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Pedagogy and Partnerships in Innovative Learning Environments

Case Studies from New Zealand Contexts

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Background

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Introduction

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Abstract This chapter outlines background information about the policy context in Aotearoa New Zealand as it relates to ILEs. It also introduces all chapters and explains how chapters are arranged and organised.

Keywords Background · Partnerships · Pedagogy · ILE

Introduction

Aotearoa New Zealand's current policy regarding school buildings for state schools, is consistent with international trends and changing priorities in political, social, economic and technological developments influencing conceptions of schooling and what it means to learn. The OECD (2013, 2018) for example, has consistently tracked such changes and their potential effects on education. The growing ubiquity of mobile devices and wireless connections has prompted researchers to examine their impact on educational provision and how learners behave when using them. Regular OECD reports resulting from such research, influence how governments plan for educational change, often beginning with curriculum documents and how they express Key Competencies (OECD, 2019). As Brett Bligh argues in Chap. 17 of this book, 'it is explicitly acknowledged, within OECD reports, that the "vision" of the ILE is something that stakeholders are supposed to engage with, own and further develop as part of the process of change (OECD, 2013)'.

In the light of international evidence syntheses, various countries have used that evidence to foster different types of school buildings that have certain characteristics in common: the spaces are open, contain moveable furniture and shared zones and are usually provided with the most up-to-date broadband access. A common label for

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such spaces has evolved from 'modern learning environments' (MLEs) to 'innovative learning environments' (ILEs). This underpins an agenda of integrating physical and digital resources to support diverse learning needs through more personalised, collaborative and engaging learning experiences across cognitive, social and affective domains. The most common intention is that such developments will privilege lifelong learning and metacognitive capabilities.

Within Aotearoa New Zealand, a similar move had been mandated via the Ministry of Education's property strategy under previous governments. The espoused aim was to develop flexible learning spaces, regarded as being more conducive to the evolving educational practices. Recently, with a new government, these have evolved again. There is an important distinction in terminology made in the Ministry of Education documentation, with a clear differentiation between the concepts of flexible learning spaces (FLS) and innovative learning environments (ILE). A flexible learning space comprises the physical environment which includes design elements such as large common spaces with moveable partitions, smaller breakout spaces and a wide variety of furniture and soft furnishings. The term innovative learning environment encompasses not only the physical species, but also the social and pedagogical spaces in which learning occurs. Mahat et al. (2018) assert that, contrary to public perceptions, an innovative learning environment is not synonymous with open plan, thus emphasising that it is more than just the physical environment which is intended to be innovative. The most recent strategy from Aotearoa New Zealand's Ministry of Education states that 'this Government has a target of all state schools having quality learning environments by 2030' See National School Redevelopment Programme for more details).

Aotearoa New Zealand has an open approach to its national curriculum. It encourages schools to interpret the curriculum in response to local conditions, and this view is demonstrated overtly. For example, the English language version of the *New Zealand Curriculum's* (NZC) vision, is for learners to be 'confident, connected, actively involved, life-long learners' (Ministry of Education, 2007, p. 7), and it also declares that 'The curriculum offers all students a broad education that makes links within and across learning areas, provides for coherent transitions, and opens up pathways to further learning' (Ministry of Education, 2007, p. 9). Together, these quotes indicate a long-term strategic policy direction for education. This long-term policy direction links closely to what constitutes quality learning spaces. The attention on the quality, size and possibilities of learning spaces has seldom occupied educators' thinking before. It may be that the regulations around the size, structure and purposes of new and refurbished classrooms have had this effect. The ability of schools to make local decisions about how curriculum is enacted, coupled with the expectations of a detailed set of regulations about new learning spaces, makes for diverse interpretations of what schools can look like.

In the past, schools were built according to the single model available at the time. Now, school buildings in Aotearoa New Zealand can look like apartment blocks, warehouses or airport terminals from the outside, as they reflect and refer to their local context.

Given the complexities and tensions that teachers now face straddling traditional and future-focused expectations, misunderstandings about what it means to teach in open, flexible spaces have arisen. However, in taking advantage of new types of learning spaces, the fundamentals of reading, writing, thinking, creating and problem-solving remain important to learning. However, they can get lost when the focus is on the nature of the spaces themselves. The greatest change rests with not only *how* learning fundamentals are facilitated, but also *what* types of resources will help learners make meaning as teachers get used to differently organised learning spaces.

Without support that helps teachers rethink how they might take advantage of differently shaped learning spaces and adapt their practices; it is therefore unsurprising that teachers insert existing pedagogical practices into new spaces. When there has been little support to rethink pedagogical design, strategies and purposes for new types of learning spaces (because these changes are so new), reverting to known practice is a typical response. Emerging research about practices in such spaces suggests that more open pedagogical spaces might result in responses on the continuum of teacher anxiety about how to cope, through to igniting learning passions.

How school leaders and teachers understand open learning spaces and their teaching and learning affordances and purposes, may now depend on whether the school is brand new, or undergoing refurbishment. When schools transition from single cell classroom spaces to more open flexible spaces, the pedagogical load on teachers can be enormous as they work out how to take advantage of the new spaces, and learn how to work in teams rather than alone. Some teachers can feel increased anxiety in unfamiliar, open and exposed surroundings. Their sense of being watched and judged by others may be felt keenly. They may feel destabilised and experience pedagogical discomfort.

In open and larger spaces, teachers are learning to navigate establishing and fostering partnerships with other staff so that they can teach together and manage larger numbers (e.g. 60–120 students) at once. When very experienced teachers—especially so for those in the secondary sector—are from different disciplines, such collaboration is relatively uncommon. For many teachers facing such circumstances, it may be the first time they have had to think about their own subject discipline in tandem with another: they are in unfamiliar territory. To collaborate with teachers of other subjects and design new kinds of learning, the skills of negotiation, compromise, teamwork and creativity come to the fore. These skills test teachers' understanding of who a teacher is, what their subject is and what it means to teach. At the same time, all of these teachers undertake their pedagogical practices with much more visible scrutiny than in the past. This visibility not only changes the nature of the possibilities available to teachers and how they organise learning, but also challenges teachers to review their tried-and-true pedagogical moves It is therefore possible that teachers become hyper-aware of a potentially constant and unfamiliar, peer gaze.

Students, as well as their wider school community, may also have misgivings about the changes new spaces might bring when a school undergoes refurbishments, or is replaced with a new one (such as occurred after the Christchurch earthquakes). Teachers and students may end up straddling both open, large learning spaces and

single cell classrooms when a school has stages of refurbishment. And schools experiencing considerable change to the nature of classroom spaces and how the curriculum works, find that some students cannot settle and end up changing schools. At least now there are different types of schools and different types of schooling ethos, students and parents have different types of schools to choose from. Public media at times has reported on those who question the viability of different learning spaces, emphasising perceived deficiencies, even when they may not fully comprehend potential or actual advantages (for student perspectives see Wright, 2018). These reactions may mask a yearning for the 'tried and true'.

This book therefore examines contexts and possibilities in Aotearoa New Zealand education contexts arising from the international trend for open, flexible, innovative learning environments. Chapters highlight a diversity of responses to the regulatory framework regarding learning spaces, through the eyes of those deeply involved: teachers, school leaders and students, as well as initial teacher education (ITE) providers. By focusing on developments in this one country, the chapters offer insights into a range of aspects that teachers, school leaders and other educators and researchers may find valuable and applicable to their own circumstances as teachers and students learn and adapt to new learning spaces.

We also offer insights into how different teaching and learning partnerships may be conceived and flourish. From an historical look at the nature of learning spaces, views of transition from one kind of learning space to another, teacher disposition and change and how teachers *make do* with what they have available to them, the book offers numerous perspectives. Chapters offer examples of how teaching in new spaces can be an exciting challenge for teachers and students trying new ideas and practices as well as rethinking the purposes of learning and what the school values. On the other hand, some educators, leaders, students and local communities may view new types of learning spaces as trampling on the tried, true and trusted and staunchly uphold very different values, often cemented in twentieth century or earlier contexts.

The Book's Focus

This first chapter foreshadows the contributions of the rest of the book to the overall themes. Together, chapters focus attention squarely on teaching and learning in ILEs across a wide variety of educational contexts. Few books, theses or articles about ILEs specifically consider the pedagogical load on teachers, the kinds of efforts they make to adapt their practices, or ideas of partnerships across, for example, teaching domains or diverse groups of students. Some texts, however, address similar ideas, but tangentially (Benade & Jackson, 2018; Wright, 2018). Our attempt to redress this imbalance responds to questions such as: *What does it mean to teach, learn, or lead in an ILE? And, what happens when teachers and students move from single cell learning spaces to open, collaborative ones?*

A defining feature of the chapters is that they are written by authors affiliated in some way with the University of Waikato's School of Education, as either current

or past staff members, or as graduates of masters or doctoral programmes. Our intent is that the book contributes a resource for others wishing to understand the effects on teachers and students of policies regarding teaching and learning spaces. This includes policymakers, practitioners, researchers and learners, any of whom might embark on similar initiatives pivotal to productive and effective ILE design, development and implementation.

Chapters draw on a range of Aotearoa New Zealand-based funding initiatives, such as the Teaching Learning Research Initiative (TLRI) and the Ministry of Education. The Wilf Malcolm Institute of Educational Research (WMIER) at the University of Waikato has been an important supportive presence in many of these endeavours, and in relation to writing this book.

Across chapters, a range of educational contexts in Aotearoa New Zealand become sites for inquiry as they respond to national policy directions prompted by the international trend for open, flexible, innovative learning environments (ILEs). The chapters highlight the diversity of responses to MOE regulatory frameworks precipitating schools into becoming ILEs through the eyes of those deeply involved: teachers, school leaders, students, initial teacher education (ITE) providers and their students. Contexts for various studies include pre-service teachers working in primary and secondary schools, and in-service teachers developing professional expertise or shifting from one kind of teaching space to another.

Our book examines ideas of partnership and pedagogy as they influence, and are influenced by, the growing alteration of school classrooms into innovative learning environments (ILEs). These environments are more than the shape of the learning spaces themselves. What turns the spaces into learning environments connects with what happens inside them, how they are inhabited and how the learning happens and how teachers expand, shift and adapt their pedagogical practices to meet the demands of working differently in different kinds of spaces. Our focus does not intend to denigrate the fine pedagogical work occurring in 'ordinary' single-cell classrooms. Instead, the book looks at what the new types of spaces create opportunities for that were too difficult to achieve or difficult to imagine in traditional, 'ordinary' classrooms, and illustrates specific challenges they pose.

Our combined efforts therefore offer insights into how different teaching and learning partnerships may be conceived and flourish. From an historical look at the nature of learning spaces, views of transition from one kind of learning space to another, teacher disposition and change and how teachers *make do* with available resources, the book gives voice to a range of perspectives, expanding our ideas of ILEs and what they might be. There is the policy view, which offers ideas about national priorities and the influence on the education sector and chapters exploring teachers viewing as exciting challenges, their practice in new spaces. Other chapters variously track teachers and students trying unfamiliar ways of teaching and learning, and rethinking purposes of learning. Overall, we discuss some implications of broader societal changes and their effects on wider perceptions of what is valued in learning.

This is not to say that all is rosy. Some educators, leaders, students, parents and local communities may object, viewing these unfamiliar types of learning spaces as

trampling on the tried, true and trusted. The book therefore offers broad perspectives from a broad range of positions.

The book is organised in five sections. It begins with Section: Background, containing three chapters setting the ILE scene, and concludes with Section: Conclusion. Together, these sections brace the following sections:

- Section: Possibilities for spaces
- Section: Possibilities for pedagogies and practices
- Section: Possibilities for partnerships

Terminology is an important starting point. We therefore outline some of the debates about terminology relevant to this topic, particularly the term 'innovative learning environment' (ILE). The term ILE has superseded earlier labels such as Modern Learning Environment or Flexible Learning Environments. Trask's chapter argues that an ILE is:

> An innovative learning environment (ILE) is an education ecosystem made up of teachers, learners, physical space and material resources (OECD, 2013; 2017). The term 'ecosystem' is significant, signalling interconnectedness between people and place. The word 'innovative' communicates an often-unchallenged assumption of doing things differently; of re-examining and reframing teaching and learning for a new age. Physical attributes of ILEs in Aotearoa New Zealand often include open or flexible spaces which accommodate large groups of students and teachers (Dovey & Fisher, 2014; Wright, 2017).

Fletcher et al. (2020) suggested that an ILE is designed to support the move from traditional single-teacher classrooms to multi-teacher learning spaces, where students are encouraged to be self-regulated learners. If that is the case, then the structures themselves act as policy drivers. The argument is still in play.

Next, we briefly outline, in numerical order, the sections and chapters, highlighting authors' contributions.

Section 1. Background (Chapters 1–3)

Three chapters constitute this background section. What you are reading now is Chap. 1: Introduction. The following two chapters, acting as the book's anchors, examine two aspects. Firstly, through a historical lens, a view of the nature of learning spaces (Chap. 2). Secondly, Chap. 3 explores relevant international and national policy frameworks and their potential effects on initial teacher education. Together, they indicate matters of history, policy and teacher education in relation to ILEs.

Noeline Wright's Chap. 2 offers an overview snapshot of historical and contemporary influences on conceptions of New Zealand schools, classrooms and the broad nature of learning spaces. Through examining characteristics of traditional school contexts including school furniture through international and New Zealand-based historical documents, she traces their development to a pivotal point in time where the Open Air Schools movement flourished. For the first time, societies embraced ideas that focused on the physical aspects of school buildings (light and ventilation

in particular) and their potential influence on children and young persons' health and physical wellbeing, with the intention of positively affecting academic outcomes. This appears to have paved a way for later ideas linking to learning spaces and their design. This rethinking of educational designs also included furniture for learning. The Open Air Movement appears to have been a key influence in the design of contemporary spaces that may facilitate positive learning experiences, and possibly indicates ways in which political decisions affect educational aims and structures.

By focusing on shifts in thinking regarding classroom furniture, pedagogy and learning, Wright walks us through the implications of these different ways of thinking, including the impact on the nature of teaching-and-learning in our current COVID-19 pandemic climate. She also asserts that architects can play an important role (see also Wright et al., 2021) in guiding the design of relevant and appropriate educational learning spaces to accommodate the shifting priorities and challenges that bear on educators and learners today, pointing out that:

> As governments like Aotearoa New Zealand's regulate the specifications for classrooms and schools, there will continue to be change over time: demographics, catastrophes (war, pestilence, natural disaster), and other factors including political agendas and social change, contribute to the flux of what is deemed appropriate as learning spaces.

They remind us that educators and their students will continue to 'make do': improvising as successive waves of changes and challenges occur across time, countries and learning spaces. Such developments and challenges provoke debates within education, research and public spheres as well as the ideas that influence those who design learning spaces. The chapter implies that through continued interrogations into educational policies about spaces and places for learning, the resulting evidence can inform debates into appropriate pedagogical practices expected to suit future learners' needs.

Bev Cooper's policy background chapter (Chap. 3) provides a view from a different window, looking at the nature of international debates and policy directions influencing educational change. She explores ways in which policies reframe teaching and learning and influence teachers' responses to shifts from traditional educational ideas and spaces to ILEs and leads to outlining potential implications for teacher learning and school leadership. Her chapter examines characteristics of twenty-first-century competencies and their intended links to developing a highly skilled workforce as proposed by international bodies such as the OECD, through a range of reports and syntheses. The general economic lens of such organisations applied to educational contexts, is however, moderated by the OECD's Learning Compass. The Learning Compass is a model synthesising expectations about the skills, dispositions and capabilities citizens across the world are likely to need to cope with disrupted, uncertain futures. Covid-19's rise is a case in point.

Cooper turns her gaze to tracing forces shaping preservice and in-service teacher education in Aotearoa New Zealand. Recent changes, for example, have led to providers having to create new teacher education programmes that meet the challenges of potential and actual disruptions and rapid changes. Teacher education programmes are expected to prepare capable and professional teachers who can assist

all learners to achieve educational success, and meet challenging demands, often, as with Covid-19 lockdowns, little warning. Next, she examines current conceptions of ILEs related to various social and pedagogical aspects that learners experience. She argues for 'significant mind shifts and changing capacities for leadership, teaching and learning', making comparisons between teachers' expectations in traditional versus ILE settings, to indicate the nature of the shifts and changing capacities we may yet face. She concludes by reminding us that 'significant investment' is needed in a range of educational areas: leadership; in-service and pre-service teacher learning. Without significant investment, it is difficult to expect that any teaching workforce is properly prepared to professionally support school students to learn to contribute to, as Cooper argues, a 'better world'.

Section 2. Possibilities for Spaces (Chapters 4–7)

The section comprises four chaps. (4–7). As a group, they consider the influences that learning spaces themselves and their design might have on teachers' practices and pedagogical thought. Such influences are likely to affect teachers' dispositional thinking and openness to shifts in pedagogical design and practices, as well as their understanding of what learning space might be.

Chapter 4 begins the section. Jenny Charteris and Dianne Smardon direct attention to ideas of spatial agency and its manifestation in ILEs. They consider relations between people, and people with material objects. Their contribution makes a distinction between *place* as opposed to *space*. The former, they argue, encapsulates the physicality of spaces that people inhabit, while the latter encompasses people's social practices within physical environments whether indoor or outdoor. Charteris and Smardon make a case that schools' spatial designs can influence students' and teachers' capacity to act. They suggest that it is essential to be spatially literate to maximise ILE affordances and understand the pedagogical actions and possibilities that might exist within such spaces.

Using a spatial ontology lens, they adopt Massey's (2005, 2009) framework about relationality, multiplicity and the fluidity of spaces to analyse data from primary school teacher perspectives regarding the influence that the spatial characteristics of learning spaces might have on teachers' and learners' agency. Their findings illustrate ways spatial agency is constantly being co-produced through the systematic manipulations of space by teachers and students, the physical affordances of the spaces and their spatial design. They conclude that '…a student or teacher cannot be said to "have" spatial agency, it is created through multiple factors (e.g., bodies, objects, discourses) in play within the school environment'. Their chapter exemplifies an important discussion on the influence of spaces and their design on pedagogical possibilities for teachers and learners.

Chapters 5 and 6 take a different turn on ideas about space and pedagogical practices. They focus on ILE spaces used to support drama teaching and learning processes and outcomes in secondary schools. Jane Luton's Chap. 5 takes the view

that drama education is unique in its positioning: that it is unlike other subject areas. Borrowing from Neelands and O'Connor (2010), she argues that drama is 'not simply a subject but also a method… a learning tool' (p. 35) where students learn about drama and through it to develop insights, ideas and dispositions in a holistic way. Luton's argument draws parallels between the United Kingdom's historical basis for the creation of drama spaces in schools, with Aotearoa New Zealand's recent developments of ILEs. She directs readers' attention to the ways drama spaces act as democratic learning spaces.

She asserts that drama educators have, for over a century, used drama as a space for possibilities, and says a drama room is 'the open space, inviting collaborative embodied learning, often through discovery'. The possibilities of such spaces suggest that power can be shared between teachers and learners, and that drama spaces are rooms where teaching–learning partnerships can thrive. Luton's notion of space resonates with Charteris and Smardon's (Chap. 4) ideas of *space* that go beyond physicality, imbuing 'an abstract concept' and becoming spaces where principles of an ILEs are related to the social, pedagogical, historical and physical aspects that connect with the *New Zealand Curriculum* (Ministry of Education, 2007).

Based on narratives collected from international drama educators through embodied reflection, Luton illustrates ways that collaborative learning is demonstrated between drama educators and learners to encourage, challenge and support each other. She notes, it 'is not only the teacher who is enacting an alternative pedagogical approach and relationships… [for] students experience an altered spatial relationship with their teacher and peers as they engage in "doing drama" in various ways with each other'. The chapter concludes with the hope that the wider ILE community can learn and draw on drama's democratic and embodied learning ideas to inform their own teaching and learning contexts.

In this way, Luton's chapter, together with Claire Coleman and Annette Thomson's (Chap. 6) and Eames and Milne's (Chap. 7), have similar intentions in opening up dialogue about what an ILE space is and could be. They bravely traverse divergent terrain in arguing for different learning spaces within and outside traditional classroom contexts. Collectively, they see these alternatives as valid and robust instances of spaces that uphold this century's learner-centred ideals of ILEs.

In Chap. 6, Coleman and Thomson report on the reflections of an experienced drama educator transitioning from the drama space she 'made do with', into a purpose-built ILE school. This transition process was fraught with challenges to both her pedagogy and her commitment to exploratory, collaborative and creative approaches. The additional restrictions of the shift to a new ILE space and its impact upon pedagogy rendered, she believed, the new space less innovative than her previous one. Coleman and Thomson problematise the effects of the transition to the new space on the teacher, her pedagogy and the opportunities and limitations for future praxis. Through undertaking a reflective practitioner inquiry into her own practice, the drama teacher offers readers insights and a new appreciation into the effort required to establish pedagogical innovation in new educational spaces. The authors draw on theory from an activity-centred analysis and design (ACAD) framework and network theory (Carvalho & Yeoman, 2018) to analyse the effects a transition to a

new ILE space has on a teacher's practice. It also analyses ways this plays out in the complexity of teaching in the arts. The chapter ends by challenging some of the rhetoric about ILEs, that posits they are a panacea for precipitating student-centred pedagogical practices on a greater scale than has been possible before. The chapter provokes future designers, schools and educators to recognise the influence of spaces on the teaching–learning nexus.

In Chap. 7, Chris Eames and Louise Milne invite the reader to consider alternative conceptions of spaces for learning transcending walled classroom settings. The alternative they propose centres on non-school spaces where important experiential learning opportunities can occur that can complement in-class activities. Their chapter argues that education outside the classroom is an important context for learning opportunities, for they embrace principles of twenty-first century learning and ILEs. As with Luton's Chap. 5 which draws parallels between drama education and ILEs, Eames and Milne begin by discussing the synergies between the principles and practices in Education outside the Classroom (EOTC) and those extolled within ILE ideals. Based on comparisons between the two bodies of literature, they then direct attention to notions of space, pedagogy and using digital technologies as a framework. They use this framework to unpack the term 'innovative learning'. Notions of space, pedagogy and using digital technologies are embellished through reporting on two EOTC research projects that involved both authors.

Milne explores her evaluation of the GeoCamp programme. The programme offered students opportunities to learn about geological science through engagement with earth scientists, creating experiences with personalised and authentic real-world projects. The fluid use of multiple spaces, pedagogical approaches and some digital technologies in a geoscientists' tool kit, enabled learners to plan, collect data, conduct analyses and solve problems in action to broaden their thinking and capabilities. Milne found that the project's impact was long lasting. At least six months after the conclusion of the programme, she traced changes in learners' perceptions of scientists and their understanding of the role of earth scientists.

The project Eames had co-led revolved around mobile learning and mixed reality (MR) to support students' learning about marine conservation. The intention was to enhance their ecological understanding. The project made use of MR to support children in making connections between their learning at a marine reserve, a visitor centre and within their classroom. Eames detailed how the different spaces, pedagogical approaches and digital technologies were used during the four stages of the project. Students, their teachers and even parent helpers were appreciative of the diverse implementation of different spaces, pedagogical approaches and digital technologies. Their insights offered suggestions for mitigating identified issues. Eames concluded that the project exemplified ways EOTC and ILEs share commonalities that resonate with the relational materiality of space. Together, Eames and Milne urge readers to reconsider their notions of the types of spaces within which learning takes place, so that it includes spaces outside classrooms. They also argue that EOTC offers viable ways to embrace principles of ILEs and twenty-first-century learning outcomes. Further, careful educational design through a framework incorporating

diverse spaces, pedagogies and technologies, they argue, is a productive way to inter-rogate the conceptualisation of spaces in ways that are student-centred and enhance teaching and learning.

Section 3. Possibilities for Pedagogies and Practices (Chapters 8–12)

This section centres on contributions to pedagogical possibilities for working in ILE spaces. These four chapters draw on three of the four education sectors: primary, secondary and tertiary.

Michelle Barnard and Jenny Ferrier-Kerr's Chap. 8 highlights the need to attend to teachers' 'liminal space'. They define this as the 'space in-between' or as a 'crossing over' space. The latter relates to the type of space one encounters during times of transition and change. Such a space can be marked by responses that reflect not only a sense of eagerness, but also uncertainty and anxiety.

Not commonly discussed in education contexts, the issue of teachers being suspended in a non-physical liminal space can impact significantly upon their behaviours, beliefs, professional identity and the success of change initiatives. The research contributing to this chapter explored junior school teachers' liminal spaces during actual or anticipated moves from traditional classrooms to ILE learning spaces. The authors hypothesised that teachers who are more cognisant of their liminal space *and* supported through differentiated professional learning opportunities are likely to have a greater capacity to positively navigate transition and change. Through surveys and interviews, findings revealed that foremost in teachers' liminal spaces were perspectives and worries about implications for their pedagogical practices. As well, findings revealed they undertook professional conversations strengthened or changed collegial relationships and had a vision for the ILE.

The authors identified seven pragmatic preparations that may enhance teachers' transitions to ILEs, drawing from productively using their liminal space. They contend that teachers can benefit from developing their liminal space knowledge and understanding as they anticipate moving to ILEs. They suggest that an 'ILE is not just a physical structure, it is subjectively interpreted and imagined' and that ILEs 'are inhabited by educational discourses driving school change'. They assert that when teachers are able to use liminal space productively and creatively, they are more likely to embrace and positively contribute to, educational and pedagogical change.

In Chap. 9, Frances Edwards draws evidence from interviews with students who withdrew from ILE contexts. Her goal was to investigate their reasons for shifting back to schools operating single cell classrooms and structures. Her research question: *What we can learn from students who have chosen to move from an ILE back to a school with single-cell classrooms?* frames the orientation of the chapter. Edwards

argues the importance of student voice within ILEs, particularly if the school purports to foster student agency.

Findings from her qualitative exploratory primary and secondary students' study revealed a range of issues creating 'mismatches' to occur between their experiences and the ILE schools' goals. Although students enjoyed some aspects of their specific ILE context, they fundamentally perceived that their experience of 'learning' in those schools did not match their expectations of what 'learning' is, nor what a learning environment should be. Edwards describes factors contributing to such mismatches and discusses structures and support within ILEs in terms of physical resourcing, social interactions or connectedness and pedagogical approaches that might align with and support these learners' needs.

Chapter 10 reveals important findings from a study that scoped principles for establishing robust mathematics (pāngarau in te reo Māori) teaching–learning practices within a Māori Medium Modern Learning Environment (M3LE). In this chapter, Leeana Herewini, Ngārewa Hāwera and Bronwen Cowie detail how teachers (kaiako in Māori) and researchers 'grappled together' to understand what it meant to be, do, and learn pāngarau (mathematics) in this specific M3LE context. The project involved understanding the intended goals, and why it had been developed. They wanted to know the extent to which it allowed teachers to work to their strengths to improve learning for students (ākonga in Māori).

The authors begin their chapter by positioning the development of Māori immersion learning contexts and how this dovetails with current Ministry of Education motivations for implementing these new designs for schools. Adopting a Kaupapa Māori framework and in partnership with teachers, the research team used findings from interviews with teachers and students, classroom observations and project team meetings to highlight important culturally-based and responsive practices. They considered these to be vital to establishing and sustaining the space for teaching–learning purposes.

Importantly, the new space—M3LE—was reconceptualised according to Māori ways of knowing and renamed as Puna Mātauranga Kiritoa (PMK). The name highlights the MLE as a place or Puna (source of learning) where Matauranga (education) is important, and the notion of Kiritoa (resilience), requiring participants to be strong and resilient is promoted. Resilience (identified as kiritoa) was revealed as an important underpinning value and attitude. Unlike typical views 'resilience', the authors assert that resilience is, from an indigenous perspective, 'ecological, and operates at both an individual and collective level'. Bringing together the collective and individual is thus essential in the operationalisation of the PMK. Collaboration between teachers-students and among students-peers was also a feature of the findings. Fostering collaboration was identified as not only complex, but also important for all parties to negotiate and navigate to meet the demands of teaching and learning pāngarau differently.

This chapter offers valuable insights for researchers and practitioners who work in Maori immersion settings as they develop the confidence to 'make sense of the potential of an MLE in their context' and to open up further avenues for discussion and productive teaching–learning aspirations.

Liz Reinsfield's Chap. 11 contribution focuses on in-service and pre-service secondary school teachers' thinking and their designing for effective learning when trust into new learning spaces. The emergence of ILEs have necessitated changes to existing and student teachers' professional practice. Using Activity Theory to frame her exploration of teacher perceptions and lived experiences, Reinsfield goes on to illustrate the importance of teacher thinking in supporting more agentic student learning 'who will face the realities of uncertain and rapidly technologised futures'. She draws attention to the challenges faced by pre-service and secondary teachers' practices and the need for professional development if they are to reshape and maximise the potential affordances inherent in flexible and well-provisioned physical spaces and digital resources. There is an imperative for student teachers to draw from research-informed and future-focused practices to be able to make sound decisions about the types of learning that will support students in a technologically mediated future. Suggestions for initial teacher education institutions in terms of supporting current and future teachers to prepare for schooling within this century are importantly offered to ensure their support and success in the profession.

In continuing the discussion on pre-service teacher education, Emily Nelson and Leigh Johnson's chapter (Chap. 12) investigates how pre-service primary school teachers (PSTs) learn to teach in ILEs while on professional teaching experience (practicum). Lamenting the paucity of research into teacher preparation for teaching in ILEs and the implications of ILEs for initial teacher education, Nelson and Johnson sought to identify key anchoring practices that PSTs draw on when adapting to teach in ILEs with the intent to inform current theory–practice gaps. Informed by a new materialist framing, they considered the influence of human and non-human forces at work in the ILE practicum assemblage. Nelson and Johnson found the notion of 'learner agency' to be fundamental to PSTs' learning while on practicum. They further propose implications for ITE along the lines of curriculum content knowledge, confidence and learner agency to ensure PSTs are better supported to be effective teaching professionals.

Section 4. Possibilities for Partnerships (Chapters 13–15)

This section brings together chapters connected with diverse partnerships. These partnerships exist between school-communities, teachers and students as they develop and enact what they hope will become effective ILEs. These chapters gather together research undertaken in primary, secondary and tertiary contexts.

Chapter 13 focuses on a whole school transition to implementing ILEs. Garry Falloon, in this chapter, sought to investigate the nuanced, complex and interconnected nature of factors guiding the school's evolution. Adopting the OECD's (2013) conceptualisation of ILEs as an analytical lens and drawing importantly from longitudinal data, Falloon accentuates the need to challenge 'teacher's entrenched beliefs about the purpose of schooling, and to empower and harness the talents of all staff towards achieving a clearly articulated and understood vision'. He illustrates how

successful ILEs demand more than mere considerations for the design of physical teaching spaces and goes on to detail key ideas essential for understanding the complex interrelationship between school leadership, curriculum, pedagogy, technology, professional development and physical learning space design in the development of ILEs. An important contribution from his work is the conceptualisation of the school's ILE development model as a way forward for informing other school leaders and policy makers on the holistic and multifaceted approach needed to map and undertake this journey and to effectively bring onboard and support the key stakeholders—school leaders, teachers and learners. He concludes by making a plea for reconceptualising of valued student learning outcomes in recognition of holistic student development in effective ILEs that go beyond current narrow standardised measures.

In Chap. 14, Suzanne Trask echoes earlier arguments that 'the act of inhabiting flexible spaces does not automatically translate to changed practice'. She adopts a novel technique; the technique of portraiture, to weave together data from three different ILE school contexts and offer stories of senior secondary science teachers and their students' stories of working in ILEs. Her qualitative study of eight teachers and their students to develop a portrait consisting of a chronological narrative illustrating what teaching and learning could or might look like in an ILE. Drawing from the salient features from each of the cases, the portraits importantly highlight possibilities and constraints, and the best and worst aspects of practice and partnerships in ILEs. Her findings demonstrate the way flexible spaces permit movement and social flow. These when combined effectively with the affordances in curriculum, assessment and digital technologies can create multiple possibilities for collaborative teaching practice and student-centred learning approaches. Taken together, her findings found support for engaging diverse learners in science-based ILEs at senior school levels and can offer important implications for other practitioners in other ILE contexts.

Emily Nelson and Maurice Rehu's Chap. 15 concludes this section. It examines how ideas of culturally responsive pedagogical practices and partnerships with key community stakeholders are crucial in a school's transformative journey towards embracing innovative learning environment (ILE) ideals that go beyond the rhetoric. Their chapter resonates with some of the ethos expressed in Herewini et al.'s chapter, for it details a case study about a predominantly Māori state school as it transitioned to become an innovative learning environment. The study traces something of the school's envisioning and journey in embedding culturally located learning through this transition. As they reconceptualised the school to become an ILE, its community sought to foster and sustain a learning ecosystem that nurtures students. Including the school community in its plans to redesign the school's physical and pedagogical structures, was a deliberate choice as the goal was to enhance students' identity and belonging development.

Through using an iterative design approach, staff, students and the wider school community had multiple input opportunities to establish Māori-centred perspectives that would support students to succeed as Māori. A key insight for practitioners interested in fostering culturally located teaching-and-learning practices within ILE

contexts is captured in the authors' observation that 'Māori student success was achieved not only through ongoing collective commitment to enhancing their mana linked across time with the wisdom of their tīpuna (ancestors), but also through culturally located spatial design, pedagogy and relationships'.

Section 5. Conclusion

Brett Bligh's chapter (Chap. 16) concludes the book by bringing together the key themes arising from the different chapters and unifying them through a 'social project' (drawing from activity theorists and specifically Blunden, 2010, 2014) perspective. His 'summary and signpost' provides an external eye to the chapters' projects researched and developed in Aotearoa New Zealand educational contexts. Adopting a 'principled enquiry' approach, Bligh unearths underlying assumptions of preceding chapters by disaggregating and reassembling them under a social project framing. In doing so, he is guided by six pillars of the 'social project' perspective: key predicaments confronted in a project, the pursuit of core concepts, the ethos guiding action, the sedimented artefacts used, the extent the social project engages with other institutions and the lived experiences motivating changes and development. He begins by positioning his work within the wider context of the *international* social project of ILEs introduced by organisations like the OECD which has shaped the global conception of ILEs. He goes on to map the contours of ILEs in Aotearoa New Zealand as a social project by tracing different stages of development across the chapters; the history of ILE including its sociocultural precedents, the introduction of ILEs and the experience of institutionalising ILEs.

Given the overall aims of the book and its individual chapters, we hope it offers an informative exposition of a range of projects exploring contextual experiences, challenges and structures related to ILEs within one country.

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Chapter 2
An Historical Perspective of Learning Spaces

Check for updates

Noeline Wright

Abstract This chapter offers some reflections on both historical and contemporary effects of specific influences on conceptions of schools and classrooms, particularly as they influence Aotearoa New Zealand education. Ideas about classrooms and schools are illustrated through images from a variety of contexts and times. These examples and ideas trace how educational changes become reflections of societal challenges. The chapter begins with outlining a background to schools and related institutions and then explores some classroom characteristics before addressing the influence and legacy of the Open Air Schools movement. The chapter outlines changes in thinking about classroom furniture, contemporary challenges and changes, and possible implications of pandemic influences on the nature of classrooms.

Keywords Historical perspective · Innovative learning spaces · Open air schools

Introduction

Education in a broad sense has existed for centuries, yet its formal arrangement into specific buildings called schools is a relatively recent event that became more common as various countries introduced basic education regulations, particularly increasing during the industrial revolution. De Carlo (1969), for example, has argued that formal education grew out of the Napoleonic view that education was a "means of directing opinion" (p. 14). In other words, the view presented by De Carlo is that education in formal institutions has consistently developed over time to manage the "necessities of the state apparatus" via mass education. In Aotearoa New Zealand, the 1877 Education Act established free compulsory education for all Pākehā children. Interestingly, the Act did not apply to Māori children. Instead, attendance at the free schools was down to parental choice. However, by 1894, primary education for Māori became compulsory. The compulsory nature of primary education created national

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demand for classrooms, and so Aotearoa New Zealand's trajectory mirrored similar changes in other countries.

On the one hand, governments seek to influence their population through mechanisms of education, and on the other, individuals recognize education as a conduit to knowledge and power. Regardless of these political tensions, 'school' is a physical structure with a specific role effectively isolating a specific group of people for periods of time to meet state requirements for educational credentialing. However, in very recent times, the massification of digital technologies has created unprecedented access to information that previously had been controlled. Such technological change shifted attention to rethinking questions about the nature of schools and the nature of learning. Now, the shape of classroom spaces has also altered, as has the labels that describe a school.

Current terms describing schools that have new kinds of physical learning spaces include *flexible learning environments* (FLS), *modern learning environments* (MLE), or *innovative learning environments* (ILE). The Aotearoa New Zealand Education Review Office (2018) defined an ILE as "the whole context in which learning is intended to take place. It encompasses the physical space (the FLS), the social aspects, and the pedagogy" (p. 16). Some of these labels suggest a focus on the nature of 'spaces' (the geography of the rooms themselves), while others on the 'environment', which may indicate how these labels arise. Labels including the word 'environment' usually imply encompassing the teaching and learning, culture, resources and intangibles of classroom life, including spaces not usually defined as traditional classrooms, which connect with the Education Review Office definition.

It is not only educators and educational researchers who are interested in learning spaces and environments. Brown and Campione (1996), for example, presciently argued there needed to be new ways for psychologists "to capture and convey the essential features of the learning environments that we design" (p. 290). It is clear however, that within the past decade, greater teacher and researcher attention is now focused on learning spaces and their role in shifting educational experiences. The design principles contributing to learning environments have also been a feature of this attention, and their connection to political, social, and economic changes has also not gone unnoticed.

Alterator and Deed (2018, p. 4), for example, argue that architectural expressions in the design of schools symbolize physical manifestations of "educational ideas and aspirations", symptomatic of social and economic change or upheaval. During times of privation such as wars or natural disasters, schools and their wider systems develop makeshift and sometimes urgent solutions to provide education. In either rebuilding existing or creating new schools, educational aspirations may reflect a social, political, or economic zeitgeist. One social and economic shift has been fueled by broadband access and the near ubiquity of mobile devices. In turn, these shifts have led to researchers rethinking teachers' roles and education in global terms beyond traditional expectations of learning spaces (Dumont et al., 2010).

Enduring Characteristics of Classrooms

Expressions of flexible and open classrooms are not especially new, notwithstanding the term's current application to specific types of school buildings and spaces, for people have created learning spaces when there is a need. Teaching and learning has taken place for thousands of years, with teachers and learners using resources at hand to achieve their goals, even while having a gendered history. Alsaif's (2014) thesis, for example, notes that despite the longevity of schools as sites of learning, they were seldom for other than males from elite social or economic classes, or clergy. Sometimes, learning was necessarily clandestine, taking place in caves or other secret spaces. People have consistently found ways to offer formal educational experiences even when conditions are obstructive, such as South Sudan, where three quarters of girls do not get a primary school education (Coughlan, 2017).

Alsaif (2014) observed that prototype school plans typically feature single rooms, sometimes replicated side by side or stand-alone. Similar one-room schools persist today, particularly in developing countries. The image below (Fig. 2.1) of a school building in Haiti HCH (Help a Child in Haiti, 2014, February 18) exemplifies privation and locals making do with local materials.

Even when resources are meagre, local communities create learning spaces which materialize traditional expectations of the teacher/student relationship. The orientation and structure of the Haitian classroom (Fig. 2.1) demonstrates Alterator and Deed's view that "school space is a necessary but not sufficient" (2014, p. 5) means of connecting material spaces with the expected social practices of formal education. Figure 2.1 is immediately recognizable as a classroom space: its arrangement

Fig. 2.1 'Secondary school classes are held in this space. Classrooms are separated by tarpaulins' (February 18, 2014) https://hisheartforhaiti.files.wordpress.com/2014/02/2013-10-17-11-02-27.jpg

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A student stands in the ruins of his former classroom, which was destroyed in June 2015 at the Aal Okab school in Saada, Yemen. Students now attend lessons in UNICEF tents nearby.

Fig. 2.2 A classroom in Yemen, after bombing https://www.unicef.org/press-releases/yemen-children-education-devastated-three-years-conflict

of furniture also implies certain assumptions about teachers and learners. Without many tangible materials for learning, such as chalkboards to write on, or books to write in, spaces and their arrangement, such as Fig. 2.1 illustrates, act in a number of ways as unidirectional conditions for transmitting information and transmitting cultural and social practices as well as power dynamics.

Figure 2.2, of a classroom destroyed in Yemen in 2015, shows that the design and associated technologies in a formal classroom setting replicate certain educational scripts that transcend country and culture. Still visible in the rubble are four walls, windows for natural light, and some kind of board for the teacher to write on as a teaching tool. While it is a physically more robust building than Fig. 2.1, it is nevertheless stark in its simplicity. The size of the child counterpoints the devastation of the space, as well as its dimensions. It is unmistakably a classroom. We can assume that since the chalkboard is fixed to the wall that students would have needed to face it, since it is where a teacher would demonstrate intended learning. We can also easily imagine rows of desks and chairs facing this wall. We can imagine that the teacher occupied the front of the room more often than any other part of the room. A positive quality of the space is that it had plenty of natural light, without the space becoming too hot and uncomfortable. We do notknow if the ceiling fitting is bereft of a light or a fan.

