The Influence of Innovative Learning Environments on Student Learning in a Mainstream Secondary School Context

by

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Abstract

The spatial organisation of schools is seen as the potential vehicle through which 21st century skills, competencies, capabilities and knowledge are acquired. Architectural designers and policy makers alike have called for the reconceptualisation of the place of learning in schools from traditional single cell classrooms to open plan areas designed to accommodate various learning activities simultaneously. The flexibility of the innovative learning environment (ILE) should promote the integration of digital technologies into teacher pedagogies but has implications too for the professional identities of teachers who have to reconceptualise the way they teach and think about their work.

Drawing on Vagle's (2014) post-intentional phenomenological approach, this study examined the intentional relationship of teachers and students with the phenomenon of interest (teaching and learning in an ILE) in a single mainstream secondary case study school. This study investigated the influence of ILEs in this school context on student learning, gathering a snapshot of the perceptions of participant teachers and students regarding classroom design and teaching and learning in the ILE. Data from questionnaires and a student focus group were thematically analysed in order to make sense of the lived experiences of the participants in the ILE. The findings suggest the existence of both potential opportunities and barriers to learning with regard to the implementation of pedagogy in the ILE, which may influence student outcomes. Based on the analysis, recommendations at a school level, teacher education institution level and policy level, including recommendations for future research, are suggested.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Melanie Patrix

Chapter One: Introduction

> Whakapūpūtia mai ō mānuka, kia kore ai e whati.
>
> Cluster the branches of the mānuka, so they will not break. (Unite with a basic philosophy and know which direction to go).

New Zealand has the largest variation in student achievement within schools amongst all OECD countries (OECD, 2015) and this inequity arguably is one of New Zealand's greatest challenges. According to Hood (2015), our education system was not designed for learning, nor was it designed for inclusiveness. Education ignored diversity and the curriculum was influenced by early theories on intelligence on how children learned, which was by rote and repetition. In the design process, schools were modelled on the factory and a system of mass production where learning was viewed as linear (Hood, 2015). Hood argues that the system was ritualistic, fossilised and mono cultural and a system that ensures a high rate of failure can no longer be justified. Hood's sentiments (2015) echo those of Nair (2014) who stated that education is manifested in systems and practices that favour the few at the expense of the many. The traditional model of education is designed to weed out the academically intelligent students destined for colleges or universities from those who would work in non-academic vocations – but this distinction is no longer valid today (Nair, 2014).

The New Zealand Ministry of Education has endorsed innovative learning environments (ILEs) and has committed to investing approximately $1 billion, over the next four years to school infrastructure that supports 21st century teaching and learning with a focus on raising achievement (Kaye, 2016). By 2021 all New Zealand schools will conform to an ILE standard (Ministry of Education [MoE], 2011). The new buildings are anticipated to be sustainable, provide flexible learning spaces[1] and last more than 50 years. The design is expected to meet the needs of a range of teaching and learning approaches as education practices evolve to accommodate changing global needs (MoE, 2011). The pedagogical practice within ILEs is embedded in the Ministry of Education 10 Year Property Plan (10YPP) process and Five Year Agreement (5YA) funding, both of which

[1] The physical space of learning and teaching, or what might traditionally be called the 'classrooom.' Typical terms now include 'studio', 'hub' or 'commons.'

form part of the on-going contracts between the Ministry of Education and schools' Boards of Trustees (MoE, 2017b).

The move towards effective pedagogy within flexible learning spaces in New Zealand is a culmination of research from the extensive research base of the Organisation for Economic Co-Operation and Development (OECD) Centre for Educational Research and Innovation (CERI) on pedagogies required to address the needs of knowledge economies (OECD, 2013; 2015) and the findings of the MoE research study – the Best Evidence Synthesis Iterations (MoE, n.d). These studies have informed the vision of the MoE and its requirements for flexible learning spaces.

ILEs with their origins in the OECD literature (Smardon, Charteris & Nelson, 2015) are described as powerful, physical, social and pedagogical learning contexts that allow students to succeed in the 21st century (OECD, 2013). ILEs draw on a large body of literature which includes personalised 21st century learning, future focussed education, digital learning and constructivist learning theory (Smardon, Charteris & Nelson, 2015). An innovative learning environment is defined by the Ministry of Education as an:

> Environment where the National Curriculum is being expressed in the way it is intended. It is capable of evolving and adapting as educational practices evolve and change – thus remaining future focused. This reflects the fact that education needs to keep pace with the world we are preparing young people for (MoE, n.d., para. 2).

The Ministry of Education (n.d.) shares the OECD (2015) view of the development of a learning ecosystem in relation to ILEs. This holistic view includes students, teachers, families and interdependent combinations of different providers and organisations who work together in support of the students becoming confident, connected, actively involved, lifelong learners (MoE, 2007). Despite the fact that the MoE has clarified this holistic definition of the term ILE, schools generally use the term to refer to their flexible learning spaces. For the purpose of this thesis, the term ILE will be used for consistency. A flexible learning space is arguably only part of the contribution to an ILE.

Hekia Parata, Minister of Education between December 2011 and May 2017, advocated that the New Zealand Curriculum is future focused but noted that education is yet to realise this potential: "Substantial capacity for innovation exists within our education

system. We must ensure that what are currently pockets of exemplary practice are spread and deepened across the system so that its best features become the experience of every student" (Hekia Parata, as cited in Bolstad & Gilbert, 2012, p. iii). The New Zealand curriculum arguably is one of the most flexible in the world. In the knowledge based economy of the 21st century, sustainability, social harmony, future prosperity, security and peace will depend on people's ability to adapt to rapid change (Yang & Valdes-Cotera, 2011) and to find solutions to pressing global, national and local challenges.

School leaders are challenged to ensure that the school design and facilities support the school's achievement goals. Osborne (2016) cautions that in order to raise student achievement the space and the pedagogy ought to be seen within the wider ecosystem of education and not as "a single silver bullet" (p.4). Both teaching practice and space need to change to ensure equitable outcomes for all students (Blackmore, Bateman, Loughlin, O'Mara & Aranda, 2011). Arguably, the MoE draw from a modernist building principle associated with 20th century architecture and design 'form follows function' to outline the importance of pedagogical innovation driving flexible learning design (Charteris & Smardon, 2016). The principle proposes that the building's purpose should be the starting point of the design rather than buildings being designed for aesthetic trends or past precedents. New modern school buildings tend to reflect postmodern ideas and have variable forms and indeterminate boundaries, and possibly look more like corporate buildings and less like schools. If pedagogy drives design then it requires the shape of the building to conform to pedagogical requirements. A tension may exist where architects and designers intend to design a postmodern building but the MoE still requires a school that meets the needs of students and the community.

The spatial organisation of educational institutions is seen to be the potential vehicle through which 21st century competencies such as critical thinking and problem solving could be acquired. The flexible learning space provides an opportunity for a variety of teaching methods which aim to develop 21st century competencies. In addition, the teaching methods ought to promote independent learning, social and collaborative learning, integrated curriculum, project based learning and direct instruction (OECD, 2013). Flexible learning spaces enhance and enable ILEs where collaborative teaching

practices and student centred learning are at the core of the school's education vision (MoE, 2016a).

Flexible learning spaces are also synonymous with the promotion of the integration of digital technology into the curriculum, while also supporting non-traditional modes of delivery (McPherson & Salmarsh, 2016). As a result, digital technologies are provoking a reconceptualisation of teaching and learning while also serving as a catalyst for innovation and transformation in education (Groff, 2013). Technology has become integral to assessing 21st century skills or competencies which are considered essential to be productive in society (2013).

The New Zealand government has prioritised all New Zealand schools to receive ultra-fast broadband (e.g. through SNUP – School Network Upgrade Project) as digital technology and access to the Internet, is an integral part of the programme in ILEs. Smardon, Charteris and Nelson (2015) posit that these flexible ILEs aim to "revoluntionise education as we know it" (p.149).

Rationale

At a recent 2017 innovative learning environment symposium hosted by Auckland University of Technology School of Education[2], Wesley Imms, the keynote speaker, called for more research in New Zealand to test assumptions regarding what is being done well in ILEs and what needs addressing, which makes this study timely and pertinent. While there is recent and previous international research into the spatial design of schools and their impact (Blackmore, et al., 2011; Fisher, 2005; Imms & Byers, 2016; Woolner, Carter, Wall & Higgins, 2012) and some critical work (Chapman, Randell - Moon, Campbell & Drew, 2014) there is limited New Zealand research. There is little research about how design, furniture and pedagogical use interrelate and impact on student learning. The New Zealand research is, however, emergent (Benade, 2017; Benade & Jackson, 2017; Bradbeer, 2015; Osborne, 2016; Smardon, Charteris & Nelson, 2015, 2017).

[2] http://www.aut.ac.nz/study-at-aut/study-areas/education/learning-environments

Furthermore, some critical problems in relation to ILEs in New Zealand were highlighted by Imms at the symposium:

- School design is arguably outstripping teachers' capacity to use spaces well.
- Teachers may be resistant to these spatial changes.
- There is a poor history regarding the collection and use of evidence to support ILEs.
- Finally, there is a tendency for research into spatial changes to focus on technical aspects at the expense of critical reflection and theorisation.

It is important to ensure that innovation in the New Zealand education system is informed by sound, well-balanced and critical research in order to meet the diverse needs of students (Osborne, 2016).

Case study

The case study is grounded at a state co-educational school. The school's current roll is 1300 and the demographic composition is as follows: 12% Indian, 36% Māori, 18% NZ European, 8% Other Asian, 12% Pasifika and 12% Other. The school opened in 2004 and was designed to respond to the global, national and local needs and trends of the 21st century. The unique characteristics of the school include: innovative learning programmes; community facilities; cross-age group learning opportunities; a rich information and communication technologies (ICT) environment emphasising visual and sound resources; flexible learning spaces and furniture and buildings that emphasise energy efficiency; natural light and fresh air and the development of the independent learner. Learning that is authentic and relevant aims to develop the school's ten Independent Learning Actions: Manaaki (Caring), Auaha (Creativity), Mahi Ngātahi (Collaboratiion), Pākiki (Curiousity), Hinonga (Enterprise), Harikoa (Joy), Ngāna (Perserverance), Aumangea (Resilience), Whakaaro (Thinking) and Ihumanea (Wisdom).

The school has as its mission to provide differentiated and personalised learning programmes to ensure all students have the opportunities to pursue their talents and interest in the manner, and to the level best suited to their individual potential. This requires that the concepts of learning, assessment and achievement be constantly challenged, and reshaped to match all student's needs including Māori, Pasifika and

students with special needs. Although the school was designed as an ILE, it was only in 2015 that the pedagogy and Bring Your Own Device (BYOD) was implemented in the junior school. To ensure equity the school makes devices available for students when required. For the purpose of the study I have de-identified the school and the participants.

The research focuses on the junior school (Year 9 and Year 10) where the learning programme follows an integrated curriculum delivering the achievement objectives of the core learning areas – English, Maths, Science, Social Studies and Health and Physical Education. There are approximately 50 students in the open plan classrooms at any given time in each of the five Whānau[3] blocks. Students, in addition, have options (Arts, Technology, Learning languages and Sport) where they are given the opportunity to further imagine, create and innovate (ICI).

Researcher positioning

As a long standing member of the school, I have participated in professional discussions surrounding the shift in pedagogy and space with senior leadership, middle management and teachers. It became clear to me that the mental, emotional and pedagogical shift to an ILE would take time. This became the catalyst that piqued my interest in gathering student and teacher voice on the influence of ILEs on student learning which included the perceived benefits and barriers to learning that the environment provides.

Research Aim

The aim of the study was to investigate the perceptions and experiences of teachers and students on the phenomenon of interest which is the teaching and learning in the innovative learning environment. The study will contribute to the research surrounding innovative learning environments in the New Zealand context by providing evidence on student and teacher learning experiences that influence learning outcomes.

[3] An organisational structure in the school where students become part of an extended family of staff and other students during their years at the school. Each Whanau block has its own unique character.

Research questions

The study will be framed by the following overarching research question and sub questions:

What is the influence of innovative learning environments on student learning in a secondary mainstream school context?

- What beliefs does a specified group of secondary mainstream students hold regarding the influence of classroom design on their ability to learn?
- What beliefs does this group hold regarding the influence of the teaching they experience in an innovative learning environment on their ability to learn?
- What do they perceive to be the barriers and opportunities that affect their capacity to learn in an innovative learning environment?
- What does a specified group of secondary teachers working in an innovative learning environment perceive to be the barriers and opportunities created by that environment on their ability to enhance their students' capacity to learn?

Design and participants

This qualitative case study explores the intentional relationship of the participants with the phenomenon of interest (teaching and learning) within the flexible learning space. A snapshot of the perceptions of teachers and students regarding the influence of the innovative learning environment on student learning was collected from qualitative questionnaires and a student focus group. Participation in the study was voluntary.

Thesis Organisation

Chapter One presents the background context and rationale for the research. A brief overview of the case study and researcher positioning is considered. Thereafter the research aim and questions are outlined, and a summary of the data collection methods is provided.

Chapter Two provides a critical summary and analysis of the relevant literature apposite to the research questions. This chapter identifies and critiques the main themes: critical perspectives on space and social relations, physical learning environments, future focussed teaching and learning, the student at the centre and digital technologies.

Chapter Three describes and justifies the research methodology and research methods used in the study. The process of data analysis is discussed and critiqued. Finally triangulation and ethical considerations relevant to the research are considered.

Chapter Four summarises and explains the findings from the student and teacher questionnaire and the student focus group. The emergent themes and findings relevant to the research question are highlighted.

Chapter Five discusses the major findings from the study. The findings are presented in themes which give meaning to the research question and the literature reviewed.

Chapter Six brings together the findings from Chapter Four and the discussion from Chapter Five to form five major conclusions in relation to the main research question and sub questions.

Chapter Two: Literature review

Education is the kindling of a flame, not the filling of a vessel – Socrates

Introduction

Over the last decade, changes in society have been brought about by factors such as globalisation, mass digital retrieval and storage of information, the development of the knowledge economy and the rapid advance of digital technology, which have in turn resulted in increasing criticism of the education system (Bolstad & Gilbert, 2012; Osborne, 2016). These societal changes have included economic changes that affect workforce requirements. Increasingly, school leavers are required to be flexible, able to display initiative and possess practical creativity. Schools are under increasing pressure to prepare students with so-called 21st century skills to assist them to navigate a future some claim is unknown (Bolstad & Gilbert, 2012). A growing body of literature indicates that the limits of educational reform have been reached using current strategies (Dumont & Istance, 2010; Fullan & Scott, 2014). In response, the New Zealand Ministry of Education has provided guiding principles for educational transformation, including changing pedagogy and the physical environment (Ministry of Education [MoE], n.d.) with a move to innovative learning environments (ILEs) that support and enable collaborative teaching and learning.

The intent of this chapter is to provide a critical summary and analysis of the relevant literature that positions and evaluates the research question. A critical perspective of space is, however, pertinent for the study. Therefore the review will comment initially on the work of two critical theorists, namely Henri Lefebvre and Michel De Certeau, whose work on space relates to the study. The review thereafter provides a narrative of features and themes of the phenomenon of 21st century learning and environments. The following are key themes, which emerged repeatedly throughout the literature reviewed: physical learning environments, future focussed teaching and learning, the student at the centre and digital technologies.

Critical perspectives on space and social relations

Social reality, historically constituted, is produced, and reproduced by people (Merrifield, 2006). Critical theory identifies the way in which political ideology has

shaped society (in this case, education) as a way of maintaining existing regimes and control and has a clear agenda to change society (Giroux, 1988). The traditional conservative notion of teaching to prescribed subject matter where students are viewed as passive human beings is questioned by critical theorists. Critical theory enables the researcher to see school as a "cultural terrain that promotes student empowerment and self - transformation" (McLaren, 2009, p. 62). Critical teachers encourage human agency, to provide the conditions for students to be self-determining and to contribute to society as engaged citizens. Teaching students how to think and have a sense of social and individual responsibility is a key tenet of the practice of critical pedagogy, which is informed by critical theory (Giroux, 1988). In addition, a critical pedagogy approach recognises that students bring their diverse experiences and identities with them to the classroom (Giroux, 1988). It could be argued, on this definition of critical pedagogy, that this is the pedagogy that might be expected in an ILE. This is a claim that will be assessed later. Pedagogy is just one example of practices that could occur in a learning space. Lefebvre and de Certeau's work on space is critical to understanding more generally, beyond pedagogy, how space is produced by practices, which is relevant to understanding the production and transformation of social relations and behaviours in the ILE case study.

Lefebvre

Henri Lefebvre's spatial theories provide a useful lens for the understanding of the design and ideology of innovative learning spaces. Lefebvre, a Marxist theorist, offered a critical insight to understanding the relationship between the use of space in schools and social relations, which influence teaching and learning. For Lefebvre, space is about power and is socially produced (Lefebvre, 1991). Being in the world is a critical part of human existence and directly influences the human concept of space. To see space as a container, as a 'thing' and not recognise the holistic interrelationship of things in space with the space, is a theoretical error, suggested Lefebvre (Benade, 2016a; Lefebvre, 1991; Merrifield, 2006). Space is a fluid location of relationships, constituting, and being constituted by, those relationships. What is learned in the space and how it is learned may not be immediately transparent. A symbiotic, dialectical relationship exists between the space and the people who work in it (Lefebvre, 1991; Soja, 1989).

If social space is a social product, as Lefebvre argues, then the space produced is inherently a means of production, which, fundamentally leads to a new creation of space where power relations and control exist (Merrifield, 2006). The socio-economic changes suggested earlier are placing new demands on education, and these, in turn are influencing the relationship between power and space. For example, the suggestion that more emphasis be placed on the development of collaborative skills, is a demand that may be met by collaborative approaches to teaching and learning, but these changes require teachers to relinquish the controls they have traditionally held over these processes.

Lefebvre's 'triadic conception' of spatial practice, which is perceived space, representations of space (conceptualised space, the space of scientists, planners, designers and social engineers) and representational spaces (the lived and 'endured' spaces) refer to the form, structure and function between spaces and social relations (Lefebvre, 1991). There is unity between the physical, mental and social aspects of space. Spatial practice directs the work of teachers and provides clarity concerning the "messages it conveys regarding what counts as worthwhile education for students in the 21st century" (Benade, 2017, p. 52).

de Certeau

Michel de Certeau (1984) proposed that everyday life can be seen through the critical distinction between strategy and tactics. He links strategies with institutions and structures of power who are the 'producers' while tactics are seen as a response or resistance to the strategies imposed by those in power. Tactics are practices that unfold through time and transcend the spatial limits imposed by the powerful or dominant.

de Certeau provides a significant lens through which ILEs can be regarded. The Ministry of Education in New Zealand has mandated that all schools will be an ILE by 2021 (MoE, 2011). The Ministry of Education is the structure in power – the 'producer'; while those who operate within the schools (teachers and students) are considered to be the 'consumers.' de Certeau's (1984) work considers the way in which modes of social behaviour are enacted by individuals or groups and describes the tactics people use to claim their autonomy from the forces of power.

Physical learning environment

The notion of a learning environment, as a broader setting than a single cell classroom has gained traction, conceptualised by the OECD (2013) as "an organic, holistic concept that embraces the learning taking place as well as the setting: an eco-system of learning that includes the activity and outcomes of the learning" (p. 22). A range of scholars argue that the success of 21st century learning demands dramatically reconceived building design which will improve student learning (Benade, 2017; Blackmore, Bateman, Loughlin, O'Mara & Aranda, 2011 ; Nair, 2014; OECD, 2013). This theme focuses on design principles from various perspectives and the impact of furniture on teaching and learning.

Design principles

Prakash Nair, one of the world's leading school designers, explored the hidden messages that school facilities and classrooms convey. He advocated for the 'alignment' of the design of places of teaching and learning with twenty-first-century learning goals. Nineteenth and twentieth century school design was geared to whole class teaching. This is evident in the inflexible classroom and corridor, 'cells and bells', school design that assumes all students will be doing the same thing at the same time using the same resources (Nair, 2014). Nair (2014) has called for the single cell, traditional classroom to be supplanted by new purpose built innovative spaces designed specifically for the purpose of collaboration, personalisation and allow flexibility concerning time and the use of space. His call echoed that of Julia Atkin, in her contribution to the OECD compendium of leading educational designs 2011 (cited in OECD, 2013), though his arguments for facilities design go beyond calls for greater flexibility; he has claimed that the traditional classroom is obsolete.

