to examine their students' behaviours, actions, and language towards gender and sexuality. Lastly, teachers

need to implement strategies to create an equitable and inclusive classroom for a diverse range of students. These strategies include engaging in conversations with students that relate to their lives, establishing relationships with families and communities, and providing literature that debunks stereotypes and teaches positive sexual health education.

References

- Blaise, M. (2010). Kiss and tell: Gendered narratives and childhood sexuality. *Australasian Journal of Early Childhood*, 35(1), 1-9. <https://doi.org/10.1177/183693911003500102>
- Blaise, M. (2013). Charting new territories: Re-assembling childhood sexuality in the early years classroom. *Gender and Education*, 25(7), 801-817. <https://doi.org/10.1080/09540253.2013.797070>
- Blaise, M., & Taylor, A. (2012). Research in Review: Using Queer Theory to Rethink Gender Equity in Early Childhood Education. *Young Children*, 67(1), 88-96. <https://eric.ed.gov/?id=EJ975506>
- Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012). *Supporting future-oriented learning & teaching: A New Zealand perspective*. Wellington, N.Z: Ministry of Education. <https://www.educationcounts.govt.nz/publications/schooling/supporting-future-oriented-learning-and-teaching-a-new-zealand-perspective>
- Compton, J., Buick, D., Bodger, G., White, A., Edmunds, C., FitzGerald, B., Reveley, E., van Gelder-Horgan, K., Wilson, D., Dickson, M., Thomas, J., & Pavelka, A. (2016). *Journal of initial teacher inquiry*, volume 2 November 2016. University of Canterbury, College of Education, Health and Human Development. <http://dx.doi.org/10.26021/847>
- DePalma, R., & Atkinson, E. (2010). The nature of institutional heteronormativity in primary schools and practice-based responses. *Teaching and Teacher Education*, 26(8), 1669-1676. <https://doi.org/10.1016/j.tate.2010.06.018>
- Duke, T., & McCarthy, K. (2009). Homophobia, Sexism, and Early Childhood Education: A Review of the Literature. *Journal of Early Childhood Teacher Education*, 30(4), 385-403. <https://doi.org/10.1080/10901020903320320>
- Education Council. (2017). *Our code our standards: Code of professional responsibility and standards for the teaching profession: Ngā tikanga matatika ngā paerewa: Ngā tikanga matatika mō te haepapa ngaiotanga me ngā paerewa mō umanga whakaakoranga*. Wellington, New Zealand: Learning Media. <https://teachingcouncil.nz/assets/Files/Code-and-Standards/Our-Code-Our-Standards-Nga-Tikanga-Matatika-Nga-Paerewa.pdf>
- Geasler, M., Dannison, L., & Edlund, J. (1995). Sexuality education of young children: Parental concerns. *Family Relations*, 44(2), 184-188. <https://doi.org/10.2307/584807>
- Gunn, A., & Surtees, N. (2011). Matching parents' efforts: How teachers can resist heteronormativity in early education settings. *Early Childhood Folio*, 15(1), 27. <https://doi.org/10.18296/ecf.0154>
- Hyland, N. (2010). Social Justice in Early Childhood Classrooms: *What the research tells us*. *Young Children*, 65(1), 82-90. <https://eric.ed.gov/?id=EJ898681>
- Loutzenheiser, L., & MacIntosh, L. (2004). *Citizenships, sexualities, and education. Theory into Practice*, 43(2), 151-158. https://doi.org/10.1207/s15430421tip4302_9
- MacArthur, J., Higgins, N., & Quinlivan, K. (2012). Children's and young people's social participation. In S. B. Carrington & J. MacArthur (Eds.), *Teaching in inclusive school communities* (pp. 235-266). Milton Qld: John Wiley & Sons Australia. <https://ir.canterbury.ac.nz/bitstream/handle/10092/12841/Edmunds%20Journal%20of%20Initial%20Teacher%20Inquiry%202016.pdf?sequence=1>
- Ministry of Education. (2007). *The New Zealand Curriculum for English-medium teaching and learning in years 1-13*. Wellington: Learning Media. <https://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum>
- Ministry of Education. (2017). *Te Whāriki: He Whāriki mātauranga mō ngā mokopuna o Aotearoa Early childhood curriculum*. Wellington, New Zealand: Learning Media. <https://www.education.govt.nz/early-childhood/teaching-and-learning/te-whariki/>
- Rands, K. (2009). Considering Transgender People in Education: A Gender-Complex Approach. *Journal of Teacher Education*, 60(4), 419-439.

<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1067.2256&rep=rep1&type=pdf>

Sylva, K. (2010). *Early childhood matters: Evidence from the effective pre-school and primary education project*. London: Routledge.

Challenging Epistemic Racism: Incorporating Māori Knowledge into the Aotearoa New Zealand Education System

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Abstract

The Aotearoa New Zealand education system is based largely on Western knowledge, and, consequently, all other epistemologies are silenced, which results in epistemic racism. Epistemic racism disregards certain peoples' capacity to produce or learn knowledge, denying their full humanity. To challenge this dehumanisation, researchers argue that Indigenous Māori epistemologies need to be incorporated into the education system as equally valid to Western knowledge. Although little research has been done in this area, several frameworks and initiatives have been developed to integrate Indigenous and Western knowledge. They identify some possible supporting factors including community involvement and the availability of Indigenous knowledge resources. Several challenges are also identified, including how to remove the marginalisation from one knowledge system without subordinating another. Epistemic racism is a complex problem that will require the transformation of our education system. However, the first step is to challenge one's ideas about what counts as valid knowledge.

Keywords: *Epistemic racism, Māori knowledge, Indigenous knowledge, knowledge diversity*



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Introduction

Diversity is increasingly emphasised in 21st century education (Bolstad, Gilbert, McDowall, Bull, Boyd, & Hipkins, 2012). However, Bolstad et al. (2012) have found that this diversity is often only seen in cultural terms. Diversity of knowledge is almost non-existent in Aotearoa New Zealand schools. Instead, our education system is dominated by Western knowledge that positions all other knowledges, including Indigenous Māori epistemologies, as lesser, resulting in epistemic racism and dehumanisation (Cooper, 2012). However, Māori are guaranteed the protection of their knowledge as a taonga (treasure) under The Treaty of Waitangi (Orange, 2004). It is therefore essential that we challenge epistemic racism by positioning Māori epistemologies as equally valid to Western knowledge in the Aotearoa New Zealand education system (Macfarlane, Macfarlane, & Gillon, 2015). Until this is accomplished many Māori students will experience dehumanisation during schooling. This literature review begins by discussing epistemic racism, and then examines several frameworks and initiatives for integrating Indigenous and Western knowledge. The problem, Cooper (2007) asserts, is to incorporate Māori epistemologies into education in a way that truly challenges their current marginalisation.

Epistemic Racism

In Aotearoa New Zealand, contemporary education is informed largely by the dominant Western knowledge,

resulting in a Eurocentric education system that has silenced Māori epistemologies (Macfarlane et al., 2015). This epistemic domination began with the colonisation of this country and has resulted in epistemic blindness towards Māori and other non-Western knowledges (Andreotti, Ahenakew, & Cooper, 2011; Harrison, 2005). Santos (as cited in Andreotti et al., 2011) calls this 'abyssal thinking' where social reality is classified as on either 'this side' or 'the other side of the abyssal line' (p. 41). The segregation is to such an extent that "the other side of the line" (Andreotti et al., 2011, p. 41) ceases as reality, becoming non-existent. Thus, Western knowledge is positioned as truth on "this side of the abyssal line" (p. 41) while any epistemologies that do not meet Western criterion are banished to 'the other side' where they are reduced to 'false' knowledge, becoming merely opinions or beliefs (Andreotti et al., 2011). Consequently, a vast range of non-Western epistemologies are neglected and thus destroyed. As knowledge on "the other side of the abyssal line" (p. 41) is reduced to 'false'; not-knowledge, Western epistemologies become the sole source of knowledge, and are thus positioned as universal and culturally neutral (Andreotti et al., 2011).

Maldonado-Torres (2004) argues that positioning non-Western epistemologies as 'false' knowledge results in epistemic racism. "Epistemic racism disregards the epistemic capacity of certain groups of people. It may be based on metaphysics or ontology but its results are nonetheless the same: the evasion of the recognition of others as fully human beings" (Maldonado-Torres, 2004, p. 34). The ability to learn

or create knowledge is characteristic of all humans. Therefore, denying someone's capacity to learn or produce knowledge, denies their full humanity. Thus, Westerners are positioned as normative, possessors of knowledge while everyone else is positioned as inferior possessors of culture (Battiste, 2002; Cooper, 2012). This epistemic racism is perpetuated in the Aotearoa New Zealand education system and many students find themselves positioned as inferior possessors of culture (Cooper, 2012). Gordon (2000) argues that this can result in double consciousness where one sees oneself through the perspective of the colonised and the coloniser. The tension of sustaining these conflicting views causes uncertainty towards one's self-worth (Gordon, 1995). Therefore, it is likely that Māori and other non-Western learners will begin to believe the societal perception that they are deficit learners, who lack epistemic capacity, an image that harms their success (Turner, Rubie-Davies, & Webber, 2015). Battiste (2002) argues that to counter epistemic racism, the challenge is to create an education system that respects the epistemologies and pedagogies of both Indigenous and Western cultures. This challenge calls for substantial rethinking of education.

Inclusion of Indigenous Epistemologies in Education

Although it is rare, some schools in Aotearoa New Zealand are working to incorporate Indigenous knowledge into their curriculum. Harrison (2005) discusses the incorporation of Waikato-Tainui epistemologies into Te Wharekura o Rakaumangamanga, focusing on their development of a Year 13 course based solely on Waikato-Tainui knowledge. Rakaumangamanga is a decile one, Māori-language immersion school for students in Year 1 to Year 13. It is located in Huntly and many of its students are descendants of the Waikato-Tainui tribe. Two researchers (Harrison and Papa) have prior relationships with the school, Papa being a history teacher in their secondary unit. Their discussion, in collaboration with the school's Runanga, is based on prior research as well as interviews with staff and some former students. According to Harrison (2005), when Rakaumangamanga was established, the school's focus was on revitalising Māori language. Limited resources meant that their initial emphasis was on translating English resources, resulting in a curriculum that was, primarily, a translation of the mainstream, Western-dominated curriculum. According to Cooper (2007), this translated curriculum is common throughout Māori-language immersion schools, and has led to Māori epistemologies being positioned in the curriculum, books and through what is said and unsaid as 'just stories' compared to the 'truth' of Western knowledge.

According to Harrison (2005), Rakaumangamanga staff, with the support of their community, began incorporating Waikato-Tainui epistemologies into the curriculum once confident in the school's Māori language instruction. They were fortunate that many Tainui tribal histories have been recorded over the years, providing a wide range of resources. Elders also visit the school to share their knowledge and Rakaumangamanga participates in tribal events at the local Waahi Marae (an important site of the King Movement) (Harrison, 2005). Harrison (2005) reports that the introduction of the National Certificate of Educational Achievement (NCEA) provided an opportunity for the school to align more

tribal epistemologies with the achievement standards and, in 2003, Rakaumangamanga developed a Year 13 NCEA course in Waikato-Tainui knowledge. Harrison (2005) argues that, while the school's incorporation of Waikato-Tainui epistemologies is unique, it is applicable to other schools with Waikato-Tainui students. They maintain, however, that urban schools will need to incorporate knowledge from multiple tribes to support their diverse students. Tribal epistemologies are clearly positioned as valid knowledge in Rakaumangamanga's Year 13 course. However, it is unclear from Harrison's (2005) research whether the marginalisation of Māori epistemologies is fully challenged in the school's other subjects. The Alaska Native Knowledge Network (ANKN) (as cited in Barnhardt, 2008) contends that it is by shifting from teaching Indigenous knowledge as a separate subject to teaching through Indigenous epistemologies that will challenge epistemic racism. However, Rakaumangamanga's efforts represent a first step towards repositioning Māori knowledge as worthwhile.

Two frameworks for integrating Māori and Western epistemologies are presented by Macfarlane et al. (2015). They argue for the need to create "an interdependent and innovative theoretical space where the two streams of knowledge are able to blend and interact" (Macfarlane et al., 2015, p. 52), thus promoting greater sociocultural understanding and improved outcomes for Māori. They use the analogy of a braided river, where the two separate streams of Western and Māori epistemologies converge to create new knowledge. The first framework, *Tō tātou waka* (Our canoe), requires educators to increase their cultural competency by learning about the Māori world (Macfarlane et al., 2015). Indigenous socialisation patterns and values are then investigated which, Macfarlane et al. (2015) argue, signals the importance of investigating Māori knowledge and cultural rationale. Macfarlane, Blampied and Macfarlane (2011) state that this information should be sought from multiple sources including kaumātua (elders) and kaitakawaetanga (professional consultants). The framework also investigates Western sciences and practice (Macfarlane et al., 2015). Thus, the *Tō tātou waka* framework 'blends' various knowledges together, both oral and written, Māori and Western, to guide holistic, evidence-based practice (Macfarlane et al., 2011).

Macfarlane et al.'s (2015) second framework, *He awa whiria* (braided river), "attempts to interrogate and integrate Western science and Indigenous Māori models of programme development and evaluation" (p. 64). In this framework, the two knowledge streams are seen as distinct (Ministry of Social Development, 2011). However, knowledge and evaluation methodologies from one stream can be applied to the other. The assumption is that when evidence from both streams is accepted into the developed programme, its efficacy will also be accepted. Macfarlane et al. (2015) argue that what is required for the success of either framework is a shift in mindset, where educators are willing to challenge their worldview. They assert that, while Western knowledge would not be lessened by these frameworks, Māori knowledge would also become positioned at the centre, free from epistemic racism. Both frameworks aim to support educators to integrate Māori epistemologies into their practice. They do not necessarily provide a model for an epistemically diverse

education system; however, they may be beneficial in developing that model.

Barnhardt (2008) describes an education restoration initiative in Alaska that also uses a converging streams metaphor to incorporate Indigenous knowledge into education. The Alaska Rural Systemic Initiative (AKRSI) was established in 1995, and while the context does differ to Aotearoa New Zealand, the initiative still offers valuable insights. The AKRSI believes that “[b]y shifting the focus in the curriculum from teaching/learning about cultural heritage as another subject to teaching/learning through the local culture as a foundation for all education, it is intended that all forms of knowledge, ways of knowing and worldviews be recognized as equally valid, adaptable and complementary to one another in mutually beneficial ways.” (ANKN as cited in Barnhardt, 2008, p. 132). To achieve this goal, the AKRSI has developed many diverse initiatives such as ‘Elders and Cultural Camps’ and the ANKN. ‘Elders and Cultural Camps’ involve students immersing themselves in a traditional camp environment with the instruction and guidance of elders (Barnhardt, 2008). Barnhardt (2008) argues that, when these camps are positioned as a central aspect of the school curriculum rather than an add-on as is commonly done, they become unique experiences with no textbook equivalent. Students are “able to immerse themselves in a new cultural milieu in a nonthreatening and guided fashion that allows them to set aside their own predispositions long enough to begin to see the world through other peoples’ eyes” (Barnhardt, 2008, p. 116).