Fig. 2.3 Jacob A Riis: 'A class at the Essex Market School, with gas lamps lit by day'. Before 1914. Public Domain: http://www.zeno.org/nid/20001892762

Figure 2.3 (below), on the other hand, takes us to the second decade of last century, where the shape and orientation of the school room resonates across time and country Fig. 2.3 depicts a school room in Essex, United Kingdom, demonstrating enduring structures and configurations visible over time and location. Students again face one way, sitting in close rows, while the teacher commands the prime position at the front, close to the blackboard, visible to, and able to view, all students. She is also the only person standing in that space, clearly delineating an unspoken power dynamic, which are, at best, implied in Figs. 2.1 and 2.2. For generations in school rooms, a board (whether white for felt tip pens, or black for chalk) has been the traditional demonstration tool available to teachers. Even while blackboards have been replaced by whiteboards, movable boards, and digital screens, their function as a tool remains the same: an opportunity for demonstration and information transmission, quickly, and visibly. Such enduring functionality is evident across time, spaces, countries, and configurations such as Figs. 2.1, 2.2 and 2.3. Vestiges persist in newly designed classroom spaces.

In Fig. 2.3, it is also clear that space is at a premium for students, for they appear to be cramped, uncomfortable, and probably unable to move, once shoehorned into the space. We might predict that when the pot belly boiler in the corner heats the room, the air becomes quickly stale, especially if the window is closed for long periods. Students closest to the potbelly boiler are likely to become overly warm and soporific, while those on the furthest margins may shiver in winter months.

Comfort and discomfort apply to visibility too. Students sitting on the periphery of the classroom must have found it difficult to view the blackboard, while those sitting in the front row seem to strain backwards for a better view. Many students

Fig. 2.4 Kaikohe Native Classroom 1939: Native Schools Project records. MSS & Archives 2008/15, folder 173/1. Auckland Library

are holding their slates in front of them to write on, suggesting that either there is inadequate room for writing or there is no tabletop to rest the slates on. Either way, these are less than ideal learning conditions. The space for the teacher at the front is also confined, intersected by a wooden chair, a desk, and what looks like a high chair on the other side of the teacher. The teaching area appears confined to a narrow space, containing a single fixed chalkboard.

While Fig. 2.3's classroom may have been perfectly suitable in its day, new knowledge brings new thinking about the way heating, lighting, space, and color affect conditions for learning (Barrett et al., 2015). Perhaps the design, shape, and orientation of a learning space matters.

Unlike Figs. 2.1 and 2.3, where students sit in shared spaces, Figs. 2.4 and 2.5 show students sitting in physical isolation from each other. Both classroom types resonate across countries, generations, and time.

The 1936 New Zealand Native School classroom, in Kaikohe (Fig. 2.5), is a case in point. The Kaikohe classroom is called an 'open' classroom, despite the rows and aisles of desks still facing one direction. The 'open' nature of the classroom rests with the ability to have one wall open to the outside, even if the internal space seems cramped. The furniture, as in other schools of the time, is wooden, heavy, square, and one-size-fits-all. This uniform and inflexible style takes no notice of growing adolescent bodies, as shown by the awkward posture of some students. Combined, these physical elements imply not only a lack of mobility and discomfort for students within these classroom spaces, but also an assumption about the unidirectional nature of learning.

By the 1960s in New Zealand, classroom furniture was lighter and more moveable. A New Zealand classroom in 1965 (Fig. 2.5 below) suggests that although the

Fig. 2.5 Rex Manihera, Glendowie South Primary School, 1965: Archives New Zealand Ref: AAQT 6539 W3537 1 / R3395

furniture may be lighter and moveable, the physical arrangement is consistent with past iterations of classrooms: rows and aisles, making it easy for the teacher to roam between aisles and students, modeling the surveillance and power dynamics, such as shown in earlier images. Students in Fig. 2.4 are geographically isolated from their peers and have a single point of reference—the front of the room.

The images depicted in Figs. 2.1, 2.2, 2.3, 2.4 and 2.5 typify functional, industrial models of education. In such classrooms, students act most likely, as passive and compliant listeners, enduring a surfeit of teacher talk. These modes for learning are now at odds with current expectations of education systems, as Dumont et al. (2010) argue. Their views of the nature of learning resonate with the open plan philosophy and the affordances implied by larger learning spaces.

The idea of open education was a philosophical development in educational practice from the 1960s and 1970s (Hill, 1975; Tunnel, 1975) which was especially prevalent in primary school education. Espousing this philosophy meant teachers rethought their views of control, ideas about curriculum and ideas about pedagogical practices. It resonates in primary school practices in Aotearoa New Zealand to this day as teachers use an interdisciplinary approach to weave subject content and skills together to enrich learning experiences. These kinds of practices have found their way into Aotearoa New Zealand secondary schools (Wright, 2018). Ideas about open plan learning spaces appear linked to this philosophical direction, where classrooms have become connected pods having few interior walls. Students mostly sit together at tables rather than individual desks and chairs. Teachers, by adjusting their practices, began turning traditional power dynamics into facilitative and collegial practices and operating in teaching teams (Wright, 2018). Teacher-centrism in such learning contexts shifted to learner-centrism. And while spaces themselves altered along with

some teachers' practices, this connection between type of learning space and teaching practice was not universal. Figure 2.4 is a case in point. It may be that class size had a large impact in the organization of the furniture and general classroom structure, but it may also be that successive teachers took little heed of the opportunities a moving side wall might offer.

In functional, industrial, classroom models, where resources (such as books, exercise books, writing implements) may be scarce or rudimentary, teachers, in the role of knowledge gatekeepers, became the arbiters of what, when, how and what kind of information was shared. Changing ideas about education echo theories Bourdieu and Passeron (1990) mounted about schools as sites of reproduction: of power, access to knowledge and cultural capital. They argued that schools traditionally replicate and model structures, beliefs, practices and systems of the past and of hierarchies of social and political order and power, but they could also be sites of social progress and social justice.

The kinds of school rooms illustrated in the figures suggest that Bourdieu and Passeron's ideas about social reproduction through education are not only played out in the way teachers can organize classroom spaces, but also by the physical geography affordances of the classrooms themselves. Classrooms therefore mediate what can happen, perhaps forcing teachers and students into transmissive and passive roles when the spaces are too small, overcrowded, and/or contain immovable or unwieldy furniture.

Events, however, serve to disrupt settled assumptions and practices, precipitating different and sometimes urgent responses. The Open-Air Schools League represents one such impetus for change to the nature of school buildings.

Impetus for Change: Open Air Schools League

The Open-Air Schools League was an international movement that grew as a response to reducing tuberculosis outbreaks in schools. League members were influential lobbyists, with their ideas about the value of open air, child health, hygiene and education, affecting school designs in various countries, including Aotearoa New Zealand. The medical fraternity was highly influential in promoting the benefits of fresh air, and the health benefits swayed political and educational decision-making about the nature of schools and learning throughout Europe, the United States, and the Commonwealth. Rodwell (1995), for example, traces in Australia, the influence of the Open Air League's views on schooling. Aotearoa New Zealand was not immune to this lobbying, especially in the decades between 1920–1960.

Open-Air Schools principles were predicated on architecture providing wide, and at times unfettered, access to the outdoors. This was often achieved via large bay windows, open verandahs, or sliding walls/doors (see Fig. 2.4). In Open-Air Schools, students were taught outdoors, even during winter. In some cases, this must have been quite challenging. Photographs of students wrapped up against the cold, as shown in a blogpost which indicates something of the challenge of outdoor learning in winter

(Messynessy, 2016, March 15). What is remarkable to note however, is that in almost all of the images, traditional classroom configurations are replicated.

In the early decades of last century, a number of architects took heed of the Open-Air Schools principles and aspirations, such as Hermann Baur (Switzerland), Walter Gropius (Germany; founder of Bauhaus) and Maxwell Fry (Britain). In Amsterdam, Jan Duiker was responsible for designing the *Cliostraat 40* school built between 1927–1930. During the same period in Denmark, Kai Gottlob designed *The School by the Sound* near Copenhagen. The school features exuberant color, as well as internal voids; both are hallmarks of current school designs. Even though Gottlob's school was built almost a century ago some ideas and practices in architectural school design have springboarded from the first half of the 20th century.

Open Air Schools featured pavilion designs that had previously only been seen in rehabilitation hospitals, which indicates something of the medical influence on school architecture. Pavilions persisted in school architecture for a number of decades, including in Aotearoa New Zealand, especially during the 1970s. Other elements from the medical field found their way into school architecture, including long, window-lined hallways immediately adjacent to hospital rooms. This same influence is visible in many school designs dating from mid-twentieth century. Messynessy's (2016, March 15) curated images of open air schools spanning the first five decades of the twentieth century indicates the wide spread and longevity of the Open Air Schools movement's ideas across Britain, Europe and into the United States. Vestiges of the movement's influence in school design in Aotearoa New Zealand is suggested in the classroom depicted in Fig. 2.4.

In Australia, Rodwell (1995) discusses a Tasmanian example of a school zealously built using the Open Air Schools principles. Rodwell describes the Launceston school as an 'amazing' wooden building accommodating 100 children:

> Each classroom had only one entire exterior wall. Thus, there were only two entire exterior walls in the whole building: one at each end. The building was supported on wooden piles so that the floor was kept dry because of the air space between it and the ground. The side walls were built up to a height of three feet six inches and were fitted with canvas slides working on ball-bearings. (p. 21)

The Tasmanian climate, however, is not as conducive to canvas walls as Queensland's or the Northern Territories' climates. Rodwell wondered if the school's design was driven more by budget constraints than learners' educational and physical health needs. Public opprobrium was described as 'vitriolic', with locals nicknaming the school 'the freezing works'.

Even in the face of such criticism, Australian school medical officers continued exerting considerable influence in school design, especially as a means to address cases of tuberculosis among students (Mirams, 2011). Through endorsement by various Directors of Education across Australian states, open school features became standardized as part of the design requirements of new school buildings. These standards highlighted the importance of the "color and texture of the walls and ceilings, the angle of the light entering the room, and the shape and size of the windows" (Rodwell, 1995, p. 22). Standards also defined the size of classroom spaces, stating a

minimum of 20% windows to floor area. Cross ventilation was provided by windows on opposite walls, as well as by wall and ceiling vents. Principles of air circulation, color, light and heat continue to influence school design specifications in a range of countries, including Australia.

Aotearoa New Zealand's education system was not immune from the Open Air influence regarding student health in the first decades of the 20th century. *The Auckland Star* (*More air*, XLVII, 214, 1916, September 7), for example, suggested a definition of 'open air school', determining that it "applied both to classes held in the open air and to school buildings constructed so as to give pupils the maximum of fresh air". The same article from *The Auckland Star* noted that Aotearoa New Zealand had given "considerable attention to [Open Air schools] in America, Great Britain, and Australia". The article further advocated that "a child that is taught in air that cannot get stale will become more vigorous physically and mentally". The same idea is traceable in Rodwell's account of Australian schools taking on Open Air principles, and the medical profession's influence on school designs.

In the same month as *The Auckland Star* article, the *Mt Benger Mail* (1916, September 27) wrote that the Otago Education Board received a memo from the New Zealand Director of Education on the topic of open-air classes, noting that Native Schools in particular were more often the recipients of open air spaces. The same memo from the Director of Education added that South Wellington School, which had an open-air classroom, had kept 'careful records' of the "comparative results in the physical and mental development of the children taught in the open-air buildings, as contrasted with that of the children taught in the ordinary school building." The results identified distinct advantages for students in the open-air building, noting students' height, weight, general health, mental alertness and energy. These are the same benefits Rodwell (1995) reports in the Australian political landscape around school design. The *Mt Benger Mail* also reported that as a result of these health outcomes, Aotearoa New Zealand was adopting open air rules for school design: a verandah or other form of shelter for teaching on fine days, classrooms with three sliding shuttered walls, and other classrooms with large windows to create cross ventilation and natural light.

Leading up to the 1920s, Aotearoa New Zealand schools did not enjoy full student attendance, even though it had been compulsory since the Education Act 1877. Instead, it was common for more than half a class to be absent at any one time. Such underwhelming attendance rates may be accounted for by many children's poor health. Their overall health was adversely affected by inadequate domestic sanitary conditions. These included drainage, sewage, and potable water supply. Other contributing factors to poor school attendance were low economic status, and, at times, child labor. Open Air classrooms were an attempt to mitigate at least some of the negative health conditions of prevalent diseases such as Tuberculosis and Spanish Flu, and poor living conditions that were common at the time. The Open Air movement's principles continued to sway school design into the next decade.

Another *Auckland Star* article (*Open air schools*, LX, 245, 1929, October 16) outlined the Auckland Education Board architect's desire to devise a plan that would "incorporate the most desirable features of existing types of open-air schools, and to

eliminate as nearly as possible, these features which have proved to be undesirable". His ideas included 'self-contained classrooms' even when incorporated into a single building, and locating utility spaces like cloakrooms on the south side of buildings. Classrooms therefore faced the sun, aligning with Open Air Schools' principles of access to natural light. The architect also proposed that blackboards should be fitted to the front of sliding doors, to accommodate cupboards, signaling a desire for supplying storage within prescribed classroom dimensions.

Evidence of the Open-Air Schools movement's influence in Aotearoa New Zealand school buildings persisted for decades. The *New Zealand Herald* (1940, September 4) included an article publicising the previous day's opening of a school embracing the "most modern improvements in school architecture, the new Mount Albert Primary School". In line with attempts to future-proof the school, the paper reports that it "is centrally heated and every classroom is wired for wireless". This same view about future-proofing continues to be touted as a focus for this century's new schools.

Wall's (2016) review of literature about the relationship between the physical design of learning spaces and student outcomes, addressed ventilation, lighting, heating and acoustics as important factors. Wall's focus echoes some of the Open Air Movement's agenda about the physical health of learners and their relationship to their immediate learning environment. It also echoes the League's principles about natural light, good ventilation, color and space. It is clear then, that the Open Air League's ideas about health and education continue to resonate with current trends in school design, and feature in the Ministry of Education's specifications for classroom spaces.

The Open-Air Schools League movement was, however, relatively short lived; the development of antibiotics and vaccines may have contributed to this demise, even though many classrooms built on open air principles still exist. A key factor in the League's demise was climate; the Launceston school is one example of this. In Aotearoa New Zealand, there is evidence from the *Otago Daily Times* (1939, May 19) that the Otago Education Board rejected the types of open-air classrooms favored by 'many northern districts' because of climate, opting for modified versions. What took much longer to change however, was how classrooms were fitted out. As indicated in some of the Figure images, desks and chairs were heavy, cumbersome and uncomfortable: regardless of a student's size, there was only one size for chair and desk.

The Materiality of Classrooms

As demonstrated in the Figures of early classrooms, the prevailing furniture material is wood. Desks and chairs were heavy, often fixed to the floor and unforgiving. This rigidity has not gone unnoticed over time. Garde (1911), in taking up this issue, positioned it within the Open Air School League's philosophical direction. She suggested that people are "awakening to the fact that it [school furniture] has

a vital interest at stake in each child" (p. 11) because children are the adults of the future. Their physical posture may be put at risk by school furniture which, she argued, is "to blame in most cases" because children have been "compelled" to use it for several hours a day. Even with numerous pleas and reports having been made to governments, she admonished politicians for their inertia for initiating change. As a result, manufacturers focused on what was easiest to sell, rather than making children comfortable. More than a century ago, she argued that school desks and chairs "must be capable of independent adjustment in height" (p. 12) to accommodate different weights, ages, physical and learning needs. She worried about "eye strain, stooped shoulders, [and] contracted lung capacity" (p. 12) when desks and chairs could not be customized. In turning her gaze to school design, she observed that "the tendency at present seems to be to spend nearly all the building appropriation upon the structure itself… but the furniture …gets what's left" (pp. 12–13).

More recently, Martinez (2005) examined the school desk as an "outstanding object-imprint of the material history of the school" (p. 72). As with others tracing the development of school designs, Moreno Martinez acknowledges the influence of hygiene and medicine as well as pedagogy in Spain, where the Open Air Schools League also influenced thinking. He noted that the pace of international ideas affecting Spain's education "induced the slow rhythm of school furniture moderniza-tion" (p. 72). Through his research, he discovered early twentieth century technical instructions specifying school furniture for Spanish primary schools. These same specifications stayed in place until Franco's rule (1939–1975). Four models were available. These models account for different ages, shapes and heights of students. However, for budgetary and economy of space reasons, a preference for bench styles was made clear. Bench styles are characterized by desks and chairs being one connected piece of furniture accommodating two or three children at a time. Figure 2.6 illustrates a 20st century use of a bench seat; such school furniture has a long history over time and educational context.

Herman et al. (2011) address Belgian school furniture as "mediating agencies" (p. 98) in the social, educational and cultural relationships of schooling. They ask, "why have many 'desks for the future', never had a future?" (p. 99). They examined the occupations of patent lodgers in respect to school furniture designs and discovered that teachers, school board members, architects, mathematicians, cabinetmakers, a wholesaler and a doctor had submitted patents for school furniture designs. Inter-national patents were also lodged, indicating a global interest in the physical health of the child. As early as the World Fair in Paris (1878), over 100 versions of school desks were on display.

The overriding emphasis in these designs centered on school hygiene, coupled with ease of use (posture, access, safety). Two other considerations featured: teachers' movement around desks and how low they needed to bend to see students' work. German patent holders became the most successful in Europe through their focus on hygiene and ergonomics. Herman et al. note, however, that any considerations about desks' aesthetic qualities or associated government regulations were absent from the school furniture designs for Belgian schools. One possible reason, the authors suggest, was a clear demarcation between furniture for everyday working use, and

Fig. 2.6 Twenty-first century students sitting at an early 20th century version of a bench-seat school desk. The Gardens School
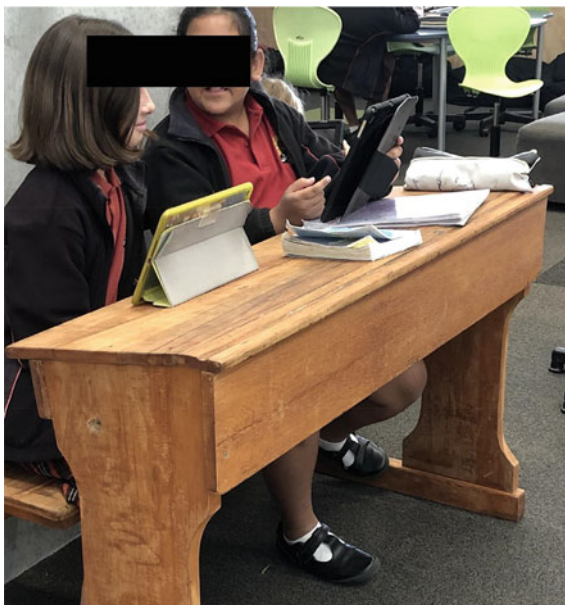
furniture as an expression of art. The austerely functional focus of school furniture has been an abiding feature. These functions consider the practicalities of cleanliness. Chairs needed to be stackable out of the way for cleaning. Keeping classrooms clean had been much more problematic when chairs and tables were fixed to the floor.

More recently, Holder (2015) argues that furniture can be either "instrumental in the success of a school, or 'compromise an otherwise successful space'" (p. 221). Furniture, he noted, serves as the most 'direct interface' to connect the learners with the built environment of the school. As such, it can organize space and provide storage, as well as suggest areas for movement or specific activities. Every day, teachers and learners use chairs, tables, lockers, benches, screens, and cupboards. This furniture acts as a mediating influence between people and learning activities. They shape, Holder (2015) suggests, "our actual experience of a learning space" (p. 221).

Current designs for school furniture in Aotearoa New Zealand advertised themselves variously as being 'innovative' and able to accommodate 'different learning styles' (see for example, Scholar Furniture, 2020). Manufacturers now produce desks and tables that can be put together to create different shapes, to suit learning needs, tasks and numbers of people. One manufacturer in Aotearoa New Zealand has even created a 'wobble stool' that acknowledges how much five year olds want to move, even while sitting (Woods Furniture, 2020). The website suggests that this stool helps increase "attention span, blood flow and strengthen lumber (sic) muscles".

Another Aotearoa New Zealand school furniture manufacturer's website suggests it provides furniture that is adaptable for size and shape, which may address Garde's

(1911) concerns. This manufacturer describes their school furniture as an "innovative and ergonomically designed system that reflects the ways students of all sizes use school furniture" (Furnware, n. d.). A Wilf Malcolm Wilf Malcolm Institute of Educational Research study (On task video analysis project, 2006, September) examined how school students used the same company's furniture compared with using standard furniture, using video footage to capture rates of movement, fidgeting, and leaning (forward or back). While findings were tentative since the footage data represented different classes undertaking different tasks, leading to different kinds of student activity, they suggest that the new type of furniture reduced physical discomfort and made it easier for students to move and manipulate resources and materials according to learning tasks and needs. It is difficult, however, to substantiate claims manufacturers make about the influence their furniture has on learning, for a direct relationship between furniture and learning is difficult to draw. We can say nonetheless, that the pace of changes to the quality, design and style of school furniture is in tandem with recent global disruptions and shifts in technological advances influencing other aspects of the educational landscape.

Precipitating Change

Technological, geo-political and economic shifts—and a new pandemic—have precipitated critical appraisals of the fitness of current school buildings and room configurations for this century's needs. A strong trend in new buildings reflecting international educational aspirations has resulted in large, open, light spaces, intended to be flexible enough for a range of needs and purposes. Furniture and partitions either help or hinder the greater fluidity expected of these new learning contexts (Holder, 2015). There is also an expectation of reduced dependence on transmissive, didactic teaching practices to meet new views of how to meet the challenges this new century brings. Greater access to technological affordances link with changes to both the design of learning spaces, learning furniture, and pedagogical practices.

Some changes to schools have been precipitated by catastrophic events, such as World Wars or, as in the case of Christchurch, Aotearoa New Zealand, the seismic destruction created by repeated earthquakes. Regarding the former, the British post war period of constrained resources meant rethinking how schools could be supplied and rebuilt (Rothenberg, 1989). About 5,000 schools in the UK were affected by World War II. Coupled with the effects of the UK's Butler Act of 1944 declaring free compulsory secondary schooling, a rethink and rebuild was urgent and pressing. From the cessation of war, a population bulge worked its way through the school system there, as it did in New Zealand. These two events—a population bulge and the effects of war—prompted a growth in new schools and their design.

The same year Britain made secondary school compulsory, Aotearoa New Zealand raised the school leaving age from 13–15. Between then and the early 1950s, the school population doubled, leading to rapid school expansion, with many classrooms added as 'prefabs' (prefabricated classrooms). Pressure on school spaces increased

again after 1989, when the school leaving age was raised to 16, partly to offset some effects of an economic crisis. New and rebuilt schools were therefore desperately needed. There were creative responses to the nature of classroom design as educators and local education bureaucracies began talking (Wright, 2018). This also led to some rethinking about how learning should happen, and what counted as learning. Franklin (2012, p. 322), in reflecting on similar pressures in British schools during a similar period of time, noted that architecture became yoked "to educational purpose", and idea that Alterator and Deed (2018) commented on, noticing how educational policy directions and the design of school spaces became more closely connected.

Woolner's (2010) description of four primary schools built in post-WWII Britain, exemplified how changed social and economic conditions led to changed conditions for schools. One example is Burleigh Primary School, in Cheshunt, Hertfordshire, built between 1946–1948 and during a period of "severe shortages of labor and materials" (Woolner, 2010, p. 4). To mitigate the effects of these shortages, the local education authority turned to architects willing to create new school designs and use new methods for construction, such as being wholly or partially built off-site, reducing labor and materials costs. By creating a series of modular designs, a number of layouts were possible, while accommodating scarce resources. Modular designs appear to be influenced by the pavilion designs of the Open Air movement, resonating with the view that a school should be built "lightly for a life of free and changing activity" (Woolner, 2010, p. 4). This sentiment persists, for the deliberate use of glass and open learning spaces common to the Open Air movement are visible in the current regulations and design of schools in Aotearoa New Zealand. It is these new designs that take the moniker *modern learning environments* or f*lexible* or *innovative learning environments.*

After the Christchurch earthquakes, the Ministry of Education commissioned testing on its schools to check their resilience in quakes. Brunsdon et al. (2014) reported on this, having examined the resilience of the Ministry's school building stock. Most of this is wooden framed and single storey, and, because the Open Air Schools' principles related to light and ventilation feature in these buildings, there is often considerable glass. This was one of the considerations in the testing. Wood is a resilient building material. New builds often feature steel and glass, as well as wood while also having to comply with seismic rules. These requirements are part of the ongoing changes and complexities of building schools for long term use. What is 'future-proofed' in one decade, may not stack up in another. Many of the new and rebuilt schools in Christchurch and other earthquake-affected areas now feature larger learning spaces, multiple kinds of furniture, and good lighting and ventilation. At the same time as coping with the physical changes of schools, teachers were also faced with pedagogical change, intensifying their professional stress. Covid-19 lockdown scenarios and physical distancing requirements have also had an impact on conceptions of learning spaces and again intensified professional stress. Effects of Covid-19 and physical distancing is addressed in a later section.

However, not all classroom spaces are blessed with the key features of space, flexible rather than fixed furniture, or good ventilation and lighting. In many instances, teachers and students continue to manage with what they have available to them.

Learning Spaces, Change and 'Making Do'

Rendinda's blog post (2018, May 7) identifies how teachers and librarians have continued to 'make do' in classroom spaces that do not speak to twenty first century learning needs. She suggests that some classroom spaces might organize desks in rows because it makes for efficient cleaning, rather than effective learning. Not satisfied with such classroom arrangements (in her US context), she argues for change, saying:

> We can DIY [do-it-yourself], take down shelves, change out furniture, add color, open windows, bring in plants. All of these things help. These things don't have to be expensive. Even the small changes can make a huge difference for our students (para 5).

Her argument centers on comfortable classrooms that foster connections between students and support learning. Rendinda argues that when students develop relationships with each other, it quickly reduces feelings of being "just an anonymous individual in a sea of a thousand students". Instead, she suggests that space and design can positively enhance pedagogy; together, they connect with positive mental health and personal growth. She asserts that:

> our learning spaces are more than just classrooms and libraries and schools. They are the place where our future is created. We form minds here. The next generation learns what they need.... Will we fix the problems with a new coat of paint and a more comfortable chair? No, but we have to start somewhere. (Final paragraph)

Similar sentiments have led some educators to seek change. Half a century earlier than Rendinda's plea, educators like Neill (1960) were already experimenting with learning spaces in schools like Summerhill because they were dissatisfied with the traditions of the existing model. Neill (1960), among others, was swayed by the ideas of the 1960s and 1970s social movements, where social justice concepts like peace education, sex education plus racial and gender equality became prominent issues. These concepts asserted influence on educational thinking, leading educators to debate ideas about the purpose of education, how it might be more inclusive of marginalized students and how it might better prepare for a changing world. The shape and functions of some school spaces and places responded to changed educational purposes and government imperatives, thus demonstrating Alterator and Deed's (2018) observation that school architecture can act as an instrument of the state, disrupting pedagogical practices through physical space design.

The decades of the 1960–1980s intensified thinking about ways of addressing students' learning needs. Professional development and research projects in Aotearoa New Zealand on literacy (May, 2007; May & Wright, 2007; Smyth, 2007; Whitehead, 2007), numeracy (Higgins et al., 2005) and Māori students learning as Māori (Bishop & Berryman, 2006; Bishop & Glynn, 2000) for example, was one method of fostering change. This renewed focus on learning needs drew attention to the nature of learning spaces and led to some experiments. Cameron and Robinson (1984) reviewed a trial of open plan units or 'pods' across over 500 primary/intermediate schools, catering for about 40,000 students. The authors noted wide variation in how schools used the

pods, and there was also wider variation in teacher/student ratios. In some schools, teachers worked together in the pods; in others, alone. There was also wide variation in how the classroom spaces themselves were used; some were entirely a single open space, while others had clearly defined and specific areas to better mimic traditional classroom contexts.

These were not the earliest experiments in changing the nature of learning or understanding the effects of new/different learning spaces in Aotearoa New Zealand. Between the two World Wars, two South Island schools recorded how they met new challenges for new circumstances. Strachan (1938) and Somerset (1938, 1941, 1948) documented how their new school buildings, coupled with inspired leadership, drew on the wider school community and local industry expertise to use local resources, creating meaningful, inclusive, community-focused and integrated learning. To do so, they found out what interested students, and built a local curriculum of authentic learning programmes that were, in turn, valued by, and contributed to, the wellbeing of their immediate communities. This same spirit is in evidence in this century's schools that are making an effort to respond to current social, economic and political challenges and disruptions (Wright, 2018; Wright & McNae, 2019). In schools which take a community involvement approach and design learning to accommodate student interests, students help to solve problems within their communities. At the same time, local communities develop closer connections with their schools, learning in turn to appreciate the skills and abilities students bring to community problems. To this end, the *Education Gazette* often outlines ways that schools and local communities connect. For example, one feature described the effects of Intermediate aged students (11–13 years old) taking charge of riparian planting in the rural town of Matamata. The article outlined the positive effects of this task on the local environment and wider skills and knowledge (Education Gazette, 2019, May 30). To date, it is seldom that similar *Education Gazette* reports address the nature of the classrooms themselves. Instead, they focus on the nature of the learning within them.

Shifts in the shape and nature of learning spaces often coincide with specific events or periods of time, including World Wars, population explosions and the carnage earthquakes can wreak. The Spanish Flu pandemic of the second decade of the twentieth century, adding to high rates of tuberculosis, influenced the rise of the Open Air Schools League movement. A very recent pandemic has also focused attention on the nature of learning spaces and what teachers and learners use as classrooms.

Making Do in a New Pandemic

Nair (2020, May) critiqued open plan offices as a failed experiment, and then turned his attention to the design of school spaces in the light of the strategies for coping with a pandemic like Covid-19. He pointed out that "All the negative consequences of being trapped within sight and hearing of one's colleagues at work are multiplied tenfold within the classroom" (p. 2). In workplaces he suggests, there are often

screens or carols that separate workers. In schools, there is "not even the pretence of private space" and that having so many students in such "close proximity for so many hours each day discourages (rather than facilitates) cooperation and collaboration while interrupting the mental 'flow' that is necessary for creativity and complex problem solving" (p. 2). Such proximity in a single space became an issue during Covid-19 restrictions. Teachers have had to figure how to offer physical distancing to prevent and manage potential or actual outbreaks of the virus. Ackers (2020, July 29) took an architect's view of what physical distancing would be like in a primary school. The blog post outlined a scenario of a student's school day when half the class could be physically present, while the other half had to learn at a distance (the pedagogical implications of this were not addressed). Ackers considers how a physical distancing regime could be maintained through concentrating on managing movement through designated learning spaces and zones, but does not address the pedagogical complexities of the simultaneous learning conditions of presence and distance.

In schools built in Aotearoa New Zealand in the decades between the 1950–2000s, the scope for abiding by physical distancing rules is quite small because of the nature of the classrooms. A classroom that normally holds 30 students, could, in a Covid-19 restriction scenario, now have room for half that number. The complexities of managing this are most likely very challenging. Such circumstances require new thinking: Ackers (2020, July 29) has attempted that from an architect's point of view.

Elsewhere, Scotland published their Framework for Decision-Making (Scottish Government, 2020) as their response to new challenges. Scotland's document outlines its intention "to redesign workplaces, education settings and other premises so they are places where [virus] spread is minimized" (Scottish Government, 2020, p. 20). A framework of this nature may result in widespread use of designs for larger learning spaces to make physical distancing easier to achieve, especially if projections about the virus's global persistence are realized. Glasgow-based Architect Jude Barber, for example, reportedly argued that "Given the spatial and behavioral challenges surrounding the pandemic, it seems only right that architects, landscape architects and planners should be central to the discussion and share their ideas and expertise" (BBG, 2020, April 24. para 7). It may be that some of the principles from the Open Air League movement might be useful still.

Architects, in designing new school buildings, are "posed with a difficult challenge: designing for the unknown" (Kemp, 2015, p. 71). This is because schools are, paradoxically, constantly changing and constantly constant. Schools cope with large numbers of people moving from subject to subject in secondary schools on a regular basis—often hourly. Furniture and spaces get heavy use. They must therefore be sturdy and durable to cope with different bodies, shapes and wear. However, even with "thorough consultation" (Kemp, 2015, p. 71), it is difficult to predict how a space will be used over its lifespan. As Nair (2020) pointed out, events may overtake us to disrupt how we perceive work or learning spaces, once people are using them.

As governments like Aotearoa New Zealand's regulate the specifications for classrooms and schools, there will continue to be change over time: demographics, catastrophes (war, pestilence, natural disaster), and other factors including political

agendas and social change, contribute to the flux of what is deemed appropriate as learning spaces. If history teaches us anything about education and the spaces that are used for learning, then it is clear that schools are responding to need, change, and shifts; even if they'd prefer not to. Teachers are generally quite pragmatic: they and their students will use whatever is available to *make do*. The key difference is the extent of the creativity teachers bring to facilitating learning within policy contexts that may help or hinder (Ministry of Education, 2007). This is also true of the physical spaces available for teaching and learning.

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Chapter 3
Policy and Strategic Directions: Implications for Teacher Learning

Check for updates

Beverley Cooper

Abstract Greater demands are being put on education systems to prepare all learners to manage change and shape a just and equitable future. Over recent years there has been significant revision of international and national policy that set the expectations and aspirations for the teaching workforce at all levels within educational systems including preservice, in-service and school leadership. Looking specifically at the Aotearoa New Zealand context, the recently developed Our Code Our Standards outlines the Code of Ethical Conduct and Standards for the Teaching Profession (Education Council New Zealand 2017), apply to all preservice and practising New Zealand teachers. The Code is underpinned by strong values emphasising empowering learners to reach their potential and to engage in positive, respectful and collaborative relationships with learners, their families, colleagues and their wider community. Similarly, the Leadership Strategy for the Teaching Profession of Aotearoa New Zealand (Education Council New Zealand, 2018) positions all teachers as leaders and its vision is to enable all teachers to develop their own leadership capability so that the teaching profession achieves educational equity and excellence for all children and young people in Aotearoa New Zealand. Teachers are expected to work in increasingly sophisticated ways to allow greater emphasis on individual learner outcomes. Accordingly, education systems have to be responsive and future focussed if the goal is that every teacher is prepared with the pedagogical skills required to innovate, rethink and transform teaching and learning. To maximise the opportunities for teachers to innovate, digital technologies and flexible learning spaces create fertile conditions for change. This means the whole context in which teaching and learning take place is under scrutiny. A whole school context encompasses the physical space, the social aspects and the pedagogy experienced by the learners. This chapter discusses how international and national policies are reframing teaching and learning in response to the shift to ILEs along with the implications of this for teacher learning.

Keywords Policy framework · ILE · New Zealand education · Initial teacher education

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Introduction

Greater demands are being put on the education system to prepare all learners to manage change and to shape a just and equitable future. Teacher education including preservice, in-service and school leadership, is seen as a critical part of system change to support educational innovation. Over recent years there has been significant revision of international and national policy that set the expectations and aspirations for the teaching workforce at all levels within educational systems. International and national policy levers are influencing the shape of preservice and in-service teacher education in Aotearoa New Zealand to prepare teachers who are capable, professional and able to assist all learners to achieve success in education in the twenty-first century.

Over the last two decades educational policies have shifted from a focus on guaranteeing universal access to education and the provision of materials and resources (inputs), to policies centred on learning outcomes achieved by students in the school system (outputs) (OECD, 2013a, 2013b). Many countries aim to prepare all their young people to become lifelong learners with deep understanding and a broad set of social skills (Paniagua & Istance, 2018). Current educational policy globally, focuses on equipping learners with broad sets of knowledge, competencies, values and attitudes to become active, responsible and engaged citizens involved in decision making for a socially just world.

International groups such as the United Nations Education and Scientific and Cultural Organisation (UNESCO) and the Organisation for Economic Co-operation and Development (OECD) advocate for the promotion of quality teaching and learning worldwide and are key influences on economies worldwide when countries formulate their education policy. Both UNESCO and OECD disseminate the results of research studies to illustrate innovative practices, trends and challenges and influence international education policy development. For example, UNESCO members gather annually at the International Policy Dialogue Forum, hosted by the International Task Force on Teachers for Education 2030, to review and exchange good practices in capacity development. Education is a key focus for the OECD and their international projects such as the Teaching and Learning International Survey (TALIS), Programme for International Student Assessment (PISA), Innovative Learning Environments (ILE) and Innovative Pedagogies for Powerful Learning (IPPL), inform policy decisions worldwide that ultimately affect what teachers learn and practice.

With a focus on policies for "better lives" these organisations maintain that the importance of teacher leadership and teacher learning has never been more paramount in societies facing rapid and substantive change. Greater demands are being put on education systems to prepare all learners to manage change and to contribute to shaping a just and equitable future.

> Schools need to prepare students for a world in which many people need to collaborate with people of diverse cultural origins, and appreciate different ideas, perspectives and values; a world in which people need to decide how to trust and collaborate across such differences;

and a world in which their lives will be affected by issues that transcend national boundaries (OECD, 2015, p. 4).

Recognising the importance of education and its influence on the economy, innovation and globalisation, Governments worldwide have set aspirational goals for their educational agencies (See Fig. 3.1). For example, the United States Department of Education's mission is to "promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access" (U.S. Department of Education, n.d., Para. 1), and the United Kingdom's Department of Education's vision is "to provide world-class education, training and care for everyone, whatever their background. It will make sure that everyone has the chance to reach their potential, and live a more fulfilled life. It will also create a more productive economy, so that our country is fit for the future" (Department of Education UK, n.d., Para. 2). In Aotearoa New Zealand, the Ministry of Education states as its purpose, "We shape an education system that delivers equitable and excellent outcomes" (Ministry of Education [MoE], n.d., Para. 1). Their vision is that "Every New Zealander is strong in their national and cultural identity, aspires for themselves and their children to achieve more, has the choice and opportunity to be the best they can be, is an active participant and citizen in creating a strong civil society, is productive, valued and competitive in the world and New Zealand and New Zealanders lead globally" (MoE, n.d., Para. 3).

Governments and policy makers recognise that teachers have a significant responsibility in preparing young people to lead successful and productive lives. For example, in 2008, Australian Education Ministers committed to specific educational goals that promote equity and excellence to enable all young Australians to become

Fig. 3.1 The influence of international policy on national policy directions

successful learners, confident and creative individuals, and active and informed citizens. They emphasised that Australian state and federal governments, universities, school sectors and individual schools have a responsibility to work together to support high-quality teaching and school leadership including enhancing preservice teacher education (Ministerial Council for Education, Employment, Training & Youth Affair, 2008). Finland's vision for student learning has as its central focus, lifelong and authentic student development as a human being and as a citizen. Integral to this central focus are broad transversal competencies within each subject area that reflect a vision for learning based on values that are personal, national, global and futuristic, including: cultural competence, taking care of oneself, multiliteracy, information and communication technologies competence, competence for the world of work and entrepreneurship, participation, influence for building a sustainable future and thinking and learning to learn (Burg, 2018). In South Korea, the national curriculum revisions focused learning on key competencies such as self-management competency, knowledge-information processing skills, creative thinking skills, aesthetic-emotional competency, communication skills and civic competency. They also promote character education and aim to produce people that communicate well with others and have balanced growth of strength, virtue and wisdom (Ministry of Education South Korea, n.d). Accordingly, education systems have endeavoured to be responsive and future-focussed and to prepare teachers to work in increasingly sophisticated ways to allow greater emphasis on individual learner outcomes across wide domains (Bolstad et al., 2012; Darling-Hammond et al., 2020). Economies have recognised that teachers require pedagogical skills and need to use adaptive expertise to innovate, rethink and transform teaching and learning to equip learners with the knowledge, skills and dispositions required for their future.

Research has found that the greatest variation in student learning outcomes is not between schools but between classrooms within schools, which supports the view that education quality is largely related to the quality of its teachers (Hattie, 2009). Many countries have introduced or strengthened mandated teaching standards to support the continuous development of a quality teaching workforce, which is seen as critical as in improving student achievement. Standards are not only intended to make explicit the complex nature of teachers' work, but also strengthen the public confidence and status of the teaching profession (Education Council New Zealand [ECNZ], 2017). For example, the recently developed *Our Code Our Standards,* which applies to all pre-service and practicing New Zealand teachers, outlines the *Code of Ethical Conduct* and *Standards for the Teaching Profession* (ECNZ, 2017) and describe the essential professional knowledge, professional relationships and values required for high-quality effective teaching and leadership for all learners across all education settings. The standards emphasise empowering learners to reach their potential and engaging in positive, respectful and collaborative relationships with learners, their families, colleagues and the wider community. Similar sets of standards have been developed in many parts of the world (e.g., Australian Professional Standards for Teachers introduced in 2013, Teacher Standards in the UK introduced in 2012 and California Standards for the Teaching Profession introduced in 2009).