Nair (2014) provided the following design principles for 21st century schools:

- Schools should be welcoming and students should feel safe. This will encourage good citizenship.
- The school building ought to be agile to provide environments that meet the different needs and learning styles of different students.
- Areas of the school should be designed to support and promote multiple learning settings, such as a learning commons and theatres.

- The school must convey positive messages about identity and behaviours in the space.

Stephen Heppell's (2016) 'rule of three' for ILE spaces supports the flexibility of school design:

- no more than three walls where space is multifaceted
- no more than three points of focus – varied groups could be presenting and learning together
- three teachers, three activities with a larger group of students
- three periods a day so less time wasted

The New Zealand Ministry of Education (2016a) suggests that school design features such as good quality acoustics, lighting, heating, and ventilation, are associated with improved student outcomes. Blackmore et al. (2011) suggested, however, that more than just the tangibles of quality of air, light, and spatial density can influence learning; the intangibles of school and classroom culture, sense of belonging and self-efficacy are the connection between learning outcomes, built environment and use of learning spaces. Moore and Lackney (1993) provided qualitative evidence to indicate that students prefer physical settings that are inspiring and comfortable with little noise or distracting behaviour.

Furniture

Furniture, fittings, and equipment have the potential to improve student outcomes. Traditional classroom furniture, the one size fits all model, fails to recognise differences in body position and posture and limits flexibility of activities (Sullivan, 2012 as cited in Benade, 2017). Oyewole, Haight & Freivalds (2010) note that a learning space is comprised of children of different statures and weight and a fixed furniture design would fail to accommodate a large population of students. Schools ought therefore to provide furnishings in the flexible learning spaces that work for everyone (MoE, 2016a). Educational furniture design arguably should support the shifts in pedagogy in addition to the anthropometric dimensions of students.

Research (MoE, 2016a; Gifford, 2002) has noted that seating arrangements may signal to students that certain types of learning is expected of them. Tables arranged in clusters

might signal, for example, collaborative learning (MoE, 2016a). In order to maintain the level of adaptability the MoE (2016a) suggests that the furniture in the room should be durable, lightweight enough to move around and purpose built for the use of digital devices. Gifford's (2002) findings for educational settings signpost that the amount and arrangement of space is significant for classroom performance and related behaviours. In addition, space affects teacher and student feelings, which is connected to the flow and density of furniture (Gifford, 2002).

Future focussed teaching and learning

Significant manifestations of the notion of 21st century teaching and learning is evident in this theme. The knowledge economy requires educational organisations to equip students with knowledge, competencies and skills that will develop lifelong students. These requirements coupled with the necessity of collaborative teamwork suggests new challenges for teachers' professional learning.

Education for the Knowledge Age

There are strong arguments that question the perception of education and its value in the current global economy (Bolstad & Gilbert, 2012). In this knowledge age, knowledge is the key advantage for a society to create value (Gilbert, 2005). Knowledge is a progressive form of capitalism in which knowledge and ideas are the main source of economic growth (Goodman & Dingli, 2017). Arguably then, meeting the needs of an advanced capitalist society becomes explicitly and almost exclusively the central purpose of schools. As schools are responsible for preparing the young for the future they have to be models of innovation where learning becomes meaningful and useful (Gilbert, 2005; Nair, 2014). Gilbert's (2005) research draws on a range of evidence and theories to argue that the 21st century has encouraged new ways of thinking about knowledge.

Developing 21st century competencies in schools has gained extensive attention. Learning involves generating knowledge, not storing it and initiating change, not conforming to it (Bolstad & Gilbert, 2012). Increasingly education is focusing on a range of skills that include 'soft skills', competencies, capabilities and knowledge (Dumont & Istance, 2010). These include the ability of students to cope with the social, communication, and emotional demands of rapidly changing environments (OECD,

2013). Arguably these skills were just as pertinent in the 20th century, but are more salient today due to the increasing digitalisation of the world's economy. Furthermore, new problems or situations, such as climate change and automation of work create high degrees of complexity and uncertainty (Bolstad & Gilbert, 2012). The teacher's role ought to shift from supporting the passive acquisition of knowledge, to encouraging students to actively interact with knowledge (Bull & Gilbert, 2012). Students ought to critique, create and transform the knowledge and to build new knowledge while learning with others (Bull & Gilbert, 2012). The ability of students to develop skills and competencies will determine whether they are prepared for work or not in the knowledge era. Education is thus at a watershed, transitioning from the fixed capital (education of the masses) of the industrial age to the human capital of the knowledge age (Bolstad & Gilbert, 2012). The shift has profound implications for schools, preparing students for the move from a system of compliance to one of a problem solving enterprise. Knowledge is no longer thought of as classified into disciplines but is viewed as something that is fluid, it does things.

In contrast to these views are the views of social realists whose arguments favour that of conceptual knowledge of subject disciplines required for critical reasoning and political agency over social knowledge (Rata, 2012; Lourie & Rata, 2016). Rata's critique of schooling that emphasises cultural knowledge is that children do not come to school to learn what they *already know*; rather school is where they should learn what they *do not know*. (Rata, 2012). Curriculum reform, resulting from digital advances and globalisation is rejected as it favoured the integration of knowledge areas and diluted epistemic knowledge with competencies and dispositions (Rata, 2012). In addition, Rata (2010) argued that the move towards the dilution of epistemic knowledge "limits access to a powerful class resource - that of conceptual knowledge" (p. 107). Young (2010, cited in Rata, 2012) referred to this as 'powerful knowledge' to which the economically and socially marginalised (Lourie & Rata, 2016) have limited access. On the other hand, Hood (2015) suggested that we need to dispel the myth that specific subject knowledge is essential for success in higher education. A questionnaire of 300 tutors in the United States found that competencies, rather than knowledge of subject content are important to succeed (Hood, 2015).

Furthermore, the idea that education contributes to the creation of *homo epistemicus:* the flexible 'knowledge worker' (Druker, 1969) is one that Biesta (2014) challenged as missing an important justification of our educational endeavours, namely "the formation of the human being as *human being"* (p 14. Emphasis in the original). The knowledge economy calls us to be a very particular kind of human being and education plays an existential role to ensure students are "fit for participation in a knowledge society" (Biesta, 2014, p.14), this emphasising the narrowing of the aims of schooling.

Competencies

Competencies such as problem-solving and critical thinking have traditionally been associated with academic achievement and are characteristic of a desirable education. These competencies are not novel, however, as Dewey, in the early 20th century recognised the need to help students to 'think well', thus identifying already then reflective thinking as a key competence (Voogt & Roblin, 2012). Towards the end of the 20th century, however, efforts were made at the level of global governance to amend the discourse of competencies.

The International Commission on Education for the 21st century proposed four pillars of learning (the so-called Delors Report of 1996) (Carneiro, 2011; Delors, 1996; Hood, 2015):

- Learning to Be (the freedom to be oneself and to develop to one's potential)
- Learning to Know (moving away from passive content acquisition to inter-disciplinary ways of knowing)
- Learning to Do (creative problem solving and developing a broader range of intellectual competencies)
- Learning to Live Together (the core values of civic life and identity-building within a context of multiple belongings)

Carneiro (2011) argued that the four pillars of learning create lasting foundations for lifelong and life wide learning in a learning society. For Delors (2013), the four pillars are inextricably linked to each other.

The OECD's DeSeCo project (Definition and Selection of Competencies) continued to widen the concept of key competencies, and identified three broad categories (Rychen & Salganik, 2003):

- interacting in socially heterogeneous groups: include relating well to others, cooperating, and managing and resolving conflict
- acting autonomously: acting within the big picture or the larger context, forming and conducting life plans and personal projects, and defending and asserting one's rights, interests, limits, and needs
- using tools interactively: using language, symbols, and text interactively, using knowledge and information interactively, and using technology interactively

Thinking and problem-solving are at the forefront. The New Zealand Curriculum identifies five key competencies: thinking, using language, symbols, and texts, managing self, relating to others and participating and contributing (MoE, 2007). The DeSECo project clearly provided a conceptualisation of 21st century competencies upon which The New Zealand Curriculum stands. The key competencies are to be at the core of all teaching and learning; supported by effective pedagogy. Benade (2012) argued however, that the notion of effective pedagogy in the New Zealand curriculum fails to consider how *teachers* will model and develop the competencies in students.

Lifelong learning

Lifelong learning concerns the development of human capital to secure economic growth (Biesta, 2013). This is highlighted in the OECD's 1997 document *Lifelong Learning for all,* which acted as a guiding principle for policy development towards improving the capacity of individuals in the face of changes in the world of work and global economy (Biesta, 2013). The New Zealand Curriculum has, as its vision, that all young people will be "connected, confident, actively involved, lifelong learners" (MoE, 2007, p. 8) whose learning reflects the key competencies. The idea of lifelong learning or lifelong education, providing adults with access to formal courses at educational institutions, emerged in the 1970s (Biesta, 2013), indicating that this 'innovative' idea has been around for some time.

Dumont and Istance (2010) suggested that learning continues throughout the lifespan in both formal and informal learning environments. To be a lifelong learner is an individual responsibility. Individuals are clearly responsible for their employability in the rapidly changing global markets (Dumont & Istance, 2010). The responsibility has therefore shifted from the state to the individual where knowledge becomes capital in the hands of individuals. Employability will depend on upon whether an individual accumulates the knowledge, skills, flexibility and attitudes to meet the employment requirements. Arguably, in a knowledge based economy individuals who have the lowest skills and weakest capacity for constantly updating their skills are less likely to be employed.

Drawing from research based on a major international study, Brown, Lauder and Ashton (2010) suggested that human capital ideas created a new relationship between capital and labour. The authors strongly challenged the link between learning and earning – the idea that more education leads to greater individual prosperity. They highlighted a power shift that is driving the new global high skill low wage workforce in emerging economies like India. Promoting education is a poor argument against the effects caused by economic globalisation. The authors posited that a university degree is no longer insurance against labour market risk (2010).

Yet, despite the tenuous link between learning and earning, Dumont and Istance, (2010), Oblinger, (2006) and Yang and Valdés-Cotera, (2011) proposed that students need to be lifelong learners to meet life's challenges. These authors repeat the claim made by futures commentators, that education needs to prepare students for jobs that do not yet exist, to use technologies that have not yet been invented and to solve problems that are not even problems yet. The knowledge economy requires schools to equip students with meaningful knowledge as well as 21st century competency skills that encourage them to become lifelong learners. This suggests that students should be encouraged to seize learning opportunities throughout life, to broaden their knowledge, skills and attitudes and to adapt to a changing and complex world (Carneiro, 2011; Delors, 2013; Dumont & Istance, 2010). Arguably, the acquisition of new knowledge, digital skills and the development of competencies in a wide range of contexts, may be the catalyst to inspire people to create new jobs even if the market has not yet provided them.

Collaborative teaching and learning

Collaborative team teaching in a shared space is a powerful tool for learning. It increases visibility, strengthens team relationships and encourages the sharing of workloads and good practice (OECD, 2013). This deprivatised teaching practice is, however, a shift from the privatised practice of traditional single cell classrooms (Benade, 2017). Stephen Heppell's Rule of Three advocates the benefits of collaborative teaching and learning; ask three before me – encourages peer support in large groups; three teachers are better than one as it stimulates teacher collaboration in the shared space which saves time as teachers plan and share ideas (2016). Collaboration and team-teaching increases inclusion and participation, reducing the risk of some students being neglected as might be the case in a single cell whole group setting (OECD, 2013).

Collaboration privileges teacher expertise as efforts are focussed within the learning environment and the school (Hattie, 2015). Arguably, the objective would be to inspire good practice. Proficient teachers who know the students and recognise their prior knowledge (Bishop, 2009) will know 'where to next' for 20 - 40 students almost simultaneously. This requires teachers in the team to have a common strategy to reliably diagnose and implement multiple teaching interventions (Hattie, 2015). The collaborative culture leads to stronger teacher pedagogy and increases student learning.

Collaborative capacity increases if teachers in the team are able to name, acknowledge and address what Barth (2002) referred to as the 'non-discussables', especially those that impede learning. An example is, when a teacher struggles with an issue yet is hesitant to speak out or open discussion. Reasons for this could be that the teacher does not want to appear incompetent or offend due to difference of opinion. This may weaken the culture of the team and disrupt the synergy. Developing a collective understanding of what is aimed for in 'synergetic' teams assists in identifying areas for the growth of the team and promotes sustainability in the learning space. Relational trust is pivotal to this process as one person's success is dependent on another (Robinson, Hohepa & Lloyd, 2009).

A collaborative culture is not one always greeted with enthusiasm, however. Educators who have been successful working in isolation may view collaboration as an invasion of their pedagogy and waste of their time. Benade (2016a) noted that innovative learning

spaces contain “within themselves the enforced requirement that their occupants relate to the space and each other collaboratively but do so against the ‘primal urge’ for privacy and solitude” (p.6). Nevertheless, it has been argued that the essence of teachers’ professionalism is the ability to collaborate with others to maximise impact (Hattie, 2015). ILE with their particular spatial features incline towards collaborative practices and enable team teaching (Nair, 2014).

Professional learning and development (PLD)

The repositioning of teachers to reconceptualise the way they teach and think requires a new kind of professional development. Teachers are expected to model the confidence, openness, persistence and commitment to prepare students for 21st century learning (Bull & Gilbert, 2012). For teachers whose careers span several decades, it may not be easy to make the pedagogical and spatial transition. In addition, teachers need to reposition themselves not as a ‘traditional’ teacher but as a highly skilled student capable of integrating digital technologies into the learning (Bull & Gilbert, 2012). Teachers ought to be open minded in order to embrace working within collaborative teams.

Professional development experiences should be personalised as teachers’ professional learning needs tend to vary (Bull & Gilbert, 2012). Bull and Gilbert (2012) also concluded, from their findings of a study of three different schools, that schools ought to ensure that their teacher professional development programme is designed to support all teachers’ cognitive growth. It has been argued that, while 21st century teachers need to be able to think about knowledge as a tool to do things with (not an object to be mastered), current teacher professional development aims to “add to the store of what teachers know” (Bolstad & Gilbert, 2012, p. 46). Professional learning and development of teachers ought to include how teachers model skills and competencies in their practice. The challenge of providing a highly skilled workforce for the 21st century however, may be exceeded by the challenge faced by schools to provide organisational structures and systems to support teachers’ ongoing professional learning needs (Bolstad & Gilbert, 2012).

In summary, the increasingly competitive global economy demands that individuals develop new and different life skills and knowledge. The role of the teacher has shifted

from being the primary source of knowledge to one that helps students to experience knowledge and develop skills and competencies required for living and working in the 21st century. Assisting students to develop these skills and competencies requires a learning environment where students are placed at the centre of teaching and learning and take an active role in their own learning (Cervone & Cushman, 2012).

The student at the centre

According to Cervone and Cushman (2012), having the student at the centre of learning begins with teachers supporting students in developing a new relationship to learning. When students exercise choice and responsibility for their learning, it demands a new approach to teaching. In this theme, literature relating to authentic learning, project based learning and personalised learning is reviewed. Culturally responsive pedagogy and assessment are sub themes of personalised learning.

Authentic learning experiences

A common feature of many innovative learning environments is to create a learning experience, which is authentic and meaningful by engaging students with "real-life problems, offering hands-on experiences, and incorporating the students' historical, natural, and cultural environment in learning activities" (OECD, 2013, p.91). Hung, Tang and Chen (2006) argued, "in order to engage a student, the learning process should be derived from an authentic demand of interest to the student" (p. 19). The authors insist learning needs to be relevant for it to be effective and a link between learning and application must exist (this includes the use of mobile and wireless technologies). Instead of a focus on learning to do, schools ought to shift their practices and create a culture where students do to learn (OECD, 2013). This approach is not novel and is evident in work of Dewey (1915) who stated that:

> From the standpoint of the child, the great waste in school comes from his inability to utilise the experience he gets outside while on the other hand he is unable to apply in daily life what he is learning in school. That is the isolation of the school-it's isolation from life

Dewey believed that education should engage with and broaden student experiences. Authentic learning focuses on real – world complex problems and proposed solutions using problem based activities, case studies and participation in virtual communities of

practice (Lombardi, 2007; Revington, 2016). Authentic learning intentionally brings into play multiple disciplines, multiple perspectives and ways of working (Lombardi, 2007). It involves the cultivation of 'portable skills' such as "the judgement to distinguish reliable from unreliable information, the patience to follow longer arguments, the synthetic ability to recognise patterns in unfamiliar contexts and the flexibility to work across disciplines to generate innovative solutions" (Lombardi, 2007, p.3). Authentic learning practices place the focus back on the student to improve how knowledge is transferred and retained. This contrasts with the traditional education system where the teacher had a set curriculum and was the expert in the classroom.

Project based learning

Project based learning (PBL) is an approach to learning where students gain knowledge and skills by collaborating in small groups to investigate a 'real life' complex problem or challenge (Lund, 2015). PBL provides a unique opportunity to help students practice critical thinking, collaboration, communication, and creativity. Real challenges rarely have set solutions and students will not find the answers in an information source or a book (Lund, 2015). When students are directly involved in planning and steering projects, they are more invested in their learning and have more opportunities for multidisciplinary learning experiences (OECD, 2013). Lund (2015) suggested that how students gain knowledge might be dependent on cognitive emotional support from peers or other, in order to develop and unfold creative thinking, critical thinking skills, meta-cognition and motivation.

This constructivist approach to teaching and learning requires teachers to have adequate expertise to support numerous projects. Learning is an active, contextualised process of constructing knowledge as opposed to acquiring it. This may be a challenge for teachers who default to traditional approaches to teaching, learning and assessment as PBL requires versatility and flexibility of teachers (Benade, 2017). Similarly, McPhail (2015) cautioned that if schools commit to the curricular and pedagogical approaches of new learning spaces such as PBL, there is a danger that "teachers may not be sufficiently equipped to be leaders of learning" (p.6). Conceptual progression will be difficult to manage if teachers are leading a class of students through individual projects.

Minaar and Howarth-Jarratt (2015) were involved in a successful PBL project to engage Māori second chance students at Matapuna Training Centre, Gisborne. The project included a strong numeracy and literacy focus as this was the major barrier preventing students gaining a qualification. Students were involved in the 'waka project' with an emphasis on whakapapa and the 'stream project', which focussed on sustainability. The success of the project is attributed to the student centred approach which encouraged personal reflection, goal setting, the use of Māori perspectives and tikanga and Māori pedagogy such as tuākana-tēina (students acting as group leaders and tutors to younger students), ako (reciprocal learning) and using kōrero (speaking), titiro (looking) and whākarongo (listening). Shortcomings included that not all staff were open to the challenges of PBL, and the time required for conceptualisation was limited.

Personalised learning

Personalised learning is putting the student at the heart of the education system (Leadbetter, 2008). The role of the student shifts from being a 'consumer' of education to a 'co-producer and collaborator' of their learning pathway (OECD, 2013), with a focus on how knowledge is used. Active involvement and self-direction encourage student engagement in the learning process leading to improved learning outcomes and experiences (2013). If no two students are exactly alike then it is logical that no one system of education works for all students (Nair, 2008). Personalised learning relates to the quality of relationships, including the cultural responsiveness of teachers (Blackmore, et. al, 2011).

Dumont and Istance (2010) in their project *The Nature of Learning: Using Research to Inspire Practice* reviewed extensive research and identified a set of seven principles to guide the design of innovative learning environments for the 21st century. Notably, there is no mention of design or physical layout in these principles, but they provide an interpretation of what personalisation means for learning (Dumont & Istance, 2010):

- the students are the core participants
- the learning environment is founded on the social nature of the learning and it encourages well organised opportunities for autonomous learning
- learning professionals are highly attuned to the key role of emotions in the student's achievement

- individual differences (culture, learning styles, prior knowledge and social background) are recognised
- the learning environment devises programmes that demand hard work and challenge from all without excessive overload
- the learning environment operates with clarity of expectations and deploys assessment strategies consistent with these expectations; there is strong emphasis on formative feedback to support learning
- the learning environment should strongly promote horizontal connectedness across areas of knowledge and subjects as well as the community and wider world

It can be suggested, despite the 'centrality of the learner', teachers are at the core of the learning process embedded within these principles guiding learning environment design.