Incorporating Indigenous knowledge into the curriculum, Barnhardt (2008) argues, calls for substantial rethinking, not only about curriculum content, but also how, when, where and who delivers it. With this in mind, the ANKN was established to catalogue the Native knowledge system to increase its availability to schools as well as to relax the structure of Western epistemologies to create space for local knowledge. The ANKN has done so by developing curriculum and pedagogical resources which are shared via a website and various publications (Barnhardt, 2008). Barnhardt (2008) argues that these readily available resources have given teachers the impetus to integrate Indigenous knowledge into their curriculum, and nearly 40,000 different people access the website each month. The goal of these AKRSI initiatives is to demonstrate that, by understanding the interactions of Western and Indigenous knowledges, the learning opportunities increase in depth and breadth for all students. According to Barnhardt (2008), while there is still a long way to go to achieve these goals, in the past decade, the academic performance of students in participating schools has increased, showing the efficacy of an education system grounded in local Indigenous knowledge. While these initiatives are based in Alaska, their success at integrating Indigenous epistemologies into the education system suggests they could provide a valuable model for similar initiatives in Aotearoa New Zealand.

Macfarlane et al. (2015) and Barnhardt (2008) both present frameworks that focus on blending Western and Indigenous epistemologies with the aim of challenging existing epistemic racism. However, the language they use to discuss these knowledges is inconsistent, occasionally positioning Indigenous knowledges as ‘cultural’ or ‘traditional’,

perpetuating abyssal thinking. As discussed above, since colonisation, Westerners have been positioned as normative possessors of knowledge and civilization who are inherently superior to those ‘others’ who possess culture and beliefs (Battiste, 2002). This binary of ‘true’ scientific knowledge and ‘lesser’ cultural knowledge is reflected in some of Macfarlane et al.’s (2015) language, particularly in relation to the *Tō tātou waka* framework which is defined as “a blending of clinical and cultural streams” (p. 62). Battiste (2002) argues that, if seen as knowledge, Indigenous epistemologies are often defined as ‘traditional knowledge’ which implies an old body of data that is relatively unchanged from generation to generation or as ‘local knowledge’ which positions Indigenous epistemologies merely as reliable data that modern (Western) science can use. Barnhardt (2008) utilises both the terms “traditional knowledge” (p. 131) and “local knowledge” (p. 117) in his work, referencing these ideas. Through this conflicting use of language, Barnhardt (2008) and Macfarlane et al. (2015) both inadvertently perpetuate the unequal positioning of knowledge which results in epistemic racism, despite their dual aims to remove prejudice against Indigenous knowledges.

A different approach to incorporating Indigenous epistemologies in education, is proposed by Andreotti et al. (2011). They discuss the inclusion of diverse knowledges in higher education, presenting a model of ‘epistemological pluralism’ which is informed by Santos’ (as cited by Andreotti et al., 2011) concept of an ‘ecology of knowledges’. This ‘ecology of knowledges’ is based on recognising the existence of multiple, diverse knowledges that are both autonomous and interconnected. Santos (as cited in Andreotti et al., 2011) argues that “[s]ince no single type of knowledge can account for all possible interventions in the world, all of them are incomplete in different ways [hence] each knowledge is both insufficient and inter-dependent on other knowledges” (p. 43). Thus, the ‘ecology of knowledges’ results in continual questioning and partial answers, providing a broader idea of what we know and do not know, but also an awareness that what is unknown by us may be known by others (Andreotti et al., 2011). Epistemological pluralism is necessary in an ‘ecology of knowledges’ and emphasises that each knowledge system is dynamic, interdependent and incomplete (Andreotti et al., 2011). Therefore, within this model, all knowledges are positioned as equally valid within their respective contexts (Cooper, 2007).

Andreotti et al. (2011) discuss several different models informed by Indigenous knowledges that support epistemological pluralism. One – informed by Māori epistemologies – is based on the metaphor of weaving a fishing net. Here, “ontologies are fishing grounds, epistemologies are fishing nets and the fish is the appropriate knowledge that will serve as nourishment for one’s community” (Andreotti et al., 2011, p. 47). To weave a functional fishing net, one needs relevant knowledge in various areas, including the diverse fishing grounds, necessary equipment and weather. One must also know what types of fish will fulfil the needs of one’s community. In other words, one must understand each knowledge as a system, their respective contexts, how they interact and how they are relevant and appropriate for one’s community. This metaphor describes epistemological pluralism in terms of the cross-fertilisation and combination of diverse fishing grounds (Andreotti et al., 2011). While this

framework challenges abyssal thinking and the epistemic racism it engenders, there remain many challenges in enacting it. Andreotti et al. (2011) identify several challenges including: translating Indigenous epistemologies into another language without changing their nature; identifying whose knowledge should be favoured in which context; incorporating Indigenous knowledge into an education system designed for a different knowledge system without institutionalising it; and finally, challenging epistemic racism without creating new abyssal divides in our society.

Conclusion

Little research has been conducted on epistemic racism or how to challenge it. However, the frameworks and initiatives reviewed here do identify several factors that support the inclusion of Indigenous epistemologies as valid knowledge in education. Understanding Indigenous knowledge was naturally identified as essential by all researchers. Andreotti et al. (2011) take this further, and argue that not just the content of Indigenous knowledge should be understood, but that the knowledge should be understood as a system as well. To be able to appropriately convey this knowledge, Andreotti et al. (2011), Barnhardt (2008) and Battiste (2002) argue that knowledge of Indigenous pedagogies is also required. Harrison (2005) in Aotearoa New Zealand and Barnhardt (2008) in Alaska found that resources on Indigenous knowledges were readily available in their respective contexts, and both attribute this as supportive to the success of the initiatives they studied. The Indigenous community, particularly elders, were also seen as an important source of knowledge and pedagogy by Harrison (2005), Barnhardt (2008) and Macfarlane et al. (2015). While these studies identified these factors as supportive, their lack conversely becomes detrimental to the successful positioning of Indigenous epistemologies as equally valid to Western knowledge.

Epistemic racism has become embedded in the Aotearoa New Zealand education system and in our thinking. It is essential that we work to challenge this dehumanisation by repositioning Māori epistemologies as worthwhile knowledge. However, the difficulty of doing so can be seen in the common positioning of Māori knowledge as just 'stories' in Māori immersion schools and in the terms Macfarlane et al. (2015) and Barnhardt (2008) occasionally use to discuss Indigenous epistemologies, terms that situate the knowledge as lesser, outdated or merely data to be analysed by Western science. Several questions will also need to be resolved, including: How can Māori knowledge, with its particular language, pedagogies and institutions be translated and incorporated into an institution designed for a different language, pedagogy and knowledge system? And, how can the marginalisation of Māori knowledge be challenged without causing other knowledges to be subordinated? The consensus is that challenging epistemic racism will require a transformation of our education system, but what form will that transformation take? Further research will need to be done to address these

issues and create an epistemically diverse curriculum as well as on the respective knowledge systems themselves, as is being done in Alaska by the ANKN. Challenging epistemic racism will be a complex and gradual process, but a first step that all educators can take is to challenge one's assumptions about what counts as valid knowledge.

References

- Andreotti, V., Ahenakew, C., & Cooper, G. (2011). Epistemological pluralism: Ethical and pedagogical challenges in higher education. *AlterNative: An International Journal of Indigenous Peoples*, 7(1), 40-50. <https://doi.org/10.1177/117718011100700104>
- Barnhardt, R. (2008). Creating a place for Indigenous knowledge in education: The Alaska Native Knowledge Network. In D. A. Gruenewald & G. A. Smith (Eds.), *Place-based education in the global age: local diversity* (pp. 113-136). New York, NY: Lawrence Erlbaum Associates.
- Battiste, M. (2002). *Indigenous knowledge and pedagogy in First Nations education: A Literature review with recommendations*: National Working Group on Education. https://www.afn.ca/uploads/files/education/24_2002_oct_marie_battiste_indigenouknowledgeandpedagogy_lit_review_for_min_working_group.pdf
- Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012). *Supporting future-oriented learning & teaching – a New Zealand perspective*. Wellington, N.Z.: Ministry of Education. https://www.educationcounts.govt.nz/_data/assets/pdf_file/0003/109317/994_Future-oriented-07062012.pdf
- Cooper, G. (2007). *He Aha Te Wāhi Ki Te Mātauranga Māori I Roto I Ngā Kura Kaupapa Māori? The Positioning of Māori Knowledge In Kura Kaupapa Māori*. University of Technology Sydney, Australia: Indigenous Studies and Indigenous Knowledge Conference ISIK, 11-13 Jul 2007.
- Cooper, G. (2012). Kaupapa Māori research: Epistemic wilderness as freedom? *New Zealand Journal of Educational Studies*, 47(2), 64-73.
- Gordon, L. R. (1995). *Fanon and the crisis of European man: an essay on philosophy and the human sciences*. New York, NY: Routledge.
- Gordon, L. R. (2000). *Existential Africana: Understanding Africana existential thought* (Vol. 1). New York, NY: Routledge.
- Harrison, B. (2005). The development of an Indigenous knowledge program in a New Zealand Maori-language immersion school. *Anthropology & Education Quarterly*, 36(1), 57-72. <https://dx.doi.org/10.1525/aeq.2005.36.1.057>
- Macfarlane, A., Blampied, N., & Macfarlane, S. (2011). Blending the clinical and the cultural: A framework for conducting formal psychological assessment in bicultural settings. *New Zealand Journal of Psychology*, 40(2), 5-15.
- Macfarlane, S., Macfarlane, A., & Gillon, G. (2015). Sharing the food baskets of knowledge: Creating space for a blending of streams. In A. H. Macfarlane, S. Macfarlane & M. Webber (Eds.), *Sociocultural realities: exploring new horizons*. Christchurch: Canterbury University Press.
- Maldonado-Torres, N. (2004). The topology of being and the geopolitics of knowledge: Modernity, empire, coloniality. *City*, 8(1), 29-56. <https://dx.doi.org/10.1080/1360481042000199787>
- Ministry of Social Development. (2011). *Conduct problems: Effective programmes for 8-12 year olds, 2011*. Wellington, NZ: Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/conduct-problems-best-practice/conduct-problems-8-12.pdf>
- Orange, C. (2004). *An illustrated history of the Treaty of Waitangi*. Wellington, N.Z.: Bridget Williams Books.
- Turner, H., Rubie-Davies, C. M., & Webber, M. (2015). Teacher expectations, ethnicity and the achievement gap. *New Zealand Journal of Educational Studies*, 50(1), 55-69. <https://dx.doi.org/10.1007/s40841-015-0004-1>

Place-Based Learning and the Importance of Partnerships Within Schools and Communities to Foster Engagement in Education

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Abstract

Place-Based Learning (PBL) is an experiential-based pedagogy differing from the conventional text and classroom-based education. PBL uses school-wide initiatives and local communities as a primary resource for teaching and learning, and is something that can be incorporated into teaching and learning pedagogies to create positive outcomes. These initiatives are diverse, and aim to integrate learning and communities through inquiry, which in turn leads to increased student engagement, higher qualities of work and the opportunity for students to gain eye-opening experiences into the importance of the wider world. The root of PBL is enhancing learning experiences through direct engagement and inquiry into place, community and culture. These experiences can contribute to shaping ākonga into confident, connected and actively involved lifelong learners (Ministry of Education, 2007). This literature review examines the role of PBL as a platform for inclusive and community-based education, and demonstrates how PBL can be implemented in schooling contexts and the wider community to gain positive outcomes for students.

Keywords: *Place-based learning, partnership, community, engagement, multiculturalism, identity, collaboration, education, service learning*



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Introduction

In the last few decades, education has been transformed by changing ideologies of the role of schools and the purpose of education. A significant contributor to this is the different priorities schools have for student learning, and the different structures and strategies in place that may enhance or hinder education. Research suggests that successful learning can occur in a variety of different places that go beyond the conventional classroom environments we may be used to, thus prompting the puzzle of why the classroom is the dominant location for education. For many years, educational theorists have identified that teaching and learning is not just the case of teachers standing at the front of a classroom lecturing students on important information, with the expectation being that students absorb this knowledge. Although early education systems would argue that teachers are the more knowledgeable other (Le, 2003; Vygotsky, 1978), current education systems reflect values of ako, community and reciprocal learning that coincide with 21st-century teaching and learning pedagogies that are important for the development of ākonga. Place-based education attempts to break down the four walls of the traditional classroom by allowing students to spend time outside on a regular basis, alongside building relationships with people and places in their community (Gruenewald, 2008). Using activities and experiences

that differ from classroom norms could be a way to help students engage further in curriculum context, learn real-life applications of issues related to their subject, and overall enhance motivation and engagement in student learning (Vennix et al., 2017). Therefore, finding connections to place are important valuable experiences for today's young people to help shape their identities, along with helping them to become actively involved lifelong learners (Bartholomaeus, 2013; Ministry of Education, 2007).

Why Place-Based Learning?

There are several reasons why teachers and schooling environments should engage with effective place-based learning (PBL) pedagogies, with the primary goal being to increase student engagement, motivate and boost academic outcomes, positively impact communities and promote an in-depth understanding of the wider-world. PBL pedagogies or initiatives that are similar can be traced back to Dewey (1963) who expressed concern over the growing disconnect between students' school experiences and their everyday lives outside of the classroom. Dewey sought to create an educational approach that would contextualise learning for students and make it more applicable to them in the real world (Smith & Sobel, 2010). Therefore, the initial idea of PBL and the differentiation it has from civic learning or service learning is the explicit focus it has on both human

and natural environments alongside its concern for equity, social justice and environmental issues (Smith, 2017). The idea of classroom learning that incorporates interests to enable students to find a purpose for learning is something that PBL coincides with (Bartholomaeus, 2013; Smith, 2002).

Sharkey et al. (2016) reinforces the idea that PBL increases student engagement, motivation, and family-school involvement. With an increase in testing throughout schools and curriculums that devalue local knowledge and emphasise deficit perspectives, PBL could be a way forward for education (Comber, 2016). This idea is explored through a study of four different schools where PBL is implemented. Upon conclusion of the study, the teachers involved indicated that PBL projects implemented increased student engagement and motivation, fostered or enhanced existing student-teacher relationships and school-family engagement. It also helped to increase student and teacher awareness or appreciation for local knowledge and its value as a curriculum resource. This reinforces the positive nature PBL can have for students, whanau, and communities. Essentially, further research indicates that PBL can enhance student learning through giving students both voice and choice in determining what, how and where they learn, thus tailoring learning to individual strengths and needs (Hanover Research, 2014). With the evidence provided by these sources, it is clear that PBL can promote positive outcomes for a range of parties involved. Therefore, incorporating PBL pedagogies into schooling environments and normalising them within national curriculums could provide substantial benefits for students, teachers, whanau and communities.

Currently, 21st-century teaching and learning environments are encountering major educational reforms, particularly with the development of modern learning environments that stray far from conventional learning (Starkey et al., 2009). PBL as a pedagogy can help contribute to these changes in education by providing students opportunities to learn with a critical community and place lens on. Overall, PBL can easily be incorporated into educational settings to provide and promote success among students. PBL can help create ties between community, place and people, which is crucial for the development of ākonga.