Twenty-First-Century Competencies

As part of the *Future of Education and Skills project 2030* launched in 2015, the position paper *OECD Learning Framework 2030—The Future We Want*, espoused the following shared vision for education:

> We are committed to helping every learner develop as a whole person, fulfil his or her potential and help shape a shared future built on the well-being of individuals, communities and the planet. …in an era characterised by a new explosion of scientific knowledge and a growing array of complex societal problems, it is appropriate that curricula should continue to evolve, perhaps in radical ways (OECD, 2018, p. 3).

Twenty-first-century learning is conceptualised as involving four dimensions; *knowledge* (traditional, modern, thematic and interdisciplinary); *skills* (creativity, critical thinking, communication and collaboration) and *character* (mindfulness, curiosity, courage, resilience, ethics and leadership)—all set within a *meta-cognitive*, *meta-learning* dimension where students and teachers reflect and adapt continuously on their learning (Fadel & Groff, 2019). The meta-learning dimension is significant. When people are given an opportunity to embrace challenges and adopt a growth mindset to learning, they improve achievement and their self-perception of their abilities (Dweck, 2006). This dimension includes ideas such as learning how to learn, interdisciplinarity and systems thinking, which are essential for establishing lifelong learning habits, activating transference and fostering creativity (Schleicher, 2012).

The OECD highlights that curriculum should be dynamic, flexible and personalised to recognise that individual students bring different prior knowledge, attitudes and values to learning. They suggest that in addition to quality learning in core curriculum disciplinary foundations, transformative competencies should be embedded within curriculum in meaningful ways that will lead to deep learning experiences for all students. Transformative competencies are defined as the types of knowledge, skills, attitudes and values students need to transform society and shape the future for better lives both individually and collectively. The proposition is that these competencies create new value, and assist people and society to take responsibility for reconciling tensions and dilemmas (Bently, 2017).

The OECD Learning Framework 2030 uses the metaphor of the "Learning Compass" to show the types of competencies students need in order to "navigate towards the future we want, individually and collectively" (OECD, 2019, p. 15). The compass metaphor was adopted to emphasise the need for students "to learn to navigate by themselves through unfamiliar contexts and find their direction in a meaningful and responsible way, instead of simply receiving fixed instructions or directions from their teachers" (OECD, 2019, p. 24). Table 3.1 summarises the composition of the elements of the compass.

The Learning Compass acknowledges the wide range and types of learning that occurs both in and out of school required to support students to be self-directed lifelong learners. This evolving framework helps develop common global terminology and understandings for educators and students, and also provides opportunities to be adapted to the priorities of local contexts.

Table 3.1 Key elements of the OECD Learning Compass

Element	Description	Composition
Core foundations	Fundamental conditions and core skills, knowledge, and attitudes and values that are prerequisites for further learning across the entire curriculum	*literacy and numeracy*; What it means to be literate and numerate will continue to evolve *health foundations*, including physical and mental health, and well-being *social and emotional foundations,* including moral and ethics and digital literacy and data literacy
Key Competencies	Competencies needed for a successful life and a well-functioning society	*Use tools interactively* (e.g., language, symbols, text, knowledge, information & technology) *Interact in heterogeneous groups (relationships, cooperation, resolution) Act autonomously (big picture, plans, interests, needs, limits)*
Transformative competencies	Students develop and reflect on their own perspective and learn how to shape and contribute to a changing world	*Creating new value Reconciling tensions and dilemmas Taking responsibility*
Student agency/co-agency	The development of an identity and a sense of belonging. Students have the will and the ability to positively influence their own lives and the world around them and the capacity to set goals, reflect and act responsibly to effect change	Students learn, grow and exercise their agency in social contexts Students develop co-agency in an interactive, mutually supportive and enriching relationship with their peers, teachers, parents and communities in a larger learning ecosystem
Knowledge	Theoretical concepts and ideas in addition to practical understanding based on the experience of having performed certain tasks	Disciplinary Interdisciplinary Epistemic and Procedural
Skills	The ability and capacity to carry out processes and be able to use one's knowledge in a responsible way to achieve a goal	Cognitive Metacognitive Social and emotional Practical and physical
Attitudes and values	Principles and beliefs that influence choices, judgements, behaviours and actions	Shared values Inclusive, fair, and sustainable economies and societies

(continued)

Table 3.1   (continued)

Element	Description	Composition
Anticipation-Action-Reflection cycle	An iterative learning process whereby learners continuously improve their thinking and act intentionally and responsibly towards collective well-being	Consider consequences for the future Will and capacity to take action Improved thinking, which leads to actions towards individual, societal and environmental well-being

(Adapted from OECD, 2019*,* pp. 23–25 *and* OECD (n.d.) *OECD Learning Compass 2030 Concept Notes.* http://www.oecd.org/education/2030-project/teaching-and-learning/learning/all-concept-notes/).

Implications for Teacher Learning

A recently published report from the USA*, Changing Expectations for the K-12 Teacher Workforce: Policies, Preservice Education, Professional Development, and the Workplace* (National Academy of Sciences, Engineering, & Medicine, 2020) has synergies with the Learning Compass. The report emphasises the importance of developing core academic content, critical thinking and problem-solving, effective communication, the ability to work collaboratively, learning how to learn, and academic mindsets. It suggests that students' experiences should be aligned with the five principles of deeper learning: (i) learning that is developmentally grounded and personalised; (ii) learning that is contextualised; (iii) learning that is applied and transferred; (iv) learning that occurs in productive communities of practice; and (v) learning that is equitable and oriented to social justice (Darling-Hammond & Oakes, 2019, pp. 13–14). The report and these principles have implications for the way that we prepare and support teachers to understand and implement the types of pedagogy that are effective in engaging learners in the kinds of conceptually rich, intellectually ambitious and meaningful experiences required for deeper learning (Darling-Hammond et al., 2020; Osborne et al., 2019).

New approaches to curriculum design and learning progression recognise that all students are equipped with different prior knowledge, skills and attitudes when they start school and have their own learning trajectories. There are new expectations for teachers. These include having the skills to pursue greater conceptual depth and understanding of disciplinary knowledge, plus integrating and using current digital technologies to work effectively with diverse groups of students and their families. The intent centres on supporting all learners to engage with inquiry and sense making (Cobb et al., 2018; Darling-Hammond & Oakes, 2019; Darling-Hammond et al., 2020; Osborne et al., 2019; Paniagua & Istance, 2018).

In a recent paper, Darling Hammond et al. (2020) synthesised research evidence about effective strategies that support the kinds of relationships and learning opportunities needed to promote children's well-being, healthy development, and transferable learning. They emphasise that children's development and learning are shaped by the interactions between factors such as the environment, relationships and learning opportunities experienced both in and out of school. Darling Hammond et al., advocate a deeply integrated approach to practice in schools within a supportive, relational environment that supports children's cognitive and social and emotional development, motivation, competence. The importance of designing meaningful work that builds on and has connections to students' prior knowledge and experiences is highlighted. Inquiry is encouraged as a major learning strategy, "thoughtfully interwoven with explicit instruction" (p. 99).

Some argue that as the new focus for education is "setting out not what children are expected to *know*, but how they *should be*" (Watson, 2010, p. 99), there is a worldwide trend to "shift from the specification of disciplinary knowledge to an emphasis on the development of generic skills, often with an instrumental focus on citizenship and/or the workplace" (Priestly & Sinnema, 2014, p. 2). The weakening of traditional subject boundaries and the lack of specification of content has implications for teacher learning and preparation and is seen as problematic, particularly for less experienced teachers (Young & Muller, 2010). However, through carefully designed rich inquiry and problem-solving approaches, it is possible to conceive alternative rigorous approaches to teaching disciplinary knowledge that are interdisciplinary in nature, rather than being framed as traditional subjects (Whitty, 2010).

The strong focus on individual learners acquiring a diverse set of competencies including a deep knowledge of subject matter and a broad set of social skills, requires teachers to have a strong understanding of pedagogy and how this influences learning. For teachers, this means they will need to use an increasing repertoire of teaching strategies, approaches, learning activities, technologies and assessment for learning strategies and to be adaptive to optimise student learning. They need to teach in ways that enable learners to learn from one another, to collaborate, to self-regulate and to develop agency over their learning. Social and collaborative learner-centred pedagogies such as inquiry or cooperative learning are particularly suitable to support student learning in authentic relevant contexts. They can also promote the application of key skills and attitudes critical to deep active learning (Drake & Reid, 2018; Paniagua & Istance, 2018). These pedagogies however, are more complex than the direct transmission of knowledge to students via textbooks or whole class teaching. They are highly dependent on firstly, the knowledge and skills of the teachers involved, and secondly, their students understanding themselves as learners. The kind of education needed today requires teachers to be "high-level knowledge workers who constantly advance their own professional knowledge as well as that of their profession" (OECD, 2012, p. 35).

The OECD's comparative review of innovative learning environments (OECD, 2013b) promotes that to develop themselves professionally, teachers need to have opportunities to work collaboratively to design learning environments and teach

in team approaches in order to address the learning needs of particular groups of students. The review emphasises that teachers need:

- knowledge of how and when to use a rich repertoire of strategies and the ability to combine approaches.
- deep understanding of how learning happens and of individual students' motivations, emotions and lives outside the classroom.
- to work in highly collaborative ways with others such as teachers, parents, professionals, para-professionals and networks of professional communities.
- strong skills in digital technologies and their use as effective teaching tools.
- to optimise the use of digital resources in their teaching.
- use information-management systems to track student learning.
- to design, lead, manage and plan in collaboration with others.
- to reflect on their practices in order to learn from their experience and be adaptive.

A key lever for improving the preparation and engagement of learners with twenty-first century skills, lies in the ability of teachers to match their pedagogy to the natural inclinations of learners towards play, creativity, collaboration and inquiry. This means creating tasks that are relevant and engaging (Paniagua & Istance, 2018). Teaching that is student-centred and promotes active participation requires deliberate planning and highly deliberate teaching. Furthermore, to allow for innovation and teaching contextually, teachers need to be aware of the way subject domains are structured and what key concepts and ideas are covered. Teacher standards emphasise the use of inquiry, collaborative problem solving and professional learning to improve teacher professional capability to impact on the learning and achievement of all learners. Ongoing experimentation and inquiry into their practice are necessary to align and/or develop teachers' personal capacities to effectively plan and use innovative pedagogies. Teachers' professional learning involves engaging in and adaptively applying this learning in practice, critically examining assumptions and beliefs, and regularly inquiring and reflecting on the effectiveness of practice, using evidence from a range of sources (ECNZ, 2017).

Implications for Teacher/school Leadership

The importance of leadership in supporting curriculum and pedagogical innovation cannot be underestimated. The OECD's comparative review of school leadership (Schleicher, 2012), for example, found that leaders play a vital role in promoting teachers' professional learning and development. Successful school leaders focus on the objective of improving teaching and learning. They strategically align resources with pedagogical purposes, such as setting a school vision or revising curriculum or rethinking the way the school develops students' key competency capabilities. In 2018, the Aotearoa New Zealand Education Review office (ERO) visited 12 schools to investigate how they were preparing students for twenty-century learning. They found that successful and innovative school leaders were proactive. They worked

with the whole school community to develop a strong, future-focused school vision, with learner outcomes at its centre. This linked to a continual focus on personalised student outcomes and curriculum and pedagogy were tailored to individual learner needs. Successful leaders exhibited a growth mindset, developing school cultures of continuous improvement aligned with the school vision. They were well informed about best practice for twenty-first-century learners. Such leaders were committed to experimenting with novel ways to work and also worked collaboratively, supported teachers' experimentation, and invested in professional development (ERO, 2018). The *Leadership Strategy for the Teaching Profession of Aotearoa New Zealand* (ECNZ, 2018) positions all teachers as leaders with the vision to enable every teacher to develop their own leadership capability so that the teaching profession achieves educational equity and excellence for all children and young people in New Zealand.

Collective teacher efficacy (a shared belief that through collective action, teachers can positively influence student outcomes), has the greatest impact on outcomes for students (Hattie, 2016). Developing collective teacher efficacy amongst all teachers in their school contexts is therefore a critical part of school leadership. Significant investment in leadership is required to ensure teachers develop shared beliefs, understanding and commitment to the student-centred pedagogy necessary to support the learning they aim to achieve (Mackey et al., 2017). For example, one qualitative study involved an investigation of practice in three Auckland primary schools where an innovative learning environment existed and personalised learning was being implemented. It found that leaders and teachers had confused and often disparate understandings of the term *personalised learning*, and they were challenged by the changes required. The study concluded that leaders must act to ensure the effective implementation of deep personalised learning. This includes clarifying how personalised learning is understood and practised and then sharing this vision with all stakeholders (Cardno et al., 2017).

Innovative Learning Environments

In Aotearoa New Zealand, Innovative Learning Environments (ILEs) have been adopted rapidly throughout the country, with the expectation that all schools are operating quality ILEs by 2030 (MoE, 2020). This trend is also seen internationally (Barret et al., 2015b; OECD, 2013a). ILEs are not only physical spaces. They need to be viewed as "learning ecosystems". The learning ecosystem includes the activity and outcomes of learning as well as interactions between the social, pedagogical and physical context in which learning occurs. These interdependent interactions occur at the micro (school/institution), meso (community/networks/initiatives) and meta level (policy/global) and with interdependent combinations of different providers and organisations playing different roles and with learners in differing relationships to them over time and in varying mixes (OECD, 2015). It is recognised that "learning environments and systems do not change by themselves but need strong design with

vision and strategy" (OECD, 2015, p. 4). ILEs are conceptualised as future focussed and capable of evolving as educational practices evolve (MoE, 2016). The *OECD* defines an ILE as "an organic whole embracing the experience of organised learning for given groups of learners around a single "pedagogical core" (OECD, 2017, p. 16) composed of four elements: learners, educators, content and resources. An ILE offers a different way of working collaboratively which ideally is learner-focused (OECD, 2013). The design of ILEs is, according to the OECD, focussed on offering opportunities to optimise learning for participants, including the activity and outcomes of learning, rather than just a location where learning takes place.

ILEs tend to be understood as teaching-and-learning spaces characterised by cutting-edge technologies and pedagogies where multiple teachers work with often large groups of students in open-plan settings. These settings are said to encourage collaboration and inquiry for both learners and teachers, and support teachers to teach in the style that best suits the needs of diverse learners (MoE, n.d.). The longitudinal *Innovative Learning Environments and Teacher Change* (ILETC) Australian Research Council project (2016–2019) involving four countries (Australia, New Zealand, Sweden and the US), defines ILEs as the product of innovative space designs and innovative teaching and learning practices. They point out that "a design may be deemed 'innovative' but it only becomes an ILE once its inhabitants (teachers and students) teach and learn innovatively within them" (Mahat et al., 2018, p. 9). Similarly, the 2018 ERO report *Leading Innovative Learning in New Zealand Schools,* highlighted that although maximising opportunities afforded by digital technologies and flexible learning spaces are seen as important, for ILEs to transform opportunities for learning, the whole context needs to be considered; that is, the physical space, the social aspects and the pedagogy experienced by the learners (ERO, 2018).

The OECD *Handbook for Innovative Learning Environments* (2017) identifies seven learning principles as important in ILEs. These principles may become a lens through which school leaders review the entire school to meet the demands of learning in this century:

1. The learning environment recognises the learners as its core participants
2. The learning environment is founded on the social nature of learning and actively encourages cooperative learning
3. Learning professionals are highly attuned to learners' motivations and emotions
4. The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge
5. The learning environment devises programmes that demand hard work and challenge without excessive overload
6. The learning environment operates with clarity of expectations and uses assessment strategies consistent with these expectations; there is strong emphasis on formative feedback to support learning
7. The learning environment strongly promotes "horizontal connectedness" across areas of knowledge and subjects as well as to the community and the wider world.

These principles all have implications for teacher learning and school leadership. They require teachers to develop the knowledge, skills and dispositions to make the best use of ILE physical spaces, social networks and pedagogical approaches to support student learning.

There is a growing body of evidence that an inclusive physical environment supports student achievement. However, "buildings alone are not enough; it is about relationships and changing cultures and practices" (Blackmore et al., 2011, p. 37). An inclusive ILE physical space can encourage collaboration and inquiry, for both learners and teachers, and support teachers to teach in ways that best suit the needs of diverse learners. For example, the most effective learning environments often provide a variety of different learning zones and breakout spaces (Barrett et al., 2015a). An Australian study compared students' attitudes to their learning experiences, motivation, engagement and academic outcomes in a traditional classroom layout with students in an ILE in an Australian secondary schooling context over a school year (Byers et al., 2018). They found a correlation between enhanced student attitudes and higher English, humanities and mathematics academic achievement in the ILE when compared with students of similar abilities who occupied a traditional classroom for the same period. When the classroom environment allowed teachers to teach in ways that were student-centred, such as spaces for collaboration or working with small groups, student achievement increased by between 11 and 19% across English, mathematics and humanities (Imms & Byers, 2016). The *Clever Classrooms* study carried out by the University of Salford in the UK also found that well-designed primary schools boost children's academic performance in reading, writing and maths. Differences in the physical characteristics of classrooms explained 16% of the variation in learning progress over a year for the 3766 children included in the study (Barret et al., 2015b). A systematic review of the effects of learning environments on student learning outcomes carried out as part of the ILETC project, also found some evidence of a positive correlation between learning environments and improvements in student academic achievement: particularly literacy and mathematics (Byers et al., 2018). The study highlighted however, the need for further longitudinal evaluations of how different learning environments impact a broader spectrum of student outcomes such as twenty-first-century learning domains of creativity, critical thinking, communication, collaboration and problem-solving.

In order to optimise learning for its participants in ILE spaces, there should be alignment between teaching practices, organisational structures and leadership with the pedagogical goals (Blackmore et al., 2011; French et al., 2020; OECD, 2017). A cross-case study analysis of four diverse schools successfully transitioning from traditional classrooms to an innovative learning environment in Australia and Aotearoa New Zealand, identified four shared characteristics that enabled alignment between the design and pedagogical use of a school building. These were:

i.   a culture that cultivated reflection and risk-taking;
ii. purposively designed enabling constraints (Nudges) that is intentional interventions to guide someone towards a certain decision, e.g., the removal of teacher desks or changing timetables;

iii.   changing structures by embracing new procedures and systems; and
iv.   establishing new norms and ensuring accountability for expectations (French et al., 2020).

In order to support personalised learning for diverse and numerous students, teachers in ILEs need to adopt a collaborative approach focused on shared planning, team teaching and interactive assessment (Deed et al., 2014). This approach and desired outcome have implications for teacher learning and preparation. Effective teacher collaboration requires a shift from managing the learning of a single group of learners to taking collective responsibility for the success and wellbeing of all learners. This requires a shift of thinking from "me" to "we" and from "my learners" to "our learners" (TKI, n.d.). With a shared goal of improving learner outcomes, teachers' focus is on seeking to understand and responding to what is happening for their learners by problem-solving together, drawing on both research and student evidence to inform and evaluate changes to practice.

In classrooms, practices need to be aligned to the pedagogical goals of the shared space. To achieve this, it will be important for teachers to explore models of team teaching and classroom organisation. This might include opportunities for peer mentoring, such as taking turns teaching and observing, or parallel teaching where teachers teach the same content to different groups. Alternatively, teachers might try tag-team teaching, where both teachers share teaching the same content and concepts to a group of learners. It also means teachers being prepared for more frequent interactions with a wider group of students. Interactions might occur with individuals or groups. In some cases, group members might change and/or, students take more responsibility for their own learning through collaborative or inquiry activities. Learners may work in multiple spaces and on multiple activities, and form relationships with multiple teachers. This may imply greater differentiation of class programmes to support all learners. In such cases, teacher interactions with their colleagues necessarily become more collaborative while their practices are more deprivatised and open to scrutiny.

Student assessment is a crucial element of effective learning environments, whether the school is built deliberately as an ILE or is a traditionally organised school. To support positive motivation and self-esteem, both crucial influences on learning, assessments should encourage students to be involved in their own learning. They should also foster students' abilities to assess their own work and understand how to improve it (Schleicher, 2012). In ILEs using team teaching, there is potential for more detailed analysis of each child's learning needs through the different perspectives of the teaching team. The processes of gathering, collecting and recording assessment data (both formative and summative) become more important as data are gathered from multiple teachers, students themselves and their peers. Teacher interactions are mostly focussed on sharing ideas with each other, problem solving and adjusting teaching practices to take account of assessment results to provide targeted and personalised learning opportunities. In turn, these adjustments and learning intentions aim for all learners to achieve more inclusive, equitable and holistic outcomes aligned with the twenty-first-century learning goals.

ILEs strongly promote "horizontal connectedness across areas of knowledge and subjects as well as to the community and the wider world" (Dumont et al., 2012, p. 7). For example, there are schools in which subjects are taught in an interconnected way, with themes linking different disciplines (Wright, 2018). In such contexts, teachers necessarily become aware of how other subject domains organise their teaching. Finding ways that these domains can be better connected can be challenging and rewarding. When working with meaningful real-life problems and inquiry processes, teachers' clarity in anticipating learning needs and how the learning will be assessed takes some effort as learning outcomes don't always fit neatly into traditional subject boundaries (Moss et al., 2019). Finding common ground with other subject disciplines has implications for assessment. Assessment systems must be nimble enough to allow for teaching skills as well as content knowledge. Such skills might include problem solving, collaboration, creative thinking and being able to negotiate through positive communication (OECD, 2013a, 2013b). The commitment to helping all learners to develop fully as people and fulfil their potential means that assessments require nuance. They need to be sensitive to students' individual strengths and weaknesses as well as provide mechanisms for feedback to support learning. Assessments therefore, have a formative function. Assessment and its implications in ILEs are a topic that warrants further exploring but is outside the scope of this chapter.

ILEs and Initial Teacher Education

The shift in the way teachers are working in ILEs is influencing the shape of preservice teacher preparation programmes including practicum experiences and academic course content. Now, new initial teacher education (ITE) programmes include mechanisms to develop understandings of what skills and knowledge that preservice teachers "must develop to prepare today's students for tomorrow's world" (Timperley et al., 2007, p. 5). The ITE system is evolving to become responsive and "future-focused" to prepare graduates to develop adaptive expertise, a necessary trait to adapt to ILEs. Preservice teachers will be faced with adapting to the changing education and societal environments in ways that embrace and reflect unique sociocultural contexts (Education Council, 2017). The OECD ILE Project (OECD, 2013a, 2013b) affirms the necessity for ITE responsiveness to build on the capacity and willingness to redesign their programmes, more overtly accommodating the needs of diverse learners and new concepts about what factors make a difference to learning. This also has an impact on the way preservice teachers are assessed as ready to teach. The advent of the recent COVID-19 crisis highlights the necessity of teachers' preparedness for responsive, adaptive and often rapid change. For many teachers, the rapid shift from physical to virtual teaching–learning interactions was very challenging; for others, almost seamless.

Very few studies have focused on preservice teachers' professional learning and assessment in light of the physical, social, virtual, collegial and pedagogical complexities of ILEs. Noteworthy exceptions are a New Zealand-based qualitative case study

of pre-service teacher practicum experiences by Nelson and Johnson (2017) and an Australian case study of teacher mentors' views of pre-service teachers in four junior secondary schools (Deed et al., 2014). These studies found that practicum in ILEs offer preservice teachers new and unfamiliar challenges, such as organising and taking responsibility for larger, more flexible groupings of learners, and increased pace of decision making. ILEs also offer opportunities for preservice teachers to gain enhanced collaborative support and mentoring from colleagues and more pedagogical responsibility.

In order to support student learning, teaching in ILEs expands the range of teacher competencies from those valued in traditional classrooms. This expansion needs to be accounted for when designing ITE preparation programmes and assessing preservice teacher's readiness to teach. Table 3.2 outlines some of the different expectations in traditional and ILE schools, and the potential implications for preservice teacher preparation and assessment of their readiness to teach.

Table 3.2 ILE implications for assessing preservice teacher readiness to teach

Traditional practice	ILE practice	Potential implications for assessing readiness to teach
Student–teacher professional practice and identity development shaped by a one-to-one relationship with a mentor teacher	Student–teacher practice and identity development shaped by one-to-many and many-to-one relationships with mentor teacher and school community	Greater focus on navigating relationships, responsive pedagogical approaches, ideas, values, expectations and understandings
Priority given to working with a whole class or individuals and groups within the class	Priority given to working with individuals or differentiated groups within a developing conceptualisation of space, grouping and class	Greater focus on formative interactions. Accurate record-keeping and communication skills are key to inform the ILE team of student progress
Full management of a class involves planning class programmes/activities	Full management involves planning for an aspect of the ILE programme and leading planning and organisation with other teachers for a designated time period	Greater focus on working collaboratively to differentiate learning across more complex multiple levels, and to find resources with more complex layers that meet multiple needs
Traditional approach to planning and children's learning (e.g., 1 teacher to 30 children)	Flexible structure, teacher–child relationships designed for predictable variability. Multiple teachers to multiple children. Increased decision-making pace	Focus on student engagement, relationship management, communication, flexible pedagogical approaches and diverse learning needs
Student–teacher plans lessons with the guidance of one mentor teacher	Student–teacher plans with the ILE team and needs the "big picture" of the learning intent	Focus on working collaboratively within a team. Ability to negotiate and respond to learner needs

To produce new teachers and support existing teachers with the skills, knowledge and dispositions to support learners to meet their potential and contribute to a better world, it is imperative that ITE introduces preservice teachers to, and provides opportunities for, in-depth engagement in new pedagogical approaches to prepare them for the shifts in thinking and ways of working required (Whyte, 2019). Preservice teachers need to be introduced to a range of models of classroom organisation and new ways of working so they become part of their normal pedagogical repertoire (Paniagua & Istance, 2018). For example, ITE programmes can provide opportunities for preservice teachers to use their strengths, passions and expertise to explore, experience and practice different models of collaborative planning, classroom organisation and teaching and assessment with their peers and mentor teachers. Undertaking inquiry processes and its implementation as well as trialling differentiated approaches to learning and assessment may also become key habits to develop.

Understanding ways that subject domains organise their teaching and how these domains can be connected will help preservice teachers recognise opportunities for interdisciplinary learning and curriculum integration, plus identify and anticipate learning needs and how it will be assessed. Also, understanding how to plan for teaching groups, allowing children to work both collaboratively and individually, often at different levels of self-direction and on different sequences of learning within the same environment. This also requires building confidence and expertise of teacher educators who may not have experienced ILE environments or some of the pedagogical approaches known to be effective. Close working relationships with school partners are essential to ensure there is a shared view of what constitutes good teaching, learning and assessment in twenty-first-century classrooms and ILEs and what knowledge, skills and attributes are required to be successful teachers in these new environments.

Conclusion

Global policy, national policy, school policy and leadership and collective teacher efficacy all influence the successful embedding of initiatives to support improved student learning and achievement across a wide range of competencies. Economies aim to prepare all their young people to become lifelong learners with a deep understanding and a broad set of social skills, so they can contribute effectively to society for a better world. The knowledge and skills being developed in young people need to develop the capacity for deep learning and lifelong learning in order to be adaptive in our rapidly changing world. The success of ILEs lies in the critical collaboration and collective strength of belief that the learning ecosystem at the micro, meso and meta levels will support excellent outcomes for learners.

Working within an ILE frame requires significant mind shifts and changing capacities for leadership, teaching and learning. As Paniagua and Istance (2018) state, "effective pedagogy requires teachers to have expert professional repertoires to support the simultaneous pursuit of the deep learning of content and of ambitious

transversal competences that need to be practised to be acquired" (p. 21). Innovation in teaching should be understood as a process in which teachers reflect on and inquire into their own practices, to better align their personal capacities with innovative pedagogies. Significant investment is therefore required in leadership, and in-service and preservice teacher learning to ensure the teaching workforce is well prepared to support young people on their learning journey to contribute to a "better world".

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Part II
Possibilities for Spaces

Chapter 4
The Complexity of Spatial Agency in Innovative Learning Environments

Jennifer Charteris and Dianne Smardon

Abstract There has been growing interest in the interplay of social and material elements in innovative learning environments (ILE) and attention to the agency of teachers and students. This chapter considers how school spatial design can influence students' and teachers' sociomaterially mediated capacity to act. The authors' research was undertaken at a time in Aotearoa when there were moves to implement ILE across schools to reflect a pedagogic vision for twenty-first century learning, with significant government investment in building design (Ministry of Education. (2015). Designing schools in New Zealand, requirements and guidelines. Wellington: Ministry of Education. https://www.education.govt.nz/assets/Documents/Primary-Secondary/Property/Design/Design-guidance/DSNZ-version-1-0-20151014.pdf). 'Spatial agency' is an emergent theme in the case study research. For both students and teachers, agency involves spatial literacy where they notice and recognise the pedagogical affordances of the material spaces and objects in the learning environment. These pedagogical affordances can be used to advantage for learning both individually and with peers. The emphasis on openness and flexibility creates an impetus for students to demonstrate spatial agency where they effectively navigate socio-material spaces. With potential for such a profound influence on teaching and learning in Aotearoa schools, research into how teachers and students enact agency in ILE is timely.

Keywords Spatial agency · ILE · Spatial design · Teaching and learning

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Introduction

Building design across the OECD has been linked with a projected future focused image of pedagogical innovation (OECD, 2017) in alignment with the discourse of personalised twenty-first century learning (Benade, 2015). Learner agency, where students are engaged proactively in pedagogical decision making, is aligned with this discourse (Charteris & Smardon, 2018a). In this chapter we explore spatial agency as a socio-material concept in innovative learning environments (ILE). Using this conception of agency, we draw attention to the sociomaterial dynamics of everyday life (including learning) as not separate from "the material 'stuff' and spaces" (Fenwick, 2010, p. 105). Moreover, rather than seeing humans and objects as separate, schooling environments are conceptualised as entanglements of technologies, architectural spaces, furniture, nature, and objects of all kinds which co-produce the relations between human and non-human elements (Fenwick, 2010). We conceptualise spatial agency in schooling settings in this chapter and build on our previous work (Charteris & Smardon, 2018a, 2018b) to problematise this notion of sovereign agency, where an individual is attributed influence with little or no regard for their context and to think about what spatial agency can look in innovative learning environments (ILE). We address the question: *how does spatial agency work in the context of ILE, in relation to teacher and learner agency?*

This chapter adds to literature through conceptualising spatial agency and emphasising the importance of considering relations between humans and between human and material objects of ILE (Bradbeer, 2016; McGregor, 2004; Mulcahy, 2016; Mulcahy et al., 2015; Saltmarsh et al., 2015). In non-traditional learning spaces teachers can engage in practices that support their learners to be agentic in ways that are in keeping with a vision for twenty-first century learning (Saltmarsh et al., 2015). Agency in ILE may be theorised in a range of ways: as possessed by the sovereign individual; as a relational construct, co-produced in the spaces between people; as a dialogic phenomenon that is socially produced and therefore inherent in social environments; as an ecological construct that emerges in the temporality of social processes; and as a new material emergence that is produced through the dynamics of schooling spaces and particularly through the relations "between objects, between humans and objects, and between humans" (Charteris & Smardon, 2018a, p. 56). The argument that space has active agency and influences our experiences is not novel (Strickland, 2014). We draw on Massey's (2009, p. 18) conception of space as a multiplicity of "relationships and exchanges" that are "constantly being made" and in their ongoing constitution constellate power relations. In this chapter, we argue that agency is a force that produces a capacity for action and is mobilised through spatial power relations.

While 'spatial agency' has been conceptualised in architecture literature (Hammond, 2018), there is little, if any, writing that applies it to ILE. Drawing from our previous research on agency in ILE (Charteris & Smardon, 2018a) and engaging with the "spatial turn" that recognises that education related spaces can be theorised as an set of relations rather than a container (Mulcahy, 2016; Mulcahy et al., 2015),

we explore how spatial agency is co-produced within the socio-spatial contexts of ILE through the deliberate manipulations of space by teachers and students, the materiality of the spaces, and by the spatial design. In the following sections, literature on spatial literacy and spatial agency and the social dimension of space and spatialised classroom practice are considered in light of moves to remodel classrooms in accordance to the twenty-first century learning imaginary. We move between these theoretical ideas to analyse the perceptions of two teachers who were interviewed about their conceptions of agency and spatialised practice in newly designed classroom environments. Implications for spatial dimensions of agency are considered in relation to the power relations in ILE spaces.

A Move to Non-Traditional Building Design

The first couple of decades of the twenty-first century have seen a focus on ILE (flexible learning spaces, modern learning environments, new generation learning spaces). These non-traditional open-plan school designs infuse student centred assessment practices and mobile technologies with a vision for twenty-first century learning (OECD, 2013, 2015, 2017). The term ILE is used by the Aotearoa/New Zealand Ministry of Education (2015) to describe their mandated non-traditional, new generation buildings and their associated pedagogy. These classrooms have been either redesigned or purpose built to align with pedagogical principles of flexibility. The open plan design includes more glass and fewer walls than single cell classrooms. These buildings usually include "polycentric room designs, infused information and communication technologies, flexibility brought about by moveable walls and other agile interior elements, a variety of 'student friendly' furniture and ready access to resources" (Imms et al., 2016, p. 6). School spaces are both physical containers and spaces that are constituted through the actions of people, e.g., leaders and teachers structure the epistemic focus in classrooms and policy makers influence "funding and procurement, urban planning, government design norms and spatial budgets" (Wood, 2019, p. 4). Spaces are produced through the interrelation between the elements in the physical container and human activities.

In Aotearoa New Zealand there has been a shift in focus in schools which emphasises a progressive focus on innovative design, where the built form is aligned with a twenty-first century learning imaginary. This powerful and pervasive schooling narrative "promotes the personalisation of learning, interdisciplinarity and 'real world' 'authentic' problems to structure the curriculum, collaborative project based inquiry learning, integration of ICT, greater connections with communities, and a de-centering of the role of the teacher" (McPhail, 2020, p. 2). This imaginary is reflected in the school building innovation in Australia (Mulcahy & Morrison, 2017) and in the Building Schools for the Future policy in the UK (which has since been replaced by a more standardised approach to building design after the James Review) (Cardellino & Woolner, 2019). Lawn (2017) observes that school building design reflects the ebbs and flows of historical influences which involve "powerful rhetorics

about the progress and design of education", for instance, the "'future of society' rhetoric which is aligned closely with school building" (Lawn, p. 19). This also resonates with Chap. 2 in this book.

The move to build ILE in Aotearoa New Zealand has been equated with student-centred and collaborative approaches to pedagogy (Cardno et al., 2017). It has been suggested that the design of open-plan classrooms may be better suited to students who are able to self-regulate as learners, as open spaces can have visual, noise and social distractions, disrupting learning (Mulcahy & Morrison, 2017). Moreover, there is literature to suggest that educators are "struggling to align their pedagogical models with these new spaces for learning" (Carvalho & Yeoman, 2018, p. 1120). A key facet of pedagogy in ILE, particularly in the Aotearoa New Zealand context, is the drive to promote learner agency (Charteris & Smardon, 2018a). The move to a 'twenty-first century learning' approach (McPhail, 2020) to classroom learning reflects a shift in relations between the agency of teachers and learners. Learner agency can be seen as an important element in sociocultural classroom relations where there is both individual and collective agency and learners share the "responsibility for learning" with their peers and teachers (Willis & Cowie, 2014, p. 33). With the focus on the affordances and constraints associated with the design of school buildings in recent years (Fouad & Sailer, 2019; Mulcahy & Morrison, 2017), it is timely to consider how spatial agency could be useful to educators, architects and researchers for conceptualising how students and their teachers engage with classroom spaces.

Spatial Practice, Spatial Literacy and Spatial Agency

Spatial practice involves teachers' (in ILE and traditional classrooms) pedagogical commitment to the affordances of schooling spaces. Affordances are "preconditions for activity" (Greeno 1994, p. 338) that increase the possibility for a certain action or behaviour to occur. Greeno (1994, p. 338), after Gibson (1979) conceptualises the term "affordance" as "whatever it is about the environment that contributes to the kind of interaction that occurs". In this chapter affordances are seen as social stimuli, objects or conditions that potentially enable or constrain spatial agency. Constraints are not placed in a binary with affordances. Building on Greeno's (1994) work, Kennewell (2001) identifies constraints as the conditions and relationships that can provide structure and guidance for a set of actions. Both teachers and students can shape and are shaped by their spatial environments. For example, some teaching practices are not possible in ILE and both teachers and students have multiple relationships to negotiate. Spatial affordances and constraints impact the broad set of possibilities for student learning in classrooms on a moment by moment basis. For students and teachers, spatial literacy involves understanding the pedagogical affordances in ILE.

Affordances in ILE can be considered in relation to Lefebvre's (1991, p. 38) notion of perceived space, where the "spatial practice of a society is revealed through the deciphering of its space". Moreover, spatial practice involves the moment by-moment customisation of classroom spaces through the use of flexible furniture

(Blackmore et al., 2011). Spatial literacy comprises teachers' and students' capacity to co-configure environments. Put simply teacher and students are able to "think in, with, and through space" (Bednarz & Kemp, 2011, p. 18) which may include fostering independent and collaborative learning activities (Yeoman, 2015). Teacher and students need to be spatially literate if they are to make the most of spatial affordances in ILE (Bradbeer, 2016; Fisher, 2004). For instance, teachers may work with students so that they understand and make decisions around how they can learn with others or individually in the various areas of the classroom. Fouad and Sailer (2019, p. 5) highlight that affordances associated with building design can influence student opportunities to learn and support students' capacity for self-directed learning.

The origins of the concept of spatial agency are in architecture, and this has had very little scholarship in educational research. Spatial agency has been used to extend architectural practice beyond aesthetic and technical building design to enable engagement with and exploration of social and spatial considerations (Hammond, 2018). "Spaces are staged and scripted with narratives regarding who is meant to use the space, and this reflects both power structures and social relations" (Forde, 2019, p. 21). There are "norms and expectations" that are "built into the architecture of child focused built environments" (Sobe, 2018, p. 158). Schneider and Till (2009) approach spatial agency as a construct that involves power sharing which can enable others to "take control" as a participative proactive engagement with others. Rather than the "transfer of decision-making power from 'influential' sectors to those previously disadvantaged" it involves permitting others to take control and initiate "different or 'alternative' spatial processes" (Schneider & Till, 2009, p. 100). With the move to ILE and the salience of the twenty-first century learning narrative, there has been immense interest in positioning learners as agentic and self-regulating. This emphasis on personalisation and democratic participation marks a shift toward more directly engaging students in relevant and authentic learning (McPhail, 2020). Student spatial agency is a key aspect of this shift although it is under theorised in the extant literature. When teachers engage in classroom practices that evoke spatial agency, they enable children to be agentic in their learning. Agentic learners (who enact spatial agency) draw on social and cultural resources, and engage in decision-making about how and when to use ILE spaces for both individual and collaborative learning (Charteris, 2019).

Spatial Ontology

A spatial ontology is a lens on the world where the characteristics of space are a primary means of sense making. We are focusing on the production of space as a means of exploring practices in ILE. We draw on understandings of space that have emerged from cultural geography (Massey, 2004) to look at how the socio-material relations (Fenwick, 2012; Mulcahy et al., 2015) are present in our case study data. Grosvenor and Rassmussen (2018, p. 5) observe that.

spatial and temporal enclosures direct the rhythmic activity [of schools], whereby the body is broken or bent into space… [with] the rhythm of school… established in the incessant interaction between pupils, teachers, flights of stairs, corridors, desks and tables, combined in timetables and rules for how and where to be allowed to move around.

A spatial ontology enables us to analyse the spatial characteristics of learning spaces (Wells, 2019) and permits us to consider how space can influence pedagogical work. Social geographer, Doreen Massey (2005, 2009), provided a theoretical framework for our conception of spatial agency. She observes that it matters how we conceptualise space as it has intellectual, social and political effects. Space is a construct that is "open, multiple and relational, unfinished and always becoming" (Massey, 2005, p. 59). In other words, with their relational fluidity, rather than being "empty vessels", place and space are "also producers of meaning and identifications through complex power structures that intersect social relations" (Brömssen & Risenfors, 2017, p. 80). Place here is seen as the physical spaces that people inhabit through patterns, behaviour and communications (Campbell, 2018), while space is the physical and social landscape that has meaning in everyday social practices (Soja, 1996). Space is "utterly imbued with and [is] a product of relations of power" and systems of authority (e.g., the relations of school classrooms) can be conceptualised as "cartographies of power" (Massey, 2009, p. 18). In this case study we analyse data deploying Massey's (2005, 2009) three characteristics of space.