Curriculum integration

Curriculum integration is a 'seamless coat of learning' where disciplines are viewed as interconnected rather than isolated from each other (Pring, 2006 as cited in Fraser, 2013). Curriculum integration involves a shift in the role of the teacher and of the student. According to Fraser (2013) curriculum integration focuses on issues. It requires that teachers scaffold the learning rather than direct the learning for the students. This requires teachers' work to be "far more nuanced, intuitive and skilful than mere telling" (Fraser, 2013, p. 21), which suggests that teachers' pedagogical abilities are crucial to the success of the approach.

An integrated curriculum integration must still draw on the distinct knowledge of the subject areas and maintain the integrity of those areas. Murdoch and Hornsby (1997) noted that curriculum integration "does not do away with the distinctions between subjects or learning areas – those remain important for the purpose of balance and organisation" (p.1). In the context of 21st century learning, it is important that students move between disciplines to develop the capabilities to work with complementary knowledge and ideas (Bolstad & Gilbert, 2012). In addition, the flexibility of the New Zealand curriculum (MoE, 2007) supports curriculum integration as it enables schools to develop their own curriculum in response to the needs of the students. Indeed, the New

Zealand curriculum states that “all learning should make use of the natural connections that exist between learning areas” (MoE, 2007, p.16).

Research reveals that curriculum integration has its challenges, however. Bishop and Brinegar (2011) found in their longitudinal study found that students can initially resist curriculum integration, conveying attitudes of indifference and scepticism. Fraser (2013) noted that some teachers may feel threatened by this approach to learning for reasons such as, their reluctance to share decision making and preference to have activities planned well ahead of time. A further challenge that causes concern is teachers’ lack of knowledge about curriculum integration. Beane (2005), Jacobs (1993) and Murdoch and Hamston (1999) suggested that when poorly executed, curriculum integration can result in a lack of student engagement and motivation.

Culturally responsive pedagogy

One of the principles of the New Zealand curriculum is acknowledgement of cultural diversity and the expectation is that schools should take the cultural context of students into account when preparing learning programmes (MoE, 2007). This suggests that any approach connected to ‘personalised learning’ enacted in New Zealand ILEs will need to address the bicultural tenets of the New Zealand curriculum (MoE, 2007) and the broader national context (Smardon, Charteris & Nelson, 2015).

Relational pedagogy that takes into account *Tātaiako: Cultural Competencies for Teachers of Māori* Students (MoE, 2011) are identified as vital within ILEs (Smardon, Charteris & Nelson, 2015). These competencies describe several cultural competencies founded on knowledge, respect, and collaborative approaches to Māori students, their whānau, and iwi that are integral to creating culturally responsive learning environments and contexts. These cultural competencies align closely with Russell Bishop’s ‘*Culturally Responsive Pedagogy of Relations*’ (Bishop, 2011) where teachers make effective use of students’ cultural knowledge and prior knowledge to create environments that encourage students to engage with learning. The link to personalised learning is evident where teachers make the necessary adjustments to engage students in learning.

Assessment

Assessment, teaching and learning are inextricably linked as one informs the other (OECD, 2013). It is an oversight, according to the OECD report (2013) to overlook the nature of the learning environment and how it places assessment within its broader aims and expectations about learning. In addition, the communication of such to the students is crucial. Research indicates that assessment is important for learning as it is the bridge between teaching and learning (2013).

Assessment for learning (formative assessment) is an integral part of the personalised learning approach (OECD, 2013). Teachers ought to assess the progress of students regularly by providing quality feedback and adjusting teaching and resources to their individual needs - a move away from the one size fits all model of learning and assessment (Bolstad & Gilbert, 2012). Formative assessment and feedback provides critique for improvement, focuses on future achievement (Black & William, 2001) and targets individual students for additional support. A strong individual focus ensures that students should know what is expected of them and their achievement and attainment.

Tension arises where teachers feel under pressure to deliver a fixed curriculum and between desires for measurable outcomes versus desires for education systems, which equip students with 21st century skills that are not so easily measured (OECD, 2013). The focus in New Zealand, on extrinsic results[4], makes education less likely to be authentic (Benade, 2017). Hattie (2015), critical of rigid academic measures, noted that there are other competencies that matter. Hood (2015) called for a more flexible assessment system that combines an academic record of learning with the student's development of the competencies (identified earlier) required for 21st century education and future aspirations. Reporting grades communicate little about what and how a student thinks and the approaches used for problem solving. Grades become a substitute for insightful description and are often used by parents to assess a teacher's ability to teach, and a school's potential to produce quality results (Ings, 2017).

[4] In most subjects students, from Year 11 to Year 13, sit an examination at the end of the school year which covers externally assessed standards. See http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-exams-and-portfolios/

In summary, a student centred approach to teaching and learning requires a cultural shift for teachers and educational organisations. Confronting students with authentic, real life problems, where collaboration is key will allow them to develop 21st century skills that go beyond memorisation of content. A personalised learning approach, which has the student at the heart of the educational experience, includes a culturally responsive pedagogy and assessment designed for learning as a process.

Digital technologies

The ubiquity and rapid development of digital technologies is changing the boundaries of education and is augmenting the role of non-traditional learning styles (Dumont & Istance, 2010). Education and learning, driven to accommodate the change, are to provide the 'bedrock foundations' to cope with the change (Dumont & Istance, 2010). It is suggested that ubiquitous access to devices will increase the opportunities for technology to be used as an integral element of everyday teaching and learning experiences (Dumont & Istance, 2010). In this theme digital media, the use of digital technology and teacher beliefs, the use of digital technology and student outcomes, and the notion of 'digital natives' are reviewed.

Digital media

Access to digital media is changing how students acquire information and elaborate knowledge. Learning using digital technologies encourages the production and sharing of knowledge. Learning is no longer the passive consumption of information (Conole, Laat, Dillon & Darby, 2008), and digital technology and access to the Internet means learning can happen anywhere at any time (Dumont & Istance, 2010), empowering students to "become active in shaping their own environments" (p.25). The acquisition of informal information by the younger generation using social media, for example Facebook and Instagram, has become a major thread of future focused education.

The use of digital technology and teacher beliefs

Findings have suggested a synergy between technological integration and teacher beliefs (C. Kim, M. K. Kim, Lee, Spector & DeMeester, 2013; Ottenbreit – Leftwich, Glazewski, Newby & Ertmer, 2010). According to Richardson (2003), teachers who have a student-centred approach to teaching and learning are more likely to use technology in the classroom. The learning will offer more choice, in terms of content learned,

processes used and products created. Technology and pedagogy provide the potential to problem solve in a real world context and construct knowledge through global interactions (Richardson, 2003; Shifflet & Wellbacher, 2015). Kim, et al. (2013) noted that a teacher's epistemological and pedagogical beliefs related to their use of technology.

Shiflet and Weilbacher (2015) in their qualitative case study discovered that although teachers believe that digital technology engages students in thinking critically, promotes self-regulated learning, and improves literacy skills, such beliefs do not always come to fruition in actual classroom practice. Believing in the technology does not guarantee quality instructional use in the classroom. Seifert, Sheppard and Wakeham, (2013) argued that the use of technology to make teaching more efficient poses a challenge; there is no guarantee that it will be exploited for learning by the student. Teachers need to know pedagogically what to do with technology (Prensky, 2011), thus their understanding of effective pedagogy can determine how technology will contribute to creating an innovative learning experience for students. While technology is crucial to innovation its presence does not, however, guarantee innovation.

Digital technology and student outcomes

There is a growing body of evidence to support the view that digital technologies have the potential to transform the learning experiences of students (Underwood, 2009) by increasing engagement, motivation and interaction (Wright, 2010). On the other hand the same could be said of well-managed non technology lessons.

Nevertheless, the general findings of the 2012 PISA (Programme for International Student Assessment) indicated that students who use computers more frequently at school perform worse than those who use computers moderately at school (OECD, 2015). In addition, the study found that there were no significant improvements in reading, mathematics or science in OECD countries that invested heavily in technology for education. Technology was also found to be of little help in bridging the skills divide between disadvantaged and advantaged students (OECD, 2015). It may be that the use of digital technology to develop deep conceptual understanding may require intensive teacher – student interactions. Furthermore adding, "21st century technology to 20th

century teaching practices will just dilute the effectiveness of teaching" (OECD, 2015, p. 3).

Digital natives

The shift in the way young people communicate and learn has profound implications for which current traditional education systems cannot cater. Prensky (2011) coined the term, 'digital natives' in his earlier writings to highlight the significance of new technologies within the lives of the younger generation. Prensky was referring to children born into the age of technology and their ability to use it with greater ease than the older generation (such as teachers). Prensky (2011) slammed the views of 'literalists' who assume that 'natives' have a "capability and knowledge of all things digital" (p.17). The younger generation are comfortable with technology, which they can master without effort if demonstrated or they choose to learn it. The literal view may imply that teachers assume greater digital competencies by their students than is merited. The premise that students know more about the technology than their teachers or parents referred to as 'digital immigrants' has been challenged. Helsper and Eynon (2010) argued, for example that, "breadth of use, experience, self-efficacy and education are just as, if not more, important than age in explaining how people become digital natives" (p. 504).

Digital technology, used meaningfully, can be an effective tool to enhance critical thinking skills, literacy skills and to spark dynamic learning experiences. Integrating social media into learning, which is perhaps the norm for digital natives, creates an opportunity to construct knowledge beyond the classroom.

Conclusion

Significant school design transformations and technological innovations have stimulated educational institutions to rethink their pedagogical position. This thesis builds upon and extends the possibility of the alignment between space, effective pedagogy using digital technology and student learning experiences.

Until now, much research of learning environments has tended to focus on technical issues, such as light, ventilation and acoustics (Blackmore et al., 2011). There has been little research with a focus on issues such as how schools prepare for and transition into

new learning spaces in ways that encourage innovative pedagogical practices. There has also been little research that seeks to understand which pedagogical practices have been assimilated and why they have been assimilated in the ILE. Consideration needs to be given to the sustainability of exemplary pedagogical practices in an ILE including evaluating how changes to physical learning spaces influence student outcomes.

Chapter Three: Methodology

> Fitness for purpose must be the guiding principle: different research paradigms for different research purposes (Cohen, Manion & Morrison, 2007)

Introduction

This research is motivated by the imperative to provide empirical evidence to address the paucity of research evidence regarding the influence of an ILE on student learning in a mainstream secondary school context. Chapter three describes and discusses the methodology and methods used for the research study. The first section discusses the rationale behind the paradigm used for the study, including the ontological and epistemological assumptions of the paradigm. This philosophical position is important as it influences how I conducted the research, what was researched and how it will be interpreted (Newby, 2010). The second part moves on to explain in detail why case study was employed as a methodology. Thereafter the methods used in the case study are examined. Finally, discussion centres on the ethical and cultural considerations of the study.

Post intentional phenomenology

Husserl's phenomenology informs the interpretivist paradigm. He rejected Cartesian thinking (O' Toole & Beckett, 2013) and an objectivist view that "objects have meaning independent of any consciousness of them" (Mack, 2010, p. 7). Phenomenology, based on personal perceptions and responses, is the study of experiences, the world as it is lived not the world as it is measured (Creswell, 2014; Newby, 2010; Vagle, 2014). Both Husserl and his student, Heidegger, asserted that reality consists of phenomena (objects and events) as understood in the human consciousness. Phenomena are ways that we "find ourselves being in relation to the world through our day-to-day living" (Vagle, 2014, p. 19). Phenomenology does not study the individual; its focus is on how the phenomenon studied manifests in reality, which does not exist independently of human consciousness. In other words, we must apply the human consciousness to phenomena in the world to derive their meaning – it is not what a person decides that is important rather how they experience the decision made.

An objective description or analysis of human behaviour is not realistic (O'Toole & Beckett, 2013) as subjective experiences are important to make sense of the research. This research draws on Vagle (2014), who focuses on intentionality, a phenomenological tool, from a post structural perspective. Intentionality highlights the inseparable connectedness between people and objects in the world. Intentionality is not an intention at all, nor conscious planning (Vagle, 2014). People are not passive in the world, and they reach out for certain phenomena. Intentionality is viewed as the meaningful connection that people make to their world, and the consciousness with which they connect meaningfully with their world. Merleau-Ponty described intentionality as "the invisible thread that connects humans to their surroundings meaningfully whether they are conscious of that connection or not" (Merleau-Ponty, 1964 [1947], p.3 cited in Vagle, 2014, p. 26). Vagle acknowledges that intentionality is a difficult concept to grasp, irrespective of how it is described. Heidegger extended the work of intentionality into how people come into relationship with experiences through 'threads of meaning.' (Vagle, 2010). Heidegger's main interest was to promote Being (*Dasein* – which literally means 'Being there'), the human being; calling attention to a person's relatedness to things, to the world and Being (Vagle, 2014).

Vagle's post-intentional approach explores the influence of coming into intentional relations with the phenomenon at hand and creates a foundation for studying the intentionality that surrounds how people find themselves in significant sense-making (Vagle, 2014). Subsequently, "a post-intentional phenomenological research approach resists a stable intentionality, yet still embraces intentionality as ways of being that run through human relations with the world and one another" (Vagle, 2010, p. 36). This instability implies what Vagle claims as 'tentative manifestations'– intentions that are momentary, changing, fleeting, and expanding through investigation. One could argue then that exploring a post intentional phenomenological approach will enable me to provide a stronger analysis of the influence of the ILE concept on learning for selected students at Manuka College. The intentional relationship of the participants with the phenomena of interest (teaching and learning in an ILE) is what is important. I have attempted to grasp the intentional relations between students and teachers, the learning environment and the teaching and learning. The manifestation of these relationships "may be evident in their feelings, such as hopefulness, despair, joy,

confusion or resistance" (Benade, 2017, p. 9). For Vagle, a post intentional phenomenological philosophy is not only one that draws on lived experiences, but it is also a philosophy designed to explore the connective nature of social and political justice (Vagle, 2014) thus moving beyond descriptive phenomenology. The recognition of this insight ensures that my contribution to developing knowledge of the influence of ILEs on student learning is inherent in a critical understanding of the lived experiences of the participants.

Research Paradigm: Interpretivism

The interpretivist paradigm, developed as a reaction to positivism, is one form of qualitative methodology, which integrates human interest into the study (Newby, 2010). Interpretivist researchers begin with individuals and then seek to understand how they interpret the world around them. The word 'interpretive' acknowledges the subjectivity of knowing (O'Toole & Beckett, 2013). Meaningful reality is different for each individual since each individual exists in a unique context, which shapes his or her view of reality. For Guba and Lincoln (1994), the emphasis is on an individual's ability to construct meaning. An interpretivist researcher's fundamental goal is to understand the subjective experiences, meanings and reasons of individuals rather than to generalise and predict causes and effects that are context and time bound. The role of the researcher in the interpretivist paradigm is then to "understand, explain, and demystify social reality through the eyes of different participants" (Cohen, Manion & Morrison, 2007, p. 19). Human interests are the main drivers of the research. Interpretivist research aims to expose hidden forces and structures (Scotland, 2012). This is in contrast to the positivist paradigm, which is concerned with identifying and measuring phenomena rather than the human experience.

The interpretivist paradigm was considered to be the most appropriate for this research as researchers in this paradigm seek understanding of the world they live and work in (Creswell, 2014). Uniform causal links are rejected in a learning environment where teachers and students co-construct meaning in an ILE setting. Furthermore, the flexible, personal structure of interpretivism has greater appeal than a rigid, emotionally neutral research approach. This qualitative research methodology encourages participants to provide their perspectives. It requires an interactive process where the researcher seeks

to understand participants' experience as they live it or feel it, and therefore will provide a deeper insight into their reality.

According to Scotland (2012), the interpretivist research paradigm raises questions about the danger of compromising the autonomy and privacy of the participants as the methods used are more intimate and open-ended than scientific research. Researchers may have to "tone down their contextualisation in order to protect participants' identities....participants have little control and are vulnerable to researchers imposing their own subjective interpretation on them" (Scotland, 2012, p. 13). It is acknowledged nevertheless, that the researcher may be biased. Furthermore, since the data collected is more empathetic in nature the possibility exists that reliability and representativeness are compromised. How these issues were overcome are discussed in the ethics section of this chapter.

Epistemological and ontological assumptions of the interpretivist paradigm

The ontological and the epistemological are intertwined in the human experience (O'Toole & Beckett, 2013). Ontology refers to the nature of 'being' or one's view of reality (Mack, 2010; Scotland, 2012). The theoretical framework used by researchers is informed by their personal ontology, by "what we mean when we say something exists" (Mack, 2010, p. 5). Epistemological assumptions are grounded in how knowledge can be acquired, communicated and created (Scotland, 2012). Every paradigm has distinct ontological and epistemological assumptions and views; therefore, they have "different assumptions of reality and knowledge which underpin their research approach" (Scotland 2012, p. 9).

Mack (2010) theorises that the ontological assumption of the interpretivist paradigm is one where people make their own meaning of their reality; there is no single external reality. There are multiple realities and each reality expressed and socially constructed by an individual is unique (Bryman, 2012; Creswell, 2014; Mason, 2002). This ontological focus "implicates the epistemological: it suggests that our bodies do not simply respond to the world; rather they partly constitute the world" (O'Toole & Beckett, 2013, p. 49). Reality cannot be predicted and is subjective. Positivist ontology on the other hand views reality as something that is tangible, objective and the objects have meaning independently of any consciousness of them (Creswell, 2014).

The epistemology that underpins the interpretivist approach assumes that people are inseparable from their knowledge. Knowledge arises from specific situations and cannot be reduced to simplistic interpretations (O' Toole & Beckett, 2013). The knowledge generated will have meaning and be time, context and culture bound (O'Toole & Beckett, 2013). My interest as a researcher is in how a group of selected student participants are making sense of their learning environment and what meaning they are allocating to it.

Methodology

As illustrated, a research paradigm is a worldview within which the research occurs. Research methodology however, is concerned with the "assembly of research tools and the application of appropriate research rules" (Newby, 2010, p. 51). The research tools are the research methods such as, questionnaires, observations and focus groups. Methodology is how this toolkit of research methods are brought together to address a specific research problem (Newby, 2010). Case study is one of the principal methodologies used in my research.

Case study

A case study is a comprehensive analysis of an event or individual circumstance that is selected either because something worked well or there was a problem or because it is unusual or because it is typical (Newby, 2010). Case study design allows for depth rather than coverage (2010). An enhanced understanding of phenomena can therefore be gained by undertaking a qualitative case study. Berg (2007) suggested that case study design will allow researchers to gain a deeper understanding of how people operate in their context, contending that a case study approach permits the researcher to "capture various nuances, patterns and more latent elements" (p. 248). A hallmark of case study is significance where the researcher has insight into the real dynamics of people and situations (Cohen, et al., 2007). Discussing 'case study' is not easy and multiple authors treat the subject differently.

Chadderton and Torrance (2011), for example, regarded case study as an approach to research which "seeks to engage with and report the complexity of social and educational activity, in order to represent the meaning that individual actors bring to the setting" (p. 53). Ary, Jacobs, Sorensen and Razavieh (2006) viewed case study as

creating the opportunity to understand why and how individuals react to changes in their environment.

The case is an opportunity to study the phenomena of interest (Stake, 2003), which, in this study, is the teaching and learning in a specific environment. Stake (2003) argued that the purpose of case study "is not to represent the world but to represent the case" (p. 156). The strength of case study is that it can use multiple methods and data sources (Newby, 2010) to generate a rich, detailed and holistic description of a phenomenon in order to represent it from a participant's perspective. The case study approach allows the researcher to investigate the processes at work that create patterns or themes. In addition, case study researchers pose the question, what is the variation from the expected? (Newby, 2010). Stake (2003) suggested that case studies are valuable for revealing complexities for further investigation as well as assisting to establish the limits of generalisability

The 'case' in this study is a specific secondary ILE (at 'Manuka College') and the phenomena of interest is the teaching and learning in the ILE. The focus of my research is how innovative learning environments look, sound and feel to the participants. The analysis of the research was guided by the imperative to find out how the case appears to the participants. A criterion for inclusion in the case study was that student and teacher participants were required to be a part of the junior school (Year 9 and Year 10). All students from Year 11 – Year 13 and teachers who taught exclusively in the senior school were excluded from participation in the study.