Place-Based Learning Within the Schooling Environment

One of the challenges associated with PBL is the potential lack of community resources available. For schooling environments that are limited to local resources, the use of the school itself to incorporate PBL is achievable as PBL can be implemented diversely. Implementing and maintaining school community gardens is one way that place-based pedagogies can be encouraged in a schooling environment where local resources may be out of reach. Gardens can be used as a valuable tool in schools to teach the curriculum, improve student behaviour and self-confidence, instil a sense of responsibility in students, and strengthen connections

between schools and the community (Ratcliffe, 2017). From a pedagogical perspective, garden-based education falls directly under the sphere of PBL, and is something that can be easily implemented and used on a cross-curricular level. Community gardens draw on PBL principles, attempting to connect students to place and make curriculum relevant outside of the classroom (Ratcliffe, 2017). Although the garden is located within the school, the knowledge learned from this space can be used and applied in many different strands of life. Students can learn and utilise a range of skills within a school garden space, therefore, showing the benefit of PBL initiatives that are exclusive only to the school. It is important to acknowledge that PBL within a schooling context is not limited to just school gardens.

Place-Based Learning and Community Partnerships

PBL experiences outside of the school environment can be used to support students in making connections between the curriculum content taught in the classroom and practical experiences. Depending on geographic location and local resources, some schools will have more opportunities to use the communities around them than others. Research shows that students learning through PBL enact different, and more complex, roles than in a traditional classroom (Malm et al., 2012). The literature about community partnerships entails positive outcomes such as increased relationships and partnerships with local communities, further engagement with curriculum content and an overall more in-depth appreciation for learning. Sloan (2013) and Cutter-Mackenzie (2009) explore the idea that PBL is just as effective within the schooling environment itself, however Efird (2015), Gross et al. (2015) and Malm et al. (2012) discuss the importance PBL has with out-of-school community partnerships.

The importance of place and community-based education by taking students to a museum for experiential learning is explored by Efird (2015). The students taking part in this project were initially needed as volunteers around a specific environmental topic that related to their curriculum, however, as the study concluded students became fully immersed in the task and involvement quickly expanded to include interpretation of the museum's permanent exhibits on local history and culture along with interaction with community members. Efird (2015) concluded that this type of unconventional, hands-on teaching and learning can be transformative for children who have found it difficult to excel in the typical classroom and textbook-based learning context. The positive outcomes associated with this community involvement included increased knowledge, improved self-confidence and a newfound interest in citizenship. Outcomes also showed increased grades for students who were immersed in the museum task, in comparison to those who did not partake and were learning via textbooks. PBL initiatives do not have to be extreme or costly. They can cater for and meet the individual needs of both students and a schooling context by using what is provided in the community around them.

Gross et al. (2015) explores how school-community partnerships can impact student success and post-school outcomes as well as positively influence and benefit the community in return. Research revealed the diverse and reciprocal nature of successful school-community partnerships. Schools benefited from the increased resources, support and relationships resulting from the development of these partnerships. One staff member articulated their value by stating that community partnerships are a natural part of the school community, and that the school relies on them to ensure they have the best education for their students. While the school and its constituents benefitted from all partners' contributions to the school, each community partner also benefitted from its interactions. These included benefits to their business or programme, personal satisfaction, enhanced knowledge of best practices and personal growth.

Malm et al. (2012) portray similar ideologies to Efird (2015) and Gross et al. (2015) through discussing the importance community and place-based education can have in providing students with exposure to the richness and complication of the world outside of academia. This study chronicles the development of a partnership between staff, students and members of a neighbouring community by getting students to facilitate and implement a community arts festival. Reciprocity is an important factor in community partnerships and PBL, which Gilchrist (2009) refers to as a power of a well-connected community. This idea concludes that the power of people working together can accomplish, learn and educate far more than people acting independently. The success of having a school work together with a local community to run an arts festival not only had positive outcomes for the students involved, but positively impacted local community members and families who were able to attend the event. This idea of a well-connected community reiterates the importance of using local resources in education. Place and community-based education models are evident worldwide, however, there is limited research about the negative implications that these pedagogies can have.

Identity Development and Multiculturalism

Ideologies associated with a sense of belonging are embedded into the basis of place and community (Bartholomaeus, 2013). The idea of place is embodied in physical locations, symbolic meanings and emotional attachments individuals may have about a given setting. Places can become a central factor for identity as people draw on social processes, values and symbols to describe themselves (Sampson & Goodrich, 2009). From a social constructionist perspective, making sense of place is crucial in understanding how individuals socially construct and form bonds and attachments to the physical environments they live in. As explored by Sampson and Goodrich (2009), the role of community in attachment to place, belonging and identity is central.

These ideas of place directly coincide with how PBL can contribute to shaping the identities of young people.

The community provides a mechanism by which individuals can culturally produce identity and belonging. Identity draws on a collective set of values, behaviours and actions that are embedded in shared community practices (Sampson & Goodrich, 2009), closely associated with ideas Sloan (2013), Donovan (2016) and Hjørne et al. (2012) express about the importance PBL has on shaping identities. Classroom spaces are diverse and can be a place where different cultures have the potential to share lived experiences and gain insight from each other's "spatial, geographical, and contextual dimensions of existence" (Gruenewald, 2008, p. 310). Classrooms are environments where students come together as a community to understand the different forms of knowledge they are being exposed to. Place-based pedagogies can assist cultural diversity and multiculturalism within schooling environments by engaging local environments.

Sloan (2013) demonstrates the importance PBL can have on shaping identities and contributing to multiculturalism within a schooling environment. Sloan supports PBL in the school itself with the use and implementation of community gardens. Mackenzie (2009) conducted a study on garden spaces, and the purpose of learning about multiculturalism and identity. This study concluded that students developed a further understanding of their own identities, alongside establishing an awareness of the interconnected nature between students and the local environment by taking part in implementing and caring for a community garden.

Donovan (2016) suggests that a PBL curriculum is integral in the changing modern world we live in. Donovan (2016) explores a curriculum catered particularly to writing standards and how PBL can help students explore their identities through writing that is informed by place. The research concluded that place-based writing practices can help empower adolescents, allowing them to connect to their local communities while demonstrating a greater understanding of individual identities (Donovan, 2016). Literacy should be implemented throughout any effective curriculum, therefore, incorporating literacy through PBL can help ākonga learn more about themselves and the different things they associate with. This is an integral part of shaping identities and helping ākonga develop values, knowledge and competencies that will enable them to live full and satisfying lives (Ministry of Education, 2007). When students begin their writing from a conversation of experience or place, they are more effective and authentic communicators. This is because they are writing about something they can resonate with. Research showed that students were more engaged and motivated when they were given the opportunity to write about something they were excited about in the community, opposed to being set a one-size-fits-all essay question (Donovan, 2016). This supports the idea that place-based learning is important and should be

implemented into schools as not only does it increase motivation, but it also helps to establish identity.

PBL is also evident in the value *Tangata Whenuatanga* which is one of the cultural competencies expressed in *Tataiako* (Ministry of Education, 2011). PBL in Aotearoa can affirm Indigenous Māori learners as being Māori by providing contexts for learning where identity, language and culture of learners and their *whānau* is valued (Ministry of Education, 2011). A deficit discourse placed on Māori learners can often prohibit or limit Māori success (Macfarlane et al., 2007). Often educators who are members of a dominant and more powerful culture can impose attitudes on students who belong to less powerful cultures, contributing to deficits being placed on learners. However, the implementation of effective PBL initiatives in culturally diverse classrooms can help to reaffirm multicultural learners. Using local resources including community spaces and people as an education source can contribute to Māori success, thus again reinforcing the importance of identity.

Essentially, for English Language Learners (ELL), PBL can help facilitate education beyond conventional classroom experiences. Epstein (1986) explores the idea that social intervention and community partnerships can build bridges for students needing to develop relationships in an unaccustomed setting. Using PBL can help to cultivate a child's sense of belonging through offering a component missing in the lives of children who are new to a country (Epstein, 1986). Challenges evident for ELL entail the difficulty of fitting into a new school and community. Glinert (2009) argues that integrating community modelling into the curriculum through PBL can help children develop a sense of belonging, along with a more concise understanding of a topic as they are able to physically experience it. Learning through place fills a void in the lives of students struggling with a new language, new societal rules, normative behaviours and pre-established community hierarchy (Glinert, 2009). Students new to a country can form community partnerships and develop a connection through a place, further demonstrating the positive nature PBL has in the development of identities and diversity in classroom environments (Glinert, 2009).

Implications for Teachers

Teachers play a critical role in developing and supporting the individual needs of students. With education systems rapidly changing because of 21st-century teaching and learning, PBL approaches can help educators meet the needs of all learners through an inclusive, community-based approach. PBL pedagogies can yield positive implications not only for students, but for teachers, *whānau* and the community as well. Teachers are more than just curriculum decision makers (McGee, 1997), they are also role models who help to foster good living habits in students, which can be demonstrated in several ways (Glinert, 2009). Often teachers can be unaware of the influence their interactions and ideas have on young, developing minds. Research suggests that an energetic and knowledgeable

teacher creates a more enjoyable classroom in which active learning takes place in comparison to a test-based teacher who will not engage as many students. This shows the importance of knowing your learners and implementing activities that encourage student participation and engagement. A teacher who uses the community as a lens for teaching will be able to note the tuned-in expression of students eager to learn. By formulating lessons that include real-world application with hands-on experiences, teachers will see an increasing interest in learning from students, along with education becoming more enjoyable (Glinert, 2009).

Although the one-size-fits-all model does not necessarily apply to PBL as it is circumstantial, research indicates that teachers who structure their curriculum around generic book-based learning can become easily disconnected from their local environment, meaning they neglect the possible learning that could occur (Glinert, 2009). This is a serious implication for teachers who may not be aware of PBL, meaning they could subconsciously discard learning opportunities for themselves and students. This contrasts with Palmer (1997) who states that we teach who we are, meaning as educators we generally sway toward teaching others the way we were educated. This means that future educators need to be flexible, adaptable and willing to take advantage of the opportunities in local neighbourhoods, local outdoor settings and community partnerships (Glinert, 2009).

Teaching through place and community can be integrated into curriculum depending on the needs of the school and individual learners. PBL can break down barriers between schools and communities by integrating academic classroom activities into place and the environment (Eyler & Giles, 1999; McCarthy, 2009 as cited in Ngai et al., 2009). Using local community spaces such as parks or businesses, and implementing these into the curriculum, can help students gain more authentic learning opportunities. Being exposed to an environment is more beneficial than just being shown photographs or videos. Essentially, using community leaders and resources such as local business owners, *whānau*, government agencies and *Tangata Whenua* can also foster collaboration and partnership, in turn contributing to student learning.

Cooper (2007) explores implications for teachers in respect of educating pre-service teachers on the importance of community partnerships in education. Evidence from previous studies (Cabello & Burstein, 1995; Wiest, 1998; Zeichner & Melnick, 1996 in Cooper, 2007) state that community-based experiences are effective in creating awareness for teachers of the cultural strengths of students and their families. Cooper (2007) concludes that institutions of teacher education need to incorporate community-based learning into the formal preparation process. This would not only help pre-service teachers know how to effectively deliver their content because they know their students better, but will also demonstrate the importance of building relationships with students, families and communities.

By educating pre-service teachers while they are still novices, they will have the tools to take new ideas into the teaching profession that will reinforce 21st-century ideas around teaching and learning.

Conclusion

Despite the potential challenges involved with establishing PBL pedagogies in schools, the accumulated research shows that relationships to place and the community are integral for schooling environments. These relationships allow for teachers to implement new pedagogies that reflect 21st-century teaching and learning practices that can be attributed toward the New Zealand Curriculum's future focus of supporting community engagement (Ministry of Education, 2007). Development of PBL can prepare students for the complexities of life, along with educating students to be critical thinkers who think outside of the box, communicators who clearly articulate ideas, collaborators who work effectively, and creative innovators who design and implement new and worthwhile ideas (Kennedy & Heineke, 2014). PBL is an important tool to help teachers develop a growth mindset of education, which in turn, helps improve the experience and education of students. In the diverse and multicultural-world we live in, PBL initiatives can provide opportunities for students to make sense of their own identity, particularly through community resources and partnerships. Place-based education also has the ability to offer more than just academic possibilities for students, which is something that current education systems may be lacking. The role of identities and community attachment from PBL may assist in long-term community involvement, contributing to the ongoing development of shaping individuals to become globalised, life-long learners. Although PBL may be ineffective in some situations or circumstances, there is limited literature outlining these perceptions. Overall, PBL is a way forward in education, and could be implemented worldwide to help students engage further with their education.

References

- Bartholomaeus, P. (2013). Place-based education and the Australian curriculum. *Literacy Learning: The Middle Years*, 21(3), 17-23.
- Cutter-Mackenzie, A. (2009). Multicultural school gardens: Creating engaging garden spaces in learning about language, culture and the environment. *Canadian Journal of Environmental Education*, 122-134.
- Efird, R. (2015). Learning places and 'little volunteers': An assessment of place- and community-based education in China. *Environmental Education Research*, 21(8), 1143-1154. <http://dx.doi.org/10.1080/13504622.2014.976607>
- Epstein, J. (1986). 'Parent involvement implications for limited English proficient parents' in Issues of parent involvement and literacy, Proceedings of the Symposium held at Trinity College 6-7 June 1986, Simich-Dudgeon, C (ed), Trinity College, 6-17, Washington DC.
- Glinert, A. (2009). *Teaching placed-based environmental education to English language learners*. Master of Arts thesis from Prescott College in Environmental Science: Environmental Ethics/Education. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.543.1461&rep=rep1&type=pdf>
- Gross, J. M. S., Haines, S. J., Hill, C., Francis, G. L., Blue-Banning, M., & Turnbull, A. P. (2015). Strong school-community partnerships in inclusive schools are "part of the fabric of the school... We count on them". *School Community Journal*, 25(2), 9-34.
- Gruenewald, D. A. (2008). The best of both worlds: A critical pedagogy of place. *Environmental Education Research*, 14(3), 308-324. <http://dx.doi.org/10.1080/13504620802193572>
- Hanover Research. (2014). Impact of student choice and personalized learning. District Administration Practice.
- Hjörne, E., van der Aalsvoort, G., & de Abreu, G. (2012). *Learning, social interaction and diversity: Exploring identities in school practices* (1. Aufl. Ed.). Rotterdam, Netherlands: Sense Publishers. <http://dx.doi.org/10.1007/978-94-6091-803-2>
- Kennedy, A. S., & Heineke, A. (2014). Re-envisioning the role of universities in early childhood teacher education: Community partnerships for 21st century learning. *Journal of Early Childhood Teacher Education*, 35(3), 226.
- Le, H. (2003). What does a more knowledgeable peer mean? A socio-cultural analysis of group interaction in a Vietnamese classroom. Victoria University of Wellington, NZ.
- MacFarlane, A. (2007). Evaluation of web search for the information practitioner. *Aslib Proceedings*, 59(4/5), 352-366. <http://dx.doi.org/10.1108/00012530710817573>
- Malm, E., Eberle, S., Calamia, J., & Prete, G. (2012). Building sustainable campus-community partnerships: A reciprocal-relationship model. *Partnerships: A Journal of Service-Learning and Civic Engagement*, 3(2), 78-98. <http://dx.doi.org/10.7253/partj.v3i2.480>
- Ministry of Education. (2007). *The New Zealand curriculum*. Learning Media. New Zealand.
- Ministry of Education. (2011). *Tataiako: Cultural competencies for teachers of Māori learners*. Education Council New Zealand. Ministry of Education.
- McGee, C. (1997). *Teachers and curriculum decision-making*. Palmerston North, NZ: Dunmore Press.
- Ngai, S. S., Cheung, C., Ngai, N., & Chan, K. (2010). Building reciprocal partnerships for service-learning: The experiences of Hong Kong secondary school teachers. *Child & Youth Services*, 31(3-4), 170-187. <http://dx.doi.org/10.1080/0145935X.2009.524483>
- Palmer, P. (1997). *The courage to teach: Exploring the inner landscape of a teacher's life*. New York, NY: Wiley Press.
- Ratcliffe, C. (2017). *How students, schools, and the community benefit from garden-based education: Frameworks for developing a garden-based education center*. Master's Thesis, University of Wyoming, Laramie, United States of America. Retrieved from http://repository.uwyo.edu/cgi/viewcontent.cgi?article=1062&context=smtc_plan_b
- Sampson, K. A., & Goodrich, C. G. (2009). Making place: Identity construction and community formation through "sense of place" in Westland, New Zealand. *Society & Natural Resources*, 22(10), 901-915. <https://dx.doi.org/10.1080/08941920802178172>
- Sharkey, J., Clavijo Olarte, A., & Ramírez, L. M. (2016). Developing a deeper understanding of community-based pedagogies with teachers: Learning with and from teachers in Colombia. *Journal of Teacher Education*, 67(4), 306-319. <https://dx.doi.org/10.1177/0022487116654005>
- Sloan, C. (2013). Transforming multicultural classrooms through creative place-based learning. *Multicultural Education*, 21(1), 26.
- Smith, G. (2017). Place-based education. *Oxford Research Encyclopedia of Education*. <https://dx.doi.org/10.1093/acrefore/9780190264093.013.95>
- Smith, G. A., & Sobel, D. (2010). *Place- and community-based education in schools*. New York, NY: Routledge. <https://dx.doi.org/10.4324/9780203858530>
- Starkey, L., Yates, A., Meyer, L. H., Hall, C., Taylor, M., Stevens, S., & Toia, R. (2009). Professional development design: Embedding educational reform in New Zealand. *Teaching and Teacher Education*, 25(1), 181-189. <https://dx.doi.org/10.1016/j.tate.2008.08.007>
- Vennix, J., den Brok, P., & Taconis, R. (2017). Perceptions of STEM-based outreach learning activities in secondary education. *Learning Environments Research*, 20(1), 21-46. <https://dx.doi.org/10.1007/s10984-016-9217-6>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.). Cambridge, MA: Harvard University Press.