Firstly, we have relationality, where space is co-constituted through complex socio-material relations. This involves a complexity of networks that involve human relationships and relations between humans and non-human elements. These "links, exchanges [and] connections [are]… produced through the establishment or refusal of relations" (Massey, 2009, p. 17). Space spans the familiar relations of daily experiences through to the global political level collective experience. Spatial agency can be enabled through the socio material relations within ILE contexts and simultaneously connected with the broader national and international policy landscape. Secondly, there is multiplicity. Space is the result of relationships within a multiplicity, where there is the "sense of the simultaneous coexistence of more than one thing" (Massey, 2009, p. 17). This is where there is an interplay between multiple factors in a schooling setting, for instance, at a meeting there are the teachers, objects like printouts of student achievement data that may cause shame, anxiety or pride, power relationships between teachers, histories of teachers' professional practice, and political discourses that frame what can be said. There is no space without multiplicity and vice versa, they are mutually constitutive. Spatial agency is multiplicitous, playing out at the intersection of a range of influences. Thirdly, there is fluidity. Space is always in a process of constitution, a politics that is always under construction. "There are always relations which still to be made, or unmade, or re-made [and therefore] space is a product of our on-going world… always open to the future" (Massey, 2009, p. 17). Space is political as there is always the possibility of changing the future. Spatial agency is enacted on an ongoing basis. It is a fluid construct and being co-produced and multiplicitous; it cannot be said to be a fixed attribute that one can possess or own. Therefore, a student or teacher cannot be said

to 'have' spatial agency, it is created through multiple factors (e.g., bodies, objects, discourses) in play within the school environment.

So far, we have described how spatial practice, spatial literacy, and spatial agency can exist in ILE classrooms. In the latter section of this paper we deploy Massey's framework of relationality, multiplicity and fluidity to analyse data from a case study and thereby make contributions to the scholarship on spatial agency. Using this spatial ontology as a conceptual framework and heuristic, we analyse the spatial characteristics of learning spaces and how they influence pedagogical work.

The Case Study

In this chapter we draw data from a qualitative component of case study research which investigated moves to ILE (Ministry of Education, 2015) and schooling practices associated with student agency in the context of professional learning and development. In education research a qualitative case study approach is often used to enhance understandings around particular schooling related contexts, communities and individuals (Hamilton & Corbett-Whittier, 2013). In this instance it is used to provide an intensive holistic description of a phenomenon within the context of a bounded unit, the principals and teachers working in schools with new or redesigned school buildings (Merriam, 2009). Case studies engage with phenomena that are situated within particular contexts (Yin, 2009) in order to explore how practices are enacted (Ball et al., 2012), in this case spatial agency within the Greenvale Primary School ILE.

Greenvale Primary School, built 10 years ago, has a rapidly growing roll of just under 600 students. The urban school caters for students from years 1 to 8. There have been two stages of building development to date with a purposely designed ILE. There are 'Learning Hubs' or large shared classroom spaces surrounded by breakout spaces. These spaces afford teachers and students opportunities to undertake a range of different learning activities. With three teachers sharing each teaching space in a hub, there is a focus on collaboration and co-teaching, which we have explored in a previous article (Charteris & Smardon, 2018b). This school embraced learner agency and supported students to consider how they learn within various build spaces around the school. It was an ideal site to investigate spatial agency.

In developing the analytical framework to generate a conception of agency in ILE we used the following question to guide us: what are the features of spatial agency within the practitioners' descriptions of practices in ILE? Having explored all of the coded data, we elected to conceptualise spatial agency from our conversations with two teachers from one school. The practice that these teachers describe is in synergy and provides a rich illustration of spatial agency in an ILE. The school was built in the last decade and is well regarded in the education community for its innovation. There are positive reports of school inspections undertaken by the Aotearoa Education Review Office. (Pseudonyms are provided for both the school

and teacher participants). The comments below were selected from two teacher interviews because they best describe aspects of agency that enable us to conceptualise spatial agency as a socio-material phenomenon. The examples from the interviews with the two teachers are provided below to flesh out how spatial agency is enacted in ILE.

Spatial Agency as a Socio-Material Construct

In this section we address the first of two themes from our analysis. We illustrate how spatial agency is socio-material in that it is produced through entanglements of technologies, architectural spaces, furniture, nature, and other objects which influence how teachers and students engage in the environment. Massey's (2009) multiplicity, relationality and fluidity are identified in the data. Kim is associate principal of Greenvale School and has worked in the school since its establishment almost 10 years ago. She teaches students in a year zero to two (ages 5–7) hub. The hub is a collaborative teaching and learning space that Kim shares with two other colleagues. They are collectively responsible for the equivalent of three classes of children.

When asked about how teachers use space in innovative ways, Kim highlights that there is a multiplicity of sociomaterial factors that influence what it is possible to do in the hub. There is her interpretation of what the taught curriculum should be (spatial practice), the noisy bodies of the infant children, the affordances of the built environment, and the flow of space between inside and outside. Collegial working relationships between teachers (relationality) are also considerations that influence teacher actions in the hub and the use of space.

> [Teachers are] not restricted to the design within the hub spaces. [They are] able to think 'actually this is where my students' needs are [and so] I'm going to use that break out space or I'm going to use the art area, the wet space, because that is the best area for me to do my teaching and learning in… [It is] like creating opportunities by looking strategically at where you want to do the learning, rather than having a fixed space to do literacy or a fixed space to do math -it's actually being flexible. If I'm going to be teaching a really noisy maths lesson, including music and infants, I'll be really self-aware and think about the implications for my colleagues and I'll use a larger breakout space with some soundproofing. Whereas if I am teaching something quieter or I wanted to collaborate with another teacher, we might use a bigger carpeted area between us and we might be collaborating with two groups and team teaching together. So, that would be the impact that it would have - trying to think outside the square in terms of that teacher's strengths (Kim).

Spatial agency in the hub does not 'belong' to Kim, as it is co-produced through the multiplicity of factors. The constraint of working closely with colleagues within the physical openness of ILE spaces where there may be up to 90 students impacts on which lessons are possible. The twenty-first century philosophy in conjunction with the design of the ILE drives an impetus for teachers to co-plan, liaise, and co-teach. There are the affordances and constraints apparent in the materiality of the space, e.g., the activities and relationships possible due to soundproofing, and the openness and proximity to colleagues. There is the affordance of willing colleagues and students

who welcome collaboration. (It is unlikely that there would be unwilling colleagues in this school as collaboration is highly valued and co-teaching is an expectation of all staff.) There are also those who see the necessity to collaborate as a constraint on their teaching, as it may not be possible to execute a "really noisy maths lesson".

Teacher knowledge and expertise can maximise the multiplicities in the ILE spaces. For instance, teachers' spatial agency is manifest when teachers take up the affordances of the openness and the objects like flexible furniture break out rooms and the various nooks and crannies that are designed for students to work individually or in small groups. Teachers understand how the constraints work in the space, e.g., the loud mat work influences the conditions for learning. There is fluidity afforded by Kim's decision making. This illustrates how the classroom space is always in a process of constitution, as pedagogical decisions are made in relation to the use of space and the capacities and strengths that teachers bring to the co-constituted spaces. Agency cannot be seen as an internal capacity for teacher choice, as a range of socio-material factors combine in the production of space and influence what teachers can and cannot do. Agency to teach is co-produced through these spatial relations.

Co-teaching also requires teachers to maximise relationality of ILE spaces, recognising that an intensified collaboration is desirable. Teachers may draw on the spatial affordances of materials to re-wall spaces. For instance, materials can include bookcases, low dividers, or tables which may be used to create separation. This is spatial agency that does not maximise the affordances of the ILE, yet if a colleague is untidy, noisy, seen to be difficult and unpleasant to work with, or if teachers see that the needs of their students are best met in a single cell classroom, spatial agency can involve re-creating spatial design to align with the teachers' perceptions. Kim describes how the ILE design is not fixed and spaces can be walled off by teachers to avoid co-teaching and sharing pedagogy.

> I would argue that the build helps enable [co-teaching], but you actually have to have a mindset beforehand. You can teach in a single cell within an ILE… People can wall off places and demarcate territories within an ILE if they don't have the right mindset… I think walls and doors always put up boundaries - whether it's mental boundaries it makes them more permanent, or whether it's physical boundaries - it makes it harder. You have to have a real desire to do it if you're not in an ILE. But you can still have teachers who want to teach single cells within an ILE. You have to have a mindset shift as well (Kim).

When asked about students' use of space, Kim alluded to how all stakeholders contributed to the building design. Although Kim is a deputy principal and may have had less interaction with the designers and architects than the principal, she reports a sense of agency that the socio-material relations were foremost in the initial planning when stakeholders were collaboratively engaged in the building design. At Kim's school the building was executed over stages and Kim's comment below highlights that the community had input to signal what they wanted from the learning spaces.

> The buildings have been designed by students, teachers, parents who all had a voice in it. I think that second stage build worked a lot better in terms of students having numerous versatile spaces, different sized breakout spaces, some that are purposefully designed. So, when you want to go and use the drum kit, you can use the drum kit and not impact on everybody else in the hub space (Kim).

Kim highlights spatial agency (fluidity) in the way that students can engage in spaces -using the affordances of the drum kit. There is flexibility afforded through the way that the teachers envisage how spaces can be created and put to use. The comment from Kim below suggests that spatial agency is a capacity that can be developed cumulatively across a school.

> So, I am thinking about how I was working with the year seven and eight this morning who were the [year]ones and zeros when we first opened. They show autonomy and agency around how they use space and when they use it. They know where they need to go in school. It's just like the adults really within our school, I need to go to x, y, and z place because that's going to help me with this piece of learning and I am going to spend this long here with these people and I know why and I can justify it (Kim).

Over years of working with cohorts of students in open spaces, teachers can foster and scaffold learners' understanding of how to use space to positive effect. Kim highlights how spatial agency is about reading the learning environment and understanding how to maximise the affordances of space and place. There is an interplay between clarity around assessment (knowing their next learning steps) and how students are able to find places to meet their needs (e.g., a quiet space).

> [Agency and space] are part and parcel of the same thing really. If you have got student agency in their learning, they know where they are or need to go in terms of both the environment they use and the space and place, but also in terms of their learning. They know what their next steps are and what the environment is that is going to help them (Kim).

Kim signals how teachers demonstrate spatial literacy through setting up "rich learning design" that permits students to make decisions around where they undertake individual and collaborative learning. Students experience *fluidity*.

> It's become an intrinsic part of them by the time they get to [Year] seven or eight, even before that actually. The children in year four to six already don't need to be told, 'why don't you go and use a quiet space'. That tends to just happen in maybe their early years. That is more of a scaffold. Yeah, I think it's also about teachers setting up really good rich learning design for real learning opportunities so that those students can be agentic about where they go and learn and giving them autonomy and freedom to do that (Kim).

The emphasis on spatial practice and spatial literacy for students and teachers is apparent in the expectation that students cumulatively develop their capacity to use the spaces to advantage without needing guidance from teachers. In the spatial relations of ILE there are systems of authority that manifest as "cartographies of power" (Massey, 2009, p. 18).

Cartographies of Power

In this section we address the second themes from our analysis, cartographies of power. Power is not unidimensional in that it circulates in ILE and is fluidly produced through sociomaterial interactions. Systems of power get built, reproduced, and contested in subtle and usually invisible ways during everyday processes of learning,

producing knowledge, and making meaning in ILE (Lewis & Moje, 2003). The power relations that underpin spatial agency are addressed here. Through challenging the assumptions which underpin the distribution of power they can be troubled and exposed to critique (Weedon, 1997).

At the time of her interview, Phoebe was a relatively new addition to the teaching staff. Phoebe teaches in a hub with combined year four, five and six students and is responsible for year four. Phoebe was attracted to the school because of its dynamism, as she did not like the culture of student silence she had experienced in her previous school. Phoebe describes how there is a collaborative effort with teachers in the hub to foster students' spatial literacy which is aimed to support them to make the most of the spatial affordances in ILE.

Phoebe describes fluidity where students have input into the creation of spaces and there is co-design between teachers and students. The students in Phoebe's hub co-determine how the spaces can be used to support learning.

> We're getting the children as part of an agency initiative to actually design our environments. So, we have our own environments set out, but they were saying we want to listen to music whenever we're doing our learning. We want to have quiet space. This week we've got them designing where they think they learn best. We thought about the quiet areas, the collaborative areas, the small group areas, the large group areas and we've given that as a basis. And then they've said 'well, I think I learn best in this area so this is what I think I'm using in that area'. So, today we finally got the whole hub set up where they've actually said where they think the areas should go. So they are little mini designers. They had a little architect team and they design the hub (Phoebe).

In Phoebe's account, we can see how the hub teachers are negotiating (relationality) the "cartographies of power" (Massey, 2009, p. 18). The politics of who gets to decide how the spaces are used is made explicit according to Phoebe and of course any 'spatial agency' exercised with students could ultimately be vetoed by teachers who do not share a similar view of how the space should be used. There is no flexibility (or fluidity) on the use of the space once the areas have been designated their purpose and the agency of students to work against the agreed upon norms is minimised. The "relations of power" around rules for space use are made explicit in an ILE where the different cohorts of students can intermingle (Massey, 2009, p. 18).

> We have those certain areas where they go to if they want a quiet time to do their work…We're trying to get the children to see that if they are choosing to work in a quiet area, even if they're in my group or in Mr. Saltpan's literacy group, if they're both working in that area they're being quiet. If they're working in a collaborative area, then it doesn't matter if you're in my group or Mr. Saltpan's group then, you are being collaborative. But they're making sure they're getting on with their work. We've kind of built up those rules as well so that we can use it across groups (space), not just single groups in different areas (Phoebe).

Spatial agency therefore is produced through the response to various elements, the affordances and constraints of the physical environment, the taught curriculum, and the knowledge and understanding students have around how to use the spaces to maximise their potential for learning. The spatial dynamics of the classroom are always in a process of co-constitution, being "made, or unmade, or re-made"

(fluidity) (Massey, 2009, p. 17). Phoebe indicates how the teachers co-plan the way the classroom areas are used in order to support students' spatial agency.

> We've changed it up because we reflected after last term and we noticed the children were all going with their backs against the walls. They were very much like they wanted their space but they were just using the walls [sitting] on the floor. We noticed that that wasn't good because it meant that the children were just up against the wall and they were not actually using the space that we had. It's very easy to let the environment slide... The reason why ILE are so good is because you can be so flexible, but because you have so much else going on (use of space) can be one of the things you can let slip because even though it's a really important factor, it's one of the things that are just there if you just let it be (Phoebe).

Phoebe signals how the teachers want to maximise the students' capacity to use the spaces well. We see Massey's (2009) relationality in the way there is thought put into who decides about furniture with the objects influencing the human relationships and how agency is negotiated in the space. She notes that teachers currently plan the classroom environment; this is something that the teachers have identified they want the students to do.

> And that's what we were reflecting on the last term before we changed the whole thing as well on the designers because we wanted the children to take ownership of it. I think that's where we all have kind of guilt at the minute; we can then choose where the furniture goes, that's why we wanted it to change [to] where the children can choose where the furniture goes because then they'll use it more and use those spaces more because they've actually got ownership of it. But the teachers, I would say we plan more of the environment than the children do at the minute but what we're trying to [do is] get the children planning (Phoebe).

Phoebe highlights a difference that the co-negotiated use of space in the ILE has meant for her practice as a teacher. She would plan for space in her single cell classroom whereas in the ILE classroom there is co-produced spatial agency developed with her students.

> When I was in a single cell I actually was able to plan like the desks were here and I would use that table for when I differentiated things or we'll use that table for all the children using this... [Here] the children decide where they want to go if that makes sense. It's more about what I'm planning for resource-wise, not space… I wouldn't use this space to be like 'I know that that child's going to go there', 'I know that child's going to go there', 'I'm going to have plans for that child to go here'. I think it's quite a nice thing because I can plan for all the resources that the child will need and they can take it wherever they want, because they're going to choose where they want to learn and I think that's why it's good in the ILE because they can choose where they want to learn. So, I would say I actually plan less for the environment because they can move where they want to go (Phoebe).

Spatial agency is produced through cartographies of power (Massey, 2009) in the classroom. We can see how the classroom spaces are in a process of ongoing constitution (relationality). Phoebe signals that there is a shift in power that produces spatial agency in the ILE. The facilitation of students' decision making around the use of classroom spaces is achieved through Phoebe's "intentional questioning", which in this instance is a means for her students to work out how they can create and use classroom spaces to support their learning. There is soft form of pastoral control (Schutz, 2004) present here, where students get the illusion of 'choice' but

really there is a requirement to comply with the teacher and be seen to be on task and ensure that there is a task completion.

> I think it is a positive shift in power because I think that's what agency is like. The children are choosing where they learn best and how they learn best. But it's getting them to make the right choice. That's the important part and that's the reflective part and that's the intentional questioning part. So, I have children now in my class where [previously] they would have chosen to work with their friends. I've got some of the boys who would say no, no we can't work together, because now they are reflecting more on where they actually learn better. So, sometimes they do go and work with their friends and you can say you've got the choice to choose where you work, but you've got to reflect on how much work you've actually done after like 10 minutes. Are you making the right choice to be with your friends? No? So, where do you think you can go? And building that vocabulary with them as well. So, I would definitely say I don't plan the space as much as I did in the single cell classes (Phoebe).

We can see how the classroom spaces are in a process of ongoing constitution. The socio-material politics of who (which students), where (nook, breakout room, open area) and what (tasks addressed) make up a multiplicity in Phoebe's class where the politics are continuously negotiated. There is some degree of spatial agency here for the students, but ultimately the power is exercised by the teacher, Phoebe, who polices their productivity. This is not necessarily a problematic issue; the teacher has accountability for ensuring that curriculum is being addressed and students maximise opportunities to learn in the classroom.

Conclusion

This study adds to the emergent corpus of research on how spatial agency manifests in ILE (Charteris et al., 2018). We have drawn on two in depth interviews in from teachers in a primary school to illustrate how spatial agency is co-produced in ILE through the systematic manipulations of space by teachers and students, the physical affordances of the spaces, and their spatial design. Spatial agency is not owned by individuals in ILE. It is produced through the multiplicities in play, the fluidity of use, and the relationality between teachers, between teachers and students and between the humans and materials in the spaces. Students enact spatial agency when they negotiate where they learn, select the materials they use, decide how they learn in the various ILE spaces, what they learn, and who they learn with. For teachers, spatial agency is co-produced through their relationships with colleagues and how they are able to engage with the affordances of ILE spaces. The parameters placed on the types of activities taking place and who is permitted licence to move and make decisions reflect the specific cartographies of power in ILE.

Working through the interview data on learner agency to write this chapter, it became apparent to us that few said much about connections between the spatial affordances of ILE and agency for students and teachers. It is likely that observation data could have provided us with more information. Using visual research methods, where students and/or their teachers could have used photographs and or

video images to stimulate discussions, might have helped us learn more about how the spatial affordances in the ILE produce or even constrain agency. Moreover, although we acknowledge that there are differences in approaches to schooling between the primary and secondary sector, we believe the spatial framework used in this article is relevant across both areas. Of course, the age of the students and demands of the different curricula foci would come into play as part of the located multiplicities that influence spatial agency.

Spatial agency in ILE classrooms is co-constituted through complex socio-material relations. These are the interrelationships and networks that include human interactions and non-human elements. Spatial agency involves the establishment and refusal of relations (Massey, 2009) in ILE, as illustrated by the way that students and teachers took up and resisted (individualistic) pedagogies and ways of working to co-teach and learn in collaboration with others. The ILE were multiplicities, revealing a range of socio-material factors that influenced the possibility for spatial agency. These factors included the taught curriculum, children's and teachers' bodies, affordances of the built environments (furniture, resources, and other objects), the flow of designed spaces both inside and outside, and human relationships. Produced through these multiplicities, spaces in ILEs are always in a process of co-constitution. Therefore, spatial agency is a fluid construct rather than a fixed attribute that can be merely possessed by a teacher or student.

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Chapter 5
The Space of Possibilities: The Drama Classroom as the First Innovative Learning Environment

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Abstract This chapter suggests that Drama education spaces, often known as "the empty space" (Brook, The empty space, Penguin, 1968), have for decades offered an example of the principles of the Innovative Learning Environment (ILE). This is a space which promotes the ideals of collaborative learning and the sharing and creating of knowledge between students and teachers. As a drama educator, I explore some of the historical documents concerning the creation of drama spaces in schools in the United Kingdom. I highlight the similarity in concept to the ideas for ILEs as expressed most recently by the Ministry of Education in New Zealand. I draw on enacted narratives from international drama educators using embodied reflections. These educators regard the drama space as a democratic space for learning, a space in which power can be shared between student and teacher/facilitator-where partnerships can be enacted. The chapter discusses the ways in which drama as a pedagogy thrives within and is informed by the open space, inviting collaborative embodied learning, often through discovery. This collaborative learning is not only enacted between pedagogue and learner but between students as they encourage, challenge and support each other. Acknowledging the long history of flexible, open spaces for shared and embodied learning in drama contributes to the literature supporting the ILE as a positive way forward in schools.

Keywords Drama. ILE · Pedagogy · Learning spaces

An Introduction to the Space of Possibilities

As Noeline Wright discusses in her chapter, "the concept of flexible, open classrooms is […] not especially new" since "there have been spaces for teaching and learning for thousands of years" (Wright, see Chap. 2). As a specialist drama teacher who has taught in secondary schools in England and New Zealand, the concept of a learning space which "can encourage and facilitate exploration, collaboration, and discussion" (Ministry of Education, 2020a, para. 1) is not unfamiliar. For many years

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I have inhabited "the empty space" (Brook, 1968, p. 11) or space of possibilities; drama studios, halls and classrooms sans desks and chairs. It is rare for me to stand at the front of a classroom and teach to rows of children. Instead, students move around me working collegially, discussing, making decisions, exploring, experimenting and collaborating. Drama teachers have worked this way for over a hundred years. Calling our learning area a space of possibilities, is to highlight "the vital place of play, the imagination, of poetry, song, dance, of image making in an education system that should be more interested in making humans more fully human…" (O'Connor & Gómez, 2017, p.4).

In this chapter, I suggest that educational drama offers one of the first examples of the concept of the Innovative Learning Environment, albeit partly by accident and partly by design, and as Wright suggests, was likely the result of teachers "making do" with limited facilities and resources (Wright, see Chap. 2). I will discuss how the drama space and its pedagogy share an affinity with the principles of the Innovative Learning Environment [ILE]; its social, pedagogical and physical aspects as articulated by the New Zealand Ministry of Education (Ministry of Education, 2020b). There has been a long history in England and New Zealand of drama educators using flexible, open spaces, successfully and imaginatively, for shared learning through an embodied practice. I shall draw on historical documents that guided the creation of such spaces in both countries. I shall use some responses from international drama educators who used the research method embodied reflections (Luton, 2014, 2017) to demonstrate their understanding of the drama classroom as a democratic space for learning; a space in which power can be shared between student and teacher and where partnerships can be enacted.

Defining the Drama Space and the ILE

The New Zealand Arts curriculum describes drama as expressing:

> human experience through a focus on role, action, and tension, played out in time and space. In drama education, students learn to structure these elements and to use dramatic conventions, techniques, and technologies to create imagined worlds. Through purposeful play, both individual and collaborative, they discover how to link imagination, thoughts, and feelings (Ministry of Education, 2014, para.5).

Space, purposeful play, feelings and collaboration are significant in this description. The drama teacher's role in the classroom is as a "facilitator who creates areas of learning for the students, rather than as an instructor" (Ministry of Education, 1990, p. 1). Drama teachers therefore need creativity, imagination, performativity and an ability to play and improvise (Brooks, 2010; Cody, 2012; Luton, 2015). We are expected to demonstrate, observe, encourage, listen, challenge, respect, empathise, support and affirm. We aim to create a positive learning environment in which ideas can be explored critically and creatively by the students themselves, as Brooks explains:

Because they've got to stand up and perform in front of each other it's our job to make sure that environment is one in which they feel they can do that" (Brooks, 2010, p. 185).

Drama education, unlike other subjects, is "not simply a subject but also a method… a learning tool" (Neelands & O'Connor, 2010, p. 35) and through this activity both the students and teachers can engage in learning socially, emotionally, aesthetically and physically. Students learn not only about drama but through drama develop insights into a myriad of other subjects, people, places, ideas and worldviews. Drama teachers crave creativity in their classes, embrace noise and controlled excitement and seek to ensure learning is a shared activity for everyone. I suggest these ideas are embodied today in the concept of the *Innovative Learning Environment* developed in New Zealand which:

includes the physical, social, and pedagogical context in which learning occurs. An innovative environment supports strengths-based teaching and learning. It offers students and teachers flexibility, agency, ubiquity, and connectedness (Ministry of Education, 2020a).

An Innovative Learning Environment (ILE) enables the ideals of collaborative learning—the sharing and creating of knowledge between students and teachers in a journey of discovery and development. It is intentionally future-focused by offering flexibility. Importantly, it challenges traditional pedagogies and space to develop students for the twenty-first century (see also Chap. 3 in this book). In 2008, when the Ministry of Education invited schools requiring new classrooms to trial a "learning studio" (Ministry of Education, 2008) based on theories about space, educational principles and pedagogy (Fisher, 2005) it resonated with drama educators. This was because for over a hundred years the drama space or studio has offered an example of these pedagogical ideals of discovery and collaboration in action. Internationally renowned theatre director, Peter Brook, believes that you can take any empty space and call it a bare stage. "A man walks across this empty space whilst someone else is watching him, and this is all that is needed for an act of theatre to be engaged" (Brook, 1968, p. 11).

Therefore, drama pedagogy thrives within, and is informed by, the *empty space.* It invites collaborative embodied learning, often through discovery. This collaborative learning occurs between students and teachers as they encourage, challenge and support each other in what Neelands calls "the most social of all art forms" (Neelands, 2011, p.4). Today, throughout England and New Zealand, rooms deliberately devoid of chairs and desks are the meeting places for drama classes. If we are lucky, we inhabit a studio space. If not, then it might be a hall or whānau space. Such rooms are filled with students engaged in embodied forms of learning and discovery, collaborating, communicating and becoming creative, confident, critical thinkers—vital skills according to the World Economic Forum (World Economic Forum, 2018). Today as ILE principles become more widespread, a new space is being created in which teachers and students can be more social, embodied and collaborative, playful and studious in a twenty-first-century learning partnership (Cooper, Chap. 3, this book). But first I want to travel back in time, using the drama strategy of a "flashback" and ask you to imagine the traditional classroom of past centuries.

The Old and the New: Pedagogy and Classroom

> The school bell sitting as usual on top of the teacher's tall desk; the worn table pressed securely against the back wall of the schoolroom; the blackboard sitting comfortably on its easel; the palm tree, tall in its brightly coloured pot, standing impassively in the corner near the doorway (Bowmaker, 2002, p. 112).

This vivid description of an Edwardian school classroom in England is typical of the period and echoes the one in Fig. 3, in Noeline Wright's chapter (see Chap. 2). If you visit the Victorian schoolroom at Howick Historical Village in Auckland's Eastern suburbs or enter Shakespeare's sixteenth-century classroom in Stratford upon Avon in England, you will see detailed recreations of these traditional classroom spaces. Looking around, perhaps you recognise the way that the desks and chairs are placed in rows facing the teacher. Having a panoptic view, from which, as Charles Dickens described in his novel *Hard Times*, the pedagogue can see "the inclined plane of little vessels then and there arranged in order, ready to have imperial gallons of facts poured into them until they were full to the brim" (Dickens, 1854/1969, p. 47–48).

His fictional yet critical description of the schoolmaster Mr. Gradgrind as a purveyor of facts, sucking the joy out of any subject, papering his classroom walls with only mathematical symbols, seems a far distant character today. Gradgrind's classroom was frequently overcrowded; children were sedentary and engaged in rote learning facing their Master. Traditional schoolrooms with their "arrangement of furniture also implies certain assumptions about teachers and learners" (Wright, see Chap. 2). The style of space and pedagogy arose from the requirements of the industrial revolution, with its need to have well-disciplined, and reliable workers (Hood, 1998) who understood their place in England's class-ridden society. Likewise, schooling in New Zealand, based on the British system, was "…a process of mass instruction and rigid discipline designed to produce, at the minimum of cost, a working population that was literate, orderly, and not inconveniently critical of its lot" (Campbell, 1941, p.74).

Let us now flash forward to the twenty-first century where we might expect classrooms to look much altered to their Elizabethan Victorian and Edwardian forebears as educational consultant Mark Osborne (2019) has suggested. But in many secondary schools in New Zealand, the traditional classroom configuration has remained almost unchanged since the Education Act of 1877. This remains so even in newly constructed glass-walled classrooms. It seems to resonate with Wright's comment that perhaps teachers take "little heed of the opportunities a moving side wall might offer" (Wright, see Chap. 2).

While the arts have always disrupted the traditional classroom format, it is the concept of the innovative learning environment being articulated in New Zealand that now offers an exciting challenge for educators. This new learning space "can be reorganised for different purposes so teachers and students have opportunities to work together in a variety of ways" (Education Review Office, 2018, p. 10). By rearranging the space and its inherent relationships:

> Teachers are better able to share responsibility for learners and collaboratively identify and respond to the needs of individual learners. Learners in an FLS [flexible learning space] are often able to make choices about where they work, with whom, and what furniture and resources they will use (Education Review Office, 2018, p. 15).

A key acknowledgement is that "the social nature of learning and emotions are integral to learning" (2018, p.15). This is innately shared by the social pedagogy of drama in schools which has always embraced group work and the importance of the ensemble (Cody, 2012) alongside the development of emotional expression and intelligence. Schools that welcome the idea of creating new kinds of relational spaces for learners and their facilitators recognise:

> The independence gained through accessing technology has meant that students are now able to manage and direct their learning. They are active rather than passive recipients of knowledge and are choosing to learn in a way that is meaningful to them. Choice can be motivating for learners (Bissett, 2014, p. 2).

The term *active* recognises that students are now more intellectually, emotionally and physically engaged in their learning. This is supported by a well-designed classroom based on the ILE principles of collaboration, active-learning and co-created knowledge (Education Review Office, 2018, p. 12). While the best drama studios may be intimate spaces surrounded by black curtains with a lighting rig and a few wooden blocks to designate levels, an ILE may be spacious, light, full of colour and well-ventilated. Groups of curved and colourful tables might weave their way throughout inviting students to come together. The chairs might be brightly coloured and suited to growing bodies, and there may even be some soft furnishings, cushions and bean bags along with window seating. It includes digital technologies, individual devices, interactive whiteboards and projectors. Some classrooms will have glass walls or the flexibility to combine several classes in one large space. There may be places for students to work quietly alone or in groups. There may be more than one teacher/facilitator working collaboratively with students and other teachers in the space to share their knowledge and skills in a journey of development. While the two spaces may look vastly different, one dark, one colourful, they share the concept of student-directed learning and collaboration.

I return now to the Edwardian schoolroom described earlier in this chapter. While it gives the appearance of a traditional classroom it was the site of an innovative approach to pedagogy which used drama strategies to disrupt the status quo. Harriet Finlay Johnson was Headmistress of a small traditional village primary school in Sussex, England in the early 1900s. She was a forward thinker and child-centred educator who transformed her classroom and developed teaching methods that foregrounded dramatic strategies to explore a wealth of subjects (Finlay Johnson, 1912). She embraced both indoor and outdoor learning, clearing a space at the front of the class or using the playground to encourage her students to explore ideas in an embodied and dramatic way, including arithmetic (Finlay Johnson, 1912). Her students independently researched a wide range of topics using the school's small library to make their discoveries. She invited her students to discuss ideas freely with her "and not merely to listen to me or answer my questions" (Finlay Johnson,

1912, p. 8). One can almost hear the fictional Mr. Gradgrind choking at the very idea. Her teaching methods were lauded as "Utopian" by school inspector Edmond Holmes who described seeing the happy faces of the children "actively employed" rather than "in doing what is only one degree removed from nothing" (Holmes, 1911, pp. 154–155). Finlay Johnson's approach was described in 1914, as "one of the most interesting and convincing educational experiments ever carried out" (Bowmaker, 2002, p.34). Not only did children *enjoy* their learning but remarkably high standards were achieved (Bowmaker, 2002). She encouraged children to disrupt the traditional space and use dramatic methods to explore ideas giving them autonomy and encouraging collaboration. She challenged the conventional ideas of classroom space and the teacher–student relationship. For village children who were not expected to attend university or travel far from their place of birth, this was revolutionary.

Many other drama educators followed her ideals including Henry Caldwell Cook who advocated for active learning through drama and play as an educational method (Cook, 1919). As a result of his experiences fighting in the Great War, his priority was to harness a child's instinct towards curiosity, wonder and "a desire to investigate" (Cook, 1919, p. 10). His classroom was an advance on Finlay Johnson's as it consisted of two rooms knocked into one large space with a raised platform at one end where pupils could explore ideas through drama (Allen, 1979).

Designing and Embracing the Empty Space: England's Story

How did drama come to embrace the empty space in schools? The studio as we know it today has developed in part from the "making do" attitude that Wright suggests is so often a part of teachers' response in difficult times (Wright, see Chap. 2). Drama has always been a marginalised subject taught in a variety of ad hoc spaces. In 1947 Alan Garrard found himself doing drama in Essex in a "school which was cramped. There was no hall. The only available space for lessons on drama was a narrow passage between two classrooms; no stage, no lights, no atmosphere. The only propitious item was a gramophone" (Wiles & Garrard, 1957, p. 43).

In another school, he found that while all the pupils had drama lessons, they took place in "cramped and crowded conditions" including Nissan huts and a stage which could be crossed in one leap (Wiles & Garrard, 1957, p. 43). Surprisingly perhaps, the work in Essex was a great success as the boys worked around the desks to create a drama from their personal experiences. It:

> marked the blitz as seen through the eyes of boys who had spent their earliest years in London under fire. As children of five and six they had heard the sirens piercing the night sky, had felt the thudding of the bombs and had seen half of London disappearing in the flames (Wiles & Garrard, 1957, p. 42).

Some teachers were lucky and could use the school hall to ensure drama happened. School halls were large public spaces with a traditional proscenium arch stage at one end used for worship and serving lunch. Their vastness and lack of seclusion,

however, could inhibit creativity. Teachers soon realised that a drama teaching space had to be conducive for children to experiment and grow in confidence as "actors" (Allen, 1979).

During the 1950s, some professional theatre companies began to experiment with using open, flexible spaces (Allen, 1979) as distinct from the traditional curtained stages of the West End—an area of London renowned for its theatres. These flexible spaces became known as black box studios. They were intimate, neutral spaces, designed for experimentation and rehearsals which may or may not result in public performances. These, in turn, began to affect the planning and design of drama spaces in schools.

Architect Mary Medd designed new secondary modern schools and their drama spaces (Allen, 1979). Teuma (2020) reports that Medd "successfully married the needs of the teachers with those of their students by careful consultation with both" and was well ahead of others, understanding "the important link between educational outcomes and the teaching environment" (para.5).

In 1958 at the UNESCO drama in Education conference held in Australia, one of the main topics under discussion was the availability of appropriate spaces for drama in schools (UNESCO, 1960). By 1963, the Newsom Report on Education in England (Newsom, 1963) made a case for drama to have specialised spaces of its own and included diagrams of how a studio might look and how it could fit within a school. These diagrams showed how the empty spaces of the drama studio contrasts with surrounding desk-filled classrooms.

Ideas of an empty drama studio space were furthered in 1964 in London when *The National Association of Drama Advisers* collaborated with architects on an exhibition and conference entitled: *The Design of Drama Spaces in Schools and Modern Theatre Development* (NADA, 1966). This conference determined that since drama offered a unique way to help children develop communication, confidence and life skills, it must have "proper facilities" (NADA, 1966, p.2) to enable movement and an "appropriate attitude of mind" (p.5). Subsequently, a twenty-page pamphlet included this central statement written in bold: **Above all, Drama requires spaces of its own, designed for the purpose and not to be shared with a multitude of other interests.** (NADA, 1966**, p. 2**).

The Newsom report (Newsom, 1963), exhibition and pamphlet (NADA, 1966) were forward-thinking ventures which identified that not all learning had to take place in traditional classroom environments. Drama is particularly affected by "the space and the environment in which it is happening" (Allen, 1979, p. 154). So, these new kinds of spaces signalled to teachers and children that something unusual could occur during the process of learning. Studio spaces allowed for "freedom of movement unhampered by school furniture" and "acoustic isolation from other classes" (1966, p. 5). These spaces enabled unobstructed movement and interactive dialogue, encouraging students to communicate, connect and create with their peers while expressing ideas physically. Students began to understand space as an important aesthetic in communicating meaning. However, drama teachers continued to be adept at working in ordinary classroom spaces, regularly moving desks and chairs to clear appropriate spaces for drama lessons. Not all schools valued drama education and

its need for an empty space in which students could move around and make noise as they worked with ideas in an embodied way.

Designing and Embracing the Empty Space: Aotearoa New Zealand's Story

In New Zealand, most secondary schools were built between the 1950s and the 1970s, on traditional designs. Aside from school halls built with a proscenium arch stage at one end so they could be used as community theatre spaces (Simpson, 1961) "there was no code related to the provision of drama spaces in New Zealand Secondary Schools" (Susan Battye, personal communication, February 17, 2020). However, at Pakuranga College, Auckland in 1975 (Pakuranga College, 2018) a drama studio was built, consisting of a separate building in the grounds, still in use today. Inside, the space is unencumbered by desks and chairs and the windows are above eye level to allow privacy as students experiment, move, make noise and create. Specialist lighting is available to create an appropriate atmosphere. It was only after Drama became one of the four essential learning areas under The Arts in the new National Curriculum in 1993 that the Ministry of Education set down some guidelines for "good drama facilities" for all age groups (Ministry of Education, 2010). These stipulated that:

> Each drama room should be at least twice the floor area of a standard classroom. If you have more than one drama room, it is suggested that one of them is made as large as three or four standard classrooms (about 15 × 20 m) (Ministry of Education, 2010).

While appropriate spaces are vital, they are not always as luxurious or as beneficial as the ideal described. Nor are they necessarily planned in consultation with appropriate staff as Coleman and Thompson's chapter (Chap. 6) in this book describe.

The Empty Space as a Symbol of Partnership

There is sometimes a misconception that doing drama requires the most elaborate of settings. It is certainly true that school productions often require a space that allows for the use of lighting, sound and multimedia. Some secondary schools have facilities which resemble a professional theatre for showcasing elaborate performances to public audiences. In their chapter, Coleman and Thompson (Chap. 6) discuss some of the issues that can arise from poorly planned drama and theatre spaces. They argue that the daily work of drama in a school requires an unusual kind of space; one that is intimate, unencumbered by chairs and desks or invaded by the public gaze.

In theatre, space has "a primal importance because it gives birth to forms and therefore has equal status with the actor" (Pickering, 2005, p. 171). A special space can inspire creative ideas and ways of being. While other subject teachers demand

classrooms containing specific furniture, the drama educator cries out to be given an empty space, that is, a "space of possibilities". In this space, students can imagine, inquire and embody ideas. However, *space* is both a place where lessons physically happen and "an abstract concept" which Helen Nicholson suggests is "associated with movement, energy and freedom [which] has sometimes been perceived as a threat" (Nicholson, 2009, p. 60). The idea of threat arises because at first, an empty space in a school can seem threatening and uncomfortable for students and teachers alike. Without desks and chairs there are no signifiers to designate where the teacher and students should be in the space which challenges and rebalances the student–teacher relationship.

Embodied Reflections

The drama educators who participated in my doctoral research using embodied reflections enacted their ideas about space in their studios in schools and universities (Luton, 2015). Instead of sitting and talking about space, each educator walked around and within their drama studio, pretending to be the teacher or the students to demonstrate physically how the drama space can be used. They began by highlighting the significance of the drama space and indicating its unique qualities. Several recreated what they felt was the "ritual" of clearing the space of any chairs and tables to prepare it for drama to occur. These educators felt that instead of the traditional classroom which suggests sitting, listening, watching, writing and being quiet, a drama space asks the question: How shall we be and what shall we do in this room? (Luton, 2015).

Throughout this highly active interview process, these experienced educators demonstrated ways in which the drama space is a place of process and experimentation, where students learn how to share space as they negotiate and interact with those around them. Drama students have moments of sitting, listening, watching and writing; they may work alone or in a group, but generally, a drama context is a space of energised collaborative activity. In this space, students explore not only the practical and academic aspect of Theatre such as plays and dramatic theory, they also devise their own work using a variety of strategies and conventions, characters, stories and topics from diverse cultures, eras and forms. Through these explorations, students appreciate that there may be no right or wrong answers, that they are genuinely expected to find things out for themselves, to make choices and mistakes and to experience the joy of discovery. This requires drama teachers to "value their pupils' contributions to the lesson more than their own" (Lehtonen et al., 2016, p. 563).