A critique of case study is that it is not viable to generalise from a small sample to the population under study as a whole. Therefore, while the findings of the research undertaken at Manuka College are not generalisable, nevertheless, the findings related to its context may be used to improve practice in other schools where the context may be similar.

Methods

The research method used will depend upon the research question and the philosophy that underpins the research. Research methods are tools to collect data. There needs to be a clear, yet flexible process for gathering data, which must be appropriate to the

phenomenon (Vagle, 2014) and be fit for purpose (Cohen, et al., 2007; Vagle, 2014). Data gathering was based on two methods (questionnaires and a student focus group), aimed at capturing the tentative manifestations of the lived experiences of students and teachers in the ILE and the resulting influence on student learning.

Questionnaires

A questionnaire is a widely used tool to collect information and can be managed without requiring the physical presence of the researcher. Closed questions, such as multiple choice items are useful as they enable comparisons to be made across the sample of participants. They are more direct, focussed, and quicker to code, analyse, and do not discriminate on how articulate participants are (Cohen, et al., 2007). Open questions on the other hand allow participants to qualify their responses and avoid the limitations of pre-set categories of responses (Cohen, et.al, 2007). The questionnaires, which were anonymous Google Forms, included open-ended items. This method was a relatively quick way of gathering information from many people at once (Cohen, et al., 2007). The student questionnaire focused on their perceptions of learning in an ILE, which included the learning environment, the teaching and identifying barriers and opportunities to their learning (Appendix A). The teachers' questionnaire differed, as it addressed what they perceived to be the barriers and opportunities for student learning in an ILE and included additional open-ended questions (Appendix B).

Consenting Year 9 and Year 10 students and consenting teachers completed separate anonymous Google Form questionnaires at the start of the study. A sample size of 50 student responses and 10 teacher responses was considered ideal. In order to keep the study manageable, there was a cut-off date for the questionnaires. All Year 9 and Year 10 students were invited to participate. Seventy-one students responded to the questionnaire by the cut-off date, and although the initial plan was to stop at 50, the additional numbers added depth to the study. As approximately 30 teachers work in the junior school ILE, an ideal number of questionnaire respondents would be 10, and thus only the nine received were used as a sample.

Focus group

Focus groups are settings, which allow selected participants to express their views on a particular topic (Cohen, et al., 2007). The interaction of the group leads to data and

outcomes (2007) such as verifying perceptions, opinions and feelings. The focus group method produces a collective rather than an individual view of the topic. The participants interact with each other, rather than the researcher so that their views emerge and predominate the interview (Cohen, et al., 2007). The goal is to find out as much as possible about the phenomenon from the participants (Vagle, 2014).

The focus group consisted of consenting students (Year 9 and Year 10 students). The data from the student questionnaire was used to inform the focus group question schedule, so that responses made in the questionnaire could be understood at a deeper level. This group of Year 9 and Year 10 students recounted their perceptions and experiences of teaching and learning in an innovative learning environment. Two groups (one Year 9; one Year 10) with a minimum of five participants each, was envisaged for the study. As the focus group could only be convened early December 2016, it was possible to secure only six students from both cohorts. Cohen et al. (2007) argued that one focus group is insufficient as the researcher will be unable to know if the outcome is unique to the behaviour of the group. Nevertheless, the one focus group should arguably provide the depth and complexity of responses anticipated for the study. The timeframe for the focus group was 60 minutes.

The physical environment was easily accessible and comfortable for the focus group session. A list of semi-structured questions guided the discussion (Appendix C). It was important that all participants could feel that their contribution was valuable. The focus group data was voice recorded. Vagle (2014) advised to maintain a system of note taking or journaling after data recording events. In terms of the agreed ethics application (discussed in greater detail later), my supervisor conducted the focus group. I was therefore in a position to be able to record notes in a journal, and this information was incorporated in the analysis.

Analysing the data

Data analysis must be consistent with the type of approach used (Creswell, 2014). Although it is expected that interpretive studies will reflect the preconceptions, biases, background and agenda of the researcher, Cohen et al. (2007) cautioned against the findings of the research saying more about the researcher than about the data. Data must describe and attach meaning to the phenomenon in the study. The critical first

step I therefore took before analysing the data was to clarify the purpose of my study and ensure that my coding scheme was coherent. As a teacher at Manuka College, I was an insider researcher, having prior knowledge an outside researcher may not have had. Based on this knowledge and the research already completed, I created a short list of pre analysis codes. I noted all my pre-understandings of the phenomenon on paper to revisit when creating codes. Coding is the process of closely reading the data for themes, ideas or categories and highlighting similar text with a code for further analysis and comparison at a later stage (Cohen, et. al., 2007; Creswell, 2014).

The audio files from the focus group discussion were transcribed by a contracted transcriber, who eliminated filler words when students were speaking over each other to voice their opinion. I checked the transcript against the original recording for accuracy. Thereafter I read and re-read the data and noted patterns, surprising or unexpected features and inconsistencies (Creswell, 2014). To find the tentative manifestations Vagle (2014) suggested using Deleuze and Guattari's 'lines of flight' metaphor. Firstly, seek where the knowledge 'takes off' and investigate what does not fit. I needed to be attentive to moments of surprise or if participants concealed thoughts or feelings. I asked questions such as "Where might I appear certain or uncertain of what something means?" (Vagle, 2014, p.135).

Thereafter, I used Nvivo 11 as a tool for storing and retrieving my data. Nvivo 11 provided the tools to organise the raw data from the transcripts and questionnaires. I imported the focus group transcript and summary information from the open – ended questionnaires to Nvivo. The software assisted me to create codes (termed 'nodes' in Nvivo) and search text to analyse the large amounts of qualitative data. Coding involved categorising and indexing what emerged from the data. I could select text and store it in relevant nodes – similar to a personal filing system. My nodes took the form of words and phrases.

The nodes contained identified initial themes. This made it easier to look for emerging themes to learn more about a participant's beliefs and attitudes by noticing the manner in which participants referred to certain phenomena (Creswell, 2014). I was then able to engage in the lived experiences of the participants. In addition, I created titled memos, where I noted themes and made inferences and links to literature, which I linked to the

nodes. Creating memos allowed me to take notes and reflect on the research process as I completed coding to the node. By creating 'parent nodes' and sub, 'child nodes', I could capture the complexity and comprehensiveness of the data. As a result of my precoding activity, I did, however, find it sometimes challenging to find a fit between the data and the nodes.

By further analysing the data in the nodes in Nvivo 11, I could visualise the information – for example, I created a word cloud for the top 50 exact words that the participants' used in their responses. Frequency of the word or code provides an indication of their significance to the data. I created a word tree for the words that I wanted to investigate further such as 'space', 'learning' and 'teachers'; I could navigate to the reference and text of the word. As words and single codes on their own have limited meaning (Cohen et al., 2007), it is important to look at relationships and meaning between the nodes.

Vagle (2014) saw the merit in using Nvivo software but cautioned that its use could produce mechanistic representations rather than a deeply embodied understanding of the phenomena in the study. The software was, however, a useful tool that assisted me to speed up the otherwise tedious 'cut and paste' that was required to create the themes. As a novice researcher, I was challenged by the time required to learn the software. I also had to learn the patience required when analysing the data so as not to impose my meaning onto the participants.

Table 1: Themes related to the findings

<table>
<tr><td>Familiarity with teaching in an ILE</td><td>Classroom design
Furniture
Space
Collaboration and flexibility</td><td>Digital technologies
Issues
Digital earning opportunities</td></tr>
<tr><td colspan="2">Pedagogy
Privatised vs deprivatised practice
Three teachers in a classroom
Relationships</td><td>Demographics</td></tr>
</table>

The findings for the open-ended questions in the teacher and students' questionnaire and the focus group were compiled by exploring unique, similar and contrasting views in the different nodes created in Nvivo 11.

In addition, I printed hard copies of the nodes for further analysis of themes. It follows that many of the codes collapsed into larger themes and the findings themed according to the data sets rather than exploring each question. The themes and sub themes in some places overlap, which added detail to the discussion of the findings and are highlighted in table 1.

Vagle proposed a whole-part-whole approach to data analysis. The whole transcript is considered to gather a sense of the whole, thereafter relevant parts extracted and recoupled to make a new whole. The new wholes then deconstructed provide the post intentional flavour (Benade, 2016b). Going through the process of whole-part-whole allowed me to dig deeper into the analysis which provided opportunities to better see the "shifting, fleeting, fluid nature of the phenomena" (Vagle, 2014, p 134).

Triangulation and transferability

Triangulation is the use of more than one data collection method and increases the validity of the study (Cohen, et. al, 2007). In this interpretive research study, methodological triangulation (different methods on the same object of study) included the data collected from the student focus group and the student and teacher questionnaires to investigate different viewpoints on how the ILE influences teaching and learning. The use of different methods compensates for the individual limitations and exploits the relative benefits of using multiple methods (Brewer & Hunter, 1989).

Triangulation is not without its critics. Vagle (2014) cautioned once more that triangulation could mechanise the analysis. In phenomenological research, when there are multiple data moments from interviews or written statements, Vagle did not see the need to triangulate across the moments in order for something to be meaningful. A single statement from a participant at one moment may be so powerful that it needs to be augmented (2014). Patton (1980) suggested too that having multiple sources of qualitative data does not necessarily ensure consistency or replication nor does it reduce bias.

Ethical and cultural issues related to the research

Ethical behaviour is a set of moral principles (Litchman, 2013) that govern an individual or their profession. To act morally is to act with integrity, honesty and openness. Researchers need to protect their research participants; promote the integrity of the research; develop participants' trust and guard against any misconduct that might reflect on their institution or organisation (Creswell, 2014). Ethical issues exist from the research topic investigated and the methods used to obtain valid and reliable data (Cohen, et al., 2007). Specific ethical research principles include voluntary and informed consent, veracity, respecting the vulnerability of participants, avoidance of conflict of interest, confidentiality and anonymity, intrusiveness and reciprocity (Cohen, et. al, 2007; Creswell, 2014; Litchman, 2013). Attention should be drawn to ethical issues prior to the study, at the beginning of the study, during data collection, during data analysis and reporting, sharing and storing the data (Creswell, 2014).

Prior to the study

Prior to conducting the study, I sought approval from the Principal of the school. Ethical authorisation was sought and obtained from the Auckland University of Technology Ethics Committee (AUTEC – Appendix D), to enable me to recruit a student focus group and allowing the focus group discussion to be recorded and transcribed. As an insider researcher, AUTEC required assurance that I would not make incorrect assumptions based on my prior knowledge of the school and I could balance the researcher and insider role (De Lyser, 2001).

At the beginning of the study

At the beginning of the study, I requested the assistance of colleagues to alert the Year 9 and 10 students in the different Whānau blocks (organisational grouping) of the research and to circulate Participant Information Sheets (Appendix E), Consent (Appendix F) and Assent Forms (Appendix G) to students interested in participating in the focus group. Some of the students that had completed the questionnaire would have been familiar with the study. Parent/caregivers signed consent forms as the students are under 16, however, they are fully capable of assenting to their involvement in their own right, thus were required to sign a student assent form.

Participants provided with the correct information, could make rational informed choices relevant to their decision to participate in the research. The participant information sheets were honest and designed to respect the participants. The student participant information sheet written in a style appropriate to the participants was simple and easy to understand.

The participant information sheets for students, parents and teachers (Appendix E) made it clear that participation was voluntary. All participants had access to participant information sheets explaining the research intention. The principle of informed consent arises because of the participants' self-determination and right to freedom (Cohen, et. al, 2007).

Participants in the study were not placed in a situation where they faced potential harm, physically or psychologically or caused any anxiety (New Zealand Association for Research in Education [NZARE], 2010). Respecting the vulnerability of participants is the cornerstone of ethical conduct (NZARE, 2010). Participation in the study was voluntary. I respected the diversity (culture, gender and age) of the students by recognising that every student would be unique in their responses, personalities and beliefs. The research was not concerned with targeting a specific cultural group. The invitation to participate extended to all Year 9 and Year 10 students. Specific ethnic groups were not the target for the study.

During data collection

During the data collection, the environment where the research (focus group) took place was safe and respectful for all participants, a requirement of sound ethical research (NZARE, 2010). Asbury (1995) noted the advantages of food in establishing a relaxed and comfortable environment. Koha (token of appreciation) in the form of fresh fruit, biscuits and juice were provided for the students in the focus group.

To ensure that the study did not become excessively intrusive on participants time, space and personal lives (Litchman, 2013), students were provided advance notice regarding the date and time for the focus group. The research therefore did not hinder students' academic progress (NZARE, 2010). I requested permission for the release of participants' from their class for the 60-minute focus group. Students and teachers had

the opportunity to complete the questionnaires anytime, anywhere within the stipulated timeframe.

There was a potential conflict of interest or power relationship ethical issue for me as an insider: the primary researcher, teacher and middle leader at the school. Creswell (2014) has spoken against insider research as the power dynamics would tend to corrupt the research. Bonner and Tolhurst (2002) in contrast noted that insider researchers would have a greater understanding of the culture studied. Given this tension, it was imperative that I had an explicit awareness of the possible effects of perceived bias on the data collection (Smyth & Holian, 2008). Thus, some of the negative effects of the power dynamics identified by Creswell were offset by having a third party, my supervisor, conduct the focus group, thereby minimising the risk of conflict of interest. I further mitigated this conflict of interest through clear communication in the focus group participant information sheet. Permission from the participants was requested for me to be present in the classroom during the focus group discussion. I was not an active participant in the focus group. I did however, take notes to assist with the data analysis. Adopting a post intentional approach to my research required me to constantly critique and reflect on my positioning (Vagle, 2014).

The participant information sheets were specific with regard to confidentiality. At the outset of the focus group, my supervisor was explicit in explaining the meaning of confidentiality to the participants. Participants in the focus group were trusted to maintain confidences. Participants were guaranteed that they could withdraw from the research at any time and up to a certain point their contributions could be removed from the research. Participants in the focus group could request the recording devices be turned off at any time if they wanted to say something ‘off the record’ or did not feel safe speaking openly.

In addition, the transcriber signed a confidentiality agreement (Appendix H) which stated that all material transcribed be kept confidential, the research material was to only be discussed with the researcher and original transcripts destroyed once the researcher approved the transcription. Importantly, views expressed by the students are confidential to the researcher.

During data analysis

When analysing the data I respected the privacy and anonymity of participants and the organisation. All identities were suppressed in the transcription documents and reporting of the research (Creswell, 2014). Assigned pseudonyms were in the transcriptions. A feature on Google forms is that questionnaires can be anonymous; no participant's response was identifiable. I avoided siding with participants and reported multiple perspectives and contrary findings (Creswell, 2014). I was accountable to analyse data in a way that did not misrepresent or misinterpret the evidence. To do so might jeopardise future researchers (Cohen, et. al, 2007).

All educational research in New Zealand has obligations to the Treaty of Waitangi and should therefore be respectful of Māori in relation to the phenomena researched. The interests of Māori should be recognised in the analysis of the findings. It was inevitable that there were Māori students in the study as Manuka College's population is 38% Māori. Capturing the voice of these participants is potentially beneficial to the school and its community by highlighting Māori concerns. Researcher-participant relationships were underpinned by notions of manaakitanga (reciprocal care and respect) at all times. Participants and the school involved in the research will be issued a report of the findings as a courtesy and to allow them to benefit, directly or indirectly, from participating in the research (NZARE, 2010). The data will be stored in the AUT School of Education for a period of six years.

Conclusion

Many policy decisions, including those in education, stand to be informed by qualitative research, which describes and interprets the settings where policies are executed. Qualitative research is pivotal as education involves complex human interactions (O' Toole & Beckett, 2010) that are rarely explained simply or with a quantitative approach. Using a qualitative approach for my study with a post intentional phenomenological lens enhanced the research and supported the process of interpretation, providing me with a critical understanding of the tentative manifestations present in the ILE and the influence on student learning, adding insight to teaching and learning in the case study school. A clear and concise methodological approach has ensured that I was accountable in the way I collected, interpreted, examined and analysed the data. When the findings

from the data collided with my own bias as an insider, my ethical commitments assisted with maintaining a sense of integrity. The following chapter summarises the findings from the focus group and questionnaires.

Chapter Four: Presentation of research findings

> Research findings tell a story and researchers need a perspective to select items from the data for the story, to create their relative salience, and to sequence them (Corbin & Strauss, 2008, p.67)

Introduction

The aim of this research was to gather student and teacher participant perceptions of teaching and learning in an innovative learning environment (ILE). This chapter presents the participant experiences that shape the tentative manifestations of their perceptions of the influence of the ILE on student learning. The findings draw on evidence based on a student focus group, a student questionnaire and teacher questionnaire. Seventy-one students participated in the student anonymous questionnaire, six students participated in the focus group and nine teachers participated in the anonymous teacher questionnaire.

I used two different methods to collect data and established that the data sets complemented one another. Initially, I present the demographic information from the student questionnaire and focus group. Thereafter, themes from the open-ended and closed questions in the student and teacher questionnaires and the student focus group are presented. The data analysis process discussed in chapter three generated the emergent themes, some of which are overlapping. Themes identified are used as headings and display multiple perspectives from participants supported by specific evidence. Consequently, the findings become more realistic and richer to allow readers to vicariously experience the participants' world (Creswell, 2014; Miles & Huberman, 1994). The described themes and findings contribute to answering the overarching research question: **What is the influence of innovative learning environments on student learning in a secondary school context?**

Student questionnaire and focus group

Demographics

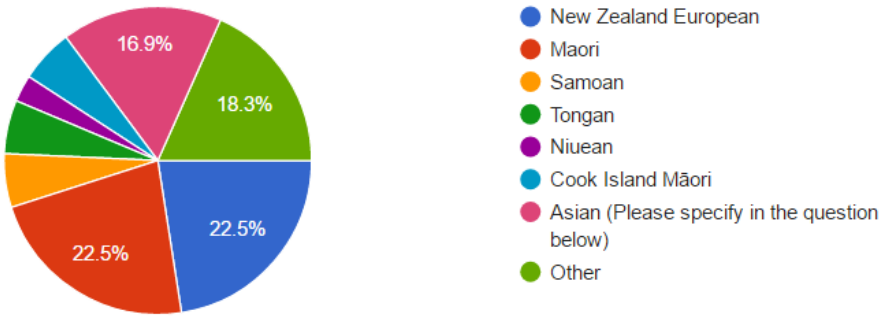

Figure 1: Ethnicities of participants

Figure 1 above presents the ethnicities of those who participated in the student questionnaire. Participants were required to specify the ethnicity they most identified with if they selected 'other.' Sixteen (22.5%) identified as Māori and sixteen (22.5%) identified as European. Thirteen (18.3%) identified as other – with five of the thirteen selecting that they identify mostly as Māori (Māori/Indian, Māori/Rarotongan and Māori/ European) hence they selected other. Four (5.6%) identified as Cook Island Māori, Samoan and Tongan respectively with 2 (2.8%) Nuiean. Those identifying as Asian were of Chinese, Thai, Filipino and Indian descent.

Of the 71 student participants, 30 were in the Year 9 cohort and 41 were Year 10. These year groups are regarded as part of the junior school and their ages range from 13−15 years. There were 30 male and 41 female participants.

Four of the six students in the focus group identified as Māori, one student identified as European and one as South African. There were four male and two female participants in the focus group.

Theme 1: Experience of teaching and learning in an ILE

This theme explores the familiarity of students and teachers with open learning spaces, which may influence their perception of teaching and learning in the ILE.

As can be seen from table 2, the majority of participants from the student questionnaire (56%) indicated they had not experienced an ILE at intermediate school.

Table 2: The type of learning environment experienced by students in intermediate[5] school (Student questionnaire)

Learning environment	Responses *(n = 71)*
Classroom like a box, around 30 students, one teacher, similar desks and chairs in rows	15
Classroom like a box, around 30 students, one teacher, similar desks and chairs in groups	40
Classroom like a box, around 30 students, one teacher, modern furniture in groups	12
Classroom like a shopping mall maybe 60 students, 3 or 4 teachers, modern furniture in groups	4

They were, however, familiar with working in a group. Twenty one percent of the participants were not familiar with an ILE or any teamwork. It is apparent from the table that very few participants (6%) were familiar with learning in an ILE and only 17% were familiar with the design aspects of an ILE from intermediate school.