Parental Involvement in Schools: Who is Left Behind?

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Abstract

Parental involvement within schools has proven to be an effective mechanism for student achievement; however, full involvement of parents in schools is yet to be attained. This literature review investigates which parents are left behind within schools and offers conclusions as to why this might be. The types of parental involvement that occur within schools are considered. This is followed by an examination of the effects of parents' socioeconomic status for educational involvement and the involvement of minority parents. Family dynamics and how familial relationships affect parental involvement are also explored. Finally, strategies to achieve universal parental involvement are proposed. Overall, the literature review reveals that, while some parents are left behind more often than others, it is ultimately up to the efforts of the school to engage all parents equally in their child's education.

Keywords: *Parental, involvement, school, education, minority, socioeconomic, relationship*



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Introduction

The involvement of parents (or lack thereof) in schooling is key in determining children's educational experiences. Students whose parents are involved in their education show higher academic values, grade point averages, and determination to move forward into tertiary education, thus, responsibility for a child's education must begin with support from home (Turney & Kao, 2009; Camacho-Thompson, Gillen-O'Neil, Gonzales & Fuligni, 2016; Park & Holloway, 2013). Within Aotearoa New Zealand, family involvement is defined as *whānau* involvement, encompassing extended family members and friends who also play a role in a child's life (Mutch & Collins, 2012). A partnership between the school community and parents should be collaborative and non-hierarchical, in which educators and families interact to improve student educational outcomes (Soutullo, Smith-Bonahue, Sanders-Smith & Navia, 2016). This literature review seeks to explore which parents are excluded from schools and why, while providing solutions to increase involvement from parents of all backgrounds.

Types of Parental Involvement

Parental involvement is a term that is often used freely within the realm of education; however, the meaning of parental involvement can be misinterpreted. There are various types of parental involvement that can be placed into two categories: home and school involvement. Turney and Kao (2009) see parental involvement as school involvement only, while Camacho-Thompson et al. (2016) argue that both home and school involvement are important for overall student achievement. School-based involvement has been identified as attending school programmes such as parent teacher association (PTA) meetings, open houses, volunteering at school, attending extracurricular activities, and communicating

with school personnel. Home-based involvement is typically identified as talking with children about school, helping them with school work, and taking children to educational places such as libraries and museums (Camacho-Thompson et al., 2016).

Parental involvement has been widely argued to be important for student achievement (Turney & Kao, 2009; Camacho-Thompson et al., 2016). However, Rogers, Hickey, Wiener, Heath and Noble (2018) argue that it is the type of involvement that is of the utmost importance for student achievement. Parental involvement does not always have positive effects on children's education, as parental control is a negative form of parental involvement. Parental control can be seen as the use of commands, punishment, nagging, and disapproval of their children's decisions, leading to a higher level of high school dropout. However, when parents act in supportive ways, such as providing praise and encouragement to their children, it can lead to higher levels of student motivation (Rogers et al., 2018) and, therefore, greater achievement. Similarly, Park and Holloway (2013) extend upon Rogers et al.'s (2018) argument by discussing the concept of 'academic socialisation', where parents discuss their expectations regarding grades and foster educational and vocational aspirations for their children, while working together to develop plans for the future in a supportive manner. While some parents may be involved in their child's education, when it becomes overly controlling, it can lead to negative consequences. Therefore, the specific type of parental involvement is a crucial factor, and support is the fundamental driver for successful parental involvement. Liu and White (2017) argue, however, the importance of understanding what type of involvement works best for different students. This is due to ethnic groups responding differently to the varied types of involvement. For example, while White students do not

necessarily respond well to authoritarian parenting or 'controlling parental behaviours,' this style positively correlated with Asian students' achievement (Liu & White, 2017).

From an Aotearoa perspective, parental involvement has always been a strong feature of our education system. In 1906, the 'home and school' association was formed, and today, similar associations continue to exist within the New Zealand Parent Teacher Association (NZPTA). These associations organise school-based parental involvement such as fundraising, open nights, and uniform sales (Mutch & Collins, 2012). Parental involvement in Aotearoa also includes home-based involvement because parents consider their most important contribution as offering support for and demonstrating interest in their children's education (Clinton & Hattie, 2013). Clinton and Hattie's (2013) work is important because it draws on a student's perception of their parents' or parents' involvement. It demonstrates that when parents talk to their children about teaching and learning, the students recognise their parents have high expectations for their learning and future, which leads to increased student motivation.

Socioeconomic Status

While parental involvement is an important aspect of education, not only in Aotearoa, but globally, there are limitations for parents to become involved in their child's schooling. An array of literature argues that socioeconomic status (SES) is a determining factor for parental involvement within education (Turney & Kao, 2009; Camacho-Thompson et al., 2016; Sedibe & Fourie, 2017; Velsor & Orozco, 2007; Clinton & Hattie, 2013). The higher the SES of the family, the more involved parents are with their child's education. According to Turney and Kao (2009), this is because parental involvement is often dependent on resources and opportunities the parents have. Therefore, parents who have to work full-time have less opportunities to engage in their child's education. Sedibe and Fourie (2017) expand further on this argument stating that families with lower SES usually reside a greater distance from the school and, thus, their involvement is limited by the need to negotiate transportation. Furthermore, Camacho-Thompson et al. (2016) state that families who have financial pressures are often under a lot of stress, which leads to parents being less engaged in every aspect of their child's life, including education.

There is a strong correlation between low SES, and poor relationship between parent and child, which demonstrates why education may not be a priority for families with low SES. Park and Holloway (2013) state that, while higher SES leads to more parental-school involvement, lower SES results in more parental-home involvement. However, Park & Holloway (2013) do not discuss if this home involvement is of a supportive nature, which as stated above, is the most important type of parental involvement. Park and Holloway (2013) do state, however, that parents who are more involved at home (and have lower SES) are less likely to hold high educational expectations of their children. This suggests that perhaps the involvement at home from lower SES parents is more of a controlling nature, leading to the inevitability of strained relationships between students and their parents.

In Aotearoa, schools within lower SES communities claim that parents are less likely to talk to the school about their child's achievement (Clinton & Hattie, 2013). This creates a challenge for students who are not achieving well, as the interaction between parents and teachers would help to increase this achievement. Contrary to Park and Holloway (2013), Clinton and Hattie (2013) state that parents with low SES have very high expectations and aspirations for their children's education, and many want to know how to best assist their children to achieve well. Parents in low SES areas want to be involved with their children's education, but struggle to engage due to not understanding the language of the school, often this being because they had negative experiences in schools themselves (Clinton & Hattie, 2013). Given the research on both sides, it is important for education staff to not make negative assumptions about parental involvement (from a deficit perspective), and to work positively to ascertain which type of extra support students might need.

Minority and Immigrant Parents

In addition to low SES families, minority parents are disadvantaged when it comes to being included in their child's education. For the purpose of this literature review, minority parents are defined as 'non-White' parents. Immigrant parents face a number of challenges being involved in their child's education (Turney & Kao, 2009; Park & Holloway, 2013; Soutullo et al., 2016; Mutch & Collins, 2016), one of the biggest challenges being language. Many immigrant families do not speak the native language of the school, and thus cannot be involved in their children's schooling, despite wanting to. Communication between the parents and the school is an important aspect of the partnership in education, however, when schools only attempt to communicate with immigrant parents in English, the partnership is heavily tainted (Turney & Kao, 2009). When schools make no effort to translate notices to be taken home by the students, it sends a clear message to immigrant families that some languages/people are valued more than others. This increases the already embedded power relations that occur in parent-teacher partnerships (Maclure & Walker, 2000), and makes it even more difficult for immigrant parents to become involved with the education of their children. Turney and Kao (2009) also discuss the strong correlation between immigrant parents and low SES. This suggests that the majority of immigrant parents are already disadvantaged when it comes to them being involvement in their child's education due to a low SES, before the barrier of language is even considered.

In addition to language, Soutullo et al. (2016) also discuss how cultural differences are a challenge for immigrant parents who have different perceptions of education than their native-born counterparts. For example, in Asian countries, it is generally accepted that the teacher's role in a child's life is to promote academic knowledge, while the parent's role is to build character. However, in a country such as Aotearoa, parents and other members of a community are seen as bodies of knowledge, and they are encouraged to engage with the affairs of the classroom (MacFarlane, 2004). Mutch and Collins (2012) also discuss cultural differences as a barrier for immigrant parental involvement, stating that immigrant parents are increasingly concerned with the amount of homework given. This shows that cultural differences can lead to tensions between schools and parents, further perpetuating

the lack of involvement of parents and the lack of a partnership between the two parties.

While Turney and Kao (2009), Soutullo et al. (2016), and Mutch and Collins (2012) discuss language and cultural differences as a factor contributing to the lack of involvement of minority parents, Liu and White (2017) argue that social capital is the ultimate factor. Immigrant parents lack social capital; they are usually socially challenged in the community because of a lack of social ties, which prohibits them from being involved in the community, such as the local school. This links back to language and cultural differences because, if immigrant parents experience culture shock, they are less likely to want to learn the native language, adopt cultural practices, or form connections with the new community (Lustig & Koester, 1996).

Family Dynamics

Family dynamics also influence parental involvement in education. According to Malczyk and Lawson (2016), family dynamics at home has a greater influence on parental involvement in a child's education than SES of the household. Parental involvement increases as the number of parental figures in the household increases. Turney and Kao (2016) state that two parents in a household leads to more involvement, however, multi-generational households (that is, those with grandparents), have even more prospects for familial involvement. This relates back to Mutch and Collins (2012) who recognise that the wider whānau plays a role in any child's education. As children age, however, the involvement of parents' decreases significantly due to children becoming more autonomous and rejecting the help of their parents (Rogers et al., 2017). Rogers et al. (2017) do not, however, discuss why parents are less involved at the school level. Park and Holloway (2013) extend on Rogers et al.'s (2017) work by stating that parents become less involved as children grow up due to the curriculum becoming more advanced and parents not feeling confident to help their children with their work. Park and Holloway (2013) also discuss why parents become less involved within the school, citing the setting of high schools makes it challenging for parents to be involved, as high school students have multiple teachers, classrooms, and buildings to navigate every day.

Turney and Kao's (2016) research suggests that children with single-parent households have less involved parents in their education. The work carried out by Malczyk and Lawson (2016) reiterates this as it looks at single-parent households that are headed by a single mother. The relationship between the child and the single mother has a significant influence on academic achievement, and single mothers tend to have a stronger relationship with their daughters rather than their sons (Malczyk & Lawson, 2016). Malczyk and Lawson (2016) do not, however, look at the relationship between a single father and his children, or how the relationship between a single mother and her son could be strengthened. According to Rogers et al. (2017), a father's involvement has a greater influence on a child's educational engagement compared with a mother's involvement. Suizzo, Rackley, Robbins, Jackson, Rarick and McClain (2016) further expand on the influence of fathers in education stating that a father's warmth, particularly surrounding education, leads to academic self-efficacy and determination. Like Rogers et al. (2017), and Park and

Holloway (2013), Suizzo et al. (2016) discusses how a father's warmth decreases as the children get older, and thus a child's academic determination declines as they age. Therefore, while it is widely argued that a father's involvement is more important than a mother's involvement in academic achievement, all parental involvement declines as children age, leading to an overall decrease in academic achievement. If there are strong positive relationships between the parents (particularly the father) and the children, the parents are more likely to be involved in the education of their children, and if parents are involved then the relationships are likely to be stronger (Camacho-Thompson et al., 2016). Therefore, it is clear that family dynamics are important for parental involvement in schools, and while low SES parents and minority parents are left behind, if the relationships between the parents and children are strong, involvement in the child's education is more likely to occur, even for these minority groups.

Solutions and Moving Forward

While it is clear that low SES and minority parents are left behind in regard to school involvement, there are strategies that can be adopted by schools which can enhance parental involvement for all. Most importantly, schools must recognise that there are an array of challenges that occur within the lives of many parents, and they should not make judgements or hold assumptions about families who cannot be involved in a child's education (Turney & Kao, 2009; Sedibe & Fourie, 2017; Park & Holloway, 2013; Soutullo et al., 2016; Velsor & Orozco, 2007). If assumptions are made about a student whose parents cannot be involved, then it is more likely that student will not succeed academically. Similarly, if judgements are made about uninvolved parents, it will push those parents further away from being involved in their child's education, perpetuating the cycle of parents not feeling welcome and teachers having prejudice views. While it is likely schools are going to make judgements and assumptions regarding a student, based on the amount of involvement their parents have in their education, Park and Holloway (2013) emphasise the importance of not generalising, as each family and culture are different. For example, while Latino parents consistently preach the importance of education to their children, they do not generally involve themselves within the school itself. Furthermore, White parents are usually involved in the school, but do not endorse the importance of education to their children as much as their Latino counterparts (Park & Holloway, 2013). Therefore, making assumptions about Latino parents would be unjust as evidence shows the Latino culture values education just as much as, if not more than, White parents. This relates to Soutullo et al. (2016) which discusses cultural differences and the different perceptions of education for various ethnic groups. Judgements should not be made against families who are not involved in their child's education, as the majority of the time, they have challenges which prevent them from doing so. Instead, schools should make conscious efforts to involve all parents.