Drama Pedagogy in the Empty Space

Drama teachers and their pedagogical approach are often considered to be "different" from those in other subjects (Cody, 2012). Neelands has suggested that drama

teachers are adept in "subtle negotiations" which help students "imagine and co-create the conditions needed for their full and meaningful participation in the social as well as artistic life of the class as community" (Neelands, 2011, p. 6). They often participate actively in their classes and "see themselves as guiding co-learners and thus become part of the group, working and learning along with the learners" (Lehtonen et al., 2016, p. 564). Dispensing with classroom furniture, drama educators invite and encourage students to collaborate physically. Lessons stimulate ideas, encouraging active participation and subsequent reflection. These goals may be initiated through drama exercises which stimulate physical and vocal engagement, often through fun and laughter. The lesson itself:

> needs to be as subtle and crafted as any other dramatic sequence that is planned to unfold its meanings or themes in time and space and which moves the audience, progressively, towards a new felt understanding of the human issues and themes that are being dramatised (Neelands & O'Connor, 2010, p. 49).

A teacher might facilitate contrasts of sound and silence, movement and stillness, light and dark to encourage student creativity. A range of technologies are frequently used, with teachers and students controlling music or lighting. They might also video work so that students can critically review or reflect on their performances to further shape their drama. Students might use their digital devices for scriptwriting, research, or self-assessment or devising drama scenes or working with scripts. For the most part, students tend to collaborate, in groups developing and demonstrating how to take advantage of a space, as well as listening, speaking, taking turns, or experimenting with ideas. Through these activities, students often regulate their own and peers' behaviour. Teachers observe and assist. However, trust becomes paramount when students are doing drama for they are learning the skills of communication and empathy. These are the same skills so often denigrated as "soft" skills, but which are the most wanted employment skills by LinkedIn (Ruggeri, 2019).

Teachers in the Empty Space

An empty space could hinder rather than encourage student learning if teachers do not take advantage of a space and use it creatively and confidently. To be effective, the drama teacher needs to know and understand their space and be confident in its use. They are usually performative and understand the techniques of the actor; voice, body, movement and use of space; eye contact, posture, vocal modulation and gesture. Because students are up on their feet creating physically and vocally rather than sitting quietly, drama teachers have a variety of ways to signal a class to silence from anywhere within the space. They must be at ease whether kneeling or sitting on the floor beside a group of students. Because drama invites students to create ideas in an embodied way, teachers have to know when to move boldly in the space or take a quiet observant role. As students regularly share their performance work with their peers, teachers set up systems to encourage supportive spoken feedback.

Students in the Empty Space

Within a space, it is not only the teacher who is enacting an alternative pedagogical approach and relationships. Students experience an altered spatial relationship with their teacher and peers as they engage in "doing drama" in various ways with each other. They might "move from place to place; they stand alone, and they work in pairs and groups" (Neelands, 1984, p. 71). They interact with each other, passing leadership from person to person, incorporating each other's ideas within their projects and making discoveries. They learn to respect and encourage each other while developing and creating drama. Students use their imaginations and embody a variety of characters or situations, without the hindrances of a traditional classroom. Students develop skills in using space responsibly to interact with others. For this to be successful it must be a *safe* working space since "an essential element in drama pedagogy is that of trust and co-operation" (Brooks, 2010, p. 187).

Conclusion: A Democratic Space for Learning

Forty years ago, drama educators Fines and Verrier (1974) suggested that "drama puts the initiative right on children's shoulders and demands that they begin to invent" (p. 80). Drama began to be considered a "democratic" space (p. 81). Students could show initiative and make their own aesthetic and organisational decisions for the group. This idea was radical because it implied there had to be a different kind of learning space to the classrooms described at the opening of this chapter. Fines and Verrier argued for a space where the educational relationship between teachers and students could be enacted in a different way. A symbol of this democracy used by drama teachers today is the circle. Students and teachers begin and end lessons, share and reflect, seated on the floor, in a circle. This solves the practical problem of there being no chairs in the space. In a secondary school, a teacher sitting on the floor has removed a symbol of status when they join students at eye level. While some other classes use the circle formation, the symbol is specifically highlighted in drama lessons as it implies an inclusivity which rows of desks cannot:

> A circle has many advantages in this situation: a teacher has a total view of the class, but can make quite individual relationships across the circle; there is a togetherness that is not a herd but a unity; there is a stage ready-made, and it only needs one footstep to enter it; there is no hierarchy of space (Fines & Verrier, 1974, p. 29)

The concepts of "unity" and "no hierarchy" foreshadow the words of Neelands (Neelands & O'Connor, 2010). Neelands believes in engaging young people in critical thinking and empathy as they learn to make decisions for the common good, making choices to help shape the drama occurring in the space. He has suggested that the circle is "the quintessential shape, the symbol that holds it all" (Neelands in Luton, 2015, p. 111). Neelands enacted this concept by using a ball of red wool to create a circle on the floor of his drama studio. The circle "symbolises that although

I am the teacher, and I have responsibility for what goes on, I want to try and find a different way of being with you as learners" (Neelands in Luton, 2015, p. 111). For Neelands, students are empowered by the democratic process, the circle acting as "the illusion at least of equality of power". The circle is a place where there is an insistence on "equality of participation and freedom of voice but also restraint in speech and action" (Neelands in Luton, 2015, p. 112).

At the beginning of the twentieth century, Finlay Johnson's willingness to step away from "conventional teaching" (Bowmaker, 2002, p. 63) gave rise to "the releasing of creative energy previously trapped inside disenchanted children" (2002, p. 63). As a result, it "ignited an energy that sparked the imagination of even the weakest scholar" (p. 63). As Finlay Johnson described:

> An ordinary class of children sitting at desks feeling themselves to be merely a class of children, might or might not be interested enough to inquire for reasons or results of actions. It is doubtful whether they would remember even what they heard, except for a very short time. Teachers have constantly to devise plans for ensuring that children not only listen and pay attention but also remember what they hear. The truth is that we all remember what we see **and do** better than what we merely hear-perhaps force ourselves to hear or are forced to hear (Finlay Johnson, 1912, p. 68).

A cry, if ever there was, for an embodied pedagogy, in a different kind of relational space, one which engages students in their learning, through a sense that they matter as individuals.

For over a century, drama has recognised and embraced the need for specialised learning spaces and pedagogy in school. In secondary schools, the majority of classrooms are filled with desks, chairs, benches, whiteboards and a teacher's desk. But in the drama space, there may be no equipment as such and no specific teacher location. In some schools, specialised studios may be available that offer curtains, lighting equipment and blocks to help create locations. While this emptiness is a practical solution for an embodied subject it is also a symbol that resonates with Brook's theory (Brook, 1968).

The drama space shares with the ILE the idea of a space of possibilities, where young people feel a sense of "agency", and "connectedness", and "where teaching and learning is collaborative" (Ministry of Education, 2020a). Neelands believes that "students do not come to us as 'human beings' but 'human becomings'—we believe that what we do is planned to help them on a journey of becoming" (Neelands & O'Connor, 2010, p. 109). As innovative learning environments become more prevalent, perhaps the empty space of drama and its creative pedagogy will be remembered as one of the foundations of this concept.

Postscript

As this chapter was being written a pandemic swept across the world and as Wright has summarised "schools are responding to need, change, and shifts; even if they'd prefer not to" (Wright, see Chap. 2, p. XXX). Likewise, drama educators adapted

and found other ways of being with their students remotely in the online space. Teaching occurred via video conferencing and students could share ideas in small online groups. In Aotearoa New Zealand, and after a hard lockdown for about two months, teachers and students can once more meet in shared spaces to develop ideas practically. In England, where Covid-19 has continued to disrupt education, *Open Drama UK,* a body of drama educators and theatre industry professionals have made documents available to help with "socially distanced drama" (Open Drama UK, 2020) in the classroom because "group work is an integral part of teaching drama and creating theatrical performances" (Open Drama UK, 2020, p.1). The government too has developed advice to help performances continue (Gov.UK., 2020) It is to be hoped drama teachers will continue to find creative solutions to ensure that the drama space will remain as a space of possibilities during times of crisis.

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Chapter 6
No Drama: Making Do and Modern Learning in the Performing Arts

Claire Coleman and Annette Thomson

Abstract Over the past decade, Aotearoa New Zealand's government has mandated that all new school buildings be designed according to an ILE approach to support student-centred teaching and encourage creativity and collaboration. For experienced drama facilitators who rely upon an environment that encourages collaboration, dialogue and flexibility this is familiar territory (Nicholls & Philip, 2012) (Nicholls and Philip, J Appl Theatre Perform 17:583–602, 2012). Often teaching in repurposed spaces, drama teachers resourcefully adapt halls, prefabs, libraries, sports fields, or empty classrooms for rehearsal, teaching, devising and performance. Drama facilitators and students have long been innovating spaces; not necessarily out of pedagogical intention, but practical necessity. This chapter discusses the reflections of an experienced drama educator who recently transitioned from the drama space she 'made do with', into a purpose-built ILE school. The ILE has presented new challenges to both her pedagogy and commitment to exploratory, collaborative and creative approaches. We examine how this purpose-built ILE facility affected her drama pedagogy, and the extent to which pedagogical innovation applies in this context. As a reflective practitioner inquiry, this case study generated data through embodied reflection (Luton, 2016) (Luton,.New Zealand J Res Perform Arts Educ 6:27–37, 2016) and journal entries. The inquiry explores the relationship between a drama teacher, her pedagogy and her teaching space. We conclude by reflecting upon the significance of the space to the teacher, its connection to pedagogy and opportunities and limitations for future praxis. We advocate for a considered review of the specific needs of Drama within future spaces to ensure practitioners are not simply making do, once more.

Keywords Drama · ILE · Transition · Secondary

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Introduction

> I walk into the Performing Arts workroom, which is much bigger than in the old school. My wooden pencil case and Shakespearean Lego figure are perched on my large desk. My cup is over on the sink bench and I put my lunch in the workroom fridge. This workroom has the potential to create collaborative opportunities between these learning areas. It is already one of the positive spaces in the learning area. (Annette, Reflective Diary, 6th May)

Recently, the Aotearoa New Zealand education system has embraced innovations to develop students' twenty-first-century skills of collaboration, creativity, communication and critical thinking (OECD, 2013). Heavily impacted by shifts to collaborative pedagogies and increased access to digital technologies, innovative learning environments entail a reimagining of both physical and pedagogical spaces. The Ministry of Education's policy recognises the elements of a New Zealand ILE as, exhibiting sufficient spaces, a central room, break-out spaces, flexible elements, visual transparency and integrated digital technology access (Benade et al., 2014). Aligned to the Ministry of Education's vision, to prepare future learners to be 'confident, connected, actively involved, [and] lifelong learners' (Ministry of Education, 2017, p. 8) its ILE strategic plan (2010–2011) required schools to update enhance or rebuild existing sites (Osbourne, 2016). Underpinned by a commitment to raise the aspirations and educational quality for all New Zealanders, the Ministry's statement of intent for 2018–2023 (Ministry of Education, 2018) maintains a commitment to reconceptualising learning spaces as quality learning environments (Hong et al., 2009; Wright, 2018). Despite an acknowledgement of the ILE as an ecosystem of social, pedagogical and physical factors (Ministry of Education, 2020b) the literature tends to suggest a linear association between these factors led by the physical (Ministry of Education, 2020a). As Wright (Chap. 2) suggests, spaces have power to mediate and mitigate the pedagogical opportunities available.

In Aotearoa New Zealand, drama in schools incorporates exploring and expressing ideas through drama and the deliberate use of drama elements and techniques for performance (Ministry of Education, 2017). Drama as a relational and embodied pedagogy, cultivates and values twenty-first-century skills (Anderson & Dunn, 2013). Arts literacies combine both rationality and emotionality (Eisner, 2002) and invite participants to think critically, express themselves creatively and respect diverse opinions (Ewing, 2018). A typically marginalised subject, drama teachers often work in ad hoc spaces with access to minimal resources and have by default become experts in creating spaces for learning that incorporate the spatial, social and pedagogical.

Through a reflective practitioner case study inquiry, this chapter explores the effect upon an experienced teacher's drama praxis when relocated from an existing teaching space into a new ILE build. It analyses the implications through the relational framework of network learning, upon her existing pedagogy. Finally, it critiques the narrative of the ILE and asks future designers, schools and educators to recognise the centrality of space to the teaching–learning nexus.

Setting the Scene

Instigated by Annette's unique opportunity to compare her praxis across two spaces, we begin the chapter with a discussion of our own positionality and experiences as drama practitioners.

Positioning Ourselves

Annette has worked in drama education since 1995, teaching in a wide range of teaching spaces through its evolution from an extracurricular activity to an NCEA subject in its own right within the arts curriculum. Like many Aotearoa New Zealand teachers, she has taught drama in school halls, prefabricated classrooms and repurposed audio-visual rooms (Luton, Chap. 5). In the precarious world of consistently underfunded and underappreciated Arts Education, flexibility, adaptability and creativity are crucial (Coleman & Luton, 2019; O'Connor & McTaggart, 2017). Claire is an education lecturer and, like Annette, an experienced drama practitioner. We continue to advocate for drama and its capacity to develop the competencies and the social skills essential for a future-focused curriculum. Well versed with 'making do', we have both experienced the difficulties caused by inappropriate physical spaces and the impact upon quality pedagogical drama practice (Neelands, 2008). While cautiously optimistic about broader shifts towards interactive and relational pedagogies in education, we remain conscious of the delicate and often unconventional nature of working in the arts (Neelands, 2006).

Positioning Our Pedagogy

We approach teaching and learning in the arts and the generation of knowledge as a shared responsibility between students and teachers. This sociocultural approach emphasises the significance and development of the social competencies most likely to engage students in creative, flexible learning. Competencies likely to prepare them for the complexities of living in a time of rapid change and uncertainty.

Drama relies upon dialogic and relational pedagogy and the creation of a community of learners. Teaching episodes in drama often involve flexible, active creative processes that invite students to determine and reflect upon their own work. While teachers require curriculum knowledge, it is their ability to foster creativity and criticality in students through this complex human art form, that is of central importance to facilitating drama (O'Connor et al., 2016). As a collaborative art form, drama requires a high level of emotional safety. Participants, through drama, enter into a creative partnership (Eisner, 2002). The alchemy of quality drama teaching and learning rests upon the interdependent and relational nature of these elements.

ILEs

Adapting learning environments to foster student-centred approaches is a key focus for the modern teacher in Aotearoa New Zealand. After examining the impact of removing classroom walls and creating open spaces, Karriippanon, Cliff, Lancaster, Okely and Parrish found that 'modified spaces were reportedly more…inclusive and allowed greater interaction' (2017, p. 301). Similarly, Warner and Myers (2010) contend that lighting, colour, decorations, furniture and resources, sensory variables, space configuration and class size can influence the potential creativity of students. Despite the gains evidenced by the literature, a 'shift to flexible learning environments does not, by itself guarantee or necessitate a shift to modern teaching and learning practices' (Benade, 2017, p. 128). As ILE spaces become more commonplace, research will hopefully move to consider the pedagogical (Deed & Lesko, 2015) and social repercussions (Coleman, 2020) within Aotearoa New Zealand educational contexts.

Drama

> Teaching drama is unlike teaching any other school subject; it is experiential learning involving each of the senses, body language, and emotion and is often a way of engaging students who have been otherwise alienated by the rest of the curriculum (Hatton, 2020,para 9).

Drama in schools incorporates both drama as an aesthetic discipline and as a pedagogy for exploring and creating, as a pedagogy it is often valued in schools for its ability to engage students with other curriculum areas (Wilhelm, 1998). Drama invites participants to explore complex responses through fiction and employ both their affective and cognitive faculties to engage, resist and act (O'Connor et al., 2016). As a pedagogy, drama welcomes play and experimentation for possibility thinking and problem solving, aligning it with the current educational focus upon creativity, resilience and flexibility (DICE Consortium, 2010). Educators acknowledge that drama elicits the playful, critical, the collaborative and the opportunity-seeking behaviours essential to the unpredictable future of our twenty-first-century learners (Pascoe, 2015). Drama can activate soft skills and engage diverse learners through integrated learning experiences in an imagined setting (Anderson & Dunn, 2013; Jablon, 2017). As Luton (2016) acknowledges, when drama entered the Aotearoa New Zealand curriculum in 1999 as a distinct subject, a number of schools were unprepared. Years later, drama classes continue to struggle for space, resources and expertise. Despite these hurdles, as an active and embodied medium, drama remains inclusive and accessible to a range of learners (Stinson & O'Connor, 2012).

In Aotearoa New Zealand, drama practice is underpinned by a strong ethic of *manaakitanga* (the shared values of integrity, trust, sincerity, equity) and *ako* (to teach and to learn). These two Māori concepts facilitate the shared negotiation of a *kawa* (etiquette or protocol) and provide a living agreement for praxis (Cody, 2015;

Te Kete Ipurangi, 2011). Ensemble building within drama classrooms relies upon the creation of *whanaungatanga* or sense of family connection. Such a connection is supported by the dialogic relationship of teacher and student, which upholds ako through the provision of a space in which students are valued and validated (Cody, 2015). Enhanced by the physical, drama spaces work towards the ongoing development of learning communities that are democratic, and inclusive in which participants are heard and repositioned learners (Leggett & Ford, 2013).

As noted earlier, the majority of Aotearoa New Zealand drama teachers are particularly adept at flexible pedagogy and the challenges of adapting spaces. As detailed by Luton (2021), drama teachers have a greater reliance upon open spaces than others' and accordingly make space for groups, rearrange furniture, or get rid of it. When teaching the default position of many drama teachers is alongside students in a circle to ensure interactions between both teachers and students (Kariippanon et al., 2017) This provides an embodied commitment to a collaborative pedagogy and the creation of an inclusive, democratic space (Vettraino & Linds, 2018). The drama classroom and its capacity to be open, transient and responsive lends 'itself to transformation by participants and the teacher' (Nicholls & Philip, 2012, p. 584).

Absent from the drama teacher's classroom are the obvious distinctions between the teacher space and student space. As Lambert, Wright, Currie, and Pascoe (2015) explain the drama classroom is one dedicated to students' becoming and offers a flexible space that can adapt to 'varied pedagogical approaches and purposes' (Nicholls & Philip, 2012, p. 586). It operates as a brave space for learning and creating that welcomes the 'strengths and weaknesses of participants' (Nicholls & Philip, 2012, p. 584) and is negotiated in partnership (Rands & Gansemer-Topf, 2017).

While there are parallels in the pedagogical strategies of the drama teacher and those advocating for ILE's, little research currently exists on ILE classrooms and teaching in the arts. Designed to cultivate flexible, adaptable and mobile citizens for the competitive global economy (McPherson & Saltmarsh, 2016) the utilitarian goals of the ILE classroom remain problematic for the arts practices.

Research Design

The next section details the research design, its focus upon Annette's drama teaching and the practical and pedagogical implications of transitioning from her previous drama room into a new ILE facility. Annette reflected upon her practice from April 1st to May 10th, 2019, spanning the last weeks in the old site and the first weeks in the new facility. Annette compared her experiences in these two sites, to consider how the move from the old drama site to the new one affected her teaching and its implications for future practice and design.

Data Generation

As a reflective practitioner case study (Schön, 1987) this research centred on Annette's personal context and required her to scrutinise her own practice in relation to making sense of a new teaching space. Throughout the study period, Annette continued in her professional teaching role while simultaneously questioning her own practice (O'Toole, 2006). A potentially transformative process (Dewey, 1905), reflective practice requires an exploration of a practitioner's values and a willingness to be transparent around potential biases (Glasswell & Ryan, 2017). Annette documented her practice in a reflective journal and explored her understanding through embodied reflections. Annette's approach to the research aligns closely with her existing drama practice as a responsive, reflexive teacher–artist (Eisner, 2002).

As her research colleague, I collaborated with Annette in the design, collection and analysis of the research and facilitated the embodied reflection workshops to stimulate Annette's thinking and provoke her sensory responses. The series of embodied reflections began in mid-March 2019 and concluded in mid-May 2019. In these workshops, Annette recounted her teaching practice while moving in and around the room to reflect on, not only her cognitive but also her affective understanding. Embodied reflections enable drama practitioners to use their skills and knowledge of drama to re-enact their own stories and invite emotional and subjective knowledge (Luton, 2016). Annette completed her journal writings prior to moving to the new site in April and during the transition into the new site in late April and early May 2019. Annette's initial findings were collated in June and have since been reconsidered. Following the data collection, we ruminated over the emergent findings, reconsidered relevant literature and began interpreting the data into an initial collection of themes.

Data Analysis

We regard learning as an emergent phenomenon that occurs in a moment and is cultivated rather than created. Hodder's (2012) and Carvalho and Yeoman's (2018) concept of learning entanglements and network learning theory offer useful structures through which to analyse the research.

Carvalho and Goodyear's (2014b) concept of network learning appeals because it recognises the relational nature of learning and unforeseen learnings encountered within drama. Networked learning regards learning as an emergent phenomenon that occurs in a moment, when people and resources are understood as relating to one another and resonates with the complexity of teaching (Hodder, 2012). Learning entanglements considers the unpredictable elements of what people do, how they think and how they feel and how that contributes to an emergent learning activity (Hodder, 2012). It resists attempts to identify direct causal links between teacher,
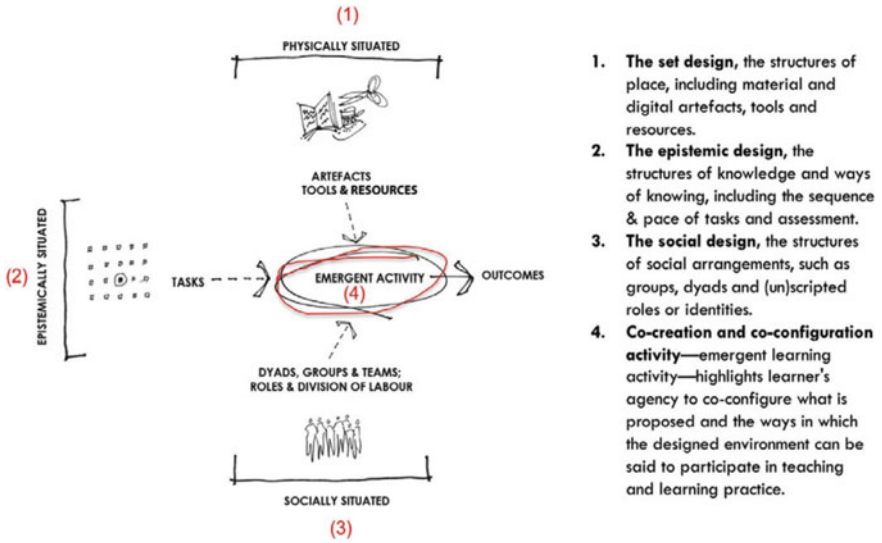
Fig. 6.1 The ACAD Framework (Carvalho & Yeoman, 2018)

student, pedagogy, curriculum, environment, or technology and echoes contemporary educational objectives of creativity and innovation (Fadel & Education Cisco Systems, 2008).

This theory is detailed by the Activity Centred Analysis and Design framework which seeks to create an alignment between learners as active collaborators designed, planned and easily identified elements of a learning moment and those realised in a collaborative enactment (Carvalho & Yeoman, 2018) (Fig. 6.1).

The ACAD framework provides an activity-centred analysis tool which honours the qualities, temporalities and dynamic nature of a teaching-learning process. Accordingly, our discussion reflects upon the relationship between the physical elements and the enacted teaching–learning nexus. As Carvalho and Yeoman (2018) assert, it provides a visual indicator of single elements whilst keeping sight of the holistic network of learning. This networking captures our understanding of physical materials such as the room and furnishings etc. as relational and part of the social context.

Locating the Reflective Practitioner

I set up three year 13 students in D2 preparing to assess and when I went in to be with the other year 13's in D3 they had set themselves up in a circle and were about to start a focus activity, they moved to include me, nice. Working together with routines well established on using the spaces. (Annette, Reflective Journal 23rd April, 2019)

Drama teachers work in open spaces, in circles and in groups, to make sense of the world through the arts (Eisner, 2002). As an artistic process, it requires relationships of trust and respect between all participants. Annette's pedagogy reflects this philosophy and she actively builds collaborative relationships at the start of her practice with a new cohort. This is enacted through sitting together in circles, collectively negotiating codes of conduct and providing students with opportunities for agency.

Locating the Context

On Tuesday 22 February 2011, Aotearoa New Zealand's third-largest city suffered a 6.3 magnitude earthquake, killing 185 people, injuring countless others and devastating many of the city's public buildings and landmarks (GNS Science: Te Pu Ao, 2011). Numerous buildings were destroyed outright or later condemned as unsafe, amongst them a number of schools.

After the damage suffered in the earthquake, the Ministry decided to build a new[1] SIDNEY school as part of a co-share ILE campus with[2] VISION school. Within the shared campus, each school retained its distinct identity whilst sharing some facilities, bell times and resources. The combined campus school also sought to implement a vision for learning that reflected twenty-first-century learning principles (Ananiadou & Claro, 2009; Hughes & Acedo, 2015) through individual learning programmes and a school-wide BYOD (bring your own device) policy. In preparation for the transition to the new school, teachers engaged with professional development on innovative pedagogies and teaching approaches including, curriculum integration and project-based inquiry.

While awaiting construction of new premises, school staff trialled integration, removed walls and encouraged cross-curricular learning in the temporary site. Structurally, they created four Pou (a Māori term for a pillar) designed to integrate vertical year levels and provide a learning space for Wellbeing. The school developed individualised student-centred learning programmes and sought to foster connections to whānau (family members) through collaborative learning interviews where family, student and teachers met to discuss and plan individual learning programmes. In junior levels, students engaged in a two-week collaborative project-based inquiry incorporating five teachers and two classes on the theme of 'journeys'. Staff visited a number of other recently built ILE schools to get a sense of the spaces in action. Such preparations were designed to create a seamless transition of recently employed innovative practices into the purpose-built innovative space. These preparations attempted to match the school rhetoric that in moving to the new site 'the only change will be where you park your car' (Personal communication, 22nd April 2019). In the midst of this preparation, drama and its ways of working remained outside the dominant conversation about innovation. Focus instead fell upon the provision of novel classroom spaces and locating all performing arts disciplines together. The next section

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[1] Pseudonym.

[2] Pseudonym.

describes the old and new teaching sites that Annette documented as she shifted from one to the other during 2019.

The Old

Annette began working at SIDNEY after the earthquake of 2011 on the original school site where the school operated temporarily. The new school was constructed between 2012 and 2019 on a different site as the old site was unusable due to land damage. Because the school hall was damaged in the earthquake, it became
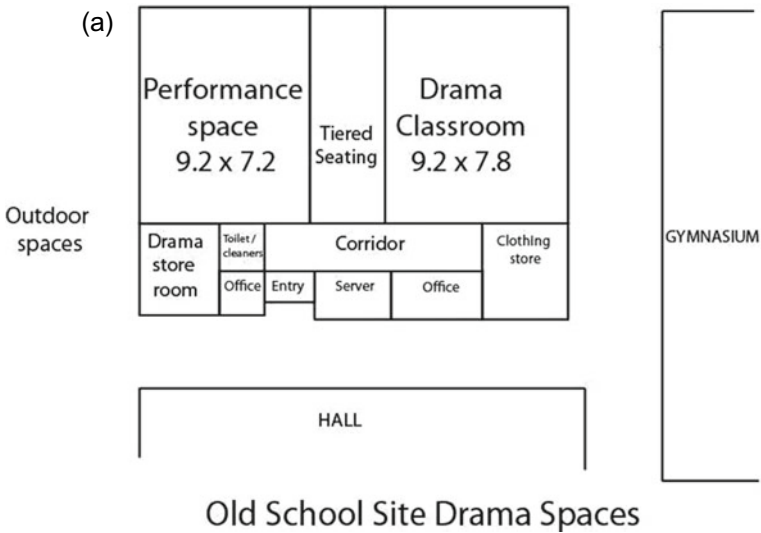

Fig. 6.2 (a) Floor plan of the old site, (b) performance space in the old site, **(c)** Drama classroom in old site

Fig. 6.2 (continued)

unavailable for teaching and drama facilities were instead created out of an audio-
visual room (repurposed as a drama 'theatre'), and a classroom next door. The adja-
cent hallway and outdoor grass spaces provided other essential auxiliary spaces for
devising and rehearsing groups. Temporarily repaired after the earthquake, all spaces
had ongoing issues with leaking roofs, heating and cracked concrete floors. As seen
below (Fig. 6.2a–c) the allocated drama spaces were of comparable size, offering
access to outdoor and auxiliary spaces. Adorned with a few posters, basic flooring
and a rudimentary lighting rig, this temporary set-up, while simple, provided drama
classes with a space of their own and an opportunity to make it do 'whatever'.

The theatre had a storage area for costumes and sets plus a small green room
which could be accessed from two sides. Adapted into a variety of configurations
for performances, the classroom had no windows and few pieces of fixed furniture.
Students could access the lighting and sound for the small theatre.

The New

Housed within the new performing arts complex, the new drama space is on the first
floor of a two-storey building. This complex houses the school's specialist Dance,
Music and Drama classrooms, along with two shared teaching spaces and lighting
and sound booths for the ILE campus's two communal auditoriums. The SIDNEY
drama space has a moveable central dividing wall. It opens on one side to a shared
performing arts hallway and on the other to the school foyer. Separately, the two
rooms are 8.6 m × 7.2 m and 8.6 m by 6.5 m. Together as one room form a 15.8 m ×
8.6 m space. Figure 6.3a is a schematic drawing of the performing arts spaces (also
see Fig. 6.3b, c).

Each room contains a set of cubbyholes, a projector, whiteboard, speakers, chairs
and cushions. Floor to ceiling windows on one side of the room overlook a shared
canteen and courtyard space, while directly facing the English and Social Studies

learning areas. The white blinds provide little real shade. The lights and temperature are automatically controlled and windows do not open.

The two multipurpose theatres are located on the ground floor below the performing arts spaces. The retractable seating in the small theatre and wooden flooring designate a performance space. The 700 seats large theatre (Fig. 6.4) is entirely carpeted. The staging space is dictated by the location of the lights and

(a)

Drama Space
with dividing wall
15.8 x 8.6

Dance Space

Access

Corridor

Music Practice Rooms
and
Dance Change Room

Office

Music

Store

Shared Music

Shared Dance

New School Site Drama Spaces First Floor

(b)
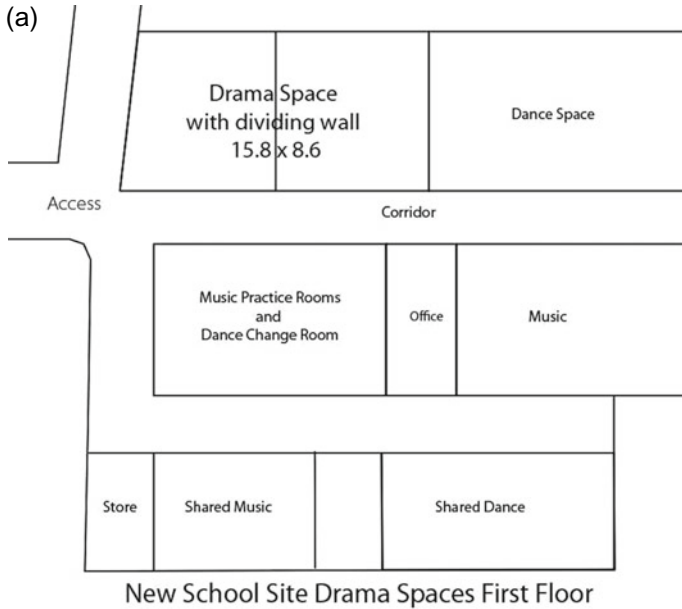
Fig. 6.3 (a) Floor plan of the new site, (b) Drama classroom partition closed, **(c)** Drama classroom partition open

(c)

Fig. 6.3 (continued)

Fig. 6.4 Large theatre

portable staging. While both have sound and lighting facilities, these are inaccessible from the theatre spaces themselves.

Teaching in the New Space

The next section highlights some of Annette's initial experiences of teaching in the new space. These thematic vignettes taken from her reflective journal entries and recordings of embodied reflections detail both the challenges and opportunities presented by the new space. Through thematic analysis, the vignettes reflect the practical implications of her move to the new spaces in physical, temporal and theatrical terms. We applied the ACAD wireframe to one of Annette's teaching programmes to assess moments of alignment or disruption within the learning network. We selected an area of Annette's teaching which exemplified her current practice and mapped it

to the wireframe to identify elements of networked learning. Based upon her reflective journal notes, we purposefully selected a common topic of Annette's teaching (Mime with Year 9) and mapped the elements that contributed to learning (pedagogy, space, content, etc.) onto the ACAD wireframe. This provided a targeted example of how all elements of the learning encounter interact to either contribute or detract from the learning experience.

Physical Space

When entering the newly designed space for the first time, students explored where to put bags, where the potential breakout spaces were and where the small and large theatre spaces were. Annette maintained usual class routines, in an effort to reinforce a sense of security for students. She wanted them to know that while the physical space had changed, many familiar aspects of teaching and learning in drama remained unchanged.

> We began sitting in a circle, I reiterated we had this beginning at the old school and so some things remain the same, start in circles, end in circles. We talked about why a circle. The students came up with 'so we can see everyone' and 'so that we are all even' and I talked also about me being a part of that, a shared part of the learning (Reflective Journal, 6th May 2019)

Maintaining the 'circle' in the smaller partitioned space however, proved difficult. Students in this space could easily sit and lean against the partition, the walls and the window to physically and metaphorically distance themselves from the working circle. This physically separated some students from the cohort and negated the commitment to a collaborative teacher-student relationship. Paradoxically the smaller footprint of this space meant that students had insufficient space for working effectively in small groups. Split into groups of five, a typical junior class of thirty students had only about a metre between each group. When required to create scenes or work in character, rather than devise through movement, students tended to sit and talk. Those who did attempt to move, could still only do static scenes as they didn't have room to travel through space or incorporate sets or props and all were likely inhibited by the close proximity of other groups. The physical impact of other environmental factors provided further unforeseen limitations with some health and safety hazards.

> I had a very bad headache by the end of the lesson due to noise within the space and dance room, and heat and glare of the sun through the blinds" (Reflective Journal, 6th May)

The blinds provided for the windows are white and reflect the light resulting in a harsh glare ensuring that students are silhouetted against them. Students cannot sit across from the projector screen due to glare of the large windows directly opposite, which made watching videos difficult. When divided into the two rooms, sounds from both classes competed, creating a noisy and untenable environment. Annette

made this entry to highlight the effect of this noise: 'A number of students can't hear me in the new spaces and often ask me to repeat instructions' (Reflective Journal, 28th April). A solution to these challenges was to book and then relocate to the small theatre rather than teach in the 'two rooms'. Having to borrow another space for effective teaching, negated the intended flexibility of the space, ultimately reducing the number of available teaching spaces.

Temporal Space

Although the concept of locating all performing arts disciplines within one central complex makes a lot of sense, it also presents a number of logistical issues. Music and Dance also have students working in small groups, requiring multiple breakout spaces. This puts the Arts disciplines in direct competition for available spaces and times, potentially creating more areas of tension than collaboration.

Spaces like the downstairs foyer, beside the stairs or the upstairs corridor offer potential break-out spaces for small group work. However, these communal spaces are difficult to utilise and in demand by all four arts disciplines. As a result, allocating these spaces for individual teaching time with students required extensive negotiation. For year 13 drama, this was particularly challenging as students worked to devise solo or paired performances. Hoping to work in private, these students reluctantly shared the classroom, dance rooms, hallways and foyers which presented other challenges as detailed in this example.

> I had asked drama groups to use the public foyer space and it was a bit noisy for the careers people and we were asked to be a bit quieter because it was 'distracting'. (Reflective Journal, 10th May)

Within these shared spaces, other learning areas and their needs took precedence, reflecting perhaps the muted position of the arts within the hierarchy of New Zealand education. The quiet, focused study required by other learning areas, asserting an implicit dominance over the potentially noisy and interactive work of drama. A further ad hoc space, the outside courtyard, is in close proximity to Science, the canteen and the senior leadership corridor. The use of these spaces depended upon the whereabouts of other classes, the weather and ability of the groups to work autonomously.

As co-tenants with the partner school of the two formal theatre spaces Annette's drama class must negotiate with the timetable of the partner school, other learning areas within her own school and large-scale events such as assemblies and exams. The high demand for these theatres ensures that any assessments, performances or rehearsals must be booked well in advance. The need for such disciplined planning and strict adherence to this centralised timetable system reduces the opportunity to alter dates and times to accommodate creative developments, student attendance or experiment with staging, etc.

Aesthetic Space

Performing in the new drama rooms is difficult as they have little capacity for creating a theatrical space. When staging theatre, it is vital that the space can be adapted via lighting, sound, set and design, etc., to create the necessary aesthetic for the performance and offer a designated place for the audience. As an outward-facing upstairs classroom, the light-coloured blinds and full-length windows provide a constant level of light in these drama rooms. Because there is no access to stage lighting and the rooms cannot be darkened, it is difficult to create a theatrical atmosphere or for the space to act as a theatre. These omissions restrict learning opportunities for students. One reflective journal entry (9th May, 2019) observed that:

> At the old site students could access the lighting and sound board easily. I could teach students how to work the sound and lighting from this area and often year 9's when assessing would rotate managing the lights and sound for each group.

Providing learning opportunities in this area is limited not only in the drama room but also in the theatres themselves. While these theatres have lighting and sound booths, neither are accessible from the theatres, and require advance booking. Access to the small theatre's sound and lighting booth requires leaving the theatre, walking through the canteen, up the stairs and along a hallway. Students are unable to operate the lighting board easily however, as the stage area is not visible, unless the lighting boards operator sits on the desk and leans out of the booth window. For Annette, these multiple access and safety concerns hindered her ability to teach, offer support or 'concentrate on a performance' (Reflective Journal, 9th May).

A Teaching Moment

The comparison between the two sites is considered more directly in the following table which applies Goodyear and Carvalho's ACAD wireframe to a specific example of Annette's teaching (Table 6.1). This wireframe offers an analytical tool for considering networked theory and Activity Centred Analysis Design as detailed earlier in the research design. It demonstrates the interdependence of resources, tasks and social groupings (Carvalho & Goodyear, 2014a) and reveals how each selected element of the learning process relates to each other (Carvalho & Yeoman, 2018). This wireframe enables the mapping of multiple factors surrounding the emergent learning activity and provides a clear mechanism for identifying disconnections between these factors. We purposefully applied it to Annette's vignettes from the research as a coding frame for the analysis. The unit of work investigated for this reflective inquiry was a Year 9 (students are approximately 12–14 years old) unit on Mime. Annette taught this established and familiar unit of work, in both the old site and the new site offering a clear case through which to compare and contrast the significance of the spaces. Essentially, this table depicts how the designed elements of the learning network facilitate or negate intended learning. The Table reflects the coherence or dissonance

Table 6.1 ACAD wireframe model

High level philosophy	Set design — Learning is physically situated		Epistemic design — Learning is supported through knowledge/creative orientated activity		Social design — Learning is socially situated	
	Old site	**New site**	**Old site**	**New site**	**Old site**	**New site**
Macro Global Level 1 Patterns	**Buildings and Tech** Space 9.2 × ×7.8 m concrete floor, with dance tiles laid over. Tiered seating (not included in dimensions) to south. Lighting and sound at side of seating. Wooden door and block out curtains. Large projector screen on north wall. Access to Drama only hallway and outside spaces	**Buildings and Tech** Space 8.6 × × 7.2 m Carpet on concrete floor. Floor to ceiling windows make up the north wall. Sound system and projector onto a whiteboard on south wall. Door is glass with dividing wall to west. Access to shared hallway and outside spaces downstairs	**Stakeholder intentions** A year 9 programme that reflects the elements of drama and has a commitment to the key competencies	**Stakeholder intentions** A year 9 programme that reflects the elements of drama and has a commitment to the key competencies. A growing awareness of how drama reflects 21st Century learning principles	**Organisational forms** One teacher with 30 students. Learning starts and ends in a circle. Students break into smaller groups during the lesson	**Organisational forms** One teacher with 30 students. Learning starts and ends in a circle. Students break into smaller groups during the lesson
Meso—Structural level 2 patterns	**Allocation and use of space** 30 students at year 9 students sit in circle on floor at beginning and end of class. Each pair or small group has approximately 3–4 mm around them in which to move. Students 'break' out to hallway and outside on fine days when in smaller groups. Students are able to work independently in areas close to the classroom but not in sight of teacher	**Allocation and use of space** 30 students at year 9 students sit in circle on floor at beginning and end of class. Each pair or small group has approximately 2 mm around them in which to move. Students lean on glass wall and walls, including dividing wall. Students can 'break' outside on fine day as an entire class	**Curriculum** Topic: Exploring the art of mime. Drama Curriculum Strands: Understanding Drama in Context, Developing Practical Knowledge, Communicating, and Interpreting	**Curriculum** Topic: Exploring the art of mime. Drama Curriculum Strands: Understanding Drama in Context, Developing Practical Knowledge and Communicating and Interpreting	**Community** Teacher is facilitator of the learning. Students take agency - creating and making decisions made by students around the parameters of the task. The teacher moves freely around these groups, facilitating and managing	**Community** Teacher is facilitator of the learning. Students take agency - creating and making decisions made by students around the parameters of the task. The teacher moves freely around these groups, facilitating and managing

Table 6.1 (continued)

High level philosophy	Set design Learning is physically situated		Epistemic design Learning is supported through knowledge/creative orientated activity		Social design Learning is socially situated	
	Old site	New site	Old site	New site	Old site	New site
Micro-details Level 3 patterns	**Artefacts, tools and texts** Mime videos accessed online and viewed in class on the projector. Online and as a group in class on the projector, screen Lighting and sound equipment	**Artefacts, tools and texts** Mime videos accessed online and watched on individual computers and in their own time	**Selection, sequence and paced** Mime taught over a 3-week unit. Students worked in a variety group sizes. At the end of the unit, groups would present a piece of mime to the class. Groups alternated working the lights – up and down– for each group presenting	**Selection, sequence and paced** Mime taught over a 3-week unit. Students worked in a variety group sizes. At the end of the unit, groups would present a piece of mime to the class. Groups alternated working the lights – up and down– for each group presenting. Students performed their mime scenes with a freeze frame at the beginning and end to denote beginning and end	**Roles and divisions of labour** Initially the teacher takes a directive, inquiry role with the knowledge learning of 'Mime'. Gradually students take agency to explore mime techniques through the body Students may work solo, in pairs, small groups or as a whole class Trust is built through groups working independently in spaces not visible to the teacher but readily accessible by the teacher	**Roles and divisions of labour** Initially the teacher takes a directive, inquiry role with the knowledge learning of 'Mime'. Gradually students attempt independent activities to explore mime techniques through the body Students may work as a whole class Confidence is minimised however due to the space available to extend out techniques, e.g. it is difficult to run and jump in the classroom Trust is difficult to develop as students are unable to work in spaces outside the whole group classroom due to being upstairs, a shared hallway and lack of accessible break out spaces to work in

of these elements in facilitating a productive learning network for the kinds of acts of creation sought in a drama class.