Two of the student focus group participants were somewhat acquainted with learning in a shared learning space where more than one teacher was present. Although their intermediate school teachers sometimes opened the walls to allow students to work together, they were however, unprepared for the experience in high school.

Nine teachers participated in the teacher questionnaire. Seven teachers were currently working in a shared space, teaching multiple students for less than one year, and two participants for two to three years. Six of the nine teacher participants were new to teaching and had worked in a single cell classroom alone for 0−1 year before working in the shared space at Manuka College. Two participants taught 4−5 years and one participant 6−10 years, all in a single cell classroom.

Theme 2: Classroom design

In this theme, evidence is used to explore the question of whether classroom design influences a student's ability to learn. The impact of furniture, space and the flexible use of the space to encourage collaboration is addressed.

[5] Ages in intermediate school range between 11 and 12 years, and cater to students in Year 7 and Year 8.

Furniture

A shared view among student participants in the focus group and those that completed the open-ended questions in the questionnaire was that the furniture and colour in the open plan classroom lightens the mood and fosters creativity. A student participant felt that “the learning space isn't depressing and outdated. Bright modern furniture does support the learning atmosphere” (Student questionnaire). The furniture made the 100-minute lessons more comfortable. A contrasting view expressed caution that students may “slack off when the furniture becomes too comfortable” (Student questionnaire). Some perceived that grouping the furniture makes learning more difficult, that the classroom becomes ‘cluttered.’ In addition participants mentioned that it has not been sufficiently considered whether all students enjoy working in groups. Where and how the participants were seated in the classroom made listening difficult at times. “The furniture is in groups so sometimes it is difficult to listen to the teacher” (Student questionnaire).

Space

There was consensus in both the teacher and student questionnaire that the existing spaces were not large enough. “There are too many people around you when you're trying to learn” (student participant – questionnaire) while another noted “sometimes the learning space [is] not conducive to the learning activities.” Sometimes, teachers second other classrooms for use.

Furthermore, a shared concern among both teachers and students was that not all students could function in this large environment. A student participant commented: “I always work best in a closed, quiet, and comfortable environment” (Student questionnaire). Student participants (Student questionnaire) noted that introverted students could become lost. Teachers did on occasion create smaller physical spaces by closing the walls. To allow flexibility with learning, teachers recommended that additional buildings be provided to create more break out spaces, maker spaces (a physical environment where tools and resources are provided, for students to work on collaborative projects) and cold spaces (e.g. science laboratories).

Noise, disrespectful and disruptive behaviour were significant factors seen as obstacles to learning due to the large number of students in the space. Teacher participants felt

that managing behaviour was sometimes difficult. The focus of teaching in the ILE, as perceived by the teacher participants, should be on the learning process and outcomes that enhance learning for the students, not on managing behaviour.

Student participants reported that adequately hearing the teacher depended on their physical position in the classroom. In addition, the geographical positioning of teachers in the space, one in front, one at the back, one in the middle, made it difficult to engage with instructions.

Collaboration and flexibility

A shared view among teacher participants was that the ILE environment allowed them to "share the gold in the room" by learning from the experiences of others. The ILE permitted the flexibility to share knowledge with each other. The set-up of the classroom space endorsed students relying on each other for help and the teachers catered for this by allowing flexibility of movement.

Student participants overall reported that the learning environment encouraged collaboration, which helped when teachers are occupied with other students. Students felt connected to their peers and other different cultures that were present in the one setting. One student participant felt, "It helps me learn because it gives me the opportunity to connect and collaborate with other students and not just my friends, it also has helped me create new friendships" (Student questionnaire). Student participants enjoyed the design of the learning spaces and the flexibility to work in the common area in their block—that is to say, the design facilitates their learning. For example, "It doesn't make me feel like it's another boring class" and "the learning environment helps me work with others and build knowledge when It comes to individual activities" (Student questionnaire). In contrast, a third of the focus group participants preferred being in a single cell classroom with one teacher and fewer students.

The evidence suggests that classroom design could facilitate or impede learning experiences. Teachers and students perceive the spaces to encourage flexibility and collaboration. The teacher participants recommended additional spaces to allow for further flexibility.

Theme 3: Digital technologies

Digital learning is integral to the pedagogies that may be expected in an ILE. Chromebooks, which are Internet-connected laptop devices using Google Chrome as the operating system, are used across the junior school in Manuka College. All applications and storage are cloud-based, and these devices are an essential learning and record keeping tool. In this theme, the evidence reflects the use of digital technologies in teaching in an ILE as both a barrier and an opportunity for learning. Issues that arise with chrome book use and the learning opportunities they offer are explored.

Issues

A common view amongst student participants and most teachers in the anonymous teacher questionnaire was that many students find digital devices a distraction from learning. Several teacher participants suggested that the school invest in software to monitor student activity on the devices. The findings indicated a number of additional issues. Many students play games and watch You Tube videos when they should be completing their learning, deftly swapping tabs as soon as the teacher passes by, reinforcing a common perception that teachers are not sufficiently active in monitoring the student use of chrome books.

Student participants reported that they were finding it difficult to work only from a chrome book. Many wanted a balance of exercise books (to hand write notes) and chrome books to complete learning tasks. Students wanted to write more, believing that completing their learning tasks using the chrome book only, discouraged them from writing. As a result, some students believed they were seeing a decline in their English asTTle[6] results. Participants expressed the perception that teachers favour technology-led teaching and avoid 'hands on' teaching. Similarly, teacher participants also perceived that some of their colleagues have become overly reliant on the chrome books.

Students perceived that teachers assume that they know how and what to do with digital technology as they are expected to collaborate and help others. A common

[6] asTTle is an assessment tool developed to assess students' achievement and curriculum level progress in reading, writing and mathematics. See https://e-asttle.tki.org.nz/

thread among teacher participants who recognised this student frustration is evident in one participant's response:

> Students must be taught how to use digital technologies efficiently to meet a desired outcome rather than assuming that they know how to use it for work completion - otherwise digital technologies may actually have a negative impact on student learning. (Anonymous – teacher questionnaire)

Furthermore, as one student complained, "most of the time [the teachers]… don't really teach us. They….get the chrome books to teach us" (Student questionnaire). This apparent perception that students acquire information and understanding from a website has arguably created anxiety for them.

Digital learning opportunities

Table 3 below addresses the question in the student questionnaire: 'Using a computer as a tool helps me to …' (participants could tick more than one box).This table is revealing in several ways.

First, using chrome books helps approximately 50% of (71) participants to be more responsible for their learning with under 30% using the technology to develop critical/deep thinking skills.

Under a third of students are provided with feedback digitally. Further findings pertaining to feedback are highlighted in theme 4.

Table 3: Using a chrome book as a tool

Response: Helps me to	Total *(n = 71)*
be more responsible for my learning	35
develop critical/deep thinking skills	20
develop digital technology skills by using other tools	34
develop more insight into other topics through self-study (digging deeper into topics	32
receive a lot of feedback from my teachers	23
complete a minimal number of learning tasks	22

The figures in table 3 are startlingly low considering the significance of digital learning in an ILE. Despite the negatives mentioned regarding the use of chrome books, the evidence from table 3 suggests that digital technology works for some students (30% - 50%) to develop their deep thinking and self-management skills, which are significant 21st century learning skills.

Most of the teacher participants concur that there are students who use digital devices well and this enhances their learning experiences. The majority of student participants agreed, however, that digital technology was a distraction from learning. A third of the student participants reported using the technology to get away with doing very little learning.

Digital technology does provide learning opportunities; as a teacher participant notes, "I believe that digital technologies can help and maybe even enhance student learning" however, the participant also felt that "it does not overpower traditional forms of instructions such as face-time with the teacher."

The evidence from this theme suggests that teacher and student participants perceive the use of digital technologies as a reason for disengagement with the learning process. Arguably, digital technology when integrated effectively with teaching and learning, can be a powerful tool to promote 21st century competencies and skills.

Theme 4: Pedagogy

In this theme, the evidence primarily explores the influencing role of pedagogy in the ILE on student experiences. Initially, the most frequently used words in the research are highlighted. Thereafter the following sub themes are addressed: privatised vs deprivatised practice, professional collaboration and relationships.

Figure 2 visually highlights the most frequently used words found in the questionnaires and focus group transcript. The word, 'teachers' was most significant, being mentioned 679 times, 'learning' 608, 'works' 409, 'think' 308, 'differently' 262, 'help' 193, 'time' 180, 'teach' 177, 'need' 162 and 'space' 161 times.

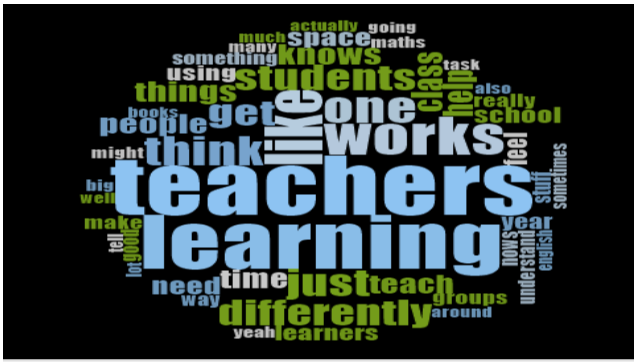

Figure 2: Wordle to highlight word frequency

The word frequency does not necessarily emphasise the word's importance – the words that occur most are perhaps salient in the minds of participants. The words 'teacher,' 'learning,' and 'think differently' are meaningful in the context of developing 21st century skills. The words may have a leading role when analysing the influence of innovative learning environments on student learning.

Challenges of deprivatising teaching practice

Privatised teaching practice refers to the traditional teaching practice of single cell classrooms where teaching is private or isolated. The teacher holds the power and is responsible for learning to occur. Deprivatised practice requires teachers working in an ILE to collaborate in a high trust environment where their teaching is visible to their colleagues. Teachers should be able to learn with and through each other without the fear of being criticised or threatened. This goal may not be easily achieved, however, and participant M3 in the focus group noted that students perceive the teachers to be uncomfortable in the learning space. It was reported that teachers have been heard to complain about each other to students, revealing for example that they are "*sick of this one person"* [emphasis in the original] as the teacher in question was deviating from the plan for the lesson.

The conflicting ideologies of the teachers has created an uncomfortable environment for the students. The findings show that when student participants ask the same question of different teachers in the classroom, they receive different responses. The student participants revealed this to have caused anxiety as they did not know who was giving them the correct information. An insightful comment made by participant M2 in the focus group was that the system is new to teachers as the school is in a transitional

learning phase and teachers have to change their existing traditional pedagogy—this, arguably, did little to alleviate the sense of insecurity experienced by students.

> M2: The way they're teaching, I think a lot of them are more used to the traditional you stand in front of the class and this is what we are doing and you sit and be quiet, whereas now they have to sort of actively be involved in what we're doing. It's new for them and so it makes me feel unsure whether they know what they're doing.

Student participants in the focus group recognised that teachers are 'told' what to teach and are struggling with learning the content knowledge from other disciplines, which is a requirement in the ILE. This may explain why student participants felt that teachers were 'unclear with instructions' and the 'relevance and expectations' of the learning were not explained. In addition, some participants felt that they were not academically challenged in the ILE. In spite of this view, student participants (both questionnaire and focus group) felt that they have the opportunity to learn about the real world using an authentic learning approach and to develop lifelong learning skills. This finding suggests that teacher pedagogy in the ILE was consistent with 21st century skill development.

Some student participants expected teachers to identify that everyone was at different stages with their learning in the ILE. Providing whole class instruction when new learning is explained created confusion as many students were not at that point with their learning. In contrast, teachers perceived the tasks were well scaffolded and allowed for differentiation in order for students to work at their own pace.

Some student participants felt that their class time is wasted when teachers are inadequately prepared for lessons in the ILE. In addition, the 'Do Now'[7] activities used at the start of the lesson went on for too long and were considered by some to be irrelevant, although participants did acknowledge their benefit is to get their concentration focussed. One student participant summed it up:

> Do Now tasks are irrelevant and I would rather be doing actual work, learning feels unrelated, learning isn't ability based, learning isn't structured and is often improvised, teachers are often unable or

[7] Activities that students do at the beginning of a lesson for 5 – 10 minutes. It can serve as a review of previous learning or as an introduction to new learning.

> incapable of controlling and dealing with bad behaviour which most of the time wastes learning time (Anonymous – student questionnaire).

Most of the student participant responses reflect that teacher ineffectiveness is a result of a lack of teacher strategies, planning and skills. “Most of the time the free time is caused as the teachers are unsure of what to instruct us with next” (Anonymous-student questionnaire). This resonates with findings from the teacher questionnaire with the question focussing on professional challenges. One of the participants said, “working with learning leaders who are not always prepared or communicative,” is a professional challenge.

Contradicting however the student perception that their teachers are mostly unprepared for lessons, one teacher participant referred to the time for planning: “Prepare. Prepare. Prepare. Then be able to throw it all away. So prepare that backup as well.” Traditional preparation weeks in advance may however, on balance not be what is required in the pedagogical approach required in ILE and with integrated curriculum.

Recognising this required change, a teacher participant suggested that teachers needed to shift their practice from a traditional approach to a more modern approach by “adapting curriculum knowledge and expectations around good practice” that allowed them to “trust that the students would meet the challenges of the learning and that I would not micro-manage them.” The teaching of different Learning Areas where they were not confident was perceived as a challenge to teachers. Nevertheless, some teachers have voiced weariness to their colleagues of principles of the ILE, such as working with other teachers and the large class sizes. This may unsettle the enthusiasm of others, and as one teacher participant remarked, “it does dampen a little of mine.”

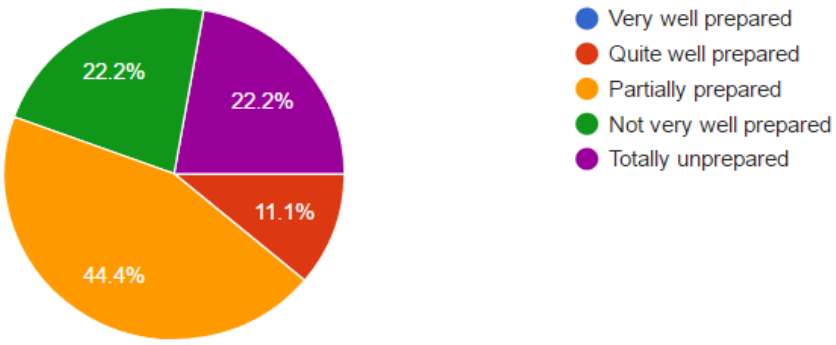

Figure 3: How prepared were you to teach in an ILE?

Figure 3 indicates that of the nine teacher participants four were partially prepared, two were not well prepared, two were totally unprepared and one was quite well prepared to teach in an ILE. In theory, 56% of the teacher participants felt that they were prepared or partially prepared for teaching in an ILE. In practice, the findings indicated the teacher participants felt that working in the ILE was far more disorganised, chaotic and unsettling than expected.

Three of the nine teacher participants felt that more time is required for professional development prior to teaching in an ILE. The shift from privatised practice to deprivatised practice requires a different set of skills that teachers may not be prepared for. In addition to the new content from other disciplines, teachers had an accelerated learning journey to become familiar with the technology that was integral to the authentic learning programme. Anonymous teacher participant responses reflected that more professional time was required before being placed in an ILE to allow for planning of the content especially as it is often not their specialist area.

Professional collaboration

At Manuka College, three teachers share the responsibility for teaching and learning in the shared environments. The common thread amongst the focus group and student questionnaire participants was that having three teachers in the space is not advantageous unless they collaborate. Participants in the focus group agreed that if teachers collaborated it would make their learning easier. Participants from the focus group and student questionnaire have highlighted that in their experience of three

teachers working together is that they tend to focus on the half of the class not working and who are disruptive. This is seen to take time away from students who need help.

Some student participants perceived having multiple teachers in the one space to be an opportunity to receive additional help, as there are teachers available from three different Learning Areas. Conversely, while some students acknowledged that their teachers have different strengths, they rarely use it to their advantage. Another advantage perceived by students to having three teachers is that it is possible to divide the students into different groups. It becomes manageable for the teacher to give students individual attention.

The research indicated positive benefits for teachers when they collaborated in the ILE. An advantage of working in the learning space as a teacher participant noted is "learning from other teachers' planning." Some teachers became more tolerant of other teaching and student management styles when teaching in the same space. In addition, teaching with others "boosted self-confidence." Developing the confidence to work with the team to manage disruptive and low ability students in the one space for consistency of practice was perceived as a good professional development opportunity.

Teaching in an ILE environment with other teachers was professionally challenging for some participants. The findings show that some teacher participants were at odds with the different meanings of authentic learning held by members of the team, with some considering the management of staff relationships in the ILE to be more important.

Relationships

Strong student-teacher relationships have positive implications for students' social and academic achievement (Bishop, 2011). One of the student focus group participants (M2) who identifies as Māori, conveyed the importance of having secure relationships with teachers, as these may have considerable influence on learning. "If you like your teacher you're going to go to class, but if you don't like your teacher then you're not going to go or you're going to go but you're not going to listen." He went on to say that when teachers leave the school, students lose the connection they spent time developing with the teacher. Students have to "redo" the connection process with someone else, which may affect their desire to learn and behaviour. Student F2 explained the transience of

their teachers when suggesting that if the teachers "believed in something then they'll like the teaching but if they don't believe in it then they don't really want to stay and that's why we've gone through so many sets of teachers."

The quality of feedback to students affects the quality of relationships, and therefore the students' willingness or motivation to engage (in learning). A recurrent theme in the data was most students felt that constant feedback and monitoring are essential for their progress. Some students' impressions of teachers were that they are overwhelmed by the large number of students and do not have a connection with them: "we only get two minutes of teacher time as there are too many in the class" (Student questionnaire). A student participant (Student questionnaire) felt that they are "handled quickly." This in turn affects a teacher's ability to provide the quality personalised feedback needed by the students.

M3 (focus group) expressed his dissatisfaction that his teacher copied and pasted another student's feedback onto his Linc-ed[8] profile: "I've got proof on mine that actually says [55.22] and then I'm just like I'm not [55.22], I'm M3." F2 (focus group) argued that if the teachers had good relationships with the students they would value giving personalised constructive feedback to each student. The lack of personalised feedback has made F2 feel that the teachers do not care for the students.

An interesting point made by a student participant is that "most of the times I have to self-assess if I have done well or not." (Student questionnaire). Students are expected to drive their own learning, however many feel that the feedback they receive is limited. Some participants reported that teachers do in fact walk around and comment on their work. Whether this equates to quality feedback is, however, debateable. Teachers do not check if the learning is correct, as there are too many students in the class. Students feel insecure and as a result they "are often left uninformed about their learning and the future of their learning" (Student questionnaire).

[8] Web application for New Zealand schools to communicate learning

Table 4: The kind of teaching that happens in the learning space

Kind of teaching	Responses *(n = 71)*
Mostly standing in the front and teaching for 20 minutes or longer	7
Often standing in the front and teaching for 20 minutes or longer	7
Sometimes stands and talks, sometimes gets the students to work alone or in groups	29
Often gets the students to work alone or in groups, sometimes works with individuals and small groups	18
Mostly gets the students to work alone or in groups, usually works with individuals and small groups	10

Table 4 reflects the findings of the anonymous student questionnaire to the question: 'Thinking about most of your teachers, choose the kind of teaching that mostly happens in the learning spaces at Manuka College.' The results reflected in the table could explain the lack of quality feedback to students.

Table 4 provides evidence therefore that some teachers are finding it difficult to let go of the traditional teacher-centred approach to teaching. Twenty five percent of teachers often get students to work alone or in groups and sometimes work individually with students or with groups, and a minor percentage, 14% of teachers mostly get students to work alone or in groups and usually work in small groups or with individuals.

Making connections to prior learning experiences of students helps teachers to foster positive relationships with students and their learning. Student participants (focus group and questionnaire) felt however, that their prior learning was not recognised and as a result, learning tasks were 'repetitive' and 'time consuming.' This may result in students feeling disconnected and could limit meaningful student involvement in the learning process.

Most of the students from the focus group also expressed anxiety that they were not receiving grades for learning completed. "I want grades. I want reports. My parents keep asking me for a report and I'm like, I don't know" (F2 – Focus group). Manuka College has a no grades environment in the junior school. The teachers are responsible for

providing quality feedback to students in order for them to assess their progress throughout the year, but as already noted, the quality of the feedback is in question.