Schools should make a conscious effort to involve traditionally excluded groups such as minority and low SES families. School outreach practices, such as keeping parents informed regularly about student progress and expectations, have been identified as being more associated with parental involvement than a parent's SES, marital status or education

(Park & Holloway, 2013). Furthermore, when high school teachers make an effort to inform parents about tertiary education, these efforts build confidence for parents and lead to greater home involvement, as parents have more confidence to encourage and guide their children into further education (Park & Holloway, 2013). A school's constant interaction with parents can enhance the social capital of parents, enabling them to form relationships with not only the teachers and the school, but also other community members, which would ultimately lead to increased parental involvement (Liu & White, 2017).

In addition to constant communication with parents, home visits have proven to be beneficial for building positive relationships between parents and teachers. Home visits minimise the power imbalance that occurs between parents and teachers, and helps overcome barriers related to low SES families such as transportation and time management (Velsor & Orozco, 2007). When schools make clear, deliberate efforts to involve parents, their SES becomes irrelevant, and involvement is more likely to occur. Although cultural differences, especially among minority families, may act as a barrier to parental involvement, Soutullo et al. (2016) encourage schools to capitalise on these cultural differences within the classroom. Parents of minority students bring cultural and linguistic expertise, lived experiences, and social and cultural resources, all of which have huge potential to improve the educational outcomes of not only their own children, but the vast majority of students as a whole, as well as creating greater equity in our educational system (Ishimaru, Torres, Salvador, Lott, Williams & Tran., 2016). Schools should celebrate the cultural diversity that minority families bring to the classroom and encourage this diversity. This would promote the beginnings of a partnership between the school and minority families, as minority families would feel valued, rather than excluded.

Conclusion

While it is widely agreed that parental involvement is very important for student academic achievement, there are still certain parents who are left behind. Low SES and minority parents are traditionally disadvantaged and left out, however, the factors that contribute to their lack of involvement seem to disappear when schools put time and energy into engaging them within the school community. The equal partnership between parents and teachers will not be fully achieved until schools make a conscious effort to involve parents who are traditionally disadvantaged when it comes to school involvement. Due to the rather limited research for Aotearoa, further research investigating which parents are typically left behind within a New Zealand schooling context, would be beneficial. This research could look at a comparison between Pākehā and Māori parental involvement, to discover if there are disparities between the two groups. Furthermore, research into how to support schools to make connections with parents who are traditionally left behind in a school setting, would be useful in promoting parental involvement in schools.

References

- Camacho-Thompson, D., Gillen-O'Neel, C., Gonzales, N., & Fuligni, A. (2016). Financial strain, major family life events, and parental academic involvement during adolescence. *Journal of Youth and Adolescence*, 45(6), 1065-1074. <http://dx.doi.org/10.1007/s10964-016-0443-0>
- Clinton, J., & Hattie, J. (2013). New Zealand students' perceptions of parental involvement in learning and schooling. *Asia Pacific Journal of Education*, 33(3), 324-337. <http://dx.doi.org/10.1080/02188791.2013.786679>
- Ishimaru, A., Torres, K., Salvador, J., Lott, J., Williams, D., & Tran, C. (2016). Reinforcing deficit, journeying toward equity. *American Educational Research Journal*, 53(4), 850-882. <http://dx.doi.org/10.3102/0002831216657178>
- Liu, Z., & White, M. (2017). Education outcomes of immigrant youth: The role of parental engagement. *The ANNALS of the American Academy of Political and Social Science*, 674(1), 27-58. <http://dx.doi.org/10.1177/0002716217730009>
- Lustig, M., & Koester, J. (1996). *Intercultural competence: Interpersonal communication across cultures* (2nd ed., pp. 323 - 343). New York, NY: Harper Collins College Publishers.
- MacFarlane, A. (2004). Strategies for Teachers. In A. MacFarlane, *Kia hiwa ra! Listen to the culture. Maori students' plea to educators*. Wellington: NZCER.
- MaClure, M., & Walker, B. (2000). Disenchanted Evenings: The social organization of talk in parent-teacher consultations in UK Secondary Schools. *British Journal of Sociology of Education*, 21(1), 5-25. <http://dx.doi.org/10.1080/01425690095135>
- Malczyk, B., & Lawson, H. (2017). Parental monitoring, the parent-child relationship and children's academic engagement in mother-headed single-parent families. *Children and Youth Services Review*, 73, 274-282. <http://dx.doi.org/10.1016/j.childyouth.2016.12.019>
- Mutch, C., & Collins, S. (2012). Partners in learning: Schools' engagement with parents, families, and communities in New Zealand. *School Community Journal*, 22(1), 167-187. Retrieved from: <https://files.eric.ed.gov/fulltext/EJ974691.pdf>
- Park, S., & Holloway, S. (2013). No parent left behind: Predicting parental involvement in adolescents' education within a sociodemographically diverse population. *The Journal of Educational Research*, 106(2), 105-119. <http://dx.doi.org/10.1080/00220671.2012.667012>
- Rogers, M., Hickey, A., Wiener, J., Heath, N., & Noble, R. (2018). Factor structure, reliability and validity of the parental support for learning scale: Adolescent short form (PSLS-AS). *Learning Environments Research*. <http://dx.doi.org/10.1007/s10984-018-9262-4>
- Sedibe, M., & Fourie, J. (2018). Exploring opportunities and challenges in parent-school partnerships in special needs schools in the Gauteng province, South Africa. *Interchange*. <http://dx.doi.org/10.1007/s10780-018-9334-5>
- Soutullo, O., Smith-Bonahue, T., Sanders-Smith, S., & Navia, L. (2016). Discouraging partnerships? Teachers' perspectives on immigration-related barriers to family-school collaboration. *School Psychology Quarterly*, 31(2), 226-240. <http://dx.doi.org/10.1037/spq0000148>
- Suizzo, M., Rackley, K., Robbins, P., Jackson, K., Rarick, J., & McClain, S. (2016). The unique effects of fathers' warmth on adolescents' positive beliefs and behaviors: Pathways to resilience in low-income Families. *Sex Roles*, 77(1-2), 46-58. <http://dx.doi.org/10.1007/s11199-016-0696-9>
- Turney, K., & Kao, G. (2009). Barriers to school involvement: Are immigrant parents disadvantaged? *The Journal of Educational Research*, 102(4), 257-271. <http://dx.doi.org/10.3200/joer.102.4.257-271>
- Velsor, P., & Orozco, G. (2007). Involving low-income parents in the schools: Communitycentric strategies for school counselors. *Professional School Counseling*, 11(1), 17-24. Retrieved from: <https://www.jstor.org/stable/42732734>

School-Community Partnerships: A Vehicle for Student Success in an Evolving World

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Abstract

What are the reasons for developing school-community partnerships in Aotearoa New Zealand and how are they best constructed to promote future-focused education? School-community partnerships are collaborative relationships that exist between schools and other stakeholders within the community. These partnerships can benefit the development of students, providing them with a broad range of opportunities and experiences, access to social capital, and often auxiliary resources in addition to what schools can provide on their own. The advantages of successful partnerships can be particularly impactful for schools in challenging circumstances in terms of providing resources and support. This review discusses the research surrounding school-community partnerships, and explores the many challenges involved in establishing and maintaining effective relationships that support future-focused education in Aotearoa New Zealand. In conclusion, it is surmised that school-community partnerships can be an effective means of providing students with opportunities for learning beyond the classroom, thus strengthening academic and social development in a rapidly changing and diversifying world.

Keywords: *School-community partnerships, community involvement, collaborative relationships, future-focused education, social capital, active citizenry, citizenship*



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Introduction

In the history of education, schools have often been looked to as the main providers of knowledge. While in the past, families were occasionally involved as partners in education, schools are now looking to the wider community to provide relevant and diverse resources and opportunities for their students (Sanders, 2001). School-community partnership is a term that describes the collaborative relationship between a school and entities within the school community. The relationship between these partners in education should be voluntary and deliberate, with the purpose of exchanging resources or goods that will benefit students, families, schools, and community stakeholders (Leonard, 2011). Schools can choose to collaborate with several different types of partners, including but not limited to other schools, families, universities, businesses, and service groups (Sanders, 2003; Hands, 2009). The advantages obtained through successful school-community partnerships are explored in depth later in this review. However, as a basic function, successful partnerships create pathways for schools to connect with their communities, and provides schools with access to a greater pool of resources and opportunities for students than they could supply on their own (Ainscow, Muijs, & West, 2006; Gross, Haines, Hill, Francis, Blue-Banning & Turnbull, 2015; Evans, 2013; Hands, 2009; Hardy & Grootenboer, 2016; Leonard, 2011; Sanders, 2001; Sanders, 2003). These partnerships broaden the horizons of education

beyond the capabilities of schools that are isolated from their community, increases a schools' capability to address new information and ideas from the evolving world, and allows the school to provide its students with 21st-century future-focused learning experiences (Bolstad, Gilbert & McDowall, 2012). In the context of education in Aotearoa New Zealand, the New Zealand Curriculum (NZC) is founded on the belief that schools should support students in lifelong learning and active community engagement (Ministry of Education, 2007). The NZC expands upon these beliefs by stating 'Community Engagement,' 'Learning to Learn,' and 'Future Focus' as three of its eight principles (Ministry of Education, 2007, p. 9). School-community partnerships establish a platform to uphold these principles, by providing students and schools with opportunities to engage with their communities in authentic, skill-enhancing ways. By giving students the chance to interact with their local, national, and sometimes global communities, school-community partnerships allow students more possibilities to extend their learning beyond the classroom and to acquire social capital (Evans, 2013). The concept of social capital is explored later in this review, as research shows that the acquisition of social capital can further the healthy development of children and young adults (Sanders, 2003). The importance of social capital is also explored in regards to youth participation in society, and the connections between school-community partnerships

and citizenship education. While the demand for future-focused education and the development of partnerships is becoming fairly ubiquitous in nature, there are undeniable challenges to developing and maintaining fully collaborative relationships. The development of successful and efficient partnerships can be a daunting task to educators as it can be complex and time consuming, and thus requires a good deal of strategising to avoid time and resource waste (Ainscow et al., 2006; Evans, 2013). This review concludes with an overview of the factors explored, including implications of the development of future-focused school-community partnerships in Aotearoa New Zealand.

Types of School-Community Partnerships and Qualities that Enable Success

Forms of Partnership

Schools can choose to collaborate with several kinds of partners, as different forms of partnerships have varying implications and potential advantages. Sanders' (2003) literature review on the practice of community involvement found that there are several main forms of school-community partnerships. Sanders (2003) divides the types of collaborative relationships by classifying them as student-centred, family-centred, community-centred, or some combination of the three. Business partnerships are generally student-centred relationships between schools and organisations. The businesses can provide material goods or work experience to the students, which can provide students with real-world experience and potentially benefit the business by increasing its workforce. University partnerships are generally school-centred relationships between a school and an associated university. In this case, the university can provide resources in the form of professional development which can increase the pedagogical knowledge and ability of the entire school staff. Service-learning partnerships are generally student- and community-centred relationships that allow a school and its students to experience civic participation, and to have a voice in local issues such as environmental or social concerns. Service-learning partnerships are a powerful tool for providing students with opportunities to extend their learning outside of school and to gather real-world experience. School-linked service participation partnerships are generally student- and family-centred partnerships that provide services to families and students in need of health and social care services (Sanders, 2003). Additionally, schools can partner with other schools in the community. As explored in Hands' (2009) qualitative case study, school-school partnerships are generally school- and student-centred, and provide for the exchange of education-related resources, for example, professional development, pedagogy and practice, and staffing support.

Qualities That Enable Successful Partnerships

A successful partnership could be defined as a sustainable relationship in which one (if not both) of the partners effectively receive goods provided by the other partner, whether that be knowledge, materials,

experiences, or some other type of resource. An external evaluation performed by the Education Review Office found that several qualities lend themselves to the success of school-community partnerships in New Zealand (Collins & Mutch, 2012). One of the most pertinent factors is the ability to communicate and collaborate well, as transparent and constant communication ensures that all partners are on the same page and working toward the same goals (Gross et al., 2015; Collins & Mutch, 2012; Leonard, 2011). Leonard (2011) also found that power sharing is essential to the success of the partnerships, as a balance of power allows for the development of mutual trust between students and the partners. Gross et al. (2015) and Collins and Mutch (2012) discovered that schools with a welcoming culture and strong commitment to student success made stronger partners. The research collected by Sanders (2003) in the United States found that in order for a partnership to be successful, great care has to be taken in the professional preparation, including carefully selecting partners based on common goals, and a demonstration of their commitment to collaboration and communication. In order for school-community partnerships to remain relevant and future-focused, they must adapt to the changing needs of students, schools, and communities, and be willing to engage in a process of critical reflection and evaluation (Sanders, 2003; Bolstad et al., 2012).

Implications of Successful Partnerships

"School-community partnerships, then, can be defined as the connections between schools and community individuals, organizations, and businesses that are forged to promote students' social, emotional, physical, and intellectual development," (Sanders, 2001, p.20).

The collated research on the many forms of school-community partnerships reveals a variety of potential advantages and benefits that can become available to students, families, schools, and communities through successful collaborative relationships. Research has shown that effective partnerships have the possibility of increasing the achievement of students, strengthening the relationships within the schools, supporting students' families, and bolstering communities (Sanders, 2001; Sanders, 2003; Hands, 2009; Bolstad, 2012). A United States case study of one urban high school used Bronfenbrenner's Ecological Systems Theory to explore why strong school-community partnerships benefit the academic and social development of young students, and revealed that the relationships built around a young individual serve to fill their developmental needs more so than a school could achieve on its own if it were isolated from the community (Bronfenbrenner, 1979, as cited in Leonard, 2011). In addition to filling a student's developmental needs, partnerships can provide students with pathways to future community involvement. A study performed in the United States revealed that youth community engagement has an impact on the likelihood that students will exercise democratic agency in the future and potentially become involved in politics (McFarland & Thomas, 2006). Similar research done in

New Zealand has shown that the opportunities provided to students through school-community partnerships gives them authentic means of developing their own citizenship dispositions, and teaches them how they might exercise agency and make change within local, national, and global contexts (Wood, 2012; Wood, 2013). In summation, successful school-community partnerships have the possibility to provide students with a variety of experiences to extend their learning beyond the classroom. This carries the potential to enhance the social, academic, and healthy development of students by providing them with a wider array of resources, experiences, and opportunities than the school could have provided on its own. The benefits of successful school-community partnerships are not one-sided. The opportunity for students to work with the community in authentic and purposeful ways can serve to bolster the wider community, while simultaneously allowing students to develop their citizenship orientations and understanding of democratic agency, as explored further.

Partnerships as a Vehicle for Social Capital Acquisition and Active Citizenry

School-community partnerships play an important role in broadening the social horizons of students beyond the walls of their school. The social networks that arise from partnering allow for students to have greater access to social capital, which can be defined as the relationships held by an individual within larger social contexts that can benefit the individual through their connections and access to influence. Social capital plays an important role in the lives of individuals as they make connections within local, national, and global contexts. Sanders (2003) argues that children in siloed schools do not receive the amount of social capital necessary for healthy development. To take the school out of isolation and provide students with greater access to social capital, schools must bridge the gap by creating pathways to social experiences through partnerships with the wider community. Leonard (2011) expands upon this argument by using Bronfenbrenner's Ecological Systems Theory to explore how relationships that branch out to the 'exosystem' of an individual, provide them with social experiences that would not have otherwise been attained (Bronfenbrenner, 1979 as cited in Leonard, 2011). The types of experiences offered via school-community partnerships is an important factor in the development of students' citizenship orientations and their ideas surrounding democratic engagement. Wood (2013) argues that social, economic, and cultural capital (which is condensed into the term 'participatory resources') is achieved through social acts such as school-community involvement, and is the basis for students' citizenship orientations. Wood's (2012) study of four New Zealand schools found that students' citizenship orientation was also largely affected by that of their teachers'.