Integral to contemporary notions of ILE spaces, the number of breakout spaces available for drama in the new site has diminished rather than increased. In the old site, adjacent hallways and outdoor spaces served as breakout spaces. While less than ideal, these spaces offered students a sense of privacy and autonomy in which to create and rehearse. In the new space, the class cannot 'break out' into smaller groups with ease. Alternative spaces which could facilitate larger scale movement and provide students with more options for staging theatre work require advance booking.

As evidenced above, other practical concerns limit the teaching and learning opportunities available. The group cannot watch videos as a class due to where the projector is located in relation to the constant glare. Without access to lighting or sound equipment, students have trouble cultivating these skills and accessing essential resources.

In this instance, the limited design of the teaching space contradicts the stated aims of twenty-first-century learning (OECD, 2013) and drama (DICE Consortium, 2010) by restricting opportunities for flexibility, creativity, critical thinking and collaboration. In successful drama, participants use spaces in which to play, explore, experiment and fail without inhibition or public exposure. In the previous site's drama spaces, students could break into small groups and work unobserved by the teacher or fellow students. The location of potential breakout spaces in the new site (outside and in full view of the Science and Social Studies block) effectively ensures student work is publicly on display. This atmosphere of surveillance by peers, other teachers, or the public, is likely to limit their feelings of emotional and artistic safety. Subject to real or perceived public scrutiny students are less likely to be playful, take risks and consequently develop dramatic capabilities.

This study reflects upon the coherence or dissonance of the social, pedagogical and physical elements for facilitating a productive learning network for acts of creation sought in a drama class. We agree with Riel and Levin's (1990 cited in Goodyear, 2014, p. 34) findings from studying successful networks, that coherent pedagogical approaches are essential in challenging an assumption that set design is of lesser importance than social design. As symmetrical and relational elements of a learning network, all aspects have a significant role to play. When the relations between the human and material are off-balance this results in what Hodder (2012) describes as 'sticky entrapment' (p. 94), a state in which, once choices are made, limit the range of subsequent opportunities for future action. He argues that 'Entanglement can thus be defined as the dialectic of dependence and dependency' (2012, p. 89).

Discussion

While Annette's new drama spaces may be physically flexible, the need to make advanced bookings and negotiate with a range of stakeholders creates a rigid timetable. This counters the potential for responsive and emergent pedagogy and emphasizes teachers' roles as administrators, replacing conversations between colleagues about teaching and learning with conversations about logistics and management. Similarly, the location of the theatres and the distances between the drama office, dressing rooms and theatre require extensive prior organisation of resources and technologies. This increasing administrative and organisational workload relegates thinking about pedagogy and practice to the fringes and inhibits spontaneous teaching.

The limited availability of teaching and performance spaces positions teachers in direct competition with one another as they vie for the best spaces and time slots. This appears to challenge the concept that working in an ILE is likely to increase teacher collaboration (OECD, 2013).

Restricted by time, space and access to technology, teaching in the new site's spaces requires participants to make do with the resources they have. The aesthetic and playfulness of drama require spaces that create an atmosphere, to foster flexible imagining. As Annette notes in her reflection below, the sound bleeding through from a neighbouring classroom hindered her ability to create a quality atmosphere for devising drama.

> As we sat we could hear the class next door and the dance class – I decided to put on some quiet devising music. Our DP came around to see how it was going and I let her in so she could 'hear' the noise from the dance class next door. (Reflective Journal, 6th May 2019)

The aesthetic element of drama is essential for crafting and sustaining fictional worlds in which participants may engage in new ideas and create as artists (O'Neill, 1989). The aesthetic creates knowing through experiences and evokes emotions which moves the drama out of the ordinary and into the unknown. It is the aesthetic elements of the arts that invite ambiguities, sparks personal resonances and challenges universal constructs (Greene, 2007). The realities of managing the space and its subsequent compromises are likely to result in the narrowing of practice.

As Annette describes the logistics of managing small groups in difficult-to-access spaces presents a considerable challenge to her ability to monitor the class. While senior students may require less supervision, time spent checking in on each group erodes quality-teaching time. Tasked with vast amounts of logistical organisation, prior to teaching, where is the time left to innovate teaching practice?

Drama is a human art form, learned through practical experience in the body and requires a brave and culturally responsive space (Arao & Clemens, 2013). In the process of devising, playing, exploring and discovering, participants must feel safe to take artistic risks and challenge themselves (Cody, 2015). Relationships of trust and mutual respect between participants along with suitable environments provide the

emotional safety necessary for working in drama. As evidenced below this conscious-ness of being 'on show' influenced Annette's organisation of the space and likely her teaching.

> "Near the window it does seem as if people can look in – we have the blinds shut at the moment because it seems quite open to the science area – even though we are upstairs" (Reflective Journal, 25th[th] April, 2019)

Glass walls and open spaces where everyone can see everyone provide 'camou-flaged surveillance' (Bisset, 2014, p.19) and a constant sense of being on display. We contend that both teacher and student participation is likely inhibited rather than enriched by the de-privatising of spaces.

Finally, sticky entrapments (Hodder, 2012) occur because although spaces may be flexible, there is less flexibility in when they can be used. The unforeseen conse-quence is that opportunities for creative and responsive teaching and learning are likely diminished. Additionally, the restricted spaces have lessened the ability for participants to learn through the body, as their movement is restrained by the space available.

Conclusion: Back in the box

Despite the title and original intention of this chapter to reflect upon Annette's move into an ILE space, it became clear through the research that the new performing arts space does not meet the requirements of an ILE. As suggested by the Ministry an ILE should endeavour to develop the students' twenty-first-century skills and afford greater; flexibility in groupings, collaboration between teachers and student autonomy over the use of the space (McNaughton and Gluckman, 2018). While the overall approach of the school focuses upon a partnership of pedagogy and practice for innovation, for drama the opposite seems to be true.

The dissonance between the school's pedagogical aims and the teaching realities for drama, suggest a lack of knowledge about drama education processes. Focused on providing performance spaces for the occasional school production, this building fails to meet the primary needs of drama students to explore, rehearse and create. The two theatres provide an architectural metaphor for the continuing place of the arts as an accessory to education. An outward dedication of respect, time and money, these theatre spaces look impressive to a generalist audience but do not match the day-to-day needs of the performing arts department. While other subjects navigate new opportunities for greater interaction, student autonomy and innovative pedagogies, in this context drama is once more making do. As detailed in Luton's chapter, drama education has been meeting many of the objectives of the ILE initiative and cultivating twenty-first-century skills such as creativity and critical thinking for decades (OECD, 2013).

While the new physical site for drama has altered considerably and brought numerous challenges, challenges are not new to teaching drama (Luton, 2016).

Decades of teaching in inadequate spaces and consigned to the periphery of the taught curriculum, drama practitioners will persevere (Brooks, 2013). The central tenet of drama as a collaborative endeavour ensures that its pedagogy continues to focus upon relationships, creativity and connection. As drama practitioners, we remain dedicated to communicating, collaborating and engaging in a symbiotic relationship of teaching and learning with students.

Restricted by issues of space, time, access to resources and negotiations with other curriculum areas, in this case it seems that drama has been put back in its box.

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Chapter 7
Innovative Learning Beyond the Classroom Walls

Chris Eames and Louise Milne

Abstract Learning began well before anyone moved into walled classrooms, but in recent times much of education has been captured into purpose-built spaces. This has both enabled and constrained learning and has sometimes given young people the sense that anything experienced beyond these classrooms is not really educative. But contexts outside classroom educational settings, such as landscapes, aquariums, museums and visitor centres, offer unique learning experiences for relevant, context-based education. The advent of technologically mediated teaching and learning has enhanced education possibilities into spaces beyond where power and internet connections are available, particularly through mobile learning. These settings also provide important experiential learning opportunities that can complement learning within formal (i.e. school) contexts. In this chapter, we discuss the synergies between the principles and practices in Education outside the Classroom (EOTC) and Innovative Learning Environments (ILEs). We draw findings from our recent EOTC studies to (re)conceptualise ILEs as learning sites that can bring together productive learning experiences within and outside the classroom. We propose a framework that examines space, pedagogy and technology to extend current conceptions of ILEs. We argue that such a framework is important in considering what innovative learning means both within and outside classrooms.

Keywords EOTC · ILE · Digital technologies · Learning spaces

Introduction

In this chapter, we argue that Education Outside the Classroom (EOTC) must not be ignored in any discussion of Innovative Learning Environments (ILEs). Education has happened 'outside' for thousands of years, from indigenous ways of knowing

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that were place-based (Penetito, 2009) and cultural (Tiu, 2016), to Aristotle's and Plato's debates in the plazas of Athens (Gaarder, 1995), about how we come to know anything through our senses or our thinking. The capture of education into walled spaces brought on by industrial forms of schooling (Thrupp, 1999) has created some efficiencies in bringing prescribed learning to the masses while seeming to consign experiences beyond these constructed spaces into educational shadows. As education has increasingly privileged knowledge-gathering driven by the insatiable demands of an information age, technological artifacts and connectivity can further tie our teachers to school-based constructed environments that afford this type of knowledge-based learning.

There is good evidence that outside-the-classroom educational spaces offer unique learning experiences for authentic, context-based education (Ballantyne & Packer, 2011; Boyer & Roth, 2005). Befitting the definition of an ILE (Dumont et al., 2012), these learning experiences are often governed by individuals' or groups' needs and motivations (Brookfield, 1986; Falk & Dierking, 2002). These settings also provide important experiential learning opportunities that can complement learning within classrooms (Falk, 2005). Contexts such as nature-based visitor centres can offer opportunities to complement and reinforce outdoor experiences by promoting reflection and meaning-making processes around socio-ecological issues (Ballantyne & Packer, 2011). Such EOTC can meet curriculum objectives (Ministry of Education, 2007), as has been shown in studies around science and sustainability within the local environment that can develop student ecoliteracy (Eames & Aguayo, 2019; Warner et al., 2014).

In this chapter, we interrogate the conceptualisation of spaces for learning, and consider how disparate learning spaces can complement each other through pedagogical and technological means. We consider how non-classroom settings offer relevant, authentic, context-based learning (Ballantyne & Packer, 2011; Boyer & Roth, 2005) that is student-centred and caters to individuals' or groups' needs and motivations (Brookfield, 1986; Falk & Dierking, 2002). Our intention is that this may offer a useful additional conceptualisation of ILEs that goes beyond the current discussions in the literature.

EOTC and ILEs

We begin our argument by examining synergies between conceptions of ILEs and EOTC. In order to do this, we first situate our discussion within the conceptions themselves. Acknowledging the diverse ideas and terms used to describe ILEs, for the purpose of this chapter we use the Aotearoa New Zealand Ministry of Education guidelines to define ILEs as 'an ecosystem that includes learners, educators, families/whānau, communities, content and resources. It is a holistic concept. It is future focused—capable of adapting as educational practices evolve and change' (Ministry of Education, 2019, p.1). This learning ecosystem is seen to include social, pedagogical and physical space elements (Cooper, see Chap. 3). We juxtapose this with an

Aotearoa New Zealand Ministry of Education definition of EOTC as 'curriculum-based teaching and learning that extends the four walls of the classroom' (Ministry of Education, 2016, p. 4). This definition acknowledges that learning can take place anywhere and EOTC can support deep learning experiences in contexts outside the classroom.

So what synergies might exist between ILEs and EOTC? The Organisation for Economic Co-operation and Development (OECD) established a set of principles for ILEs (Dumont et al., 2012). Underpinning these principles, is an acceptance that 'not all learning takes place in the classroom as much of it occurs at home, on sports fields, in museums and so forth (non-formal learning) and sometimes implicitly and effortlessly (informal learning)' (p. 3). In Table 7.1, we examine the synergies between these principles (Dumont et al., 2012) and EOTC.

Table 7.1 Synergies between ILE principles and EOTC

ILE principles (Dumont et al. 2012)	**EOTC**
The learning environment recognises the learners as its core participants, encourages their active engagement and develops in them an understanding of their own activity as learners	EOTC is by its nature active, sensorial and self-managing. Students are tasked with connecting experiences with classroom learning according to their needs
The learning environment is founded on the social nature of learning and actively encourages well-organised cooperative learning	EOTC develops social relationships amongst learners and provides opportunities for types of skill development not easily attainable in class (Bolling et al., 2018)
The learning professionals within the environment are highly attuned to the learner's motivations and the key role of emotions in achievement	Experiences outside the classroom provide direct interactions with diverse values and can engender emotional responses in learners (Liddicoat & Krasny, 2013)
The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge	Novel experiences can create cognitive dissonance allowing reflective and critical thinking, whilst acknowledging difference
The learning environment devises programmes that demand hard work and challenge from all but without excessive overload	Well-designed EOTC complements and augments classroom learning in a stimulating and supportive environment (Falk, 2005)
The learning environment operates with clarity of expectations using assessment strategies consistent with these expectations; there is a strong emphasis on formative feedback to support learning	Well-designed EOTC sets clear objectives that provoke questioning and reflection upon shared experiences. Diagnostic assessment before and during an experience and formative assessment during and after help interpret the experiences
The learning environment strongly supports 'horizontal connectedness' across areas of knowledge and subjects as well as to the community and the wider world	EOTC is by its nature interdisciplinary, providing learners with connections to places and community members which develop a learner's understanding of their world beyond school (Delen & Krajcik, 2017; Wheaton, 2015)

Whilst each of these synergies provides fruitful ground for further exploration, for the rest of this chapter we confine our focus to ideas of *space*, *pedagogical considerations* such as student centredness and authenticity, and the use of *digital technology*. These ideas flow across several of the principles and are particularly pertinent to the illustrations in our recent research. Next, we discuss synergies between EOTC and ILEs within these, before providing the example illustrations.

The seven principles of ILEs indicate little about the physical spaces in which learning may occur, yet in New Zealand at least, a focus for ILEs has come to play upon the nature of these spaces. This focus may emanate from the Aotearoa New Zealand Ministry of Education's document *Designing Schools in New Zealand* (Ministry of Education, 2015) in which guidelines are provided for new-builds and renovations to school property. These embody conceptions of ILEs, and as Kedian and West-Burnham (2017) report, may be leading principals to focus heavily on designing physical spaces within constructed environments, at the expense of social and pedagogical design. This may be ignoring the development of teacher efficacy for working in ILEs (Cooper, see Chap. 3). This is further enhanced by ILE researchers who focus their work on school-based physical spaces (e.g. French et al., 2019; Whyte et al., 2016). We agree that well-designed physical spaces have the capacity to enable learning, for poorly designed spaces can constrain learning (Wright, see Chap. 2). Well-designed physical spaces have long been important in formal education, while materiality within these built spaces associated with furniture (Holder, 2015) and classroom design can be configured to stimulate aspects such as creativity (Green School New Zealand, 2020). However, as Mulcahy and Morrison (2017) argue, relational thinking about space and learning is important. This clearly points to considering students' relational experiences which can link mind and matter in learning beyond school classrooms. The affordances of learning environments 'outside' are sensorially rich and may stimulate thinking, feeling and acting related to the materiality of these spaces, in the same way that well-designed classroom spaces can. Equally, not all outside-the-classroom spaces will foster intended learning outcomes and careful 'design' through selection and use of these spaces is important.

Alongside these principles of 'space' as they relate to teaching and learning environments, learning in the twenty-first century encompasses pedagogy that recognises and endorses the key principles of authentic practice and personalised or student-centred learning. The term 'authentic' generally refers to something that is 'real', measurable, quantifiable, and possibly original. How then, does this present within educational practice? Hennessy and Murphy (1999) describe being authentic as students engaging in educational experiences that are personally real, relevant to their lives, and to situations they may encounter in future workplaces. Snape and Fox-Turnbull (2013) identify three dimensions of authentic practice that examine this further. These include:

- authentic pedagogy, whereby learning is significant, meaningful, and driven by student interest and ideas;
- authentic activities or tasks, those that relate to the real world of the students, are open ended and provide opportunities for collaboration and reflection; and

- authentic teachers and learners, teachers with the pedagogical and professional expertise to guide student practice, and students with the "will, drive or determination" to achieve a goal (Riggs & Gholar, 2009, p. 6).

The twenty-first-century model of teaching and learning, as discussed by McPhail (2016), suggests 'personalised learning' as 'a genuine involvement of students in decision making about their learning' (Bolstad et al., 2012, p. 19). This may be realised through partnerships with the community providing students with opportunities to experience authentic 'real-world' projects (McPhail, 2020) and where 'schools [are] no longer siloed from the community' (Bolstad et al., 2012, p. ref). The world of the students includes relationships with families, whanau and communities. Accordingly, an important principle of the *EOTC Guidelines: Bringing the Curriculum Alive* (Ministry of Education, 2016) is to provide students with opportunities to see and engage with community issues and to plan for, and find, workable solutions. This involves connecting with local people, organisations and places (MoE, 2016) and where students can experience a strong sense of personal identity and recognise their place as active members of society.

A final point which relates to the third idea is the enhancement of learning opportunities through digital technologies. There is an expectation that school-aged students in Aotearoa New Zealand become capable and discriminating users of digital technology (Education Review Office, 2018). The *New Zealand Curriculum* maintains students should 'confidently use ICT (including, where appropriate, assistive technologies) to access and provide information and to communicate with others' (Ministry of Education, 2007, p.12). EOTC is not restricted to teaching and learning away from the classroom. Effective EOTC will incorporate classroom time at two key points: (i) before a visit to prepare students for an experience away from the classroom, and (ii) time after a visit in which students may reflect on their experiences, piece together elements which may have become entangled or misunderstood, and complete follow-up tasks to consolidate their learning (Tofield et al., 2003). As in any effective educational experience in today's classroom, it is likely that the use of digital devices will play an important role, either through seeking out additional information or researching unfamiliar concepts prior to or after the EOTC visit, or through resources or materials that are part of the visit experience, including digital tools that enable data to be effectively and accurately collected and analysed, and experiences to be enhanced and reinforced.

In the following examples that describe two EOTC projects, we exemplify the use of innovative and complementary spaces, the engagement with student-centred and authentic learning, and the inclusion of digital technologies.

Study 1: Innovative learning in the GeoCamp (Wairarapa) programme

In 2018, GNS Science—Te Pū Ao—delivered their seventh two-week Earth Science education programme in the Wairarapa region of Aotearoa New Zealand. GNS Science is a government-owned geoscience research organisation. As part of their obligations to enhance understanding of geological and earth-system processes (https://www.mbie.govt.nz/science-and-technology) they also offer hands-on, 'in the field' educational programmes for 10- to 13-year-old students. The GeoCamp concept came from a group of scientists from GNS, drawing on the research of Dr. Richard Levy and team who examined the impact of a science-based Summer Camp for pre-service teachers in Nebraska, USA (Nugent et al., 2012). The GNS team consisted of six male scientists and one female scientist.

The second author (Louise) was invited to undertake an evaluative research project to determine the effects the Wairarapa GeoCamp had on students' understanding and enthusiasm for earth sciences. Questionnaires, unstructured observations and document analysis were the main methods used for generating data.

The GeoCamp project was premised on findings from a quasi-experimental study with theoretical underpinnings from experiential learning (Kolb, 1984), scientific inquiry (Jarvis & Pell, 2002), and teacher education and professional development (Ingersoll & Kralik, 2004). The GeoCamp programme's general aim was to give students an opportunity to work 'in the field', learning procedures for carrying out scientific investigation, and applying these to their own investigations and understandings of geoscience. By working alongside scientists, the GNS team believed students would acquire greater enthusiasm for science and perhaps be inspired to pursue science through to their senior years at school, and for some, possibly opening up a future career pathway. Of equal importance was the potential for the supervising teachers, also participating in the programme, to develop greater confidence in presenting science as a learning opportunity outside the classroom and be better equipped to support their students in emulating the work of earth scientists in the field.

Each camp was tailored to the geological features and phenomena of the region, along with three specific learning goals to guide student learning:

- Science is a process of careful observation, and asking questions about those observations
- Observing and understanding processes is key to interpreting what we see in natural science
- Geological archives tell us that the world we presently see and experience was different in the past, and allows us to predict how it will be different in the future.

To facilitate these learning goals, the GeoCamp included three field trips to Mangapari Stream, Lake Wairarapa, Castle Point beach and the Tinui mud volcanoes, with a day in between each one at the Masterton REAP Centre [Rural Education Activities

Figu. 7.1 Scientist, teacher and students discussing features of Lake Wairarapa

Programme] to prepare for and then review each field trip (see Fig. 7.1). This culminated in three days designated for planning group presentations for an 'expo' planned for the Saturday of the second week. With a focus on student-centred learning, this was an opportunity for students to share their experiences with invited guests including their families, friends and teachers, as well as providing an opportunity to pursue a science investigation of their choice.

The REAP Centre was the physical space or home base for the programme. It offered a large flexible space with moveable tables and chairs, a SMART board, fixed and moveable white boards and a small kitchen off to the side. This became not only the meeting place for the duration of the programme, but also a storage space for equipment, and importantly, a social space where staff, students and the GNS team could congregate for morning tea and lunch. The socialising that occurred and relationships that were built during this time gave a 'human face' to the scientists—they were real people and, contrary to many of the students' pre-camp contributions to a draw a scientist task, generally quite sane!

Whyte et al. (2016) discussed the significance of physical spaces that may be assigned for learning, such as the REAP Centre as an alternative learning space, and more importantly, the visits to geological sites that were to be the key focus of the camp. A valuable reference was made to 'the dynamic interface between such places' where learning spaces are a potential additional '3rd teacher' (p. 82). This resonates well with current views of EOTC and its role or function as an important adjunct to in-class learning (MoE, 2016).

Notable strengths of the GeoCamp programme were the pedagogical approaches the GNS team used. When designing and planning the programme, it was to be multimodal and this included presentations and discussions led by scientists, small group tasks for students, collaborative practice modelled by scientists, and group

work that involved students, teachers and scientists working together. There were phases of focused information-sharing prior to a visit, while new vocabulary and conceptual understandings associated with the geology of the site visit were introduced. This ongoing cycle continued throughout the two weeks, culminating in a student-driven project where pairs or groups of students selected an area of interest, posed a question of inquiry, and were supported by the GNS scientists to research, and then create a presentation board for the community expo. Because the focus of the programme related to the practice and field work of the earth scientist, it naturally reflected many of the goals identified as those of twenty-first-century learning and teaching whereby opportunities for students to experience authentic, real-world projects were key (McPhail, 2020). Personalised learning, using knowledge to develop learning capacity, and new kinds of partnerships and relationships were all reflected within this approach (Bolstad et al, 2012). In addition, students observed individual members of the GNS team taking a lead when specialist knowledge was required. They learned that scrutiny and debate emanating from individual scientists' research, was a vital element of their practice. This strongly relates to Snape and Fox-Turnbull's (2013) third dimension of authentic practice, which identifies 'authentic teachers' who have the professional knowledge and expertise to effectively guide student learning (Cranton, 2001; Riggs & Gholar, 2009). In this example, the GNS scientists, as experts in the field, shared first-hand experiences and skills with the GeoCamp students. This contrasts with a classroom setting, where this is likely to be a second-hand interpretation of practice delivered by the classroom teacher.

The three field trips of the GeoCamp programme were selected because of their geological interest and because they offered valuable opportunities for students' observation and exploration. For example, the mud volcanoes, appearing on a Tinui farm were of high interest with the combined sensory experiences of unusual, but clearly active landscape, with smell, gas bubbles and upwelling water (see Fig. 7.2).

Anderson et al. (2003) argue the emotional and sensory connection with an exhibit or experience such as this, heightens student engagement and their memory of the event. This becomes important when students are required to draw on previous experiences and apply their existing understandings to new and different contexts.

The capacity to select and use appropriate digital technology in the natural environment was an additional feature of the students' experience at each of the site visits. Water chemistry monitoring equipment, digital thermometers and laser measurement devices were used along with digital microscopes and multi-sensor gas detectors to measure carbon dioxide, hydrogen sulphide and methane emissions. These devices were all part of the scientists' tool kit and enabled immediate 'in the field' analysis. In a world dominated by digital technology, the experience of using devices to gather information, make decisions and solve problems effectively broadened students' thinking and capability and beyond communication and recreational pursuits.

The final phase of the Wairarapa GeoCamp was the preparation and delivery of the students' inquiry projects at the Saturday morning 'expo'. This required students to reflect on their experiences of the previous fortnight, seek advice and guidance from the GNS team, and in doing so, consolidate their learning. By inviting members of

Fig. 7.2 Sampling gas emissions from a mud volcano

their families and school community to the expo, the event became both a celebration of what had been achieved, and an opportunity for reciprocal learning between the students, the scientists and the guests. Knowledge of geological phenomena that students had observed during the camp, was likely to be unfamiliar to the general public. The opportunity to speak with some confidence to members of their immediate community provided students with a valuable and memorable conclusion to the project.

Six months after the conclusion of the GeoCamp, we revisited the 'Draw-a-scientist' task. The resulting drawings indicated significant changes in the students' perceptions of scientists and their understanding of the role of an Earth Scientist. The 'mad male scientist' in a lab coat, surrounded by test tubes and setting off explosions of their first drawings were replaced with both male and female scientists wearing conventional street clothing. Background details showed the paraphernalia of the earth scientist, rather than that of the chemist. The eccentric or mad scientist depiction seemed to have vanished. The possibility of becoming a scientist now appeared to be more accessible to students and the data as a whole indicated that the GeoCamp programme had been effective in building on and influencing students' attitudes and motivation about Earth Science and their knowledge of the world of the scientist and scientific process.

As in any designated teaching space, the pedagogy of the teacher and the impact this has on student learning is critical. In reflecting on Bolstad et al.'s (2012) model of teaching and learning in the twenty-first century in which personalised learning, authenticity and strong links to the real world of the students are highlighted, we see a valuable example in the GeoCamp programme in which the physical environment is beyond the four walls of the classroom but the principles of ILE are unchanged.

Study 2: Innovative Learning in Marine Conservation

During 2017–2018, the first author (Chris) co-led a Teaching and Learning Research Initiative (TLRI) project which explored the integration of mobile learning with EOTC (Eames & Aguayo, 2019). The aim of the study was to explore how purposeful educational design using mobile learning might enable integration of classroom and outside of classroom teaching and learning. The context for the study was marine conservation with a goal to enhance the ecological literacy (ecoliteracy) of primary school students. This section discusses how this project exemplifies an ILE through considerations of space, pedagogy and technology.

The project engaged with Mixed Reality (MR) digital learning technologies to enhance learning. MR is seen as an immersion continuum between experiences in the real environment and the digital environment (Aguayo et al., 2017; Akçayır & Akçayır, 2017; Milgram & Kishino, 1994). We employed MR to make links between learning at a marine reserve, a visitor centre and the students' classroom. The project partnership involved:

- a primary school teacher and a class of her senior students (Years 5–8; 8–12-year olds). The school encourages students to bring their own mobile devices or laptops to school for learning purposes—'bring your own device' (BYOD),
- educators from the marine reserve visitor centre,
- a marine scientist,
- a learning design/technology team, and
- researchers experienced in science and sustainability education.

This two-year study used a design-based research (DBR) methodology (Amiel & Reeves, 2008; The Design-Based Research Collective, 2003) to produce design principles for mobile learning integrated with EOTC, and to test the feasibility and impact of MR in supporting the teaching and learning of marine ecoliteracy. The project had four phases.

In Phase One in early 2017, the teacher planned and implemented a marine reserves unit in her class of 20 students (age range 8–12 years). The unit included a visit to a marine reserve and associated visitor centre. Data collection included pre-unit and post-unit student questionnaires exploring ecoliteracy and attitudes towards, and use of, mobile learning technology during the unit. Observations (both in person and video) were made of the visitor centre educators', teacher's, students' and parents' behaviour during the visit. Finally, we conducted post-visit focus groups with students and an interview with the visitor centre educators, and post-unit focus groups with students and interviews with the teacher and parent helpers.

In Phase Two, the research partnership then worked collaboratively face-to-face and online using a Google+ community, to design a mobile learning framework. This framework drew on data evidence from the marine reserves unit and a number of theoretical positions drawn from environmental and sustainability education and mobile learning. Importantly, the framework engaged the pedagogical principle of

heutagogy, or student-generated content and contexts, embodying a key principle of ILEs.

> In Phase Three, the co-constructed mobile learning framework was then used to inform the design of an MR intervention for the same unit taught by the same teacher with her 2018 class, including a visit to the marine reserve and visitor centre. This design and development involved a continuous loop between:

- collaborative refinement of practical problems;
- development of solutions informed by existing theory and technological innovation;
- iterative cycles of testing and implementing solutions in practice; and
- reflection to produce design principles and enhance solution implementation (Amiel & Reeves, 2008).

This process involved user-informed design that drew on the ideas of the students, the needs of the teacher and the visitor centre educators, and the infrastructure available at the visit setting: all key aspects of ILEs.

In Phase Four in early 2018, the teacher planned and implemented a marine reserves unit again to her class of 28 students, this time incorporating an MR-based intervention. Similar data collection methods were used as in the first phase to evaluate the intervention. Findings from the project provide evidence that EOTC and ILEs share many commonalities that resonate with the relational materiality of space.

The visit in Phase Four consisted of two hours at the visitor centre in the morning and a one-hour snorkelling experience in the afternoon. The visitor centre could be regarded as a proxy for a regular classroom, having walls, roof and functional furniture for learning. However, it also had one end open to the marine reserve which lay directly below it, allowing a sense of connection to the outdoor environment. Several activities within the centre also sought to make connections between the built space and the reserve outside. Firstly, two regular features of the centre are the 'touch tank' and the 'big eye microscope'. The touch tank is a space where visitors can see small marine animals up close and even handle them, and the big eye microscope allows visitors to gain greater insight into the structural features of marine animals and plants, gaining sensory input that connects the lives of the animals, plants and the visitors. These two features were firm favourites with many of the students.

Secondly, an interactive touch-based installation of a synthetic kelp (large seaweed) forest with plastic pollution attached, enabled an almost 'real' experience for students to become sensitised both to the nature of kelp and the problems of plastic pollution in the ocean space. The students enjoyed interacting physically with the 'kelp' forest. As one said 'I really liked it, it's basically telling me if you see plastic in the sea or on land you should probably pick it up and throw it away. I spent quite a lot of time there cleaning the forest, it was fun'. This installation provided a material bridge between the visitor centre space and the marine environment outside where kelp was growing.

Thirdly, an immersive virtual reality (VR) experience in which viewers followed an avatar, Pipi the snapper (see Fig. 7.3) through a virtual tour of the marine reserve,

Fig. 7.3 Pipi the snapper

encountering features and hazards. It linked the imaginary with the real of the marine reserve outside. Students rated the VR as their favourite mobile experience in the centre, with one older student commenting that 'I really think the VR has so much potential, it could become something really cool if you had missions and things like that, saving dolphins from getting caught in nets'. However, most (23/27) students indicated that they found the experience less engaging than snorkelling. As one noted, 'I kind of liked the whole VR with Pipi, but I'd rather be snorkelling and see'. These outcomes for students suggest potential and preferences for sensorial learning in spaces which fulfils notions of innovative learning.

The snorkelling experience was at the 'real' end of a mixed reality continuum between virtual and real experiences. Students engaged in a guided tour of the marine reserve, donning wetsuits, masks and snorkels. This total immersion in the outdoor space provided an opportunity to connect their learning in the centre and to fully engage their senses. Although students were highly engaged with the technological resources in the Centre, most students (20/27) strongly agreed that snorkelling to see fish was preferable to seeing them on screen.

Observational data generated during the snorkelling event supported the high engagement of students, with two girls agreeing with each other after 20 min in the water, 'that this is the most great thing I have done', and sharing experiences with peers and parent helpers. There was also evidence that learning experiences from the visitor centre were being transferred into their water experiences, as one student called out 'I can see a kelp forest'. Focus group comments provided further illumination of these views, with snorkelling supporters noting that they liked 'Real life—you can see things properly. See things that are real, not fakes', while others were more equivocal, seeing value in 'mobiles—you can see things you wouldn't normally be able to see' but also that they 'can make you think things are real'. These views are particularly insightful regarding the role of technology in creating authentic experiences for learning across spaces.

In this project, we sought to explore how students complemented their EOTC learning with their classroom experiences, which provides points of comparison about space. This group of students attended a small rural school with single-cell classrooms. Once back in the classroom, they sought to build on their EOTC. One group decided to construct their own kelp forest, which drew in the rest of the class and led to in-depth work around marine plastic pollution. This issue had regularly been in

the media at the time, with graphic images of seabirds and turtles with stomachs full of plastic. It appeared that the experience in the kelp forest at the visitor centre had provided a trigger for further learning about this. The class decided to create 'fish' out of plastic bags and to fill each one with the plastic rubbish in their lunchboxes. This made for a very graphic display which was highly memorable, with students readily commenting in the focus groups that 'we bring too much plastic in our lunchboxes and that we should start putting things in more containers and use less plastic bags' and 'I try not to bring too much plastic and things in my lunchboxes'.

This learning also transferred to the home environment, with parents seeing this as strong and overt. One parent said, 'She is very hot on not having plastic in her lunchbox. She is driving that', and another said, 'He has been telling us off for using plastic bags and straws, whereas he always used to use them happily'. Other parents noted an acceptance of family norms, as one said 'We were already very environmentally friendly by reducing plastic use. But I think the kids are more OK with that now and don't see it as weird'.

Turning attention to the ILE focus on pedagogy, this project adopted the principle of heutagogy, which manifested in two ways during Phase Four. Firstly, students were encouraged to follow their own interests within the visitor centre and engage with activities in any order and for any duration. This led some students spending a lot of time with the more 'real' activities such as the touch tank or the kelp forest, while others focused more on the augmented and virtual reality opportunities. This led to a vibrant, student-directed two hours of learning and created some challenges for parent helpers who had been assigned to look after a group of students. These helpers were concerned about completing all tasks. One helper said 'I think giving parents directions sort of helped but I found it hard to do the tasks in the order given, as there was some congestion at some points, and kids followed their own interests. I did write some responses down but not as much as the teacher expected I think'. The visitor centre educators also struggled more with this pedagogical approach, being more used to a structured visit where they felt in control, as one said 'As to my role, I just didn't know how to kind of … if I should be teaching, if I shouldn't, should I be standing off, you know'. But one observation he made indicated the power of the heutagogical approach, saying, 'I saw them using [the Big Eye microscope] in ways that I didn't think of, they were more like focusing on patterns, like getting amazed by the actual patterns within the animals rather than focusing on the function, so it's completely different [what the students see to what we see as scientists]'. These findings clearly indicated that for both the parents and the visitor centre educators there was a greater need for briefings about the heutagogical approach prior to the visit.

Secondly, the heutagogical approach appeared to stimulate students to follow their interests once back in the classroom, as described above. The teacher then took the role of facilitator, as she guided students through their deeper inquiries into plastic pollution in the ocean, marine ecosystems and connections between the land and the sea. There was clear evidence that learning was both authentic and social. Connections were made between real and augmented/virtual environments and marine conservation issues. Many students made insightful comments about

their learning about marine reserves and pollution, and showed evidence of complex systems thinking, as one said 'Since we are only 11 and 12, there's not much we can do, except to try our best not to use plastic. One of the biggest problems with plastic is poverty, because no matter what, people are going to buy plastic because it's the cheapest thing, and they'll do what they can to survive and I can't blame them for that'.

Lastly, in this example of the connections between EOTC and ILEs, the place of digital technology in this project indicated some key outcomes. To begin with, many of the research team were a little uneasy about the use of technology getting in the way of immersive, sensorial experiences in the natural environment. Although some thought was originally given to the use of tablets and phones on the beach to capture images for later use, this idea was abandoned as the teacher was adamant that 'we talked at the beginning about the balance of not having devices on the beach, I still prefer not to do that' and one parent agreed that 'I wouldn't have them on the beach, they would distract from kids using their senses, and gaining a [three dimensional] appreciation of what is around them'.

The use of the mobile technologies in the visitor centre, however, was viewed very positively and as described above, provided opportunities for connecting EOTC with classroom reinforcement of learning. The mobile learning opportunities were seen to highly engage the students, enhancing learning in some cases, and promoting social learning between student peers, and with parent helpers on site. And later, between students and family members at home.

A final outcome was the recognition of the importance of Wifi connectivity. Despite the best efforts to be well prepared for this, there were significant hitches initially with logging on. Interestingly, few students raised this as a concern after the trip, with some mentioning briefly that some augmented reality (AR) features and QR code scanning didn't work due to the Wifi issues. The teacher was understanding of the problem, the visitor centre educators recognised the 'organised chaos' that ensued and dealt with it as well as they could. A number of parent helpers mentioned the Wifi issues, with one saying 'there were challenges with getting connected. That was a bit off-putting'.

In summary, this project has illustrated some clear synergies between EOTC and ILE principles in the aspects of space, pedagogy and technology in learning.

Conclusion

There is little doubt that school buildings, the 'containers' for learning described by Mulcahy and Morrison (2017, p. 751), will continue to be the learning experiences spaces for our young people for many years to come, for understandable reasons. Indeed, many of the chapters in this volume make strong arguments for how this can be done to maximise educational outcomes. But, if we are to take seriously the constructive principles of ILEs and twenty-first-century learning, we need to extend our thinking about the types of spaces where this learning may occur. Education

outside the classroom provides valuable opportunities for embracing these principles, as shown in these two project examples. As Healy (2016) argues, 'learning is not confined to school and school-based pedagogies but emerges through heterogeneous pedagogic encounters (human and non-human) that occur in a variety of settings' (p. 237).

We hope that our chapter has challenged current thinking around ILEs. In one sense, EOTC provides an opportunity to re-ground students in the real world when so much learning is now in the virtual world. Our studies have shown a hunger within students for those types of experiences, where students relished the authentic, context-based learning opportunities to apply knowledge in their everyday worlds. But the studies have also shown that it is not one or the other that counts, and how careful educational design incorporating diverse spaces, pedagogies and technologies can enhance teaching and learning. We see value in Carvalho et al. (2020) argument for networked learning landscapes which involve multi-layered assemblages of artefacts (technologies), people and places that can model this type of design. In networked learning landscapes, learning is emergent from the assemblage of the whole. In our two examples, this resonates with the network of place, experiential and collaborative pedagogy, and digital tools, such as the development of understanding of marine reserves through the juxtaposition of the augmented and virtual reality of Pipi the snapper and the experience of seeing snapper in the water.

Certainly, there is much still to learn about how this can best be done and we encourage further studies that, in particular, explore the complementarity of EOTC and classroom work as spaces for achieving student learning outcomes through innovative pedagogies and technology use. Rethinking material relationality, through understanding the constitution of landscapes and ecosystems, has illustrated a dimension to learning that emphasises the innovation, and student agency, recommended for ILEs. This demands the development of a teacher's spatial literacy (Imms, Cleveland & Fisher, 2016) to understand how to combine pedagogical practice with the affordances of the indoor or outdoor spaces (also see Charteris & Smardon, Chap. 4 this volume). Recent events during the Covid-19 pandemic have challenged our thinking further about spaces for learning, with home becoming a significant spatial element. How teachers manage their design for learning in these circumstances, and take advantage of spaces in the immediate vicinity of students, offers different conceptions of EOTC. This work seems very important in realising the potential of Innovative Learning Environments.