The evidence highlights that it is not only about the space in the ILE but the teaching practices that happen within the space that influence student perceptions about their learning. Establishing connections and building relationships with students promotes their desire to learn. Providing quality feedback is important to establish high expectations, guide a student's thinking and extend their prior knowledge.

Conclusion

Student voice from the questionnaire and focus group mainly represents a Māori demographic. The voice of Māori students is clear in the focus group. Upon analysing the survey data, however, there was insufficient evidence that the responses to the questions in the student questionnaire represented one ethnic group over the others.

The evidence further indicated that some student and teacher participants questioned the capacity of a few teachers' pedagogy in the ILE. This could relate to the finding that most teachers felt unprepared for teaching and learning in the large, open, flexible space. Teacher and student participants have acknowledged that the design and use of the classroom space nevertheless encouraged collaboration and flexibility.

Student participants perceived their teachers to be grappling with deprivatised practice, which is manifested in the challenges experienced. How teachers manage and maintain relationships with a large number of students in the space was another common challenge, which is evident in the teacher and student participant responses. Some student participants expressed concern for the introverted student in the open plan classroom where it is perceived that there is little opportunity for quiet reflection. In addition, some student participants want to be more academically challenged in the ILE.

The participants perceived the ubiquitous use of digital technology as both a barrier and opportunity for learning. In Chapter 5, meaning will be derived from the interpretation and discussion of the key findings with information gleaned from the literature (Creswell, 2014).

Chapter 5: Discussion of findings

Introduction

> Analysis is the act of giving meaning to data. (Corbin & Strauss 2008, p.64)

The purpose of this study is to increase research evidence on the influence of innovative learning environments (ILEs) on student achievement. The research focuses on classroom design, the teaching and learning and the barriers and opportunities for learning within the ILE from a student and teacher perspective. The influence of these aspects on student learning is explored.

The discussion section presents an opportunity to examine and give meaning to the key research findings in relation to the research questions and the literature reviewed. This discussion reflects how the findings of this research study differs from, reinforces and extends current knowledge regarding the influence of innovative learning environments on student learning. The teachers and students at Manuka College have a unique lived experience of teaching and learning in the case study ILE, which is evident in the responses from students in the focus group and the questionnaires (from both students and teachers). The perceptions of participant teachers and students concerning the influence of ILE on student learning are analysed according to the themes of design and classroom space, digital technologies, pedagogy and personalised learning. Intentionality is a lens through which the themes will be explored. The tentative manifestations of the phenomenon of interest, namely teaching and learning in the ILE from the perspective of students and teachers are recognised in the lived experiences of students and teachers, which are at the core of this study. As mentioned in Chapter Three the themes do tend to overlap.

Design and classroom space

Manuka College is designed to be an environment where students can develop independent learning skills, and this priority has driven the integration of flexibility and choice throughout the school. Flexible teaching spaces through moveable walls are visible throughout the school. The junior school students (Year 9 and Year 10) experience most of their learning as a cohort on the ground floor of each of the five

Whānau blocks. In this theme, student perceptions towards the use of furniture in the ILE, the geographical positioning of teachers and noise level and behaviours are analysed.

The use of furniture in the ILE

Student participants felt that the colour and furniture in the open plan flexible classroom lightened the mood and fostered creativity: "the bright modern furniture does support the learning atmosphere" (Student questionnaire). Participants are perhaps experiencing the space as 'organic' and 'alive' and not as an object (Merrifield, 2006). Physical artefacts, such as furniture, can elicit certain responses from their users. Thus the students react and behave in certain ways in relation to the furniture. The student participants represent the space (Lefebvre, 1991) as a place where they can relax and be creative.

Lefebvre's concept of representations of space (1991) is evident in the furnishings of the ILE. Representations of space refer to conceptualised spaces, which are constructed by assorted professionals such as designers and architects (Merrifield, 2006). Designers of ergonomic furniture are responding to the different anthropometric dimensions of the students. Research and development has gone into creating ergonomically appropriate furniture for learning spaces as students spend over 30% of their time at school (Oyewole, Haight & Freivalds, 2010). The designers of ergonomic furniture and architects want to make learning spaces seem more like 'home.' Oblinger, (2006), Organisation for Economic Co-Operation and Development [OECD], (2006) and Sullivan, (2012 as cited in Benade, 2017) concurred that the design of the furniture should ensure that students will feel 'at home' and 'at ease' in their learning space. Student participants expressed that they find the furniture comfortable. A few student participants were concerned that the furniture could become 'too comfortable' and in relation to that notion, some students are perceived to 'slack off' from their learning. Through the re-conceptualisation of space as socially produced, Lefebvre provides the tools for the subtle understanding of the social and material interplay in an active space (Merrifield, 2006).

Conversely, the design and furnishings of the classroom in an ILE was perceived by student participants to create a further barrier for learning as one participant noted that

it “gives a higher opportunity to hide the fact that you are not doing any work – the teacher cannot see you.” de Certeau (1984) referred to the mastery of places through sight: the division of space “makes possible a panoptic practice…objects can be observed and measured” (p. 36). In single cell classrooms, the teacher has a panoptic view and can see all the students, but not so in large flexible spaces. Students’ intentional use of the space is evident. The Ministry of Education has the strategy (the policy of creating ILEs as the new ‘standard’) but the students subvert by using the tactic of repurposing the space. They hide out in places within the space where they cannot easily be identified as doing no work.

Some student participants felt that the classroom design and furniture in the learning space encouraged ease of collaboration, sharing of knowledge and flexibility. In addition, the flexibility to work in the common area of the Whānau block facilitated learning for some participants. The student experiences perhaps corroborate the views of Moore and Lackney (1993), and are reinforced by Blackmore, et al. (2011) that flexible learning spaces can support the development of prosocial behaviours that indirectly support learning.

Noise levels and behaviours in the ILE

The study highlighted that the Year 9 and 10 classroom open spaces at Manuka College were not large enough for 60 students. Student and teacher voice expressed dissatisfaction with the high noise levels which were perceived as a further barrier to learning in the ILE. The geographical positioning of teachers in the room made it difficult to hear when instructions were given. Published research evidence suggests that some students may find noise distressing and will be challenged to concentrate in a noisy environment (Gifford, 2002; MoE, 2016a). A student participant (questionnaire) wrote with an underlying sense of frustration that “there is not much focus on our own personal learning because of the large class number and the noise.” Poor acoustic quality can have an adverse effect on student outcomes in that it could cause them to miss or misinterpret part of the teacher’s lesson, which may lead them to lose concentration. The use of flexible walls and sound absorbing acoustic materials that divide the room into smaller workspaces is an option; however, it may bear the disadvantage of crowding the room even more.

Student participants appear to be grappling with aspects of 'disruptive behaviour' and 'disrespect for teachers' in the shared space, which they viewed as a barrier to their learning. Blackmore et al. (2011) and Nair (2014) argued for the positive influence of design on behaviours and attitudes of students. Arguably, the area of space available together with the arrangement of the space and teaching strategies are important for classroom related behaviours. ILEs have positive effects on outcomes where teacher pedagogy aligns with the use of space – fewer behavioural problems would be anticipated (Gifford, 2002). The literature suggests that if students feel connected to a space and have a sense of agency over the space they are more likely to engage in behavioural change and ready to learn (Blackmore et al., 2011). "Being in a community that respects each other" is important for learning (student participant – questionnaire). The evidence supports Moore and Lackney's (1993) research that students prefer physical settings that are comfortable, with little noise or distracting behaviours.

Collaborative expertise in the ILE

The Ministry of Education (2016b) suggests that ILEs are tailor made for Māori and Pasifika students. "Spaces which support different teacher locations within the room increase discursive teaching practice, which is linked to higher Māori student achievement" (p. 8). The evidence gathered in this research study indicates, however, that this is not so. Māori students in the focus group felt that "one teacher runs the power point …. another stands in the middle…. the other teacher is by their computer." Student participants perceive their teachers to be uncomfortable in the space. If the geographical positioning of three teachers in an open plan classroom does not facilitate collaboration between the teachers, then according to the participants "it does not make their learning easier."

Woolner, McCarter, Wall and Higgins (2012, cited in Benade, 2017) found that pedagogical practices do not necessarily change in an altered space, which could be attributed to the entrenched practices that have developed in single cell environments (Benade, 2017). As a teacher participant revealed, "my experience had been in an individual classroom – my initial experience in the co-teaching environment with three teachers was to revert back to the skills and strategies that I knew." This captures the notion that it might be difficult for teachers to suddenly be in an environment that challenges their traditional way of thinking and teaching. To not be fully in control could

create a sense of fear for the teachers in the ILE. The findings revealed that three of the nine teacher participants had taught in a single cell classroom for 5-10 years. Six teacher participants were beginning teachers and learning how to cope in the ILE, which makes defaulting to traditional teaching practice a possibility.

On the other hand, traditional teaching may be what some student participants yearn for. Statements like, “I miss traditional teaching”; “I feel l learn the most when teachers go back to traditional teaching” and, “maybe a hybrid of traditional and modern learning needs to be created in the ILE,” indicate that student participants recognise the value of quality teaching and feel that they may not be receiving this in their ILE. These participants appear to prefer more explicit teaching and learning.

This theme has considered the space in which teaching and learning occurs and related this to the perceptions of the student participants in the study. The lived experiences of student participants in the ILE assisted in establishing the intentional relationship that the student participants have towards teachers, each other and the flexible classroom space.

Digital technologies

The urgency for students to be prepared for a rapidly changing world requires teachers to develop new pedagogies to meet the purpose of equipping students with 21st century skills and knowledge (Benade, 2016; OECD, 2013). In an ILE, the links to teaching incorporates various digital technologies and the teaching is transformed by it. Teachers are required to make fundamental mind shifts (Benade, 2016) as the traditional way of teaching is replaced by modern practices and technology. This theme captures teacher and student participants’ lived experiences by exploring their intentional relationships with the phenomenon of digital technology. Teacher attitudes and the relationship between device use and student learning are analysed in relation to the findings.

Teacher attitudes

“The teachers most of the time ask us to get chrome books and don't really teach us. They just give us the chrome books and get the chrome books to ‘teach’ us” (Student participant – student questionnaire). Some student participants had the perception that they are required to self-direct their learning from a website. These provocative

statements challenge teacher attitudes towards technology, which appear to be instrumental, unthinking and overstating the role of technology. Heidegger (1977, cited by Benade, 2017) cautioned that technology should not be thought of merely as an instrument or a tool, for to do so is to be mastered by the technology. The teachers at Manuka College are perceived by the student participants to have assumed the role of passive spectator in relation to technology and its role in teaching and learning. Meanwhile the student participants appear to want the teachers to challenge themselves to be full contributors to the learning process instead of leaving students to grapple on their own with integrating digital technology into their learning.

The findings indicated that students willed 'teachers to teach.' The use of digital technology in an ILE is not a replacement for teachers; rather it should be utilised as a gateway to personalising learning (OECD, 2013). Thus the form instrumentalist thinking takes amongst teachers at Manuka College is one that shows them to be reluctant to engage deeply and fully with technology. This may be due to their inability or unwillingness to grasp both the potential and the role digital technology can play, hence they acquire just enough knowledge to 'get by.' One way to 'get by' is to put their students on 'auto pilot,' but it is by this very action that they leave their students frustrated and wishing their teachers would be more active in the teaching process.

The findings of this research study at Manuka College further revealed that teachers assumed greater digital technology competencies on behalf of their students than is merited. In effect, the teachers have assumed their students are gifted users of technology, being members of a 'Net Generation.' The idea that there is a 'Net Generation' of competent expert younger users and an older generation of teachers for whom technology is unfamiliar might, however, not be true (Helsper & Eyon, 2010). Helsper and Eynon (2010) argued that self-efficacy and education are vital components in explaining digital competence. The assumption that students know intuitively what to do with the technology (which may be true) does not mean that they have the competence, for example, to sufficiently collaborate with and help others. To assume students 'naturally' have such competence is a critical error. At least one teacher participant did, however, recognise that "the skills necessary to navigate the internet and other digital technologies are simply not present for a lot of students." Students might be adept at using mobile phones, social networking sites and gaming devices,

however, teachers might be assuming too much if it is taken for granted that students are experts at using applications required by the school. In fact, prior to attending Manuka College, student participants in the focus group had not had access to one-on-one digital devices for all their classes. Teachers' assuming their students to already be competent digital users may partly explain why 31% of student participants use their digital devices for off task behaviours.

Relationship between device use and student learning

Some teacher participants felt that learning had become 'over-reliant on technology,' which could be a result of the move by the school to being a paperless environment. This opinion held by some teacher participants aligns with the dissatisfaction referred to above by the student participants, that most learning is achieved by the use of chrome books. Technology, when used correctly, should assist students to master concepts. It does not nullify thinking required to solve a problem. The OECD (2015) finding of the 2012 PISA results indicated that there were no significant improvements in student achievement for reading, mathematics or science for countries that invested heavily in ICT for education. This could be seen in this study in the context of computer use that appears to lack personalised learning opportunities for students at Manuka College.

In the Manuka College study, a small percentage (28%), of student participants (Student questionnaire) recognised the potential of using digital technology (eLearning) to actively develop their critical thinking skills with 45% using the technology to develop additional insight into other areas of learning. Research by Shiflet and Weilbacher (2015) discovered, however, that even though teachers believe in using digital technology to promote critical thinking, such beliefs do not always come to fruition in the classroom. One reason for this failure that surfaced in the study was that teachers may not be adequately prepared to use the technology: "I found that I was going to use Google Docs for the first time…that meant an accelerated learning journey to try and become familiar with the technology that was integral to the delivery of the programme" (Teacher participant). Studies highlighted in Benade (2017), indicate, however, that shifting teachers "from digital consumption to critical digital production is challenging" (p. 138). Competent student use of digital technology in ways that challenge their thinking, however, requires teachers to be competent users with the ability to exploit digital technology in the service of higher levels of learning.

It is evident that many teenagers are adept in inhabiting multiple realities, such as being simultaneously present in the classroom while also maintaining an interaction with their social group and virtual lives through digital technologies (Prensky, 2011). Student and teacher participants were, however, critical of this in their qualitative comments about students engaging in off-task, device-driven behaviours. This off task behaviour could be perceived as negatively affecting achievement. A student participant felt perplexed by the digital learning completed in class (questionnaire) remarking that "I could just do my learning at home. I don't see the need to come to school when I could learn more at home by myself." How teachers address students' presence in the classroom and use digital technologies to engage and promote deep learning (Richardson, 2003) rather than disengage students' warrants further research and exploration.

The analysis of teachers' intentional relationships with the phenomenon of digital technology reinforces the study by Benade (2017). He found that teachers are "in a confusing place, moving uncertainly between their known trusted and traditional approaches and approaches that place more responsibility on their students and rely more on the power of digital technology to convey learning experiences" (p. 160). Students' on the other hand want to feel challenged and expect their teachers to become more involved in the learning process when assigning learning using digital technology.

Pedagogy – perceptions of teaching and learning experiences in the ILE

Pedagogy means more than a reference to classroom strategies or techniques. It refers to what teachers and students perceive teaching and learning in the ILE to be. Pedagogy has an "axiological (values) component, as much as it has epistemological (pedagogical content knowledge) and ontological (teacher-student relationships) components" (Benade, 2017, p. 172). In this theme the intentional relationships of teachers with the phenomena of professional development, collaboration and integrated learning are analysed.

Professional learning and development (PLD)

Teacher participants have revealed that PLD for teachers before "being thrust" into an ILE should be a requirement for schools. PLD for teaching and learning in an ILE might

guarantee that teachers become more open to developing the skills and competencies, such as collaborative teaching, required for deprivatised teaching practices to meet the educational demands of 21st century learning. The Ministry of Education [MoE] (2017) has acknowledged that preparation of teachers for changes to their pedagogy is a national professional development priority. As the contexts of ILEs differ in schools, the PLD ought to be personalised to integrate organisational and individual development with teachers' professional learning needs (Bull & Gilbert, 2012).

Collaboration

The specific spatial designs of ILEs create possibilities for collaborative practice and teamwork (Lippman, 2015). Collaborative planning for learning, to meet the individual needs of students is a core practice of teaching and learning in an ILE. Teachers create the climate for learning in a teaching space. This practice, however, is not always according to the ideological plan. Benade (2016), noted that the "transition from one kind of space (physical single cell classroom) to another (ILE) requires an inner [mental] transition that makes the physical shift very difficult" (p.10). This was evident at Manuka College where student participants in the focus group reported that their teachers were grappling with working together and undermined a colleague to students in the class. Teachers in the team were "sick of this one person." In my personal reflection journal I noted that I was uncertain of this finding and recalled Vagle's suggestion of using Guattari's 'lines of flight' metaphor. I spent additional time reading and rereading the lived experiences of the students in the focus group. I was very surprised by the lack of professional regard that the teachers showed each other, especially in front of the students. The teachers in attempting to navigate the space are using the tactic (de Certeau, 1984) of undermining a colleague in the classroom, which perhaps demonstrates their resistance to the school strategy of developing an ILE and associated pedagogy at Manuka College. This resistance to the space, expressed in unprofessional terms, is picked up by the students, possibly unsettling them, a mood discerned at several places in their qualitative and focus group feedback.

Barth (2002) warned that the culture of the team becomes weak when teachers have a problem with their teaching partners. The solution may well lie in developing relations of trust as a prerequisite of collaborative work. Robinson, Hohepa and Lloyd (2009) saw trust as the 'glue' in building a culture of collaboration. Building trusting relationships

comprises openness, integrity, honesty, personal regard for others, competence and reliability (Hohepa & Lloyd, 2009). A teacher participant complaint that "there were so many different relationships within the teams" signals significant frustration. Despite this frustration, however, the teacher participants felt that they did have much to gain by working together. Perhaps Hattie's (2015) advice that the narrative about teaching and learning needs to shift from "fixing the teacher to collaborative expertise" (p.3) is apposite here.

Hattie (2015) (now famously) claimed "the greatest influence on student progression in learning is having highly expert, inspired and passionate teachers and school leaders working together to maximise the effect of their teaching on all students in their care" (p.2). Hattie's view resonated with the findings among teacher participants that collaboration in the ILE encouraged them to share ideas, thereby learning from the planning and experiences of others. Teacher participants further developed confidence in managing students when they collaborated with the team.

Curriculum integration

The concept of 21st century learning challenges schools to shift their focus from knowledge acquisition to developing students with skills such as key competencies, focussing on the development of lifelong learning and preparation for future employment (Bolstad & Gilbert; Dumont & Istance, 2010; 2012). "We need to look at the processes and not the content, this is the challenge to teachers" is the view of a teacher participant in the Manuka College study. These views challenge most secondary school teachers who have professional identities as subject specialists (e.g. teacher of History or English). Furthermore, the complexities of integrating knowledge and skills from various curriculum areas was seen as challenging by the teacher participants and the findings revealed that some teachers were not confident teaching different curriculum areas. This could explain why students received 'multiple stories' from teachers when they asked the same question, which arguably created stress and anxiety for students.

Benade's (2017) research indicated that although an integrated approach to curriculum is liberating for some teachers, others in his studies found the "break with disciplinary knowledge difficult to reconcile with their previous experience" (p. 83). This supports

the finding in the study, which infers that some teachers feel insufficiently equipped to lead integrated learning. This may also be evident in the concern expressed by a student participant who is grappling with seeing the links of curriculum integration "I don't feel that I am successful with my learning….I don't feel that I have learned anything. We haven't done maths this term and the whole year we did science once or twice." Bishop and Brinegar (2011) noted that students can initially resist curriculum integration and convey scepticism. McPhail (2015) cautioned against an integrated pedagogical approach, as teachers are required to have an advanced understanding of both foundational and threshold concepts of a discipline before any meaningful links are likely to be made.

In spite of the challenges of curriculum integration, one teacher participant felt that the challenge of integrated learning "has made me better – I have to prepare more specifically. The stress comes from the unknown, but the happiness comes from the reassurance that I am doing something worthwhile and productive." Student and teacher participants have therefore manifested evidence of the challenge and benefits of engaging with modern, innovative teaching and learning practice. Teacher participants recognised that professional development is essential to develop the skills required for the unique approach to learning at Manuka College, which would include integrating curriculum

Personalised Learning

In this theme, the tentative manifestations of the phenomenon of interest, personalisation, a key driver in an ILE, are analysed. It specifically identifies perceptions of authentic learning, student learning experiences, relationships and the development of feedback and assessment for learning perceived by teachers and students to influence learning in the ILE.