Additionally, it was found that students from low decile, low socioeconomic, rural schools tended to be more concerned with local and community issues while students from high decile, high socioeconomic urban schools tended to be more concerned with national and global issues. If the findings of Wood's study are held

true, there must be a balance struck by teachers and school administration between upholding the probity of global concerns whilst concurrently maintaining a commitment to developing authentic relationships with the local community and valuing local concerns. If not addressed, the dichotomy between the citizenship concerns of low and high socioeconomic schools could lead to increased polarisation and calcification of beliefs. This would potentially result in active global citizenship holding higher symbolic capital than local active citizenship, and the ability to participate in global social contexts becoming "the preserve of elites" (Wise & Velayutham, 2009, p. 48 as cited in Wood, 2012). To avoid global citizenry from becoming the dominant form of citizenship education and the domain of the higher socioeconomic majority, it is imperative that citizenship education be responsive and relevant, but also acknowledge school-community partnerships and participation within local community contexts as a form of active citizenry (Wood, 2012). In regards to the development of school-community partnerships, the research on social capital and citizenship education reveals a few implications for achieving successful, future-focused partnerships. School-community partnerships should offer students opportunities to learn that are relevant to their lives and local/communal contexts, but also opportunities that allow them to extend their engagement and interest to broader contexts. Bolstad et al. (2012) argues that these types of far-reaching partnerships will promote innovation and change, and act as a cornerstone for future-focused education.

The Impact of Partnerships on Schools in Challenging Circumstances

School-community partnerships can be particularly beneficial to schools, families, and students from difficult or challenging backgrounds. These schools are often consistently hard pressed to find enough resources to support the developmental needs of their diverse learners, and may have poor relationships with the wider community. A study undertaken in Australia revealed that the deliberate establishment of a 'Community Partnership' programme in a low socioeconomic community was the foundation for a series of beneficial changes, including strengthened relationships between the school and the community, and the critical reflection of established and previously unquestioned teaching practices (Hardy & Grootenboer, 2015). In the United Kingdom, partnerships with other schools in the community (school-school partnerships) were shown to benefit schools in challenging circumstances, as it increased the school's capability of addressing complex challenges such as supporting the needs of vulnerable learners, and of solving problems such as staffing shortages (Ainscow et al, 2006). Therefore, lower decile schools in Aotearoa New Zealand should endeavour to develop school-community partnerships, in order to increase the number of resources and opportunities available to students and families, and to increase the equitability of educational experience.

Challenges to Developing Meaningful Partnerships

There are several major challenges that must be overcome in order for school-community partnerships to reach their full potential (Sanders, 2001). One of the biggest difficulties cited by schools is the amount of time needed and complexity involved with developing partnerships (Ainscow et al., 2006, Sanders, 2001). Ainscow et al. (2006) found that due to the number of variables involved in school-founding partnerships, there is a considerable amount of strategising necessary in order to avoid wasted time and wasted resources. This means that the education staff involved in pursuing partnerships must be willing to work hard and be persistent in their efforts. In order for school-community partnerships to provide authentic and relevant means for students to participate within social contexts, teachers must face the challenge of imparting the importance and brevity of global issues while concurrently valuing local and community issues (Wood, 2013). This presents a challenge as teachers must be willing to critically reflect on their own citizenship orientations, and to take an unbiased and equitable approach to addressing local, national, and global issues. Research undertaken in Australia on the effects of school-community partnerships in challenging and low socioeconomic environments, found that critical reflection upon the practices involved in community collaboration is necessary for the partnerships to not only be beneficial, but relevant to a school's specific needs (Hardy & Grootenboer, 2016). That being said, Hardy and Grootenboer (2016) identify one of the main obstacles as being the need to approach education in a more holistic way, and for teachers to broaden their perceptions of teaching practices to reach beyond the boundaries of the school walls. In order for school-community partnerships to support future-focused education, a shift must be made from the traditional approach to partnerships in which external partners support the school in mainly extra-curricular or co-curricular realms (sporting events, school camps, etc.) (Bolstad et al., 2012). This manifests itself as a challenge to also find partners who are willing to provide experiences and opportunities for students to participate in activities that fall outside of the traditional domain of school-community partnerships. As found by Evans (2013), one of the most significant challenges faced by new educators is the development of relationships with families and with the community. As classrooms continue to diversify, the difficulty of creating authentic relationships increases as teachers are responsible for widening their cultural knowledge and making sure their pedagogical practices are culturally appropriate for all. To summarize, the main challenges surrounding the implementation of successful school-community partnerships are: acquiring resources such as time and willing partners (including school staff), taking an unbiased approach to addressing issues from a local to a global context (and acknowledging all scales of participation as active citizenry), shifting to more future-focused partnerships, and giving teachers the space to

develop deep and diverse cultural knowledge that is relevant to their students.

Conclusion

Despite the many challenges facing educators and partners in the development of school-community partnerships, the collated research reveals that these relationships have diverse and impactful benefits for students, schools, and their communities, and should be pursued where possible. The New Zealand Curriculum supports community engagement, and lifelong and future-focused learning in its principles (Ministry of Education, 2007). The development of school-community partnerships has the ability to bring these principles to life in the classroom. Through these partnerships, schools are able to supply students with more than a basic subject-driven education. These partnerships provide students with the opportunity to participate in the community and work alongside partners, gaining extra-curricular and real-world experience, and in many cases enabling them to give back to the community. Gross et al. (2015) found that schools that showed a commitment to inclusive education were able to impart associated values back into the community. That being said, school-community partnerships have the potential to promote a social shift away from long-held deficit perspectives and non-inclusive practices. School-community partnerships can provide social experiences and influence that support future-focused learning as students are able to experience active citizenry as they participate through relevant and authentic ways in the community, concurrently learning about their roles as democratic agents of change. Through these experiences and opportunities, students gain greater access to social capital than they would have received within the walls of the school. In essence, school-community partnerships serve to remove schools from the isolation of their physical boundaries, and expand the horizons of education (Bolstad et al., 2012). As research reveals, community involvement can increase the likelihood that students will be civically or politically engaged later in life (McFarland & Thomas, 2006). In order to fully understand the advantages and challenges of school-community partnerships in the context of Aotearoa New Zealand, more research should be done on New Zealand schools to gain an understanding of how best to achieve cultural cohesion with the community and deepen learning opportunities (Collins & Mutch, 2012). Given the nature of social inequality in New Zealand schools (Wood, 2012; Wood, 2013), the potential for school-community partnerships to provide all students with opportunities to engage with their communities could result in future politics being more democratic and truly representative of diversity within society. In order for schools to be able to develop such successful, future-focused partnerships that meet the needs of the New Zealand Curriculum, they need to overcome challenges such as the amount of time needed, finding willing partners, and the work required to maintain authentic relationships. As New Zealand becomes an increasingly diverse country, classrooms are likely to become more diverse in their make up too. School-community

partnerships provide an outlet for students to come to an understanding of their identity in the context of their local community, which allows them to have a deeper understanding of their individualism in regards to national and global contexts within this increasingly diverse country. In conclusion, the development of school-community partnerships is an important and effective practice of future-focused education, as they can provide a plethora of resources for students that could empower them on their educational journey and development of identity, and civic responsibility in an evolving country and an evolving world.

References

- Ainscow, M., Muijs, D. & West, M. (2006). Collaboration as a strategy for improving schools in challenging circumstances. *Improving Schools*, 9(3), 192-202. <https://doi.org/10.1177/1365480206069014>
- Bolstad, R., Gilbert, J. & McDowall, S. (2012). *Supporting future-oriented learning & teaching – a New Zealand perspective*. New Zealand Council for Educational Research.
- Gross, J., Haines, S., Hill, C., Francis, G., Blue-Banning, M. & Turnbull, A. (2015). Strong school-community partnerships in inclusive schools are “part of the fabric of the school....We count on them.” *School Community Journal*, 25(2), 9-34. Retrieved from: <https://files.eric.ed.gov/fulltext/EJ1085646.pdf>
- Collins, S. & Mutch, C. (2012). Partners in learning: Schools’ engagement with parents, families, and communities in New Zealand. *School Community Journal*, 2(1), 167-187.
- Evans, M. (2013). Educating preservice teachers for family, school, and community engagement. *Teaching Education*, 24(2), 123-133. <https://doi.org/10.1080/10476210.2013.786897>
- Hands, C. (2010). Why collaborate? The differing reasons for secondary school educators’ establishment of school-community partnerships. *School Effectiveness and School Improvement*, 21(2) 189-207. <https://doi.org/10.1080/09243450903553993>
- Hardy, I. & Grootenboer, P. (2016). Cultivating community: Detailing school and community engagement under complex conditions. *Teaching Education*, 27(1) 21-38. <https://doi.org/10.1080/10476210.2015.1034683>
- Leonard, J. (2011). Using Bronfenbrenner’s ecological theory to understand community partnerships: A historical case study of one urban high school. *Urban Education*, 46(5) 987-1010. <https://doi.org/10.1177%2F0042085911400337>
- McFarland, D. & Thomas, R. (2006). Bowling young: How youth voluntary associations influence adult political participation. *American Sociological Review*, 71(3) 401-425. <https://doi.org/10.1177%2F000312240607100303>
- Ministry of Education (2007). *The New Zealand Curriculum*. Wellington: Learning Media.
- Sanders, M. (2001). The role of “community” in comprehensive school, family, and community partnership programs. *The Elementary School Journal*, 102(1), 19-34. Retrieved from: <https://www.jstor.org/stable/1002167>
- Sanders, M. (2003). Community involvement in schools: From concept to practice. *Education and Urban Society*, 35(2), 161-180. <https://doi.org/10.1177%2F0013124502239390>
- Wood, B. (2012). Scales of active citizenship: New Zealand teachers’ diverse perceptions and practices. *International Journal of Progressive Education*, 8(3), 77-93. Retrieved from: <https://eric.ed.gov/?id=EJ1002010>
- Wood, B. (2014). Participatory capital: Bourdieu and citizenship education in diverse school communities. *British Journal of Sociology of Education*, 35(4), 578-597. <https://doi.org/10.1080/01425692.2013.777209>

From Placement to Practice: Factors Affecting the Classroom ICT Integration of Pre-Service Teachers

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Abstract

Technological progress has resulted in unprecedented access to technology in education. While this removes the age-old issue of information and communications technology (ICT) availability for pre-service teachers, it does not remove the need to meaningfully integrate technology into their practice. Three areas of influence significantly impact the self-efficacy of pre-service teachers and, therefore, their ability to effectively use technology. The first, initial teacher education, should provide technological, pedagogical, and content knowledge (TPACK) initiatives to prepare trainees for practice, alongside mentors who are themselves competent in ICT integration. The second, schools and school communities, must provide relevant professional development around ICT use alongside a positive and open-minded culture around ICT use in the school, as well as addressing issues of access for students in lower socioeconomic areas. Finally, the pre-service teacher themselves must maintain an open mind and a constructivist pedagogical perspective to increase their own self-efficacy and successfully integrate technology into their future practice.

Keywords: *Technology integration, efficacy, digital pedagogy, teacher education, pre-service teacher*



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Introduction

Due to the rapid changes in technology available to students in schools, education technology has long been an area of interest to both teacher educators and educational theorists (Instefjord & Munthe, 2017). As general access to devices and software has increased with the introduction of inexpensive devices such as Chromebooks and free applications such as Google apps, so has the ubiquity of use in the classroom. In their report for the Ministry of Education, Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012) wrote that simply adding information and communications technology (ICT) into the classroom is not going to “trigger beneficial and meaningful educational change” (p. 6), and that a set of interconnecting strategies are required to do so. This implies that the challenge is not *if* ICT should be used in the classroom, but how technology can be *meaningfully* integrated into classroom practice in a way that enhances learning (Bolstad et al., 2012; Chai, Koh, & Tsai, 2010). Approaches like the technological, pedagogical, and content knowledge (TPACK) framework allow for educators and pre-service teachers to consider the intersections of thoughtful teaching and learning, and the relevance technological competency has to the world the students enter after school every day.

Preparing teachers and supporting the increase of self-efficacy (or ‘belief in one’s ability to succeed’) in this area should be a key focus of initial teacher education, as opposed to simply supporting digital competence (Instefjord & Munthe, 2017). Further, the role of the school environment and wider community is to continue to support teacher perceptions of

their own self-efficacy and to provide professional development opportunities to continue to promote effective integration in the school (Kopcha, 2012). Finally, the way teachers’ themselves interact with personal barriers, such as time and perception, has a significant impact on their commitment to increasing or maintaining their digital competence and constructivist versus traditional pedagogical views (Petko, 2012).

The Role of Teacher Education

Teacher education programmes are a pivotal point for pre-service teachers in developing their teaching philosophies and perspectives on vital areas of their teaching practice. Initial teacher education is often the first place pre-service teachers engage with technology in a classroom context, and so has a marked effect on the teacher’s ability and motivation to integrate technology successfully into their practice. Among the largest impacts on these factors are reported to be the competency and relatability of their mentor teachers and educators, and the focus of the initial teacher education programme (i.e., looking to the TPACK framework: a tool for teaching integrated ICT as opposed to skills and outcomes-based teaching).

The Impact of Coursework

Chai et al. (2010) developed a special ICT course for Singaporean pre-service teachers to study the contribution content knowledge, pedagogical knowledge, and technological knowledge had towards overall TPACK competency. While the content knowledge was left to other classes in the programme, they provided specific lessons on

pedagogical knowledge looking at approaches to using ICT for learning and related classroom management issues. They went on to provide specific technological knowledge classes where the pre-service teachers would learn about a new technology, and would link the use to pedagogical pros and cons, as well as considering how it could result in “tech enhanced lessons (TEL)” (p. 66). Finally, the last few lessons looked at integrating these concepts into the TPACK framework where students needed to come up with a tech-integrated unit with justification of the use (or not) of technology and the pedagogical approaches used in the decisions. The data gathered focused on the perceived competency of each strand (content, pedagogical, technological) before and after the completion of the course. Generally, students rated themselves as slightly above average in all areas before the course, and increased their ratings in all areas after the course ended. Pedagogical knowledge was correlated most strongly with overall TPACK competence in both surveys, though all areas were strong in the post-course survey. It could be argued that the article is missing some data to support their conclusions about the learned competence of the students – for example, exemplars of the final integrated unit plan assignment, rubrics, or perhaps interviews with the students once they were teaching in schools and putting their learning into practice. Did their perceived competence fresh from a course actually result in confidence implementing these skills in the classroom?

Lee and Lee (2014) performed a similar study with a specially formulated ICT course focused on integrating technology into lessons. Instead of focusing primarily on TPACK competency, they instead provided training on the ASSURE model for lesson planning (i.e., analyse learners; state standards and objectives; select strategies, technology, media, and materials; utilise technology, media, and materials; require learner participation; evaluate and revise) including reflective steps on meaningful integration. The students were also provided with brief training on general programmes such as Photoshop and Windows Movie Maker, and classes on approaching technology integration using TPACK. Students reported the lesson planning training and ASSURE model to have the biggest impact on their self-efficacy, but again the study failed to provide examples of what exactly they were looking for to determine competency in these areas.