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Part III
Possibilities for Pedagogies and Practices

Chapter 8
Moving to an Innovative Learning Environment: Exploring Teachers' Liminal Space

Michelle Barnard and Jenny Ferrier-Kerr

Abstract Within the milieu of educational change in the twenty-first century in Aotearoa New Zealand, teachers have been asked to traverse myriad and complex transitions in their pedagogical practice and their physical environments. During times of transition and change, teachers endeavour to maintain their focus on their professional practice and simultaneously traverse a space in which they can become suspended 'betwixt and between' (Cook-Sather in Anthropol Educ Q 37:110–127, 2006). Known as the liminal space, both positive and negative issues can occupy it during a time of significant change. Consequently, the liminal space can have an impact on the success of any change initiative as teachers individually and collectively navigate such processes. This chapter discusses the findings of a small scale study that explored the experiences of junior school primary teachers as they moved from their single cell classrooms into two newly constructed innovative learning environments. Responses to a survey comprising a variety of Likert-type and open-ended questions guided the subsequent semi-structured interviews with purposively selected teacher participants. Thematic analysis highlighted that the main occupiers of teachers' liminal space as they navigated transition and change were the pedagogical practice implications; professional conversations; collegial relationships; and, vision for the innovative learning environment. We subsequently identified seven pragmatic preparations which could support teachers' transition from single celled practices to practices associated with an innovative learning environment, by helping teachers prepare to make productive use of their liminal space. The study's findings led to our contention that teachers should be supported to develop their knowledge and understanding of the liminal space as they anticipate moving to an innovative learning environment. Our belief is that when teachers are able to use the liminal space productively and creatively, they are more likely to embrace change and contribute positively to it.

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Introduction

In this century, educators in the school sector have been required to navigate significant and complex change. While change is inevitable in education contexts, the various discourses championing twenty-first-century learning pedagogies and the physical environments in which they work, have reified the concepts of flexibility, innovation, visibility and collaboration deemed necessary and vital for teachers to educate twenty-first-century learners (Organisation for Economic Cooperation and Development [OECD], 2013; Phillips et al., 2004; Wells, 2018; Wright, 2018a). With education re-framed to focus on learning rather than teaching, greater currency has been given to the notion of the learning environment as an "organic, holistic concept—an ecosystem that includes the activity and the outcomes of the learning" (OECD, 2013, p. 11). Navigating change has therefore become critical for teachers and school leaders, and how to do so has become increasingly important for change initiatives to succeed (e.g. Ferguson, 2001; Greyling, 2006; Hopson, 1982; La Due, 2016).

Context

In Aotearoa New Zealand, changes arising from the update of the Education Act 1989 (Ministry of Education [MOE], 2015) and national funding systems for schooling (MOE, 2016), and a shift in the MOE's standards in school policy and property (Education Review Office [ERO], 2018; MOE, 2011) have coalesced into architectural innovations in schools. As the lead adviser to the New Zealand government, the MOE's Innovative Learning Environment (ILE) strategy has radically influenced teachers' pedagogical and relational practices as they move from Single Cell Classrooms (SCCs) to the largely deprivatised spatial model of the ILE (Charteris & Smardon, 2018). The move to different physical spaces has required teachers and school leaders to deliberately engage in practices that are intended to be student centred and use a range of strategies to work collaboratively with each other. These shifts from SCC to ILE have had a profound effect on teachers' professional beliefs, and their pedagogical and relational practice (e.g., Benade, 2017a, 2017c, 2017d; Borko & Putnam, 1995; Bradbeer, 2016; ERO, 2018; Dovey & Fisher, 2014; Fisher, 2004; Hargreaves, 2000; Wright, 2018b).

Implications of Transition and Change

Leading and managing change is a complicated process for school leaders. Teachers inevitably respond variously. When teachers perceive, for example, that their long-held beliefs are being challenged, or that they are asked to discard them altogether, they can become anxious about the implications for their professional practice. This can lead to resistance to perceived changes (Alterator & Deed, 2013; Guthrie, 2011; Keavney & Sinclair, 1978; Zimmerman, 2006). When change is externally imposed, and local and international drivers combine to increase its pace and complexity, challenges can be magnified. While any change process can be intense with the intensity ranging from exhilarating to uncomfortable, even to extremely difficult, it is seldom clear-cut. Furthermore, it may increase the pressure on teachers to navigate transition and successfully achieve change at both the individual and organisational levels (Arenstein, 2018; Baruch, 2003; Ferguson, 2001; Fisher, 2005; Greyling, 2006). It is critical therefore that school leaders act strategically to manage and lead change to generate, nurture and sustain a supportive change culture (Beckhard & Harris, 1987; Bunker, 2008; Ferguson, 2001; Guerrero et al., 2018; Mulcahy et al., 2015; Saif et al., 2013).

Transition is an internal process that is "profound, dynamic and uncertain" (Morrison & Ferrier-Kerr, 2015, p. 264), and is often depicted in models as a process on a curve to indicate how an individual's sense of self is impacted as they navigate waypoints. Hence, the ways in which individuals interpret and experience transition has a significant bearing upon their overall ability to cope with it (Beckhard & Harris, 1987; Elrod & Tippett, 2002; Fletsch, 2011; Piras, 2018; Quick et al., 2011). While any change that impacts upon an individual has the potential to create tensions between their existing values, beliefs and practices and the anticipated altered ones (Fisher, 2012; Hopson, 1982), how long individuals spend within each transition phase differs from person to person (Ferguson, 2001; Field & Lynch, 2015; Vince & Martin, 1993). However, when the impact of transition upon an individual's personal construct system is understood (Greyling, 2006), the ways in which they might interpret transition has a significant bearing upon their overall ability to cope with it. Ultimately, this influences how they respond to the change (Fletsch, 2011; Quick et al., 2011). These ideas about transition apply to teachers shifting from one kind of classroom to another (SCC to ILE).

When contending with change that will have significant implications for their future practice, teachers must simultaneously maintain a focus on their current practice. They may find their liminal space—the ambiguous and uncertain territory which lies between transition and change—occupied by both positive and negative issues (Bridges, 1995, 2006; Chand, 2015). Although rarely discussed in education contexts, being suspended in the non-physical liminal space 'betwixt and between' can impact significantly upon teachers' behaviours, beliefs, professional identity and ultimately the success of change initiatives.

Liminal Space

Originally derived from the Latin for margin or threshold (Ibarra & Obodaru, 2016), the concept of liminality was conceived as an expression of a limbo-like state of being 'betwixt and between' two clearly defined positions (Turner, 1967). The liminal space is often referred to as a 'crossing over' space, the time between 'what was' and the 'what is next?' Common to most thinking about liminality is its association with a "sense of displacement" (Nouwen et al., 1982 as cited in Franks & Meteyard, 2007). Franks and Meteyard (2007, p. 216) suggest that this is a "sense of being in no man's land, where the landscape appears completely different, there is no discernible road map, and where the journeyer is jolted out of normalcy". The 'no man's land' characteristic of liminal space is an important one, given it is neither easily defined, nor clearly owned by anyone. Some say, it is where anything can happen (Shortt, 2015). Moreover, as a place of transition, the liminal space can be extremely disruptive. As individuals and groups move from the known to the unknown, they may experience a suspension of identity, philosophical or pedagogical tensions, and a sense that they lack control or the ability to influence the change or navigate it successfully (e.g., Land, 2016; Meyer & Land, 2005; Piro & O'Callaghan, 2018; Rattray, 2016; Tempest & Starkey, 2004).

Historically, individuals would have followed a carefully guided and tightly scripted 'rite of passage' while navigating their way towards a predetermined outcome (van Gennep, 1977). In the present day, it is the extent to which each person is able to make productive and creative use of their own 'betwixt and between' or liminal space that is emphasised. If the liminal space is traversed unaided, individuals' ability for sense-making and reflection tends to be limited (Ibarra & Obodaru, 2016). Their perception that they cannot influence change becomes amplified, generating active resistance to it (Langenberg & Wesseling, 2016; Weick & Quinn, 1999; Wooten, 2008). However, if individuals have opportunities to cognitively, emotionally, reflectively and reflexively explore the space lying between the internal process of transition and the anticipated externally imposed change (Morrison & Ferrier-Kerr, 2015), the ambiguous liminal space that often develops in more negative conditions (Shortt, 2015) is less likely to gain traction. Further, when the liminal space is experienced in positive, progressive and emancipatory ways, it can become a space for innovative learning (Field & Lynch, 2015; Franks & Meteyard, 2007) for 'genuine newness' to begin (Rohr, 1999).

Study Background

In her capacity as a primary school teacher and middle leader, one of the authors Michelle Barnard (2019), noticed certain assumptions, attitudes and beliefs being made by teachers about their professional practice. For example, teachers worried about having their own teaching space as they anticipated a move from their SCCs

to an ILE. Her interest in the concept of liminal space was heightened by a growing awareness that the distance from what is perceived, conceived and lived (Benade, 2017a) had significant implications beyond building design. In Michelle's school, it implicated relationships between space and social relations (Lefebvre, 1991) and bore witness to the effects of a policy's origins to its destination in a school- its leaders, teachers and students.

Although increasingly explored in multidisciplinary environments, the paucity of research on the topic of liminal space in the field of education motivated Michelle to explore what was occurring in junior school teachers' liminal spaces as they experienced or anticipated a move to an ILE. Her initial thinking was that if teachers were to become more cognisant of their liminal space, and their knowledge and understanding of it increased through differentiated professional learning opportunities, they would have greater capacity to positively navigate transition and change.

As she became more attuned to the issues troubling teachers regarding their move to an ILE, Michelle recognised that it was not the architectural modifications about to impact the structures, systems and culture of the school that were of most concern to her colleagues, rather it was specific issues to do with professional practice (Bridges, 2006; Institute for Education Leadership, 2014). She wondered what would happen if teachers were provided with facilitated opportunities to support them to deliberately pay attention to their liminal space—the 'space in-between'—and whether that would help teachers to recognise and understand the origins of their assumptions and beliefs about teaching and learning, reflect on and perhaps deconstruct them (Cook-Sather, 2006; Menter et al., 2011). Subsequently, supervised by Jenny, Michelle's research was concerned with exploring teachers' liminal space as they anticipated impending educational change.

Research Goal and Questions

Michelle's central research question: *What is occurring in teachers' liminal space as they anticipate and prepare to shift to an ILE?* guided her study (Barnard, 2019). A further three questions helped unpack teachers' experiences:

- *How can teachers prepare and be prepared as they transition from SCCs to an ILE context?*
- *What pragmatic preparations are undertaken during the transition to a new teaching context?*
- *What teacher beliefs occupy their liminal space during transition?*

Participants

Participants were the teachers in the Year one and two syndicates who had already moved or were anticipating a move from their SCCs to two ILEs with their 180 students. Among this cohort of 12 teachers, who all agreed to participate in the

survey, teaching experience ranged from one to 25 years; experience among the leaders ranged from one to ten years; there was one male and 11 females, and included one senior leader and two middle leaders.

Methodology

An interpretivist approach allowed Michelle as an insider researcher to embrace the 'pragmatically curious manner' of the modern-day qualitative researcher (Chenail, 2011b). This allowed her to explore ideas that resonated with the participants, and be reflexive (Whiteley, 2012) as their perspectives and interpretations emerged. Moreover, she viewed herself as an anthropologist in the study who was tasked with 'digging' into teachers' and middle leaders' perspectives to uncover the complexities of their experiences and interpret with them the issues occupying their liminal space (Agee, 2009; Geertz, 2012). Through this process, rich data could be generated as teachers explored, shared, interpreted, reflected on, critiqued and co-constructed the issues occupying their liminal space.

Nonetheless, Michelle was alert to the risk of conceiving teachers' perspectives and interpretations as problems to be solved, rather than problems for inquiry (Cox, 2012). Additionally, as the conduit through which the conversations and data flowed, she was aware of the potential threat she posed to the trustworthiness of the research (Chenail, 2011a; Poggenpoel & Myburgh, 2003). While Michelle believed that her insiderness (her dual roles of teacher in the participants' school and researcher) had the potential to open up contributions to knowledge, she also sought to mitigate her impact on the research process (see Barnard (2019)). She therefore paid scrupulous attention to the shared discourses and positions. During the interviews for example, she endeavoured to remain in a neutral position and refrain from sharing her own experiences (Fleming, 2018). She was also aware that her familiarity with the context and the participants could lead to asking less probing questions and not challenging assumptions (Dwyer & Buckle, 2009); hence, the need for in-depth preparation.

Research Methods

Survey

A confidential, but not anonymous, online survey (consisting of Likert scales) elicited a snapshot of, and insights about, what teachers were thinking about their move to an ILE. The survey also revealed what was occupying their liminal space. Participants were asked 8 questions in two groups: (a) four Likert-type closed questions and (b) four four-point scale responses ranging from none to constantly. To gauge the level of sensitivity and intensity of teachers' perceptions, a Likert-type scale rating minimised 'uncertain' or 'neutral' options. The asymmetric scale 'forced' teachers into making choices (Boone & Boone, 2012; Guilford, 1965).

The survey captured teachers' feelings, actions and opinions about issues relating to their lived and anticipated transition and change experiences (Joshi et al., 2015). The themes extracted from the survey responses influenced the nature of the questions for the subsequent semi-structured interviews.

Semi-structured Interviews

The confidential survey results assisted with the purposive selection (Giles & Bills, 2017) of six participants for the subsequent semi-structured interviews. They were organised into two groups: Group A, four teachers who had already moved from their SCCs to an ILE; Group B, two teachers anticipating their move.

The purposive group was identified through criteria such as:

- a range of experience;
- professional roles and career stages;
- representation from the two-year levels; and,
- different gender (hampered by the gender composition as indicated above).

Open-ended questions proved effective for probing knowledge, feelings, attitudes, beliefs and expectations in the interviews (Menter et al., 2011; Poggenpoel & Myburgh, 2003; Taylor, 1995). These allowed for deeper insights to identify what occupied teachers' liminal space. Group A teachers' experiences were immediately relevant to the research question of what was occupying teachers' liminal space, and the Group B teachers offered further insights into their anticipation and transition.

Through an iterative coding process, significant words, phrases and statements were detected. Participants' individual perceptions were shifted from the original transcripts into a new document for coding. This process extended our immersion in the data, leading to emerging themes. The coded statements and keywords were then further identified via frequency counts. The first theme, *implications for pedagogical practice*, occupied significant liminal space. While teachers expressed their anxieties and confusion about the implications of change and how they could prepare for it, many also shared their optimism and their enthusiasm for a new way of working. *Collegial relationships* was the second theme. Teachers were conscious that nurturing relationships was essential, but they also recognised that there were challenges in developing and sustaining new relationships in light of the complexities of change. The third theme, *professional conversations*, was considered imperative for sustaining relationships and conveying leaders' vision for change. However, as teachers explored their liminal space, it became apparent that professional conversations were not occurring regularly or with any specific purpose. Even so, teachers not only emphasised their importance, but also suggested ways to facilitate them. The final theme, leaders' *vision for the ILE*, highlighted teachers' expectations about the importance of a clear and shared direction.

Themes

Implications for Pedagogical Practice

Aware that it was not the building alone which would lead to changes to pedagogical practices, teachers felt vulnerable, insecure and exposed. For many, a sense of anxiety pervaded their liminal space. Group A teachers expressed the most concerns about this change. They were unsure of the expectations about the ways the ILE space would be used. They focused on relational and pedagogical compatibility in particular. Two comments sum this up well:

1. [if] teaching practices are very different… so completely different, then use of space is going to be so different (August, Group A, Interview).
2. Dale (Group A, Interview): [there are] conflicting ideas … because that's what their beliefs are, different beliefs, challenges of different mindsets, different ways of using stuff.

On the other hand, the Group A teachers conveyed a greater positive anticipation of the impact of change upon their teaching practice than those in Group B. Their willingness to: '*try new things and have a go*' (August, Group A, Interview) indicated an openness to change that included a desire to be flexible and adaptable in their teaching practice. August also talked about: *thinking of creative ideas… having more flexible, open space allows a lot more flexibility to set up little spots like a shop [as a learning activity], the ideas and the possibilities.* Chris (Group A, Interview) argued that: *we have to find that way [forward in teaching practice] ourselves… and the different views about what good teaching looks like/what good learning looks like.* These two comments indicate how much liminal space this issue occupied. It was apparent that conflicting ideas about the use of space had emerged relatively quickly; both highlighting the challenges, and identifying solutions. Together, they suggest the breadth of teachers' differing practices and beliefs about learning and teaching.

Teachers also talked about their cognitive understandings of the discourses of de-privatised and collaborative practices (Charteris & Smardon, 2018; ERO, 2018; Hargreaves, 2000). Paradoxically, while an intention of the ILE is to de-privatise space and generate collaborative practices (Charteris & Smardon, 2018), teachers frequently voiced examples from their own and their colleagues about the physical and pedagogical reclaiming of territory in the ILE. Each of the Group A teachers, for instance, revealed ways in which they had reclaimed territory within a short time of their move to the ILE. Ongoing noise and the resulting distractions were examples. As students 'roamed' their new space, several teachers chose to offer alternative lessons to address their perceptions of the impact on students' learning, whereas another chose to relocate students to a break-out space, shut the door and continue with the lesson. Further, assertive positioning connected with the use of space was demonstrated by the four Group A teachers. Emphatic about her stance, Chris (Group A, Interview) asserted: *I have pole position… I will be over-precious about [the space] in defence of it.* This kind of territorialism was espoused by Dale, Brooklyn

and August (Group A). Each 'end' of the ILE functioned differently because of the varying pedagogical beliefs of these three teachers. This presented as anxiety in teachers' liminal space:

> The anxiety is pushing into teaching practice… and it seems judgemental … probably the biggest thing is how each person views what good teaching looks like and what good learning looks like… and then wanting to defend what my good teaching looks like or what good teaching looks like to me, and how it looks to you… and both are right but… different… and they can remain right but different, so long as we both stay in our separate corners but they won't look right if we try and mix it up (Chris, Group A, Interview).

Even so, teachers from both groups believed the move to an ILE would have or already had positive implications for their teaching practice. They believed that as they adapted to the new context, appropriate pedagogical practices would emerge and evolve in response to the ILE's physical space (Woolner et al., 2012). It was possible that for some, this reflected mimicry of discourse (Rantatalo & Lindberg, 2018), where teachers gave the impression that they were engaging with a new concept whilst actually retaining their current skills, knowledge and behaviours (Meyer & Land, 2005; Piro & O'Callaghan, 2018; Reinsfield, 2018b). Such a tension was conveyed by August (Group A, Interview) who noticed:

> underdeveloped pedagogical practices … colleagues chucked into a new building … [so our] practice changes based on what works best in the building purely out of the need to survive rather than being based on good teaching practice - whatever that may be.

Teachers were aware that the ultimate aim of the pending change was to improve teaching and learning. However, they considered that the implications for their pedagogical practice had been neither acknowledged nor comprehensively discussed. A consequence of this was a negative impact upon collegial relationships—the second theme to emerge in the study.

Collegial Relationships

Relationships with each other became a key issue for teachers. Forming and sustaining collegial relationships occupied a considerable amount of their liminal space. While teachers from both groups described the SCC as a strengths-based, controlled, autonomous and safe space, they also indicated this was a space that could be isolating and lonely; hence, their optimism for the move to an ILE. Group B, more so than Group A, positively perceived ILEs as supportive and collaborative communities in which sharing and collegial relationships were central. Even so, teachers in both groups remained curious and optimistic as they experienced and anticipated change. They expressed excitement and enthusiasm about working more collaboratively with their colleagues—sharing workload, working to their strengths and delegating:

[delegating work] has worked really well in reading and maths; we don't have to teach more groups, we just split them up across the two class loads and the very low ones get bombarded - she will grab them and I will grab them. Dale (Group A, Interview)

The Group A teachers similarly thought that their established collegial relationships would ensure a relatively smooth segue to the ILE: "when we moved into the space we had something that we knew was successful and would hopefully just continue in the new space" (Brooklyn, Group A, Interview). Highlighting that what might seem minor to some teachers might not be deemed appropriate by others, August (Group A, Interview) commented:

[it] would be really beneficial to be able to have a respect for other people and understand why other people are working the way that they are, and try being able to value those differences because they're understandable. And using them to help the team, rather than to just create conflicts… so being able to work together.

Brooklyn (Group A, Interview) illustrated this negative perception of having to accommodate, communicate and tolerate colleagues' annoying habits: "it's like, 'really? I don't have toasted sandwiches and coffee in there, so why should I be cleaning up your stuff at school?' Those little things that really… they are important. It's about relationships."

As teachers' divergent beliefs revealed themselves, it was clear they were influencing thinking about the implications for teachers' pedagogical practices (Errington, 2004). This included what was considered pedagogically worthwhile to pursue through to mundane, practical considerations such as collective responsibility for keeping shared spaces in order (Errington, 2004; Woolner et al., 2012). Brooklyn (Group A, Interview), a teacher and middle leader, viewed her team's collegial relationships with an additional sense of responsibility. As their move to an ILE drew closer, she articulated a key issue for her: "probably coming from a leadership thing too… definitely teacher-teacher relationships. Absolutely. That's been massive. That's almost made me leave." This affirmed that one of the extra challenges for leaders when facilitating collaboration, is to ensure their team doesn't 'fall out' (Benade, 2017a), and highlighted the importance of addressing teachers' feelings of being vulnerable, exposed and overwhelmed as they navigated transition and change.

Despite the relational challenges, Group A teachers experienced, they also emphasised the positive consequences of collaboration (Benade 2017a, 2017b; Bradbeer, 2016; Denning, 2015; Hipkins et al., 2017). August, Brooklyn, Chris and Dale specifically referred to the enjoyment and satisfaction they had already gained from working in their respective teaching pairs. Their collegial engagement also appeared to provide teachers with opportunities to recognise and develop their professional identities in the ILE setting (Mulcahy et al., 2015). Recognising and understanding the similarities of their beliefs for instance, had resulted in the strengthening of Group A teachers' professional relationships. This seemed to increase in proportion to the degree of congruence of teachers' beliefs (Errington, 2004) and may explain why teachers who had transferred their paired practice into the ILE, had found success working at each 'end', rather than as a team of four across the entire space.

In light of the impact on their colleagues' relationships, the middle leaders of both groups acknowledged their responsibility to lead change with their teams. These leaders had significant concerns in common that occupied their liminal space in relation to facilitating their respective teams' collegial relationships. Brooklyn (Group A, Interview) found this to be hugely significant: "from a leadership [perspective the most difficult aspect has been] teacher/teacher relationships—absolutely massive—almost made me leave [and is a feature which] overlays everything else." The challenge for the team leaders lay in how to maximise opportunities for their colleagues in an evolving change environment (Bunker, 2008; La Due, 2016). Importantly, the potential of collegial relationships could not be overstated by the team leaders, both of whom perceived that moving to an ILE had the capacity to be a unifying factor for their teams: "it forces you to become a team, to journey together" (Lou, Group B, Interview):

The more negative take on collegial relationships prominent among the teachers in Group A was largely defined by their references to relational positioning and 'power over'. Largely connected with the use of the space in the ILE, this positioning was exemplified by Chris (Group A, Interview):

> the way the space is used works for me. I am a permanent [employee]. I've been here long enough - I have pole position. I will be over precious about [the space] in defence of it, I have got a little bit of weight on my side.

While the influence this form of assertive positioning could have on Group A's successful transition to an ILE was not investigated further, it highlights the importance of paying attention to teachers' beliefs during a time of transition and change, given beliefs shape perceptions and give form to action taking (Czarniawska, 2005; Pajares, 1992).

Professional Conversations

For collaborative pedagogical practices and collegial relationships to be successfully established, maintained and enhanced, professional conversations emerged as the third theme occupying teachers' liminal space. Teachers believed that open, honest, purposeful and at times difficult conversations between each other and with senior leaders were important. They indicated that professional conversations were critical for providing spaces through which they could pay rigorous attention to issues such as: participation (i.e. developing and reaching consensus on a shared pedagogy for teaching in their changing and changed educational environment); external support (e.g. someone from outside of each teaching team); and professional safety when risk-taking. Both groups desired professional conversations. Lou and Morgan had this to say: "[we] must have lots of discussions …[keep] talking to other teachers—being really honest and open" (Lou, Group B, Interview). Morgan, in Group B interview, said: "… we have talked about the need for [conversations about teaching practice] a lot, but we haven't had that [actual] conversation" (Morgan,

Group B, Interview). Meanwhile, Dale (Group A, Interview), already working in an ILE, articulated the importance of consistency: "conversations are considerable and significant… converse constantly … can't be just one conversation … check about how we are going, concerns about kids, new ideas…".

When reflecting upon the impact professional conversations could have on teachers' liminal space, Morgan (Group B, Interview) described a 'wilderness experience'. She connected teachers' uncertainties and the ways that these could be addressed through conversation with the biblical narrative of Moses leading the Israelites in the desert as they approached the Promised Land (see Franks & Meteyard, 2007): "that would be a conversation we need to have—about 'how do we work'? … the 'wandering in the desert'" stuff—that's real (Morgan, Group B, Interview). In essence, this kind of conversation means that listening for the unexpected is a critical element. In other words, while it begins with an initial question or issue, the conversation follows participants' lead (Smull, 1996).

In addition, because teachers felt avoiding issues was a common strategy, they believed that external support could facilitate robust and open professional conversations. For the team leaders, avoidance constrained the facilitation of productive conversations among team members; when certain topics were deemed 'undiscussable' they were unable to be addressed (Le Fevre, 2014). In light of this, Brooklyn (Group A, Interview) proposed: "ongoing regular support with someone who has experience and knowledge to bounce ideas off with the whole team". Chris (Group A, Interview) advocated for: "someone who can facilitate the tough conversations, because it is tough to have to do that talk and then go back to working side-by-side". A further perception was that the absence of external support had resulted in teachers' limited risk-taking. When risk-taking occurred, issues of professional safety sometimes arose: "we have only had one meeting where it has got a little bit tense and the rest of it is 'we will just let it be and you do your thing, and we will do our thing" (Dale, Group A, Interview). Two teachers referred to challenges of online professional conversations. Perhaps this highlights the challenges and tensions that can occur when the 'ground rules' for online interaction are not established (Lock, 2006).

> there have been very different ideas … wasn't really talked about beforehand. We tried to talk about it… [in] online discussions ... but not everyone contributed. A lot of people thought 'we'll just get in to see how we go' [but] it's those things that we need to talk about so that everyone is on the same page… if these discussions happened beforehand, then at least we would know what other people were thinking - what they were expecting (August, Group A, Interview).

> I found it disturbing because some of the content I read, I thought 'I don't want to go into this with you if that's how you think - stop talking'. So I probably didn't participate in many of those and I felt that my silence was an indicator that I didn't want that… I couldn't honestly post to that document, so I didn't waste my time… and most of those conversations didn't go anywhere (Chris, Group A, Interview).

Brooklyn (Group A, Interview) indicated how constrained she felt in her role as team leader in being able to create positive conditions for productive conversations among her teaching team: "some people had ideas in their heads about how this

is going to be done, but they didn't express those to everybody else, so not everybody knew and not everyone thought the same which was a bit of a shame". While she had no immediate solution, Lou (Group B, Interview) suggested that issues of professional safety and risk-taking could be addressed by having conversations in a one-to-one setting rather than in bigger settings or online. Echoing Group A teachers' concerns, Morgan (Group B, Interview) asserted it was not necessarily the size of the group that mattered, but how the opportunity to risk-take was created:

> I'm afraid to speak up at this point without that open space for it... I have identified a few things already that I know I am going to need to talk about but haven't had the chance to share them ... I am feeling quite vulnerable in that way… that's key … making that space for that conversation.

In articulating their need to feel comfortable and safe in order to be honest, open and vulnerable in their professional conversations with others, these teachers emphasised the importance of a deliberate and consistent approach that allows for voices to be heard in an environment where there is a genuine interest in and care for each other, and where active listening is valued rather than teachers just listening to respond (Kay, 2019; Lancer et al., 2016).

This theme has highlighted that change and transition are inherently risky, especially as new practices render the 'old' ones vulnerable and exposed. The significance of the risk-taking involved in either confronting or avoiding the challenges teachers face during educational change can substantively occupy their liminal space during transition. Therefore, having opportunities to open up professional conversations to provide a forum for teachers to air, share and challenge their concerns, beliefs and perspectives appears important (Dweck & Molden, 2017; World Economic Forum, 2016).

Vision for the ILE

Teachers felt that the ILE vision lacked clarity, adversely adding to the pressures upon teachers' obligations, motivations and capacity to navigate transition and change. Teachers' perceptions of the rationale for educational change were expressed in a variety of ways: "it's an educational trend; it's intended to improve pedagogical practice; it's linked to the need to upgrade buildings; because research said so; because of twenty-first-century needs; it's a changing workplace/world". This diversity of responses perhaps indicated the fuzziness of the school's vision for the ILE. Some teachers claimed they had received no communication about the ILE vision from school leaders, while others indicated only initial communication. As Morgan (Group B, Interview) commented: "I had to form my own 'why' [it's] hard to pinpoint exactly what [leadership's] definite 'why' was… but the general point I got was there wasn't a real strong reason 'why'." Although teachers and middle leaders were expected to execute change, the perception was that they had not been invited to contribute to setting a change agenda or become involved in determining the features of the ILE

in which they would soon be teaching (Mulcahy et al., 2015): "you know what? It would have been really nice to have a bit of input into the design of the building" (August, Group A, Interview).

A consequence of the overall lack of clarity of the ILE vision was the significant effect on middle leaders, largely because of their additional responsibilities to implement change. As middle leaders grappled with their previous SCC reality and the future reality of the ILE, the pressure upon them and their obligation to lead transition and change intensified, not just for themselves but for their team members, the school and the school community. In seeking to make sense of the impact of the lack of clarity, Lou (Group B, Interview) discovered that she was simultaneously grappling with:

> be[ing] vulnerable, not a step ahead of everyone, journeying with them… not feeling secure or safe stepping into new ground ... trying to lead or help others move without being sure what's around the next corner.

Elliot (Group B, Interview) expressed similar thoughts even as she sought to make suggestions regarding vision clarity:

> I have suggested we do this [work on vision clarity] with a leadership person within school or an outside mentor on a weekly basis. This would involve further and more specific planning and collaboration to reach a shared understanding about the vision/goals of the 'why', nuts and bolts for the details of the 'how', the teaching and learning for teachers and students.

It was evident that while these leaders sought to maximise opportunities for themselves and their teaching teams to re-orientate their pedagogical practice (Bunker, 2008; La Due, 2016), it was proving challenging given the lack of clarity and the absence of conversation about the ILE vision. Although it was the middle leaders who considered that a key imperative of the ILE vision must be to emphasise the benefits to learners, they also expressed some scepticism about whether research supported the learner-centred ILE discourse. This occupied significant real estate in teachers' liminal space and was captured by Lou (Group B, Interview) who asked:

> what long-term evidence [or] proof is there, that the learning is better for the children? What is the actual data to prove that it is better and not just a cost-cutting way to save money? … long-term data and proof - that's going to take years.

While the middle leaders' 'job' was to lead teachers through a rapid period of change (Benade, 2017a; Bolstad et al., 2012; Charteris et al., 2016), as designated agents of change within their organisation, they perceived they were constrained in their ability to support, inform and guide teachers.

A clear ILE vision would have been expected to come from those school leaders spearheading the change. However, most struggled to clearly articulate their vision for ILEs. Brooklyn's (Group A, Interview) comment shows this well: "hmmmm, what were the reasons? … I don't think they ever had any real reasons… I don't really know the reasons" and Lou (Group B, Interview) who clearly struggled to recall the vision "that is testing the memory—a number of smaller things… I don't know that they have knuckled it down to one solid thing."

These comments typified not only those teachers who had already moved into an ILE, but also of those anticipating a move. This included leaders from both teams. It is possible that the intentions of school leaders may have been for teachers to chart their own course with guidance from various sources, such as professional conversation and dialogue and their collective professional expertise (Wright, 2018b). However, leaders' knowledge and understanding of organisational transition and change management should also have alerted them to the importance of clear and regular communication of the ILE vision, given leadership is an acknowledged ingredient for educational change (Hargreaves et al., 1998; Retallick & Fink, 2002). Given teachers' frequently expressed desire for clear communication of the ILE vision by their leaders, the incremental steps required to develop and embed change (Elrod & Tippett, 2002) seemed a missed opportunity.

Using Teachers' Liminal Space Productively

When understood as being a dynamic and meaningful transitory space, liminal space can be used productively by teachers to make meaning during a time of transition and change. While deliberate intervention was not a goal of this study, an outcome of teachers' participation was their developing awareness of liminal space and its impact upon their responses to, and capacity for, significant change. A definitive conclusion cannot be drawn but it seems that teachers' use of liminal space can aid navigating transition and change.

A focus on 'preparation' to better position teachers as active participants in a flexible and responsive change process (Fullan, 2007) is critical. In light of this, we have identified *seven pragmatic preparations* that encourage the productive use of liminal space as teachers prepare to move to an ILE. While reflective of existing practices designed to bring about educational change, the seven 'preparations' emanate from the liminal space of teachers in the study; hence, we believe them to have specific relevance to their navigation of the ILE change process.

Seven Pragmatic Preparations

The seven 'preparations' are drawn from what teachers claimed were important for them to be ready for change. We do not suggest they displace existing resources providing practical ways for teachers and leaders to facilitate and embed ILEs (Core Education, 2020; OECD, 2017), but paying close attention to preparing for change helps teachers to successfully navigate it. The seven preparations are outlined next:

1. **Consistent, scaffolded and incremental communication of the ILE vision**.

   - Negotiate the most appropriate formats to explore, articulate and disseminate the ILE vision.

- Teachers are involved in purposeful strategic planning that includes: formal and informal face-to-face conversations; teams present progress reports to their colleagues; informational email; digital and face-to-face forums; access to literature/research; access to external facilitators and thinkers in the ILE field.

2. **Develop shared understandings and a common language about transition and the change process**.

   - Facilitate professional learning opportunities for school leaders and teachers.
   - Develop a common language that clarifies, explains and enhances the change process as it pertains to the ILE context and the local context.

3. **Explore teachers' beliefs with particular emphasis on de-privatising practice and what that means as teachers 'rethink' their practice, and the implications for students' learning in an ILE**.

   - Collaborative exploration of teachers' beliefs about teaching practice through professional learning opportunities (e.g. school-wide and teaching team workshops; professional conversations; mentoring), with a specific emphasis on ILE pedagogy.

4. **Support teachers' sense-making about change processes in a safe environment**.

   - Initiate school-wide mentoring and coaching to facilitate professional conversations.
   - Use expertise to establish and facilitate effective coaching and mentoring.
   - Engage in professional conversation to develop a shared understanding of what a 'safe environment looks like'.

5. **Collaborate and engage in professional learning to build a shared vision, common language and understanding about the ILE**.

   - Collaboratively inquire into ILE pedagogical practice.

6. **Enable teachers to process their individual responses to transition and change**.

   - Teachers maintain reflective journals to make meaning of their respective change journeys.
   - Invest time for teachers to collaboratively and individually reflect—digitally and face to face—to ensure they retain the locus of control.
   - Teachers inquire into prevailing non-physical liminal spaces.

7. **Enable teacher input into building design**.

   - Invite teachers' involvement in decisions about the physical space.
   - Teachers visit other ILEs.
   - Explore the impact of decisions about the physical space on teachers' non-physical space.

- Talk about ways to declutter and use space—the physical and the non-physical.

Conclusion

It is well documented that school leaders directly influence the process of change and improvement in their schools and that teachers' individual perspectives are important within this process (Fullan, 2002; Hall & Hord, 1987). However, educational change literature has rarely addressed liminal space. In seeking to advance understanding of liminal spaces in educational contexts, this study demonstrates that the speed and ubiquity of educational change can influence ways that teachers experience and express liminality. Space is more than the dominant physical spaces of teachers' SCCs or an ILE. Spaces, teachers recognised, are inhabited by educational discourses driving school change (Shortt, 2015). Having said that, Group A who had moved into an ILE, seemed to have significantly more demands upon their liminal space than their colleagues in Group B who were simply anticipating impending change. While it was apparent that Group A teachers framed their perceptions more negatively during their exploration of what was occurring in their liminal space, they were, nevertheless, optimistic that they would not be 'stuck' there (Field & Lynch, 2015).

Drawing teachers' attention to their liminal space during the study underscored that it could be intentionally and sensitively used to support teachers. Such an approach not only had the potential to engender a better understanding of the transition and change processes, but also enable teachers to make sense of the change and the implications for their professional practice. Although a gap between what was envisioned, enacted and experienced was identified among the teachers, they had begun to conceptualise the move to an ILE as having the potential to end isolation, increase collegiality and create collaborative communities. But they also experienced anxiety as they perceived a threat to their pedagogical practice by moving to different educational spaces (Cochran-Smith, 2015). The tensions and stresses associated with the impact of change upon teachers' teaching practice and collegial relationships were particularly evident, especially when combined with their perceptions that school leaders did not fully appreciate the complexity of the change (Woolner et al., 2012).

Regardless of role, when the natural aspects of loss during a change process and the associated emotional implications are not recognised and acted upon, or when teachers are asked to absorb more disruption than they have the capacity for, barriers invariably develop. For teachers to effectively navigate transition and change therefore, both the cognitive and affective elements of change must be acknowledged and addressed. This can be accomplished with a transition management plan—a necessary component of an overall change management plan. When teachers are helped to cultivate effective transition management skills, they are more likely to respond positively during a period of significant change. Unpredictability is a consequence

of teachers moving to, or anticipating a move to an ILE (Skogland, 2017). Exploring and making sense of what is occupying the liminal space with 'another' (school leaders, external facilitators, peers) during transition and change can help them to more positively navigate both.

A positive change experience also meant that teachers are more likely to become effective change agents and contribute to future change (Fullan, 1993, 2002). To support teachers becoming change agents, school leaders must be aware that teachers may mimic policy discourses of openness and innovation without necessarily agreeing with them. This may not be a duplicitous subversion—rather, it may indicate that as teachers traverse their respective liminal spaces, they are genuinely grappling with threshold concepts of troublesome pedagogy and disruption to their beliefs (Mulcahy et al., 2015; Meyer & Land, 2005, 2006). As the research into the complexity of teacher beliefs contends, beliefs are a significant influence on teachers' curriculum implementation (Coenders et al., 2008; Reinsfield, 2018a). School leaders have a responsibility therefore, to support teachers to make productive use of their liminal space to not only explore the processes of transition and change, but to imagine their future selves in a new educational setting (Cross & Markus, 1991). Furthermore, positioning teachers as partners is likely to increase autonomy, creating opportunities to develop pedagogically, work collaboratively and promote their school's shared values and change objectives.

The power differential amongst staff, particularly during transition processes when production, efficiency and capabilities become negatively affected must also be borne in mind (Elrod & Tippett, 2002; Vince & Martin, 1993). Because the emotionally disruptive work of transition and change can be amplified when the power differential is not recognised and proactively addressed, specific strategies for navigating transition and change (for example, transition and change management plans) can provide structural support (La Due, 2016). Exploring and reflecting on the liminal space could therefore be considered a critical, initial undertaking. Some of our key findings suggest that in addressing change, the following are important elements:

- a clear and accurate understanding of the vision for the change;
- all change agents (such as teachers, middle and senior leaders) must comprehensively and consistently communicate the necessary incremental advances; and
- external and timely support (such as mentoring) must be available.

Moreover, we consider that such strategic approaches can help individuals focus on the learning required to develop the requisite self-awareness, to inform and guide them in their continued personal and professional development (Morrison & Ferrier-Kerr, 2015).

Future Research

Two areas for future research emerged from the study. Firstly, developing longitudinal research with teachers could allow further determinations to be made about whether mimicry of discourse is occurring—and if so, whether it has emerged as subversive resistance or is extant to teachers' productive use of their liminal space. Our view is that such determinations could only be made once all teachers have moved into an ILE. Then the proof of their beliefs could be revealed in practice. Secondly, in light of the middle leaders' vulnerability and insecurity a specific investigation into middle leaders' liminal space would be appropriate. For middle leaders who frequently bear formal responsibility for enacting change, a focus on their unique and complex context, for example via a shared professional inquiry, could support their specific professional development needs.