Perceptions of authentic learning

Some teachers perceived their colleagues to have a different understanding of the concept of authentic learning and this influenced the teaching and learning in the ILE case study. This finding is significant as authentic learning is the foundation of teaching and learning in the Manuka College case study. As an insider researcher, I wonder whether this finding is a result of teachers confusing vicarious learning and authentic

learning. Vicarious learning occurs when learning engages students solely in classroom settings with real world examples inferred (Revington, 2016) whereas authentic learning experiences are outcomes or products intended for community betterment or consumption (OECD, 2013; Revington, 2016).

According to Revington (2016) and Lombardi (2007), authentic learning is the synergy and process of engagement that defines the human experience – it adds real value in education. The evidence that some student participants appreciated the opportunities that the authentic learning programme offered such as developing lifelong skills and learning about the real world, supports this claim.

Student learning

The literature reviewed in the Manuka College study focusses on teacher collaboration with minimal emphasis placed on student collaboration. Collaboration is a desirable skill in the workplace (OECD, 2013) and teaching students to collaborate can better equip them, enhancing their prospects for employment once they leave school. Arguably then, collaboration is an important skill and ought to be included in learning. Some students may, however, lack the skills to work together and therefore face challenges with their learning. “We just do it” was in response to the question: Who trains you to work together? (Student participant - focus group).

Some student participant responses indicated concern that teachers do not recognise their prior academic learning. They felt that the learning did not challenge them intellectually and they spent periods completing time consuming repetitive work. Their distress is evident in this student participant response to the item, ‘the type of teaching I prefer the least is’: “when the teacher thinks I am the same as every other student.” The participants also noted that there was a lack of variation in tasks and that the relevance and expectations of the learning was inadequately explained to them. When learning is relevant and authentic, students will make personal connections with the learning, thereby reducing their constant claim of boredom as indicated in the teacher findings. Revington (2016) argued that relevance is the glue that allows genuine learning to stick.

In addition, student participants expected teachers to recognise their individual learning differences. One fundamental difference being that they would work at different paces and levels, which implied that they should not all be given the same task instructions by teachers. This finding resonates with the OECD (2010) design principle that teachers who are the core of the learning process should recognise individual differences, which include various learning styles and ability. It is arguably by incorporating various teaching methods and personalising learning that teachers can ensure all students may be able to experience success with their learning.

Student participants in the focus group have recognised the shift in how knowledge is viewed. M4 noted that they "build and make sense of knowledge" in the core disciplines of science, mathematics, English and social studies and "creative thinking is basically what we do …thinking outside the box." There was enthusiasm expressed by a student participant in how they learn in the ILE "We are given choices on how we want to learn, such as working in a group, pair or individually. We can choose the tasks we want to complete first" (Student questionnaire). Arguably, the choice of task and who you want to work with may not be as easy to transfer into the workplace.

Some student participants seemed confused about their learning in the ILE and aptly felt they could do the same learning in a single cell classroom. Research tells us that students do need to develop in – depth knowledge in some areas to encourage continual learning (Bolstad & Gilbert, 2012). They have to see a purpose in the pedagogy of the ILE to get a sense of progress, to feel challenged and use their initiative, which are important Knowledge Age concepts (2012).

Relationships

Russell Bishop's *Te Kotahitanga* research described a culturally responsive pedagogy as one in which teachers create a learning context, which is dependent upon the building of good relationships in order to improve student engagement (Bishop, 2011). The findings in the Manuka College study are consistent with Bishop's research, which emphasises that relationships are key drivers in lifting student achievement and improving engagement. A student participant felt happy about the use of space in the ILE: "the space brought the Whānau Year 10 cohort closer together than if we were in a single cell classroom" (Student questionnaire).

Student participants in the focus group indicated that when certain teachers resigned from the school they lost the connections already established and needed to reprocess a connection with someone else. Four of the six participants in the focus group were Māori and the findings support Bishop's contention that students' value having a relationship with their teachers as this encourages them to "attend and listen in class" (M2 focus group). An interesting finding that does not mirror the literature in the review of literature is that F2 in the group wanted to experience the teachers having a connection with the students as well as with the learning in the ILE. This student participant felt that the teachers lacked connection to the learning. The perceived result was that many teachers left the school, possibly as they did not believe in the pedagogy that underpins the ILE. The implicit message is that students want their teachers to remain constant, as they believe student-teacher relationships to be vital to their achievement.

Student participants in the focus group were fervent about their 'Imagine Create Innovate' (ICI)[9] passion classes. They felt that the learning was easier as they had a connection with the one teacher, again reinforcing the importance of relationships (Bishop, 2011) to these students and their learning success.

The type of teaching that student participants believe helps them to learn is highlighted by a participant response: "teachers teach concepts from a specific subject in small groups and we get given the work to complete on the topic" (Student questionnaire). Most students felt that they learned more within a small group environment opposed to whole class learning. This once more, reinforced the importance of connections (Bishop, 2011) that are established when working in small groups.

Feedback

The literature highlights the importance of quality feedback, as students should know what is expected from them and how they can improve their achievement and attainment (Black & William, 2001; Bolstad & Gilbert; 2012; Hattie; 2012; OECD, 2013). Student participants viewed their success with their learning in various ways from "when I completed tasks on time … complete the worksheet," to "when I look through my work

[9] Option classes where students experience the Arts, Languages, Technology and Sport through ICI programmes of learning.

it shows that I have become more developed in how I think things through." This evidence reflects that students view their learning success very differently which may be a result of the type and quality of feedback they received. This resonates with Hattie's (2012) view that while feedback is one of the most common features of successful teaching and learning, the enigma is that its "effects are among the most variable" (p.115).

Many student participants indicated that they were concerned with the lack of and the quality of the feedback received from teachers. The aim of feedback is to reduce the gap between where the student is and where the student is meant to be with the learning (Hattie, 2012). The findings reveal that teachers do walk around and comment on the students' work. This is one way of confirming that the task is correct or incorrect and assists in pointing to the direction that the learning should go. In addition, providing students with different cognitive processes and restructuring understanding models effective feedback (Hattie, 2012).

Feedback contains messages that teachers communicate to students about their potential for success (Hattie, 2012). It is interesting then to note that two participants from the focus group linked the lack of personalised feedback to the lack of connection that teachers have with them. They noted that when providing feedback some teachers did not personalise the feedback and copy pasted incorrect names on LINC-ED. In my personal reflection journal, I noted students were vociferous and upset by receiving this generic feedback.

Assessment

An innovative approach to teaching and learning requires assessment to be viewed differently. Manuka College has a no grade learning structure in the junior school. Teachers write two learning stories per term, which could have more than one learning focus. Dispositional knowledge, the essence of personalised learning, and student competence, related to a specific skill or outcome, is reported on.

Student participants in the focus group would prefer grades on their reports as this is an indication of their progress, which they could measure against other students. Students in the focus group compared their learning at Manuka College to their friends at other

schools: “All my friends are doing exams to prepare them for NCEA and they are doing so well and I’m like hey...” (F2). This would seem to suggest that students unprepared for a no grades learning environment may not understand the reporting process. Importantly, these participants also questioned whether they would be ready for the challenges of NCEA. Participants’ sense of fear of feeling unprepared for NCEA is captured by a participant who wrote: “I feel that I have not been learning enough strategies ….I understand that asTTle tests at this level don’t represent all my learning but I feel that it has left me unprepared for Year 11 NCEA” (Student questionnaire).

Yet Ings (2017) argues that students have become convinced that learning should be competitive, that a grade on the report obtained from sitting a test will signal that they are superior to their peers. It is argued that obsession with testing and assessment in schools is rewarding strategy rather than true learning (Bolstad & Gilbert, 2012; Hattie, 2015; Hood, 2015; Ings, 2017). Rewarding outcomes over the process of thinking leaves students unprepared for lifelong learning (Ings, 2017). Ings (2017) advocates that we need to go beyond formula, change the culture in schools by cutting back on comparative assessment that teaches some students that they are not as good as others. What is assessed, how it is assessed, and how we communicate the results sends a clear message to students (Bolstad & Gilbert, 2012) about what is considered to be worthwhile learning.

Conclusion

The preceding analysis aptly demonstrates Lefebvre’s theory of the relationship between conceived space (idealised, mental notions of the purpose of space), perceived space (symbolic representational space; the ‘culture’ of the space) and the lived space of teacher and student experiences (the actual lived experience of practices occurring in the space) (Lefevbre, 1991; Merrifield, 2006). These spaces coupled with the teaching and learning practices within the spaces have the potential to transform education and the educational experience (Benade, 2015). The findings and discussion manifest that students and teachers mostly appear to be struggling to navigate the shift from a traditional pedagogic arrangement to the 21st century learning arrangements of ILEs (Charteris, Smardon & Nelson, 2017). These struggles raise questions about the stress

and emotional energy required from both students and teachers to cope with the implemented shift in practice at Manuka College.

In Chapter 6, discussion will focus on the framework that I used to answer the research questions. Conclusions based on the four sub questions that pertain to the main question are formed and recommendations made. Thereafter, areas for further research and the limitations of this study will be highlighted.

Chapter Six: Conclusion

> Kua takoto te *Mānuka*
>
> The leaves of the mānuka tree have been laid down (The challenge of a new way of teaching and learning has been laid down – how the leaves are picked up is the greatest challenge)

The phenomenon of interest explored in the study was the perceptions of teaching and learning in the innovative learning environment at Manuka College from the perspective of participant teachers and students. I have sought and gained a deeper understanding of what it is like to learn at Manuka College, in a system that supports a vision of education requiring drastic changes to the way teachers work and think about their work. This in turn affects the way students perceive their learning. It is within this framework that the research question and sub questions were explored initially by collecting data from a student focus group and a teacher and student questionnaire and thereafter analysing the findings through a post structural phenomenological lens. The main question and sub questions are:

What is the influence of innovative learning environments on student learning in a secondary mainstream school context?

- What beliefs does a specified group of secondary mainstream students hold regarding the influence of classroom design on their ability to learn?
- What beliefs does this group hold regarding the influence of the teaching they experience in an innovative learning environment on their ability to learn?
- What do they perceive to be the barriers and opportunities that affect their capacity to learn in an innovative learning environment?
- What does a specified group of secondary teachers working in an innovative learning environment perceive to be the barriers and opportunities created by that environment on their ability to enhance their students' capacity to learn?

Five major conclusions from the study can now be presented. These conclusions, which overlap, contribute to answering the main question and sub questions. The evidence from the study has indicated that the space alone does not have a significant influence on student learning; the pedagogical and relational practices within the space are the

critical factors. Teachers are required to redefine their identities as they adjust to the learning environment and the change in pedagogy. They [the teachers] remain at the core of teaching and learning, and positive relationships between students and teachers influence learning outcomes. The evidence also indicates that teachers and students collectively feel that there is an over-reliance on technology for teaching and learning. Based on the conclusions from the study, recommendations are made at a school level, education institution level and Ministry level. Finally, the limitations of the study and areas for potential research are identified.

Conclusion 1: It is not just about the space

Lefebvre (1991) challenged the view of space as a container. Space, instead, is considered to be socially produced (1991). The design and use of space in the classroom was a tangible element (Blackmore, et al., 2011) viewed by teacher and student participants as both enabling and restricting learning. Intangible elements like pedagogy need to be considered (Blackmore et al., 2011; Moore & Lackney, 1993) in the ILE, aside from the building fabric.

At Manuka College the colour of the walls and furnishings in the classroom and the Whānau common area reflect the Whānau colours, designed for a sense of belonging. The colour and furnishings according to student participants played a role in their emotion and productivity and indirectly supported learning. The flexible use of furniture in the space encouraged collaborative work and relational possibilities.

On the other hand, both teacher and student participants perceived the large number of students in the space, high noise levels and distracting behaviours as adverse to student learning. In larger environments, such as the ILE spaces at Manuka College, it may be more difficult for teachers to identify noise-makers. Nevertheless, it is important that teachers distinguish between noise created by learning talk and off-task noise. Qualitative research by Moore and Lackney (1993) indicated that students prefer physical learning environments with less noise or distracting behaviours. The activity in the space – noise level and behaviours – also affects teachers' and students' emotions (Gifford 2002) which impacts teaching and learning.

The inability of teachers to properly understand how to work in the space was perceived by student participants as a hindrance to their progress. Students were also of the opinion that their teachers are unprepared for teaching and learning in the ILE. Student participants still expected teachers to teach. It appeared that student participants desired to know that their teachers were making an effort to engage them with the learning. What is apparent is that most of these student participants still need to develop the skill of learning how to learn on their own without passively receiving information.

The space in schools such as Manuka College has been strategically engineered by the Ministry of Education with the objective of ringing the changes in pedagogy, directed towards increasing student outcomes. Arguably, a linear relationship does not exist between space, pedagogy and student outcomes as space has agency (Blackmore, et. al., 2011). Simply putting teachers in the space will not automatically change their practice. A contextualised personalised professional development programme might be one way of engaging teachers with the use of technology and shifting pedagogy.

Conclusion 2: Teaching for the 21st century requires teachers to redefine their identities

For Heidegger intentionality is an ontological concept that describes the way in which humans meaningfully connect with phenomena in their world; it refers to a sense of personal being and a physical being in the world (Vagle, 2014). This case study has not investigated subjective intentions of teachers but the ways meanings “come to be” in relations (Vagle, 2014, p. 107). Equipping students with 21st century skills and dispositions requires that teachers are open to practice differently and they have the confidence to continually learn and relearn to improve student outcomes.

The voice of teacher participants reveals that there are significant frustrations with working within the ILE, which may influence student learning. These participants responded openly regarding the challenges that they face daily. Learning in the ILE is not particularly conducive to specialised curriculum teaching. Hence, a major challenge was developing the skill to manage an integrated curriculum and effectively deliver it to the students.

Most teacher participants in the study perceive that they have made the effort to shift their practice, and felt that they have much to gain from collaborating with others on their team. The informal professional development opportunity they gained from working in the shared space was valued. Collaboration implies a high trust model (Robinson, Hohepa & Lloyd, 2009) however, student participants have inferred that this is an area on which teachers need to focus as there is no point in having three teachers in the space if they cannot effectively collaborate with each other. The inability of teachers to effectively collaborate with each other in the presence of the students might convey negative messages that may affect behaviour and student outcomes.

Developing deprivatised teaching practices, maintaining relationships with team members, working outside their comfort zone and dealing with the challenges of digital technology have required teachers to redefine their identities while 'grappling' with the changes (Benade, 2017) associated with 21st century teaching and learning.

Conclusion 3: Teachers remain the key to successful learning

Student participants viewed teachers as the most important aspect of teaching and learning. The word, 'teachers' was mentioned 679 times by the student participants. Research by Hattie (2015) and the MoE (2017) concur that teachers are the most important feature for effective teaching and learning to occur. Student experiences in the ILE are influenced by the axiological, ontological and epistemological components of pedagogy (Benade, 2017) that are enacted by their teachers.

Manuka College's unique approach to curriculum includes a commitment to personalised learning, which requires teachers to create learning experiences from student interest. Student participant voice in the study reflects that students do want to feel academically challenged and that their teachers can correctly identify where they are at with the learning. It is evident that the integration of digital technology into teaching and learning did not meet student expectations, possibly reflected by the high levels of disengagement of students when using the digital devices. Teachers becoming more thoughtful and specific about the learning and the implications thereof may be what is required.

Conclusion 4: There is an overreliance on digital technology for teaching and learning in the ILE

Student experiences of teaching and learning in the case study ILE are nuanced and complex. Their lived experiences are in a unique context, which plays a role in shaping their individual realities. Students in the ILE are also required to redefine their role in the learning process. At Manuka College all students in the junior school have access to school digital devices. They are required to adjust to the integration of digital technology and new ways of teaching and learning in an open space.

Teacher and student participants jointly agreed that the overreliance on digital technology in the processes of teaching and learning strongly contributed to student disengagement. They also concurred that most students did not use the digital devices for intended learning purposes. Some student participants felt that this overreliance on technology was the core reason for the decline in literacy results. Teachers overstated the assumption that students knew what to with digital technology.

Conclusion 5: Positive teacher – student relationships influence learning

Māori student voice supported Bishop's (2011) argument that developing a positive relationship with students was by far the most valuable aspect available to teachers who want to foster a favourable learning environment. Students in this study expressed disapproval towards the high teacher turnover at Manuka College as they felt that it had an adverse effect on their academic success.

Student participants in the focus group perceived that the quality of the relationship that they have with their teacher motivates them to learn. They relate the quality of the relationship they have with their teacher to the quality of the feedback that is provided to improve their learning. Effective, quality, just-in-time feedback from teachers is essential for students to monitor their progress (Hattie, 2015). These participants however, felt strongly about teachers who simply provided them with generic feedback. They felt that these teachers did not have a connection or relationship with them because they regarded them "to be the same as other students."

Recommendations

For school leaders

Teacher voice and ownership is key to understanding the transformation of innovative ideas from conception to implementation (Yildirim & Kasapoglu, 2015). Yildirim & Kasapoglu (2015) suggest that "how teachers perceive the main goals of a reform is important because it greatly affects their motivation to make changes to their own professional practice" (p.566). Change reforms implemented from the bottom up rather than imposed from the top down are recommended as this may encourage teachers, as stakeholders, to make the pedagogical shifts that are required of them in an ILE.

The evidence in this study suggests that teacher collaboration in the ILE ought to be an important focus of PLD. The ubiquitous use of digital devices in the ILE also requires PLD that specifically involves digital learning for teachers to support innovative teaching and learning.

Students should understand how and why what they learn is assessed differently. The no grades system at Year 9 and Year 10 suggests that novel or non-traditional approaches to assessment must be clearly articulated to students, parents and caregivers to avoid confusion. Meaningful feedback is a way forward, and providing effective feedback avoids the traditional, intellectually stultifying, system of attaching a grade (Ings, 2017). School leaders should thus encourage teachers to discuss and model effective feedback and feedforward systems for their students. This is by no means an easy task and is time consuming for teachers, thus school leaders should allocate a time allowance to teachers to manage this task.

Teachers

The evidence from the study has indicated that the quiet student is overlooked in the ILE. It is recommended that teachers identify the different needs of students and seek to provide a range of acoustic spaces so that the quiet student can be accommodated.

Student participants in the study have questioned the capacity of some teachers to teach in the ILE, however, pedagogy at its best should be about what teachers and schools do that not only helps students to learn but actively strengthens their capacity to learn (Ministry of Education, 2010). It is evident from the study that many teachers

are not prepared for collaborative team teaching, which requires a different skill set than working solo in a single cell room. As students are required to work collaboratively in an ILE, it would be an expectation therefore that their teachers should be able to model high quality collaborative behaviours (Hattie, 2015). Student participants in the study do want to feel academically challenged. It is recommended that teachers in their 'collaborative teams' use their discipline expertise to integrate high level curriculum concepts into a personalised and authentic learning programme for students.

Teacher Education Institutions

The findings indicate that the teacher participants found it difficult to engage with non-traditional pedagogy and spaces. Teachers have complex roles and need to become expert orchestrators of learning settings in ILEs (OECD, 2013) and having the experience at university might set the scene. Collaboration, personalised pedagogy and the principles and practices of integrated curriculum could be modelled at university, which will change the nature of learning experiences for beginning teachers. These enhancements might, however, be challenging as many lecturers still favour or have no choice but to teach in single cell lecture theatres. University courses should tend away from siloed, specific disciplines in favour of thematic, integrated offerings.

Policy makers

As an insider researcher, I have often experienced the dismissive attitudes of many teachers regarding the move to an ILE environment. This may be grounded in the fact that research in New Zealand is emergent, rather than established. There is limited evidence that ILEs improve achievement for all students in the New Zealand context (which is not to say that ILEs do not support achievement and student learning). It is recommended that the Ministry of Education commits to providing effective PLD to support teachers with the policy shifts towards an ILE, which includes digital innovation in schools (Benade, 2017), but also that it makes a range of qualitative and quantitative research available to teachers.

Areas for further research

There is no evidence from this study to suggest that Māori students, who are familiar with the open plan communal learning spaces of the marae are achieving or have adapted to the space better (or worse) than other ethnicities in the study. It is

recommended that further research is undertaken to explore whether Māori aspirations are being met in open plan innovative environments.