The Impact of Mentorship and Modelling

Instefjord and Munthe (2017), and Barton and Haydn (2006) both performed studies observing the impact mentor teachers and modelling had on the self-efficacy of their pre-service teacher counterparts. Instefjord and Munthe (2017) made a determination based on the correlation between teacher educators’ technological self-efficacy and the subsequent reporting of self-efficacy from their trainees. Their study showed that 35% of the teacher educators surveyed believed they modelled technological integration at a high level to their trainees, however, the study went on to discover that when asked to rate their perceived interactive whiteboard competence, educators gave themselves a mean score of 2.94 (out of 6). A similar question was put to the teacher trainees, asking if they believed they had received good training in interactive whiteboard use. The trainees gave a mean score of 1.94, indicating that the low competence of their educators had a significant impact on the learning of the trainees. Further, despite teacher educators scoring themselves a 3.90/6 for being

a good role model for effective technological integration, their teacher trainees rated them a 2.72/6. It is possible that trainees perceived different aspects of integration to be of higher value than those valued by the educators, and thus a discrepancy in ratings could be explained this way. Despite gathering a lot of quantitative data from this study, the researchers admit that the modelling technique used requires a larger sample size (>200) than they had (136). The participants ranged in focus from early childhood education to secondary education, resulting in significantly different use-cases for ICT in the classroom and no explanation as to whether this would affect their conclusions – the assumption was made that it would not.

Barton and Haydn (2006) asked trainee teachers what they perceived to be strategies and interventions implemented by their initial teacher education provider that positively impacted their ability to use ICT in their teaching. The study gathered data through quantitative questionnaires asking yes/no or 1-5 agree/disagree scaled questions. Of the participants, 79% responded that they had used ICT on placement, though this could have been only a small part of a single lesson. Of the trainees, 97% reported that they had used ICT to create teaching resources while on placement. The trainees went on to report that 86% of them had discussed the use of ICT with their mentors, though just over half of them believed they had a role model for the use of ICT within their department. Only 9% of participants believed they used ICT less than others in the department, and nearly a third reported that they used ICT more. Barton and Haydn (2006) concluded that the data positioned access issues and mentor support as major factors in the participants’ self-efficacy progress, but this study was performed in the mid-2000s when personal computers and tablets were less ubiquitous and easily obtained as they are now, so access is less of a barrier than it was then. As shown in Instefjord and Munthe (2017) in a more recent study, no mention was made of access issues, but the impact of mentor teachers on trainee self-efficacy was reiterated in their data.

The Role of the School and School Community

Once pre-service teachers have begun their practical experience in schools, and when they have finished study and are beginning an in-service teacher role at a school, the impact of the mentor teacher remains, but the influence of their teacher educators is lessened. The significance of the attitudes and opportunities afforded by the school and the wider school community comes to the forefront, particularly the culture, demographic aspects, and openness to change.

The Impact of School Culture

Gil-Flores, Rodríguez-Santero, and Torres-Gordillo (2017), Inan and Lowther (2010), and Kopcha (2012), undertook studies on the influence of school culture on whole school perceptions of ICT, specifically focusing on how the provision of professional development opportunities impacted the effective integration of ICT in the classroom. Inan and Lowther (2010) found that, of their school-based factors, professional development opportunities had the greatest impact on the participant teachers’ readiness to integrate laptop computers into their practice, alongside overall school support having the greatest impact on teacher self-efficacy. Technical support, while not ranking the highest, came a close third

behind professional development. It was also found that, while these factors had significant value in affecting teacher belief and readiness, if a teacher already has positive beliefs and considers themselves ready, this will mitigate negative effects from school-based factors. This study used the same model analysis as Instefjord and Munthe (2017), with a higher sample size (379 versus 136), meaning this study had more statistically stable results. Similarly, the participants of this research spanned primary and secondary sectors as well as rural to urban geographical locations, which is not considered a source of variance in their data.

Kopcha (2012) conducted a study with 18 primary school teachers where the participants received situated professional development (in-class and connected to classroom practice) and mentoring for one year, and developed communities of practice over the following year. The participants were surveyed and interviewed after the initial year of mentoring, and at the end of the year of developing communities of practice with minimal mentor guidance. The study was looking at changes in teacher perceptions of five barriers to ICT integration: access, vision, professional development, time, and beliefs. The study found that, while the teachers found the mentoring and professional development meaningful and useful over the initial year, once the mentor left and they were left to develop their communities of practice, the constraints of time and inexperience made the second year less successful than the first. Participants generally agreed that it was easier to find and use ICT resources with the help of the mentor, but that they had found that they could troubleshoot their own integration ideas by talking with other teachers about what they were implementing. As the school culture changed, demands on communal devices increased, resulting in an access issue. With the mentor gone, the technical support was also lacking, which meant that teachers spent time clearing updates on the communal laptops when they were able to book them, and had to sort technical issues themselves, something they did not feel adequately prepared for. Despite these issues, the participants' perceptions of ICT integration remained positive. The study determined that sustained professional development can have a significant impact on teacher and school perceptions of ICT, but that the communities of practice were not as influential and, in some cases, were detrimental. Kopcha (2012) had a small sample size (18), but was focused on a single primary school. Both quantitative data (Likert scale survey questions) and qualitative data (interviews and classroom observations) were collected. They note that the small, specific context makes it difficult to extrapolate to other contexts, but that the focus was on the ability of sustained professional development to change a school culture, for which the case study method was appropriate.

Gil-Flores et al. (2017) carried out a large study of 3339 secondary educators in Spain. They observed the effect of the presence or lack of ICT infrastructure in schools through quantitative data collection via ranked surveys. Their data showed that if the perceived need for professional development was low, the frequency of ICT use increased. As teacher collaboration increased, so did the frequency of ICT use. If a school does not have appropriate access to education software, the frequency of ICT use will drop significantly. While this study did determine some areas of correlation within ICT infrastructure in school, it found that, in general, teacher

characteristics were more relevant to ICT usage than any infrastructure-related variable. The large sample size could be considered to negate the geographical differences between participating schools. Trends can be picked out from a sample size this large that can be considered general. However, because this study was so large it was impossible to gather and analyse qualitative data which means that, while there is enough quantitative data to determine frequency of ICT use, there is no way to determine quality of use.

The Impact of Location

Maxwell (2000) analysed the effect of certain biases on equitable student access to technology in the US, but a lot of the findings can also be true for New Zealand. They write that often rural and poor areas of the country are the last to receive new technology, and for similar reasons do not have the same level of access to professional development training to learn to use new technologies. Students and families in low socioeconomic zones tend to view technology as a luxury, and not a necessity, resulting in a technological disparity between students who can afford their own device to use at school and those who cannot. This puts further pressure on the school to provide the devices to shorten the gap and promote equity, an expense schools in more affluent areas do not have to bear. It is of particular importance to invite families into the integration process so that they can understand how technology can enhance student learning. This means that they can encourage technology use at home, even if this is in the form of regular trips to local libraries or a family purchase of a laptop for communal use. Often schools in low socioeconomic areas have further expenses to bear that others do not. On top of trying to provide students with devices at school, there is also pressure to ensure students are fed and clothed in order to be able to engage in their education. Teachers in these schools not only face their own barriers to technology integration, they must address the barriers facing the students' access to and engagement with technology in the classroom and at home. Maxwell's paper is not a study but more an overview, and it is fairly out of date, but the points it brings are still relevant in a current New Zealand context. There is generally a lack of data on New Zealand inequity about student access to devices, and the literature covers barriers to teacher integration and simply assumes ubiquitous access to technology on the part of the school and students. While it is true that it is easier and cheaper than ever for schools to purchase devices and educational software, and that students in general have constant access to smart devices, there are areas of New Zealand in which this is not the case, and the schools inevitably bear the financial brunt of this disparity.

The Role of the Teacher

Each of the studies presented also referenced the relative importance of teacher belief, perception, and characteristics. Across the board, the teacher-based barriers to ICT integration are the most significant. Pedagogical belief, perception of the severity of barriers, and understanding of personal self-efficacy are deciding factors in the ability of a pre-service or in-service teacher to successfully and effectively integrate ICT into their practice.

The Impact of Teacher Belief

Petko (2012) performed a study based on the model adopted by Knezek, Christensen, and Fluke (2003), which was

developed to explain the variance in technology use in the classroom. The model covers three core variables – the teacher’s will or belief in the relevance and meaning behind using technology; the skill of the teacher, in both personal and pedagogical contexts, and the availability of tools and devices in the school. Part of Petko’s study focuses on the “will” part of the model, surveying 357 teachers from 15 secondary schools on pedagogical beliefs and perceptions of the effectiveness and efficiency of ICT in the classroom. Results of the survey show that positive beliefs surrounding ICT use have significant impact on the frequency of ICT use. Further, teachers reporting a constructivist view of teaching were more likely to use ICT in their classrooms, though this was not as significant as simply having a positive perception of ICT. The study suggests that the small amount of variance in answers from constructivist teachers is due to the fact that most of the participants identified as constructivist, so there was not enough non-constructivist data to draw a solid conclusion. The findings of Lee and Lee (2014) support this conclusion, also finding that teachers felt their self-efficacy increased with targeted training around ICT. The pedagogical focus of TPACK allows for teachers to look for the meaning behind their use of technology and consider whether it is necessary or enhancing learning.

The Impact of Time

Aside from teacher perception of their own ability and pedagogical beliefs, time is the most significant barrier to teachers who want to integrate ICT in their classrooms. Even if teachers have the will, the skill, and the tools, as well as supportive schools and a solid background from their initial teacher education programme, the time it takes to find and adapt digital resources and plan for meaningful ICT use in class is still present. Kopcha (2012) wrote that, despite having a mentor for professional development and establishing communities of practice, teachers’ perception of the time it took to use technology in the classroom was overwhelmingly and consistently negative. Haydn and Barton (2007) also recognised the importance of providing time to trainee teachers and their mentors to discuss ICT implementation strategies and purpose. They suggest that often this issue is negated by providing schools and teachers with more strategy guides and software, without addressing the need for time to learn to plan for new software or new methods of instruction.

Conclusion

Each initial teacher education provider is different, each teacher is different, and each school is different. Due to the wide variation of situation and severity of influential factors, it is impossible for any strategy to be a ‘silver bullet’ or a one-size-fits-all solution to remove barriers from schools and teachers. However, an in-depth understanding of the mitigating factors surrounding the challenge of meaningful ICT integration can better prepare pre-service teachers to engage with them openly and work with others to try to overcome them in their own specific context. Initial teacher education providers can use the literature to inform their own practice and development of ICT resources for trainee teachers. Sustained

and relevant professional development in schools as well as follow-up mentoring and classroom observations can make a difference in school culture surrounding the use and meaningful integration of technology in a school-wide context. Technology has progressed rapidly in recent years, and will continue to do so in the future. Part of future-focused education is to prepare our students for the world they will be entering once they finish schooling, and technology is a big part of that world. Approaches like TPACK, that integrate a need for meaningful learning experiences that *can* include the use of technology in a way that *enhances* the learning that is occurring within traditional teaching and learning settings, are a great tool for keeping teaching and learning current as well as meaningful.

References

- Barton, R., & Haydn, T. (2006). Trainee teachers' views on what helps them to use information and communication technology effectively in their subject teaching. *Journal of Computer Assisted Learning*, 22(4), 257-272. <http://dx.doi.org/10.1111/j.1365-2729.2006.00175.x>
- Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012). *Supporting future-oriented learning & teaching: A New Zealand perspective*. Ministry of Education Wellington. <http://bit.ly/bolstad-et-al>
- Chai, C. S., Koh, J. H. L., & Tsai, C.-C. (2010). Facilitating preservice teachers' development of technological, pedagogical, and content knowledge (TPACK). *Educational Technology and Society*, 13(4), 63-73.
- Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J.-J. J. C. i. H. B. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. *Computers in Human Behavior*, 68, 441-449. <http://dx.doi.org/10.1016/j.chb.2016.11.057>
- Haydn, T. A., & Barton, R. (2007). Common needs and different agendas: How trainee teachers make progress in their ability to use ICT in subject teaching. Some lessons from the UK. *Computers & Education*, 49(4), 1018-1036. <https://doi.org/10.1016/j.compedu.2005.12.006>
- Inan, F. A., & Lowther, D. L. (2010). Laptops in the K-12 classrooms: Exploring factors impacting instructional use. *Computers & Education*, 55(3), 937-944. <http://dx.doi.org/10.1016/j.compedu.2010.04.004>
- Instefjord, E. J., & Munthe, E. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education*, 67, 37-45. <http://dx.doi.org/10.1016/j.tate.2017.05.016>
- Knezek, G., Christensen, R., & Fluke, R. (2003). *Testing a Will, Skill, Tool Model of Technology Integration* [Paper presentation]. Annual Meeting of the American Educational Research Association, Chicago, IL.
- Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers and Education*, 59(4), 1109-1121. <https://doi.org/10.1016/j.compedu.2012.05.014>
- Lee, Y., & Lee, J. (2014). Enhancing pre-service teachers' self-efficacy beliefs for technology integration through lesson planning practice. *Computers & Education*, 73, 121-128. <https://doi.org/10.1016/j.compedu.2014.01.001>
- Maxwell, D. (2000). Technology and Inequality Within the United States School Systems. *The Journal of Educational Thought (JET) / Revue De La Pensée Éducative*, 34(1), 43-57. <http://www.jstor.org/stable/23767141>
- Petko, D. (2012). Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the ‘will, skill, tool’ model and integrating teachers’ constructivist orientations. *Computers & Education*, 58(4), 1351-1359. <https://doi.org/10.1016/j.compedu.2011.12.013>

The Role of New Technologies: The Educational Effectiveness of Video Games, Simulations, and Virtual Reality in the Science Classroom

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Abstract

With the recent advancement of technology, more schools are starting to integrate ICT into their curricula. This review looks at the effectiveness of this integration regarding video games, simulations, and virtual reality, and their role in science education. Numerous benefits were found relating to student engagement, attitudes towards science and in the development of 21st-century skills such as creativity and problem-solving. However, there were inconclusive results regarding the academic potential gained from these tools compared to more traditional science teaching methods. Overall, it was found that the teacher's pedagogy surrounding technology was the key factor in determining whether the ICT tool resulted in significant learning gains.

Keywords: *Digital-technology, Science education, video games, simulations, virtual reality, game-based learning*



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Introduction

Traditional teaching methods of stating facts verbally, projector presentations, and visualisation on a whiteboard are inherently static in nature, and do not require student input or interaction (Bibek & Deb, 2016). Using these techniques, learner attention and engagement can be easily lost over extended periods of time. User-focused information and communication technology (ICT) allows for first-person experiences, which involves active engagement from the learner.

In recent years, the availability and access to laptops and other ICT devices have led to their gradual integration into the science classroom (Rutten, van Joolingen & van der Veen, 2012). However, workbooks and textbooks remain the primary resources for teaching in most schools today (Barab et al., 2009). Trying to understand science from a textbook, is like trying to learn how to play a video game from solely reading the game manual, where there is an abundance of information with limited to non-existent context.

Many processes in chemistry and biology occur on a microscopic scale, such as chemical reactions and protein synthesis, while earth and space science concepts require a macroscopic scale. This is a common reason why science is often difficult for learners to comprehend properly (Pekdağ, 2010). Through the use of ICT, and in particular, video games, simulations, and virtual reality, students change the scale of these processes to start recognising their own misconceptions, and start to build

accurate mental models that will contextualise scientific information.

Video Games and Game-Based Learning

Game-based learning describes the knowledge and skills acquired by the student through problem-solving challenges in the context of a video game environment (Qian & Clark, 2016). Through game-based learning, video games promote 21st-century skills such as creativity, collaboration, communication, and critical thinking (Qian & Clark, 2016). These skills are important for learners to obtain as they transition into the post-schooling world. In recent years, educators are moving away from teaching only subject content knowledge, and are now aiming for cross-curricular content that nurtures 21st-century skills. In contrast, traditional educational methods often minimise these skills by favouring high-stakes individualistic standardised testing (Qian & Clark, 2016). Video games compliment science education as it contextualises many of the complex phenomena that are currently in the curriculum (Barab et al., 2009). The virtual gaming world has the benefit of having readily manipulated variables, such as chemical composition, the force of gravity, and the direction and speed of time, as well as different representations of scientific concepts like atoms and cells. They have interactive and learner-led storylines with complex interacting mechanics which can lead to substantial learning potentials. Unfortunately, given all these possible benefits, video

games are still stigmatised by some educators; being perceived as just entertainment and having no value for educational purposes in the classroom (Annetta et al., 2013).

Educational video games create a “low-stress environment” (Marino et al., 2013) where learners can interact with more accessible versions of complex scientific vocabulary, concepts and ideas. Teachers can use these video games in the design of a universal design for learning (UDL) curriculum which is made to suit all learners, including students who may be hindered by learning difficulties. Students with learning difficulties are more likely to hold negative dispositions towards science (Marino et al., 2013). This is due to the vast amount of complex reading and text in the subject which limits their ability to meaningfully understand and comprehend the scientific information. New vocabulary and ideas are often presented to the students through inaccessible media, instead of through UDL techniques. As a result, struggling learners may fall further behind until they leave the subject altogether. This can result in secondary science in schools becoming a test of reading comprehension rather than an active exercise in experimental inquiry (Barab et al., 2009).

In a study of 57 middle school students with learning difficulties, three educational video games were played by the students, and the learning gains experienced were analysed using standardised pre-post testing versus more traditional ‘pen and paper’ methods (Marino et al., 2013). The quantitative results from this study supported the notion that the gaming units were of no benefit to students with learning difficulties compared to traditional teaching methods (Marino et al., 2013). These results were also supported by Annetta et al. (2013) who found no difference in academic student performance when using games to review a genetics unit compared to ‘paper and pencil practice’. However, the qualitative feedback from both studies showed students reporting higher levels of engagement and understanding the information content when using video games. The students were collaborating with their peers on the games; sharing and explaining the games to their friends and family, and teaching the content to others. For example, a quote by a student was: “I played the game at home with my dad, he was excited about the bacteria game.” These games captivate and excite students enough to spend hours of their own time outside of the classroom learning on their own (Annetta et al., 2013). Educational games can create lifelike experiences and assist in the creation of active context-based learning. Students reported making connections between what they experienced in the games, and the real world, for example, “It’s a lot like the store where my mum works, so it seemed real” (Marino et al., 2013). This is a key step in bridging what students experience outside of the school to what they are currently doing and learning in the classroom.

What Makes an Effective Educational Video Game?

Annetta et al. (2013) found that video-games need to be educational by design, with a focus on instructional

content, and less on visual animation and audio. An example of a purpose-built educational game is Taiga Park designed by Barab (Barab et al., 2009). Taiga Park is a multiplayer virtual environment which allows users to explore, problem solve and interact with non-player characters (NPCs). In this purposefully designed world, the student becomes the protagonist who has a form of agency using their own virtual avatar. They are in control, and they take responsibility for the consequences of choices made in-game to progress the storyline. In a study of 51 university undergraduates, it was found that the group assigned to the virtual world Taiga Park, performed significantly better on a post-test evaluation, compared to the group given more direct focused information by traditional texts (Barab et al., 2009). This was surprising as the gaming group had to implicitly infer the educational concepts from their gaming experience for the test afterwards.

A multi-variable study (Israel, Wang & Marino, 2016) analysed the performance of 366 middle school students in three science-based video-games. What they found was that post-test scores were significantly influenced by three main factors, namely, reading ability level, previous subject knowledge, and self-perceptions about scientific capabilities. The researchers found that, much like the classroom environment, learners enter the gaming environment with varying levels of confidence, prior knowledge and self-deterministic attitudes. Teachers and educators need to be able to assess these factors to decide on the most effective ICT tools to implement in their practice (Israel et al., 2016).

Simulations

Computer simulations are designed purposefully to assist in the facilitation of teaching and learning through visualisation. In the science classroom, they offer a wide range of simplified, dynamic, user-focused model representations of natural processes and experiments that could not otherwise be performed in a school environment (Sarabando, Cravino & Soares, 2014). In chemistry, some reactions are either too dangerous or too time-consuming for students to carry out on their own. However, they still have an immense academic value associated with them, so a simulation can be used to show the reaction while avoiding the risks or costs of doing them (Pekdağ, 2010).

When compared to traditional textbooks and whiteboard presentations, computer-based simulations create a stress-free environment where learners can change the time-scale of events. This allows the user to explore hypothetical situations at their own pace without fear of judgement by their teacher and peers (Rutten et al., 2012). Additionally, a simulation allows for the precise control of each parameter and variable of a system individually, which might not be possible to achieve in real life (Yaman, Nerdel & Bayrhuber, 2008). This lets the student actively control the final product of the simulation and focus the student’s attention on the desired phenomena, or cause-and-effect relationship (Sarabando et al., 2014).

A study investigating the effectiveness of computer simulations in physics, replacing traditional hands-on experiments (Sarabando et al., 2014) was conducted. A total of 142 middle school students were split into two groups: one group had a 90-minute session with a computer simulation; the other group did a physics lab experiment with written instructions. The results of the study showed that the use of computer simulations helped the students better understand the physical concepts of weight and mass. Analysed using a standardised pre- and post-test, the group accessing the computer simulation reported learning gains of 40-58%, whereas the control group who performed experimental lab activities, their total gains were only 20-37%, which was significantly lower. These results support the notion that interaction with digital simulations can effectively contextualise the core concepts in science that are traditionally presented to students through symbolic notion (Sarabando et al., 2014).

The effectiveness of a computer simulation depends on the teacher's role in its implementation (Sarabando et al., 2014); some teachers think that the simulation will be taking over their teaching responsibility (Pekdağ, 2010). Teachers need to be provided with concise explanations as to what their role is in providing instructional support with regards to ICT and simulations.

A challenge with giving verbal feedback or instruction to the student (e.g., "Try changing this parameter...") is it can be damaging to the learner's agency; it can be seen as an attempt to limit the student's personal control over the simulation (Lindgren, Tscholl, Wang & Johnson, 2016). While working with simulations, having instructional support tasks embedded in the programme can help the learner identify the simulation's educational learning objective explicitly, without feeling as if the teaching is directly telling them the steps to take (Yaman et al., 2008). Another challenge arises when simulations try to replace all real-world experimental lab work, meaning the student will lack competent laboratory skills which are often the learning intention behind doing experiments. However, limited use of simulations can make lab work more effective by having it as pre-lab training (Rutten et al., 2012).

Virtual Reality

Virtual reality (VR) is a first-person interactive computer-generated experience within a simulated environment. Unlike video games and simulations, which both use mainly audio and visual prompts, VR uses the user's own movements and gestures to interact with the virtual world. From an educational standpoint, interacting in virtual reality creates conceptual anchors from which new knowledge can be built (Lindgren et al., 2016).

Currently, the use of VR in classrooms is almost non-existent, which is surprising given the technology's potential as a valuable learning tool. Different versions of VR can be readily accessed by learners using a

smartphone with an internet connection. Many schools already have a 'bring your own device' policy in place, with most students having access to a smartphone (Bibek & Deb, 2016), therefore, it is not a lack of technological access stopping the implementation of VR.

The importance of place-based learning has already been well established in the literature (Johnson, 2011). VR makes place-based learning more accessible, costing less time and money, as educators can take their classes anywhere in the world using their own devices. In a worldwide trial organised by Google in 2015, selected schools were given cardboard VR headsets which students could use with their own phones. With these headsets, learners went on guided virtual journeys of educational sites and landmarks such as space stations, coral reefs, museums, laboratories and volcanoes (Bibek & Deb, 2016). During these guided virtual journeys, the teachers could lead the students while they are experiencing VR through a separate tablet, highlighting the relevant places and details the students should focus on.

Bibek and Deb (2016) conducted a study of 40 university undergraduates over a two-month period on varying aspects of computer science. Their study involved two groups: a control group being taught with textbooks and a whiteboard, and an experimental group with VR headsets. Over 16 sessions, both groups' learning gains were assessed using pre- and post-testing. Initially, the control group performed better with traditional teaching methods than the VR group, however, as the VR group got used to using the headsets, the VR group ended up testing significantly and consistently better than the control group towards the end of the study (Bibek & Deb, 2016). Physical activities seem to more effectively focus the learner's view of science as being relevant to the real-world (Lindgren et al., 2016).

In a study of middle school students, an experimental group of 58 students experienced the game MEteor, an interactive and immersive virtual simulation of physics and astronomy. The experimental immersive group reported significantly higher levels of enjoyment and received significantly higher scores on a post-test than those in the desktop control group, in addition to fostering a more positive attitude towards science and education in general. Overall, the researchers found that the immersive full-body simulation led to the learner feeling more connected to the subject content (Lindgren et al., 2016).

The Limitations and Challenges Surrounding ICT Tools

The biggest barrier to ICT integration in the science classroom is the failure of educators to incorporate the technology effectively into their teaching and learning pedagogy (Pekdağ, 2010). Only providing the means of access to devices and software without attention to learner support and instruction, does not result in student

learning and the desired conceptual gains (Sarabando et al., 2014). In response to this, teachers should be provided with up-to-date education on ICT integration with concrete examples if their students are to receive the most benefit from using these tools (Pekdağ, 2010). Pre-service teacher education programmes need to cover the integration of technology in practice, as this has been shown to improve in-service confidence and effectiveness using various ICT tools (Lee & Lee, 2014).

The design of ICT tools is important in determining how effective a teaching resource it is, as some video games, simulations, and virtual reality programmes have a high 'cognitive load' defined as the mental effort required to understand a concept in an individual's mind (Pekdağ, 2010). Conversely, 3D simulations have been found to be detrimental for learners conceptualising information. The simulation was unfolding too quickly and presenting too much visual information at one time. This caused extra cognitive load for students, which lacked the spatial ability to comprehend the simulations completely (Vavra et al., 2011). Educational ICT tools should be learner-focused by design to not create a cognitive overload for the student, due to learning and memorisation being hindered by extreme cognitive loads (Pekdağ, 2010).

Conclusion

The role of new technologies in the science classroom is still being investigated. What has been found is that technology engages students in the learning process, and can result in significant learning gains when used appropriately. The effectiveness of integrated ICT tools in science education is a direct product of the interplay between the ICT tool, the learners and the teacher. Without adequate teaching skills and training for teachers to incorporate technology into their teaching and learning pedagogy, the full potential of video-games, simulations, and virtual reality as a teaching resource may remain out of reach (Sarabando et al., 2014).

There is still much research to be done in this area, particularly regarding senior high-school science. The literature appears to focus on junior and university science, as there is more flexibility in the curriculum for research during this time (Annetta et al., 2013). There is also a need to get students' input regarding what they think will work for them as they are the target audience. Longer-term studies are also needed – with most of the literature focusing on students having one short session with an ICT tool – because learning gains will be more apparent when students are comfortable and familiar with the technology which they are using.

References

- Annetta, L., Frazier, W., Folta, E., Holmes, S., Lamb, R., & Cheng, M. (2013). Science Teacher Efficacy and Extrinsic Factors Toward Professional Development Using Video Games in a Design-Based Research Model: The Next Generation of STEM Learning. *Journal of Science Education and Technology*, 22(1), 47-61. <http://dx.doi.org/10.1007/s10956-012-9375-y>
- Barab, S., Scott, B., Siyahhan, S., Goldstone, R., Ingram-Goble, A., Zuiker, S., & Warren, S. (2009). Transformational Play as a Curricular Scaffold: Using Videogames to Support Science Education. *Journal of Science Education and Technology*, 18(4), 305-320. <http://dx.doi.org/10.1007/s10956-009-9171-5>
- Bibek, A., & Deb, S. (2016). Smartphone Based Virtual Reality Systems in Classroom Teaching. In *International Conference on Technology for Education* (pp. 68-71). Madurai: IEEE computer society. <http://doi.org/10.1109/T4E.2016.022>
- Israel, M., Wang, S., & Marino, M. (2016). A multilevel analysis of diverse learners playing life science video games: Interactions between game content, learning disability status, reading proficiency, and gender. *Journal of Research in Science Teaching*, 53(2), 324-345. <http://dx.doi.org/10.1002/tea.21273>
- Johnson, S. (2011). Place- and community-based education in schools. *Environmental Education Research*, 17(3), 425-428. <http://dx.doi.org/10.1080/13504622.2010.548154>
- Lee, Y., & Lee, J. (2014). Enhancing pre-service teachers' self-efficacy beliefs for technology integration through lesson planning practice. *Computers & Education*, 73, 121-128. <https://doi.org/10.1016/j.compedu.2014.01.001>
- Lindgren, R., Tscholl, M., Wang, S., & Johnson, E. (2016). Enhancing learning and engagement through embodied interaction within a mixed reality simulation. *Computers & Education*, 95, 174-187. <http://dx.doi.org/10.1016/j.compedu.2016.01.001>
- Marino, M., Gotch, C., Israel, M., Vasquez, E., Basham, J., & Becht, K. (2013). UDL in the Middle School Science Classroom. *Learning Disability Quarterly*, 37(2), 87-99. <http://dx.doi.org/10.1177/0731948713503963>
- Pekdağ, B. (2010). Alternative Methods in Learning Chemistry: Learning with Animation, Simulation, Video and Multimedia. *Turkish Science Education*, 7(2), 111-118. https://www.researchgate.net/publication/49607764_Alternative_Methods_in_Learning_Chemistry_Learning_with_Animation_Simulation_Video_and_Multimedia
- Qian, M., & Clark, K. (2016). Game-based Learning and 21st century skills: A review of recent research. *Computers in Human Behavior*, 63, 50-58. <http://dx.doi.org/10.1016/j.chb.2016.05.023>
- Rutten, N., van Joolingen, W., & van der Veen, J. (2012). The learning effects of computer simulations in science education. *Computers & Education*, 58(1), 136-153. <http://dx.doi.org/10.1016/j.compedu.2011.07.017>
- Sarabando, C., Cravino, J., & Soares, A. (2014). Contribution of a Computer Simulation to Students' Learning of the Physics Concepts of Weight and Mass. *Procedia Technology*, 13, 112-121. <http://dx.doi.org/10.1016/j.protcy.2014.02.015>
- Vavra, K., Janjic-Watrich, V., Loerke, K., Phillips, L., Norris, S., & Macnab, J. (2011). Visualization in Science Education. *Ain Shams Engineering Journal*, 41(1), 22-30. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.409.1681>
- Yaman, M., Nerdel, C., & Bayrhuber, H. (2008). The effects of instructional support and learner interests when learning using computer simulations. *Computers & Education*, 51(4), 1784-1794. <http://dx.doi.org/10.1016/j.compedu.2008.05.009>