The evidence in this study has indicated that teachers and students perceive that the ubiquitous use of digital technology increases disengagement. Teachers and students should be empowered as curriculum designers who are capable of using digital technologies to create a learning experience that promotes deeper thinking. Further research is required to determine the efficacy of the use digital technologies in the classroom to engage and promote deep thinking.

This study has revealed that there are barriers to learning and opportunities for learning in an ILE. A natural progression of this research could be to explore how schools prepare for and transition into new learning spaces in ways that encourage exemplary innovative pedagogical practices.

Limitations of the research

Although an effort was made to capture a snapshot of teacher perceptions of teaching and learning in the case study, the scope of this research did not allow for more in-depth discussion with teachers, such as interviews or focus groups. Teacher perceptions were gathered through a questionnaire, so further probing of the underlying purposes and meanings associated with their questionnaire responses in interviews or focus groups may have revealed richer data.

This interpretivist research provides an analysis of a case, which is teaching and learning in an ILE at Manuka College. While it does not provide a universal representation of the perceptions and experiences of all teachers and students in an ILE, the findings and recommendations related to the context of Manuka College could, however, be applied to other schools with a similar context.

Final word

In answering the research question, this study has deeply informed my way of knowing and understanding with respect to teaching and learning in an ILE. Significant implications for my own practice have resulted from this study.

Deleuze and Guattari's notion of lines of flight (Vagle, 2014), which illustrate how things connect rather than what things are, is evident in this ILE case study. There is a connection between teaching, learning and the effective use of space. This study has disrupted the binaried approach associated with ILEs as either about pedagogy or the physical arrangements of space (Charteris, Smardon & Nelson, 2017). The study has presented the perceptions of teachers and students as they work and learn in the ILE. Teachers and students need to remain open and flexible to follow lines of flight towards something unknown or new, which some may view as being radical although the change taking place is far from unique. The lines of flight aim to flee the tight boundaries of any theoretical framework and both teachers and students find themselves in constant tension as the flights proceed. This ILE case study embraces the pedagogy of creativity and innovation rather than a given curriculum. Learning implies an increase in knowledge through a newly created concept; new ways of preparing students with the dispositions and competencies required to deal with the complex problems that exist today. The ILE becomes so much more than the space in which learning takes place. Charteris and Smardon (2016) refer to ILEs as "more than open plan classrooms, they are the perfect storm of a range of 21st century elements" (p.8).

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Appendix A: Student questionnaire

Student survey

The aim of the survey is to find out how innovative learning environments (use of big spaces and digital technologies) influences your learning

*Required

1. **What is your year level?** *
   Mark only one oval.
   - ◯ Year 9
   - ◯ Year 10

2. **What is your gender?** *
   Mark only one oval.
   - ◯ Male
   - ◯ Female

3. **What ethnic group do you identify with? Please select one** *
   Mark only one oval.
   - ◯ New Zealand European
   - ◯ Maori
   - ◯ Samoan
   - ◯ Tongan
   - ◯ Niuean
   - ◯ Cook Island Māori
   - ◯ Asian (Please specify in the question below)
   - ◯ Other: _____

4. **If you selected other please enter the ethnicity you most identify with** *
   _____

5. **Thinking of your primary school, indicate the kind of learning environment you experienced. Choose 1 option** *
   Mark only one oval.
   - ◯ Classroom like a box, around 30 students, one teacher, similar desks and chairs in rows
   - ◯ Classroom like a box, around 30 students, one teacher, similar desks and chairs in groups
   - ◯ Classroom like a box, around 30 students, one teacher, modern furniture in groups
   - ◯ Classroom open plan, few walls, maybe 60 students, 3 or 4 teachers, modern furniture in groups

6. **Thinking of your intermediate school, indicate the kind of learning environment you experienced. Choose 1 option** *
Mark only one oval.

- ◯ Classroom like a box, around 30 students, one teacher, similar desks and chairs in rows
- ◯ Classroom like a box, around 30 students, one teacher, similar desks and chairs in groups
- ◯ Classroom like a box, around 30 students, one teacher, modern furniture in groups
- ◯ Classroom like a shopping mall maybe 60 students, 3 or 4 teachers, modern furniture in groups

7. **What are your memories of how you were prepared for learning in new modern learning spaces (either at your past schools or here at AC)?** *

8. **Thinking of the learning environment here at AC. How does the set-up of the learning environment help you to learn?** *

9. **Thinking of the learning environment here at AC. How does the set-up of the learning environment prevent you from learning?** *

10. **Thinking about your learning in general. How do you know that you are successful with your learning?** *

11. **What do you most like about this learning space at AC?** *

12. **What do you least like about learning in this space at AC?** *

13. **Thinking about most of your teachers, choose the kind of teaching that mostly happens in the learning spaces at AC** *
Mark only one oval.

- Mostly standing in the front and teaching for 20 minutes or longer
- Often standing in the front and teaching for 20 minutes or longer
- Sometimes stands and talks, sometimes gets the students to work alone or in groups
- Often gets the students to work alone or in groups, sometimes works with individuals and small groups
- Mostly gets the students to work alone and usually works in small groups or with indivduals

14. **What is the kind of teaching that happens in your learning space that you like the most?** *

15. **What is the kind of teaching that happens in your learning space that you like the least?** *

16. **Thinking of the teaching at AC, explain what helps you to learn** *

17. **Thinking of the teaching at AC, explain what makes it difficult for you to learn** *

18. **Using a computer (chrome book) as a tool helps me to.... (you may tick more than one box)** *
Tick all that apply.

- [ ] be more responsible for my learning
- [ ] develop critical/deep thinking skills
- [ ] develop my digital technologies skills by using other tools
- [ ] develop more insight into topics through self study (digging deeper into topics)
- [ ] receive a lot of feedback on my learning from my teachers
- [ ] complete a minimal number of learning tasks

19. **Here you can make any comment about the learning space and the teaching and learning that you have not yet covered. Please keep your comments well mannered and do not mention names.**

Appendix B: Teacher questionnaire

Teacher survey

The influence of innovative learning environments (ILE's) on student learning. This survey aims to find out what secondary teachers working in an ILE perceive to be the barriers and opportunities created by this environment on their students' ability to learn.
The completion of the survey indicates your consent to participate in the research study.

*Required

1. **How long have you worked in a collaborative, shared space, team teaching multiple students? Please select one:** *
   Mark only one oval.
   - ◯ 0-1 year
   - ◯ 2-3 years
   - ◯ more than 3 years

2. **How long before first working in a shared space at Alfriston College, did you work alone, in a single cell classroom?** *
   Mark only one oval.
   - ◯ 0-1 year
   - ◯ 2-3 years
   - ◯ 4-5 years
   - ◯ 6-10 years
   - ◯ more than 10 years

3. **How prepared were you to teach in the new shared, flexible learning environment?** *
   Mark only one oval.
   - ◯ Very well prepared
   - ◯ Quite well prepared
   - ◯ Partially prepared
   - ◯ Not very well prepared
   - ◯ Totally unprepared

4. **Explain your response to the question above** *

5. **Thinking now of your level of confidence working in an ILE. You are: (select one)** *
Mark only one oval.

- ◯ Relaxed, happy, confident
- ◯ A little stressed, generally happy, and generally know what I am doing
- ◯ Struggling a bit, but managing
- ◯ Not very confident, and quite stressed
- ◯ Do not know what I am doing, am in over my head and quite stressed

6. **How has teaching in an ILE challenged you professionally?** *

7. **What changes did you need to make to your teaching practice in order to successfully teach in an ILE?** *

8. **What do you enjoy the most about working in this space at AC?** *

9. **What do you enjoy the least about working in this space at AC?** *

10. **Thinking about student learning in the ILE at AC. What is is about the environment that improves the amount of learning of your students?** *

11. **Thinking about student learning in the ILE at AC. What is is about the environment that improves the learning skills of your students?** *

12. **Thinking about student learning at AC. What are your thoughts about the relationship between the use of digital technologies (chrome books) and student learning?** *

13. **Thinking about student learning in the ILE at AC. What is it about the environment that makes learning difficult for your students?** *

14. **Here you can make any comment about the learning space and the quality of student learning that you have not mentioned above.**

Appendix C: Focus group indicative questions

- Do you understand why we are here today?
- How is your learning different from what you did in intermediate school?
- Did you have big spaces with more than one teacher?
- Does using digital technology (chrome books) help you to learn better?
- How long were your blocks of time in intermediate school compared to Manuka College?
- If we were to break down your 100 minutes into 4 x 25min blocks how would you use this time?
- What does the geography of the learning spaces look like?
- What does it look like and feel like for you having three teachers in the classroom? Are there advantages to having three teachers in the room at the same time?
- If you had the choice, would you rather learn in a little space (single cell classroom) or big space?
- What are some of the barriers (challenges) that you experience with your learning in this learning environment/large space?
- What are some of the learning opportunities that learning in this space provides you?

Appendix D: AUTEC approval

AUTEC Secretariat

Auckland University of Technology
D-88, WU406 Level 4 WU Building City Campus
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

7 November 2016

Leon Benade
Faculty of Culture and Society

Dear Leon

Re Ethics Application: **16/371 The influence of innovative learning environments on student learning in a mainstream secondary school context**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 7 November 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/researchethics. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 7 November 2019;
- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/researchethics. This report is to be submitted either when the approval expires on 7 November 2019 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,

Kate O'Connor
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: m.patrix@alfristoncollege.school.nz

Appendix E: Participant information sheets

Participant Information Sheet (students)

Date Information Sheet Produced: 15th September 2016

Project Title:

The influence of innovative learning environments on student learning in a mainstream secondary school context

An Invitation

My name is Melanie Patrix and I would like to invite you to participate in my research study. I am completing a Master of Educational Leadership thesis at the Auckland University of Technology. This investigation is asking: What is the influence of innovative learning environments on your learning?

What is the purpose of this research?

The way people like teachers, university experts and big companies think about knowledge is changing. Part of this change is finding different ways to teach and learn. One of these ways is to use computers and digital devices and to work in big spaces (innovative learning environments). The purpose of my research is to find out more about how an innovative learning environment influences your learning.

How was I identified and why am I being invited to participate in this research?

You have been invited to participate, as you have been a part of the exciting journey in the junior school at ... College. I want to find out more about how an innovative learning environment (the use of large spaces and digital technologies) influences your learning.

How do I agree to participate in this research?

If you agree to participate in my research study then you can collect the forms below from the teachers who are informing you about the research:

1. a ***consent form*** for your parents to sign. This means that your parents will agree to you participating in the study. This must be completed if you want to participate in the research.
2. an ***assent form*** for you to complete. This means that you agree to participate.

It is your choice to participate in this research and you can decide not to participate. There is no penalty for not participating. If you do participate, but later decide you want to stop, then you can withdraw at any time. If you do withdraw, then the information you have shared can be removed if you want. However, once the report is written, your information cannot be taken out. It is also important for you to know that your name will never be used.

What will happen in this research?

1. You will complete an online survey of tick box questions and some questions asking you to add detail. This is a quick way of getting information from many people at once. The link to the survey will be available on posters and will be placed on the notice board in the different student buildings with a tear-off stub that has the link to the survey.
2. The survey will find out what you think about the teaching and learning in your learning environment, to understand what works and does not work, and what you like and do not like.
3. In addition, you can volunteer to be a part of a focus group. This is like a meeting where about 12 students from Year 9 and 10 will talk about your learning and learning environment. My university teacher will take this meeting. In this meeting, he will use a digital voice recorder to record what is said, but he will turn it off if you want to say something you do not want recorded. You also do not need to answer a question if you do not wish to do so. You can only be part of the focus group once all the consent forms are returned.
4. The information that I collect from you will be used in my thesis (a long written report) which will help me get a Master's degree. Me and my university teacher might also use this information to talk about at meetings or write about in short articles. But remember, your name will never be used.
5. The forms you return to school, and the information you give us, is all stored safely at the Auckland University of Technology (AUT). After six years, all of this is destroyed, because we will not need it anymore.

What are the discomforts and risks?

1. You might feel a bit uncomfortable at the start of the focus group, as you do not know my university teacher. You can request that one of your parent's or another adult that you trust be present at the focus group. We call this a support person.

What are the benefits?

Your participation and contribution is important and will be very helpful. Your information will allow me to write a report that our school and other schools will find useful because it will suggest how we can improve your learning in an innovative learning environment. The report also helps me to get my Master's degree at AUT.

How will my privacy be protected?

No real names will be used (not even the school's name) when I write and speak about the research. The names I use will not be yours. Because the focus group is a meeting, the members will be asked not to discuss what is said, after the meeting.

What are the costs of participating in this research?

The survey will take no more than 30 minutes. If you volunteer, and are asked to join the focus group, that will take about one hour. If you come to the focus group, there will be some fruit, biscuits and juice.

What opportunity do I have to consider this invitation?

Please decide in one week and return the Consent and Assent Form to the box at the school front office.

Will I receive feedback on the results of this research?

Yes, I will provide a summary to those families who sign the Consent Forms.

What do I do if I have concerns about this research?

If you have concerns about this project, please contact the Project Supervisor, Dr Leon Benade (lbenade@aut.ac.nz). Tel: 921 – 9999 ext 7931.

If you have concerns about the conduct of the research (the way it is carried out) please contact the Executive Secretary of AUTEC, Kate O'Connor, ethics@aut.ac.nz Tel 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Melanie Patrix (pty0172@autuni.ac.nz). Tel: 021 082 00791

Approved by the Auckland University of Technology Ethics Committee on *7th November 2016*, AUTEC Reference number 16/371

Participant Information Sheet (Teachers)

Date Information Sheet Produced: 22 October 2016

Project Title:

The influence of innovative learning environments on student learning in a mainstream secondary school context

An Invitation

Mr ……., our Principal at ……. College, has given permission for me to invite you to participate in a research project I am conducting as part of the requirements for my Master of Educational Leadership degree at AUT under the supervision of Dr Leon Benade.

What is the purpose of this research?

The aim of the study is to investigate how an innovative learning environment (ILE) influences teaching and learning. I want to find out what secondary teachers working in an ILE perceive to be the barriers and opportunities created by this environment on their students' ability to enhance their capacity to learn.

How was I identified and why am I being invited to participate in this research?

You have been invited to participate as you have been a part of the exciting transition of the junior school at …. College and I want to investigate how the innovative learning environment has influenced the way you teach and how students learn.

How do I agree to participate in this research?

If you agree to participate in my research study then please complete the teacher survey.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

1. You will complete an anonymous 20 minute online survey which will include open-ended responses (for you to add detail).
2. The completion of the survey will indicate your consent to participate in the research study.
3. The survey will focus on your perceptions of teaching and learning in your learning environment
4. The information that I collect for my research will be used in my thesis and may be used for publications and presentations. Data will be stored separately and securely at the Auckland University of Technology. It will be stored for a period of six years and then destroyed in an appropriate way.

What are the discomforts and risks?

There are no anticipated discomforts or risks to you by participating in this research study.

What are the benefits?

Your participation and contribution is valued and significant. The views that you express will help me to produce a report that our school and other schools will find useful as it will have recommendations on how to improve your teaching and learning experiences in an innovative learning environment. The research also forms part of my Master's qualification at AUT.

How will my privacy be protected?

The survey will be anonymous, using Survey Monkey or Google forms, and no names will be recorded.

What are the costs of participating in this research?

There are no costs for participating in the research study.

What opportunity do I have to consider this invitation?

You are requested to make a decision within one week of receiving this information sheet.

Will I receive feedback on the results of this research?

Yes, you can request a summary when you complete the consent form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Leon Benade (lbenade@aut.ac.nz). Tel: 921 – 9999 ext 7931 or 027 433 8330

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, *ethics@aut.ac.nz* , 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Melanie Patrix (pty0172@autuni.ac.nz). Tel: 021 082 00791

Approved by the Auckland University of Technology Ethics Committee on *7th November 2016*, AUTEC Reference number 16/371.

Parent information sheet

Date information sheet produced: 15th September 2016

Project title:

The influence of innovative learning environments on student learning in a mainstream secondary school context

Dear Parent/Caregiver

My name is Melanie Patrix and your school has agreed to participate in my research project. The research project is a part of my Master in Educational Leadership qualification, and is supervised by Dr Leon Benade, a senior lecturer in the School of Education at AUT University. I want to have a better understanding of the influence of innovative learning environments on student learning.

You are receiving this information as your child has expressed an interest in participating in a focus group (a meeting of about 12 Year 9 and 10 students). There is also an online survey for the students to complete. The survey will take no more than 30 minutes to complete and the focus group will take about one hour. At the focus group session, there will be some fresh fruit, biscuits and juice provided for your child.

Information from this research (including any information your child gives) will be used in my thesis and may be also used in academic journals and conferences. The focus group, which will be run by Dr Benade, will be recorded using a digital voice recorder. There will also be a teacher from the school present.

A contracted transcriber will type up the recording. This person has signed a confidentiality agreement. No actual names will be mentioned when I speak or write about the research. Pseudonyms (aliases) will be used. The school will be provided a research report at the conclusion of my research, and I will mail you a summary this report.

Your child's participation in this research is completely voluntary. If you do not wish for your child to be involved in the focus group, then please feel free to say no. Even if you agree to your child's participation, but want to withdraw this consent at a later stage, then you are free to do so. There is no disadvantage to your child by not participating in the research.

I have included a Parent/Guardian consent form, and a Child Assent Form. Once you have read and discussed our request with your child, please complete both forms and return them to school within a week. Please note that your child has the right to withhold his/her assent irrespective of your parental or legal guardian consent.

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Leon Benade (lbenade@aut.ac,nz). Tel: 921 – 9999 ext 7931.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, *ethics@aut.ac.nz* , 921 9999 ext 6038.

***Approved by the Auckland University of Technology Ethics Committee on 7th November 2016 AUTEC Reference number* 16/371**

Appendix F: Consent form

Parent/Guardian Consent Form

AUT
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

Project title: ***The influence of innovative learning environments on student learning in a mainstream secondary school context***

Project Supervisor: ***Leon Benade***

Researcher: ***Melanie Patrix***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 15th September 2016.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw my child/children and/or myself from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw my child/children and/or myself from the study then I will be offered the choice between having any data that is identifiable as belonging to my child/children and/or myself removed or allowing it to continue to be used. However, once the findings have been produced, removal of our data may not be possible.
- ○ I agree to my child/children taking part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Child/children's name/s : .....

.....

Parent/Guardian's signature: .....

Parent/Guardian's name: .....

Parent/Guardian's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 7th November 2016 AUTEC Reference number 16/371

Note: The Participant should retain a copy of this form.

Appendix G: Assent form

Student Assent Form

Project title: ***The influence of innovative learning environments on student learning in a mainstream secondary school context***

Project Supervisor: ***Leon Benade***

Researcher: ***Melanie Patrix***

- ○ I have read and understood the sheet telling me what will happen in this study and why it is important.
- ○ I have been able to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ○ I understand that I can stop being part of this study whenever I want and that it is perfectly ok for me to do this.
- ○ If I stop being part of the study, I understand that then I can choose to allow the researcher to keep using any information I have provided, or I can ask to have that information removed. I also understand that sometimes, if the results of the research have been written, some of my information may not be able to be removed.
- ○ I agree to take part in this research.
- ○ I want to receive a summary of the findings of the research.

Participant's signature: .....

Participant's name: .....

Participant Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 7th November 2016 AUTEC Reference number 16/371

Note: The Participant should retain a copy of this form.

Appendix H: Transcriber confidentiality

Confidentiality Agreement

For someone transcribing data, e.g. audio-tapes of interviews.

Project title: ***The influence of innovative learning environments on student learning in a mainstream secondary school context***

Project Supervisor: ***Leon Benade***

Researcher: ***Melanie Patrix***

- ○ I understand that all the material I will be asked to transcribe is confidential.
- ○ I understand that the contents of the tapes or recordings can only be discussed with the researchers.
- ○ I will not keep any copies of the transcripts nor allow third parties access to them.

Transcriber's signature: .....

Transcriber's name: .....

Transcriber's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Project Supervisor's Contact Details (if appropriate):

.....

.....

.....

.....

Approved by the Auckland University of Technology Ethics Committee on 7th November 2016 AUTEC Reference number 16/371

Note: The Transcriber should retain a copy of this form.