Final Thoughts

It is crucial to be conscious that spaces have a double construction because simply changing a physical space will not change teachers' pedagogical practices (e.g. Benade 2017a, 2017b; Osborne, 2016; Wright, 2018a). The ILE is not just a physical structure, it is subjectively interpreted and imagined (Gieryn, 2000) and cannot be thought about as a 'container distinct from its contents' (Lefebvre, 1991). However, even when teachers and leaders become aware of the liminal space and subsequently adopt an idealised practice (Woolner et al., 2012), the policy discourses of openness and innovation may not be shared, leading teachers to default to their more familiar practices (Benade, 2017a; Charteris & Smardon, 2018). But if teachers have facilitated opportunities to explore and interpret what is occupying the liminal space, they may be more able to navigate transition and change, and engage with both. Facilitating subtle shifts in teachers' liminal space—from 'ambiguity to meaningfulness' (Shortt, 2015) may serve to strengthen their capacity to navigate transition and change. As teachers become cognisant of and supported in their use of the liminal space—in conjunction with the more dominant spaces such as the physical building, the time-frame for change and the space occupied by the ILE discourse— their increased knowledge and understanding of the ILE context and rationale for change, and of the implications for their pedagogical practice will enable them to positively and successfully embrace the new space in which they are to teach.

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Chapter 9
What We Can Learn When Things "Go Wrong" for Students in Innovation Learning Environments

Frances Edwards

Abstract Schools operating as Innovative Learning Environments (ILEs) are purported to "allow students and teachers flexibility, agency, ubiquity, and connectedness" (Ministry of Education, Innovative learning environments, 2019, para. 1), thus providing for individual student needs within a collaborative and innovative space that emphasises responsibility for learning as a partnership between student and teacher. However not all students thrive in ILEs. This chapter explores the views of students for whom ILE practices have not been successful (in their or their families' minds), and who, in spite of social and emotional ties to their ILE school, have felt strongly enough to move to a school with single cell classrooms. I undertook to investigate the experiences of students from around Aotearoa New Zealand who had moved from a primary or secondary school ILE back to a school with single cell classrooms using a qualitative approach underpinned by an interpretivist research paradigm. In semi-structured interviews, students discussed their experiences and the reasons for their decisions to move schools. Overall, this group of students felt that practices within the school meant that their learning was not progressing in the ILE. These students described learning in an ILE environment as less structured, more self-directed, lacking in opportunities for teacher attention and relationship-building, chaotic, noisy, fluid, lonely and stressful. For some, managing new expectations for learning that the spaces provided (such as more self-directed discovery approaches) was a big challenge. The students provided suggestions about what might help them and others integrate into ILE environments. These students' voices provide another lens to view how student needs can be met within the practices and purposes of the ILE context. These voices may help those working in such school contexts understand how to better cater for all students.

Keywords ILE · Students · Learning · New Zealand

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Introduction

In thinking about an innovative learning environment (ILE), it is helpful to view places where learning happens as ecosystems, positioning them as organic and holistic. These ecosystems, or schools, encompass physical space, social aspects and the pedagogy experienced by the learners (Organisation for Economic Co-operation and Development (OECD, 2013). They include both the activity and the outcomes of learning. The teaching and learning opportunities presented in ILEs are different from those in traditional classrooms. Such differences are held by both students and whānau/parents/family (whose perceptions of 'what school should be' are perhaps influenced by their own experiences of schooling), as well as for teachers.

This chapter examines how students and their whānau (a Māori term denoting extended family or community) experience the reframing of schooling as an ILE in terms of physical space, social aspects and pedagogy. Not all young people thrive in a traditional classroom environment and, similarly, not all students thrive in newly developed or rebuilt ILEs. If they find themselves no longer able to 'make do' in the school they are attending, an option (and sometimes the only option) is to leave. I therefore use the notion of 'mismatch' to discuss the experiences and perceptions of a group of students who did not feel successful in the ILE setting and who consequently left. It describes important elements that contributed to the mismatch and discusses structures and support within ILEs in terms of physical resourcing, social interactions or connectedness and pedagogical approaches that might align with and support these learners' needs.

ILEs are characterised by open or flexible spaces which can accommodate larger groups of students and teachers. In these spaces, agile features such as moveable fittings, furniture, and sliding walls are featured and allow for different work configurations that can cater for team teaching and group or individual learning (Dovey & Fisher, 2014; Wright, 2018). This differs markedly from traditionally organised teaching spaces.

Physical Space

Physical classroom spaces can be understood as containers to 'hold' what happens, in which case a space itself has no impact on learners and learning, and it is what teachers and students do within a space that matters (Bligh & Crook, 2017). Alternatively (and this is the view that this chapter takes), physical classroom space is seen as constitutive; that is, space matters and has an impact on learning in terms of what teachers and students perceive is possible to do and not do (Barrett et al., 2015; Bligh & Crook, 2017; Imms, 2018). A key idea is that space and the types of resourcing within it set up *expectations* for how learning will or could happen by supporting or constricting certain configurations for learning such as collaborative team teaching. Furthermore, flexibility and agility in design and space configuration might support

different types and structures of learning (Bligh & Crook, 2017; Jamieson et al., 2000). For example, large open spaces and permeable boundaries can encourage freedom of movement of furniture, people and potentially, ideas. On the other hand, these spaces may also limit learning for those who prefer quiet spaces with few distractions.

Social Interactions

Social interaction within an ILE is an accepted and encouraged element of the activity typically found within ILEs. As discussed by Mulcahy and Morrison (2017), "the *social* ILE is consistent with ILE policies and the new infrastructural arrangements and characterised by student-centredness, collaborative practices, flexibility and visibility" (p. 756). Sociocultural learning theory would lend weight to the argument about the benefits and even necessity of social interactions with respect to the learning, as learning is seen as incorporating dynamic social practices which occur within specific contexts.

Curriculum documents foreground competencies such as managing self, relating to others and participating and contributing (Ministry of Education, 2007). These competencies can be developed as students work in groups, interacting and making connections with others, as well as creating opportunities for others. The infrastructure and resulting flexibilities in ILEs can facilitate more creative and multileveled interactions between students, thereby enhancing their development of independence, individual responsibility as well as collaboration and contribution. However, policy frameworks situated in the twenty-first-century learning discourse (evident in, for example, Department of Education and Early Childhood Development, 2009; OECD, 2006) do not give strong accounts of how twenty-first-century learning competencies "work for different learners, and whether, how, and in what ways the ILE may advantage some students over others" (Mulcahy & Morrison, 2017, p. 756). So, although social interactions are seen as a positive contribution to student learning, there may be advantages for some students in traditional environments, and advantages for others in ILEs.

Pedagogy

One of the central assumptions made regarding ILEs is that teachers' pedagogy and students' learning experiences will be different in these spaces, compared with traditional school settings. There is a large body of literature on teacher adaptation to flexible or innovative spaces (Deed et al., 2019; Imms, 2018). However, there is less in the literature to suggest that learners' views about the use of physical space as an influence have been considered. Studies show that teachers and learners experience

these spaces differently, and that pedagogical advantages and affordances are not always as expected or intended.

Student Views

Although much research and literature is focussed on teachers and teaching in ILE environments, some studies centre on student experience. An early example by Bennett and Batley (1977), focussed on the reactions of a small number of middle school students starting at an open-plan middle school. They came from three different typologies of learning space. These can be described as closed traditional, closed progressive and open progressive. Students coming from closed schools thought noise was an issue in the open school, saying it was harder to concentrate. Yet 78% of all students said they were happier in the open-plan middle school. Although the authors make no comment in their brief report, the possible connection between these factors is that increased opportunity for social interaction in open spaces led directly to the issues with increased noise and reduced concentration.

Lemley et al. (2014) mixed methods study, investigated aspects of learning environments that best address the needs of secondary school student learners, according to students themselves. With newly designed physical learning spaces and digital tools changing teaching and learning, students felt that the most significant factors were autonomy including choice and leading their own learning, relevance including curriculum, materials and teacher competence. Students in this study also highlighted that connectedness encompassing teacher–student relationships, and teacher care and respect for students was of great importance.

More recently, Mäkelä et al.' (2018) analysis of Finnish secondary students' participation in learning environment design demonstrated the need for a complex balancing of often conflicting influences, needs and wants in learning. Design features enhancing communality to allow for socialising or collaborative work need to be balanced with needs for individuality and private, distraction-free zones. Using novel technologies such as planetarium ceiling must be balanced with the provision of conventional pedagogical tools and approaches. Direct teacher-led guidance and instruction were considered key supports as learners gradually developed the skills and capabilities that eventually enabled them to take more self-regulated and personalised paths. Overall, student participants felt that flexibility and functionality were key b (Mäkelä et al., 2018).

Raising Questions

In recent times, Aotearoa New Zealand government and media articles on the benefits or otherwise of ILEs for teachers and learners have represented varying views. Aotearoa New Zealand's Ministry of Education (MoE) has published *Designing quality learning spaces* (MoE, 2020) to give design teams working on schools,

details of the requirements, guidelines and processes expected for government-funded school buildings. Alongside these, the MoE have published reviews linking school design with student outcomes (Wall, 2016). Such reviews suggest that ILEs benefit both teaching and learning, but elsewhere it is clear that redesigned learning spaces do not necessarily result in improved educational outcomes such as student motivation and attainment (Leiringer & Cardellino, 2011).

Many published articles and opinions suggest that ILEs are not working for some students, parents and teachers. Titles such as *'Difficult to justify' investment in modern learning environments, ministry-funded study says'* (Redmond, 2017) and '*How modern learning environments work, and what parents' options are*' (Gattey, 2018) sit alongside cautionary comments from researchers saying that making causal links is very difficult, given the complexity of education. The media have provided platforms for robust debate. For example, Stewart (2018) writes '*Why must schools be immune to innovation?'* in response to Morris's post (2018) *'These education reforms put the sector at the precipice of disaster*' on the current affairs and news website, *The Spinoff.* Discussion and debates have also raged on social media platforms such as Facebook. One very clear feature is evident in these debates. More often than not, it is adults that are speaking, and the voices of the learners themselves are not present. ILE studies also focus predominantly on teachers and less on students and their experiences.

The rest of this chapter gives students a voice by focussing on the experiences of students who have opted to move from schools with ILE architecture, using the focussing question: *What we can learn from students who have chosen to move from an ILE back to a school with single-cell classrooms?*

The Study

In order to hear the voices of students, I developed a study to enable students from around Aotearoa New Zealand to talk about their experiences. These students had moved from primary or secondary school ILEs back to single cell classrooms. The criteria for inclusion in the study were that the students had moved from an ILE school to a more conventional schooling environment, and that their leaving was associated with their or their parents' dissatisfaction. A purposive convenience sampling approach was used netting 13 students as participants. Five were primary school-aged (Years 1–8) and eight attended secondary school (Years 9–13). The participants were assigned pseudonyms to preserve anonymity. At the time of interviews, only around 5–10% of New Zealand schools fitted the description of having ILE spaces. A number of these were still in the early stages of adapting their programmes to take advantage of pedagogies compatible with teaching and learning in ILEs. These schools are easily identifiable by demographic data or descriptors such as geographical location, therefore only general descriptors of school type are shared. Demographic information is presented in Table 9.1.

Table 9.1 Interviewee demographic data and school characteristics

Pseudonym	Age at interview; (school year)	Gender	Shifted from school type	Age at shift; (school year)	Key decision-maker for shift	Moved to (school type)
Suzie	11	F	State primary co-ed Year 1–6	10 years (Year 5)	Parents and Suzie	Private girls' Year 1–15
Jack	9 years (Year 5)	M	State primary co-ed Year 1–6	8 years (Year 4)	Mother	Home-schooling at time of interview but intending to go to a State integrated school co-ed Year 1–15
Emma	10 years (Year 6)	F	State primary Year 1–8	9 years (Year 5)	Father and Emma	State primary Year 1–8
Peter	13 years (Year 9)	M	State intermediate co-ed Year 7–8	12 years (Year 8)	Mother and Peter	State correspondence school co-ed Years 0–13
Jason	13 years (Year 8)	M	State primary co-ed Year 1–6	10 years (Year 5)	Parents	Private co-ed school Year 0–8
Kirsty	14 years (Year 10)	F	State junior co-ed secondary Year 7–10	13 years (Year 9)	Kirsty	State integrated co-ed Year 1–15
Sarah	14 years (Year 9)	F	State girls' secondary	13 years (Year 8)	Parents	State integrated co-ed Year 7–15

(continued)

Table 9.1 (continued)

Pseudonym	Age at interview; (school year)	Gender	Shifted from school type	Age at shift; (school year)	Key decision-maker for shift	Moved to (school type)
Kate	14 years (Year 10)	F	State junior co-ed secondary Year 7–10	13 years (Year 9)	Parents and Kate	State integrated co-ed Year 1–15
Steph	15 years (Year 11)	F	State junior co-ed secondary Year 7–10	14 years (Year 10)	Parents	Private co-ed secondary Year 9–13
Anna	15 years (Year 11)	F	State junior co-ed secondary Year 7–10	14 years (Year 10)	Parents	State integrated co-ed Year 1–15
Jordan	16 years (Year 11)	M	State senior co-ed secondary Year 11–13	15 years (Year 11)	Jordan and parents	State integrated co-ed Year 1–15
Josh	16 years (Year 11)	M	State senior co-ed secondary Year 11–13	15 years (Year 11)	Parents	State integrated co-ed Year 1–15
Claire	18 years First-year university	F	State co-ed secondary Years 7–13	17 years (Year 13)	Claire	State co-ed secondary Years 9–13

Semi-structured interviews of around 30 min were conducted with each student, either face-to face or online using Zoom. These were exploratory interviews and allowed students to relay their experiences and perceptions of being a student in an ILE. The students also discussed their reasons for taking the decision to move schools.

Interviews were transcribed verbatim. NVivo qualitative data analysis software compiled data and facilitated the systematic coding process. Inductive thematic analysis was used, and inductive codes were assigned to data segments that described each new theme as it emerged.

Findings

Adapting to ILE

As schools are built or rebuilt to incorporate ILEs, the transition time can be difficult for teachers and students moving into these environments. Claire, along with other students, experienced uncertainty. This stemmed from the fact that as students, they had to make major adjustments in getting used to the learning environment. Compounding this, the teachers were voicing their own uncertainty. Claire explains,

> All the teachers were still from the traditional schools so they were also learning, so we were all just guinea pigs really. I remember the teachers constantly saying, "just bear with us because we're all trying to learn this". Which wasn't the most encouraging…Because we were like you're meant to be the teacher; you're meant to know how to do things. [Claire]

As students reflected on their experiences of adapting, they variously used terms like 'overwhelming', 'a challenge', 'quite interesting', 'really weird', 'really strange', 'very rough' and involved in these reactions were emotional responses.

> [It] is a really big shock, because it was all open… which I found really weird. 'Cause there was different curriculars. And the Year Nines and the Year Tens together. And it just – it was weird trying to work, it was very loud…. It was multiple teachers so it would be like a class of 60 with two teachers. [Kate]

There were aspects of the ILE that most students seemed very happy to adapt to, for example, they talked about the relaxed atmosphere and the perceived freedom within their schools.

> You could sit where ever you want, there was couches, there was beanbags, there was corners with chairs and stuff in it, and you could sit where ever you want [Emma]
>
> It's just so big. So you could walk out and they wouldn't notice. [Jordan]
>
> The freedom to spend the time doing – in class, doing what **you** felt interested in. So that was definitely a plus. My knowledge in terms of computing extended hugely during my time there. [Josh]
>
> Sometimes I liked the freedom of just being able to do my own thing and learn my own way. [Kirsty]

> In open learning, you didn't have to see just one teacher, you could go see a teacher in a different field if you wanted to, but they could all have an input and try and help you understand. Like I found a lot of my science teachers understood my way of thinking better than my English teacher. [Claire]

However, they all reflected that these freedoms were not always best for their learning, identifying their weakness in self-management. Here Josh and Anna reflect on their engagement at school.

> So – they give you a lot of freedom, freedom of choice, what you do with your time I guess. And they don't check on your tasks, whether you are even doing any work…Yeah, but you can get away with most of the small tasks without doing anything. [Josh]

> I think [I] tended to slack off if I wasn't like particularly, like, interested in the subject. 'Cause I wasn't like – I wasn't like forced to do it, so I didn't really feel the need that I had to. [Anna]

Most of the students spoke about the difficulty of managing themselves when they perceived there to be little structure. Some identified this difficulty as their own lack of self-discipline whereas others felt it was a weakness in the school, and that their school was letting its students down by not putting pressure on them to complete work and perform well academically.

Another area requiring adaptation for students moving into ILE was the approach schools took to curriculum delivery. There were a number of students who talked about adapting to the wide use of digital devices for almost all learning. Although a number of students were able to recount specific computer-based learning activities that they enjoyed, most of them expressed dissatisfaction with the expected reliance on computers. Although not questioned about this, Sarah talked about computer access as she did not own a computer. She observed:

> When I work on a computer, you can issue chrome books, but there were so many kids, there were computers for people that couldn't afford them, but you would always have to wait in line, and then the librarian would be like, "Sorry, you'll have to come and get one at lunchtime". And then I wouldn't know what to do because there's topics you have to search up and I didn't know what to do. [Sarah]

What Worked in ILE

Students involved in the research shared things that worked for them individually. Some enjoyed the curriculum arrangements, as in many ILEs there are opportunities for integrated units spanning several curriculum areas. For example, Steph talked about subject combinations she enjoyed:

> I did art and chemistry, so it was kind of like how paints are made throughout years and stuff and we got to make our own paints using chemicals and I really enjoyed that. There was a maths and PE one which was Stats and looking at sports statistics and stuff and I enjoyed that one too. [Steph]

Anna enjoyed the benefits of a wide range of options, that being in a larger school provided.

Like you could involve yourself in so many like extras activities as well. And it was like the school had access to anything. Like even in terms of like field trips, or like just like people to come in and talk to the class. Like, like guest speakers and stuff. It just had access to everything. [Anna]

Several students mentioned the social elements of being in large open spaces, with freedom to move around. They enjoyed socialising with others, sitting where they wanted to and making friends.

Like sitting with my friends, but like we could kind of like do whatever we wanted. Like we weren't really closely monitored… [Anna]

But I did like working with my friends, I enjoyed that a lot, and since we were picking classes after we had all started school, I'd made friends and I picked classes that they were in, and so we had all the same classes. [Steph]

I usually got together with my friends and worked with them, and when I did, most of the time I chatted (laughing) with them, and said, "What are you doing tonight" and…just chatted about things… [Jack]

Sometimes I liked the freedom of just being able to do my own thing and learn my own way… [Kirsty]

Thinking About Leaving

Students' perceptions of the ILE setting were that school was fun but that the learning was not as it 'should be', and this motivated them to think about leaving.

I really enjoyed my time there, but I suppose school is about the learning and I wasn't learning, actually, I don't remember learning anything massive that I kind of hadn't already somewhat known before. [Steph]

Sarah talked about one of her cross-curricular learning units, which was called 'Adrenaline'. This unit focussed on physical education and science saying:

We went paintballing, and we went to the river and jumped off the bridge, feel adrenaline or something, just wasn't really learning, it was just going to school and having fun. [Sarah]

She noted that the cross-curricular learning was "not like Maths and English, but combined in a really difficult way that I didn't understand."

One factor that caused students to think about leaving was the environment, especially the busyness and noise of class groups. Student participants were self-aware enough to notice that their learning was being affected by distractions in class.

I enjoy working with people, but also sometimes it was a massive distraction, like, I think I got to the point where I actually just told the teacher, because I noticed my work standard was just dropping, and I handed in a piece of work and I was like, I know I can do this better but I was just being so distracted by the people around me. And it wasn't just from who I was sitting with, it was just people everywhere, just making comments and talking back to the teacher and it was just a massive distraction. [Steph]

Like it was cool, we got freedom. But I also wanted teachers to stand up in the front of the classroom, and we would sit at our desks, and she would tell us [what] to do, and we would

do it..it was just more freedom. And I couldn't... Just... I couldn't think. I couldn't see how I'm going to succeed. [Kate]

Nevertheless, moving towards the decision to leave was not an easy decision. There were two key factors/reasons for staying—*social* and *freedom.*

No matter who made the decision, the social aspect of leaving friends made the move difficult. Nearly all students interviewed mentioned this. Not all students necessarily wanted to make the decision to move schools, and for some, it was their parents that made the final decision. While some said they outwardly protested, they also acknowledged their need to move.

Well, I actually didn't want to leave my friends…when Mum told me… and I was really mad, I don't think I talked to her for like a week or something (laughing). But then deep down I actually did want to move. [Sarah]

Well, it was mum and dad [who thought I should consider moving] (laughs). I'm so glad that they did. [Steph]

Other students made the decision to leave themselves:

I loved my friends there, I made like really good trusted friends. Yeah…It was hard for me to say I want to move schools. [Kate]

Well, when the noise just started carrying on, and the teachers were trying to do everything to make it more quiet, and it never really worked, and so then I kept on complaining that I couldn't concentrate and since we just live in [town name removed], my dad just asked me if I wanted to go to [Town name] school and I said yes so we checked it out and it was really good and nice and quiet and it was just everything I needed. [Emma]

Some students commented on their enjoyment of the atmosphere and the freedom, even as they acknowledged that they were not progressing in their learning according to their (or their parents') expectations:

It was definitely a hard decision because I loved the atmosphere and just the idea of having the free will to do essentially what I wanted at [ILE school], to an enclosed, four walls classroom where it's just one teacher with 30 odd students doing maths for 50 minutes straight. [Claire]

Key Themes

Four noticeable themes emerged, providing insight into the impetus to explore learning opportunities at another school and subsequently to make the shift. These themes, addressed in order, are: teacher support, noise and 'distractibility', being overwhelmed and perceived lack of challenge or lack of progression in learning.

Teacher Support

The first theme was *Teacher support.* Eleven ($N = 13$) students described feeling as if they were on their own in their learning, and that they did not have the teacher support they needed. As two students put it:

It was multiple teachers so it would be like a class of 60 with two teachers. But I would so, I would so want that one-on-one with a teacher. Like not a private... Like you know, something that I can count – someone that I can count on to always… I couldn't like get to the teacher for advice, and I couldn't have the teacher. [Kate]

The teachers don't really check what you're doing with you unless you ask them to. There's so many students that you normally have to wait quite a while with your hand up before they'll come and talk to you. [Josh]

Jordan remembered being invited to an extension maths class, where there were only twenty students working with one teacher. He "found that a lot better", not only because of the harder work but because he was checked on more often to "see if you're doing alright." He noted that "there weren't as many kids for the teachers to look after".

So, although it is always difficult for one teacher to keep up with 25–30 students in a cellular class, students' perceptions were that these issues seem to be compounded in ILE because of shared teaching, multiple teachers, uncertainty about 'who is my teacher' and the chaos of the space. Students' programmes often involved them moving around the large learning spaces for group workshops with a range of teachers, and at other times choosing their own workspaces for independent activities. In the ILE, students perceived that they were doing more independent work more of the time. Sarah was frustrated by having to wait for a teacher's attention when she wanted help. Kirsty wanted to 'keep' the teacher with her for long enough to answer her questions.

You'd just have your hand up for **ages**. And you'd be like, "Can you please help me?" And she'd be like "Yep, yep, I'm just coming". And then other kids: "Miss, miss, can you please help?" and she'd be like "Yep, yep, after this one", and then there'd be a long line. [Sarah]

Secondly, students felt that they were competing not only for preferred learning spaces (seating, special couches, break out space, bean bags) but also for the teacher's attention.

There were a lot of students, so [when] all the students needed to double check with the teacher, so it would be very hard to keep the teacher with you for a while. [Kirsty]

Large numbers of students needing attention at once meant students found it difficult to get or keep the teacher's attention. Anna described it as "challenging to have one-on-one time with the teacher. Steph experienced the disconnect as an invisibility, which was a "huge issue." She felt that the teachers "didn't really know [her] all that well" and that they were often "busy dealing with more problematic kids." Jack similarly commented that he "never got a chance to talk to the teacher because the teacher was helping the people that weren't very good at learning." Jason also felt that he was inconspicuous, sometimes, he felt, only receiving half of the help he needed:

…not being able to actually talk to the teacher, because there was so many kids, that the teacher didn't really have time to focus on one specific child or a few of them…. you would have to wait in this line of students, or they would be too busy, and maybe just half explain it, or wouldn't have the time. [Jason]

Noise **and '*Distractibility*'**

The second theme encompassed issues associated with *noise and 'distractibility'*. This is related to the third theme of *overwhelm* below. All students talked about the noise and busyness of the learning environment. For example, Kate talked about the challenges of working in noisy environments.

> It was weird trying to work, it was very loud. And they're like, 'Oh all the walls suck in sound.' And I didn't believe that. I just couldn't cope with all the noise. It was like one of the biggest things [Kate]

Emma declared that you couldn't even really hear yourself think. To mitigate this, students talked about dashing in to try to save a seat in one of the small breakout rooms, instead of working in the large spaces. Steph, when asked if there was anything that got in the way of her learning replied:

> Actually, the group work, (laughs). So it was a good thing. I enjoy working with people, but also sometimes it was a massive distraction. And it wasn't just from who I was sitting with, it was just people everywhere, just making comments and talking back to the teacher and it was just a massive distraction. [Steph]

Jack also noticed "distractions around the room, with everyone chatting", but he noticed how he would be drawn into the conversation:

> I disliked the distractions, cos I just wanted to go, 'Leave me alone!', but then I was like…Oh, this sounds like a fun thing to talk about, let's talk about that! [Jack]

Claire described how the space could be used flexibly, turning a sometimes-chaotic space with a lot of distractions, into a space where students and teachers could focus:

> …lot of distractions for people who easily get distracted. And the teachers would then get distracted trying to deal with the students that weren't on task. Sometimes it was quite chaotic but then other times it would work really well, because we had areas you could close off with glass ranch sliders. So then that way the teacher could solely focus on who was in that room. [Claire]

> It was quite hard, cause you were just looking at everybody else. There were other classes going on, some classes were just watching movies, so then like, I would just get distracted. You just lose focus. [Sarah]

> If opposite you there's a science class doing a lab experiment or something you would get really distracted with that, or if the class down the hall would be like playing games and be very loud and really distracting. [Kirsty]

Being Overwhelmed

The third theme, *being overwhelmed*, relates to students feeling that they had too much to deal with, too many choices, too much freedom and with too many people. Being overwhelmed appeared to be connected with students becoming stressed by their experiences of self-directed learning due to perceived lack of structure in the classroom. Students reported that they experienced lack of task clarity, time pressure,

competition for resources, less supervision than they wanted, too much unstructured time or lack of self-motivation. All in all, this contributed to stress for the students. A number explained that even free choice in itself created stress for them. The degree of autonomy required and the learning choices that needed to be made, alongside the large tracts of unstructured time appeared to be mismatched with students' self-management skills and their ability to understand or accomplish tasks autonomously.

Interestingly, feelings of being overwhelmed were mentioned by students at all stages of schooling. Younger students (Years 4–9) most frequently spoke of the difficulty in deciding what to do and where to work within the ILE space, and working out what to do when they could not access teacher help. More mature students (Years 10–13) reported feeling overwhelmed by their perceived lack of academic progression. These students admitted that their own lack of self-discipline contributed to this. Those involved in schools with integrated senior curriculum felt that they were not learning anything of consequence within the integrated curriculum they were offered, and they were concerned about their qualifications, NCEA.

> I wanted competition, and I wanted something challenging to do. Yeah. And I wanted to write essays, and I wanted to take tests, and I wanted to sit exams. But like you know, to prepare me for university, or in fact when NCEA starts. [Claire]

Students were expected to manage their time in self-directed learning. There was often time pressure:

> You had to do this work in a week, otherwise you'd have to do it next week, and plus next week's other work, so it was just very frustrating – "Get this done!" rushed and then "Get this done" [Jack]

Or pressure for resources:

> There was only like 2 tables, so you had to kinda hog the tables, get there first, and there were couches, which people rushed to, to work on…but…yeah, it wasn't very …. What's the word?..like…it wasn't really….(thinking…to find a word)…reasonable! [Jack]

> The rules for the breakout space weren't set. You just had to run and get to it. [Sarah]

> There was this one room that was totally enclosed, and that place, I always went in that place, so I would have some quiet time to work. But then loads of other people would come into that space and yell and that would be really annoying. [Suzie]

> There was like little breakout rooms that we would, that I would try to always get in, because I could not work in an environment where everyone was just... You can hear everything from like two rooms across. [Kate]

> If there's no doors between the classrooms it gets quite overwhelming sometimes with all the students talking. [Damien]

Being overwhelmed can be particularly distressing to students with special needs, e.g. having the perception of too many people in a space can be distressing for some students. Peter had learning and behavioural needs. He brought a photograph to his interview. He is face-planted in a bean bag, legs protruding, arms stretching backwards like he is skydiving. Explaining what was happening for him in the photograph, he described his feelings of helplessness, of wanting his own quiet space. Jason, on the other hand, discovered he had tinnitus. His coping strategy was covering his ears:

I remember if we were out in the room, and I was trying to read a book, or get work done, I would have to cover my ears and as I found out this year I actually had tinnitus, so that's why (covering ears) helped me so much. But in the breakroom, it was nice to get away without having to cover your ears the whole time.

Researcher: And nobody picked up on the fact that you were sitting there with your ears covered in the room?

A few of my friends would, but apart from that, no one else. They (friends) would say, "What are you doing Jason?", and I would just say, "oh I'm just covering my ears so I can actually get my work done and they would go, "Oh yeah." [Jason]

Perceived *Lack of Challenge or Lack of Progression in Learning*

Another key element in final decisions to leave an ILE was students' perceived *lack of challenge or lack of progression in learning*. This is the fourth theme. Lack of progressions was associated by students with lack of structure and supervision but also with differing or unclear expectations, for example, students' own expectations of who is responsible for what in the learning relationship. Kirsty noted lack of structure: "*I found that there wasn't much structure with the work, and I didn't feel like I was learning anything*" Damien recognised his own part in a lack of progress on a website project, but also noted what he saw as a lack of teacher contact and supervision:

I spent the time that I was supposed to use creating a website, doing other tasks. And the teacher sort of ignored for weeks, and weeks, and weeks. And one day he came to me and he was like, 'What have you done?' I showed him the basic outline of [the] website, and he was not impressed. Called my parents and had a big argument about that. [Damien]

Anna similarly commented that she wasn't closely monitored:

I always just sat next to my friends and I always just used to talk and not really do what we were supposed to do. [Anna]

Jason commented on rules and supervision for the breakout room:

A few people could go in and just do their work quietly, which sounds good in theory, but then there is no teachers to go check on them [Jason]

Lack of challenge was associated with lack of progressions and again with structure and supervision. Seven of the students felt that teachers either did not know what they as students were doing or were capable of doing. Additionally, because students were progressing individually, they were not so easily able to compare themselves to others. For learners who are competitive and who like to be 'at the top', this was demotivating as they had no real way to judge their performance. Jordan, for example, was given work that he had "done before", possibly because large groups of students were set the same work online.

So I'd get it done really fast while everyone else was still working on it. And then I'll have nothing to do for the rest of the class. [Jordan]

I suppose school is about the learning and I wasn't learning, actually, I don't remember learning anything massive that I kind of hadn't already somewhat known before. Like in maths for example, I'd done all the stuff before, all of it. [Steph]

I wanted something to challenge me. There was none of that. And they would, they would give me something like hard, but I wouldn't have any competition, if that makes any sense. [Kate]

Claire talked about her parents' perspective, noticing a lack of cognitive challenge in the schoolwork:

My parents were like, this child needs to be challenged, and throughout the years from year 7 to year 11, they just saw that I wasn't being challenged as much as they thought I should be. [Claire]

Anna also relayed her parents' impression of the differences between the ILE setting and a 'traditional' school. Her parents thought the ILE was viewed *more as a social thing* and that it would be best for Anna to move, "to focus on the academics more, in like a traditional style".

Some ILE schools have a project day, where students engage in project-based, cross-curricula learning, usually self-chosen and self-led. Students often have permission to go off-site. Learning gains in these settings are not easily quantified and are often related to development of capabilities and encouraging dispositions such as self-regulation that would be valuable in post-school settings. However, supervision and structure again become issues.

I wanted to do more schoolwork on a [named weekday], But they wouldn't really let you. They were like no it's [project day]. So lots of kids wouldn't come to school on that day. They'd say, 'Yeah I'm doing my [project]' and they could just go home. [Sarah]

Reflections from Their New School

Some students reflected on their learning in their new non-ILE schools. Anna explained that she would not go back to open plan learning or an ILE again. According to Anna, the ILE setting was great in terms of being able to socialise, however, she was getting better results in her new, traditional school. She reasoned that there was "*more workload*" and "*more pressure*" to complete tasks in the new school and that the freedom and independence in the ILE setting was not conducive to her work efforts: "*I wasn't forced to do it, so I didn't really feel the need that I had to.*" Admitting that she sees herself as more likely to "*slack off*", Anna decided that the environment of the ILE was more suited to students who were very independent, diligent, self-driven or able to rely on themselves. She advised students attending ILE schools such as the one she went to "focus on your work, like, you need integrity, I guess. People aren't always going to be chasing you up to do everything. You have to take it upon yourselves to do everything."

Steph also noted that she preferred learning to be more episodic and clearly structured: "At my new school they just get on with it, they're like, 'Right today, get out

your books and do this', but at [ILE school], they were like 'Okay so, once you're finished this, you'll do this, and then after that we'll get onto this'". Steph contrasted the two school environments and offered theories for why and how it was easier for her to learn and succeed in her new school:

I noticed my work standard was just dropping, and I handed in a piece of work and I was like, I know I can do this better but I was just being so distracted by the people around me…. And that might also be a reflection on the rules or whatever because I've noticed that's not a problem at [new school] and that might be the fact that the class sizes are small or the fact that they enforce the rules more strictly. I found I've been distracted a lot less at [new school].

Emma and Jason reflected on class size also:

Well, there's less people, there's only about 24 or 25. We've got our own desk, so it goes girl boy girl boy, so we can't really talk to each other. My teacher is very strict, she likes to make it very quiet in our classroom, so she's very strict with that stuff, so I guess that's helped me a lot. I really like it because it's better for me with my learning and I just learn more than I used to at [ILE school].

Small class sizes, and how everyone knew each other, and everyone was friendly to each other, and just all the teachers, how you actually got one on one time with the teachers. There was no break rooms there, and you would all do it together, and if you ever needed in any help, you could just go to the teacher and they would help you out. [Jason]

One student did reflect that his learning was definitely better in the new non-ILE school he had started attending, but he left the door open to moving back to an ILE once he became more mature and self-disciplined.

What Can We Learn from These Students?

Social and emotional connections to friends and teachers mean students feel real ties to their school. If so, the decision that students/parents make when they change schools is not one that is taken lightly. These students and their families have decided not to "make do" with their learning situation, but to take action that will make a quite disruptive change to their schooling. The voices of such students can provide clues to teachers about the perceived successes and failures of schools, and maybe give us ideas about how better to meet the needs of students who are learning in some ILE contexts.

It is apparent in this study that there were elements of schooling in ILEs that students enjoyed. In particular, the social aspects of schooling were spoken of positively. Therefore, students were not necessarily unhappy about everything in their schools—in fact, some really enjoyed school. However, what these students experienced as 'learning' in the ILE schools they attended, did not match their expectations of what 'learning' is and should be. Additionally, their experience was contrary to their expectations for what a learning environment should be. For some, it was outside of their ability to manage the new expectations for learning that the spaces provided,

and some indicated that the teacher support they needed was lacking. These participant students wanted to learn. They cared whether or not they were learning and they wanted to do well at school. A number were self-driven, setting high standards for themselves. However, they felt their learning was not progressing in the ILE as it should.

Interestingly, although each school context varied, students' accounts of experiences and reasons for moving were remarkably similar across the four themes. They described these themes as tipping points in their decisions to change schools.

With regards to space, these students generally found the large areas and numbers of students difficult to deal with. Spaces tend to be more variable in ILEs (Benade, 2017), and, as found in other studies, open spaces can allow more distractions (e.g., Bennett & Batley, 1977), especially with increased noise levels (Mealings et al., 2015; Shield et al., 2010). Working in open spaces meant students had to deal with more interruptions and distractions. The lack of desks and chairs in quiet work areas was identified as a barrier for some students who preferred to be seated more formally. Some ILEs tend to use a wider range of furniture including easy chairs, bean bags alongside traditional desks and chairs. Some students found this a distraction.

Social relationships were identified as important. Students felt they did not have close relationships with their teachers in ILEs. This was possibly because of the shift in pedagogy that teachers were using, in which students were expected to be more self-managing. Nonetheless, participant students voiced their concern over the perceived lack of one-to-one contact with their teachers. They felt ignored and unable to build good teacher-student relationships. Benade (2017) discusses space as a place for social relations and the environment as the 'third teacher', but these students did not experience this.

The pedagogy students described did not necessarily match the collaboration within flexible environments that ILEs allow. Much of the learning they described in ILEs involved considerable self-regulation and motivation, and was solitary; students struggled with managing themselves as learners. In particular, they wanted to be in a structured instructional learning environment, with more direction, tighter expectations and more accountability to the teacher.

Authors such as Mulcahy and Morrison (2017) describe an *instructional* learning environment as one where the teacher is central, where spatial boundaries allow students to hear what is said and to do their work, and where bodies are disciplined. In more traditional educational environments, students are more likely to be told what to do, how to do it and when to do it. According to the participant students, learning in an ILE environment can be experienced as:

- self-directed, that is, not necessarily told what to do and when and how
- self-managed
- discovery, i.e. not necessarily told what to learn
- lack boundaries, i.e. not necessarily checked up on or supervised
- lack of contact with teacher, i.e. there are difficulties with supervision of many students on different and self-directed tracks
- fluid—many learning choices

- social—easy connections with friends
- lonely
- stressful—when being asked to undertake self-directed learning
- overwhelming
- noisy
- confusing—with cross-curricula work
- chaotic with many people in one place
- fun but not purposeful learning.

Combinations of these experiences could be seen as drivers for students to move to schools where they feel more instructional learning can occur.

What Is Important in ILEs in Moving from 'Mismatch' Towards 'Match' for Students and Their Learning?

In teaching and learning, there is a constant tension between what teachers want to have happened, and what students want to have happened. With shifts to more student-centred learning in many schools including ILEs, it follows that it is important to listen more closely to student voice (Wright & McNae, 2019). For the participant group of students, the affordances and possibilities of ILE spaces challenged the capabilities of some students to exploit learning approaches and opportunities in ways which resulted in increased feelings of learning and achievement.

In their comparative analysis of ILE and traditional classroom layouts, Byers et al. (2018) recently found that "differences in spatial layouts affected student attitudes to their learning experiences and engagement" and student achievement, but only when within the ILE there were "teachers who were able and willing to align better the affordances of the physical learning environment to a wider array of pedagogies" (pp. 175–176). The following suggestions arising from students' discussions are worth considering if teachers want to truly meet their needs. These suggestions centre on physical space, social interactions and pedagogy.

Physical Space

There is a tension between the learning environment as flexible and informal (e.g., couches) and the ability of students to self-manage within this environment. There are students who prefer seating at tables/desk in areas where there are relatively few distractions. Perhaps providing more seating options like desks and chairs, offers students choices in learning furniture. They might then learn more comfortably.

Noise generated by large classes is difficult for some students to deal with, and can become debilitating for some. Many ILEs, even those with noise-baffling provisions, can be noisy simply because of the numbers of students in one place. Noise-cancelling headphones have been suggested to mitigate this noise, but may further

isolate students. Quiet spaces are needed for some students and they should not feel the need to "fight" for limited spaces.

Social Interactions

Access to teachers was a major issue that students raised. They enjoyed social interactions with their friends, although they found these were distracting at times. But interactions with teachers were seen as problematic. In more student-directed environments students still need individual help and many students felt they did not have access to a teacher for personal help when needed. For example, although there may be three teachers in a space with 75 students, this does not always equate to more teacher availability. Often one or more teachers will be working online so students presume they are not available for face-to-face help, leaving the remaining teacher/s to monitor a large number of students working in a range of spaces. It could be that in an ILE more students have a greater awareness of being and feeling lost, given the scale of the people groups. Students need a strong relationship with at least one teacher who really 'knows' them. This requires more one-to-one time with individuals.

Pedagogy

Data suggest that participant students would benefit from more structure in their learning. Some of them did not do well when left for long periods of time to work on their own devices. Anecdotal evidence shows that in secondary schools a common pattern is that students are given work via a LMS (e.g., Google classroom or Schoology) and are then expected to complete the work and submit it electronically to the teacher, who then marks it online and provides online feedback.

Teachers working in large spaces with large groups of students can mean that no one teacher is directly responsible for any one group of students. In cellular spaces teacher 'withitness' (Kounin, 1970) includes constant scanning and redirecting off-task behaviour, or noticing and responding when students need help. Perhaps this might imply that teachers need to develop strategies to manage multiple groups in large learning spaces in an ILEs.

Ten of the students spoke of being overwhelmed by the level of self-management required, and spoke of preferring clearer structure, including steps for direction and indicators of progression. Over time students will develop self-management skills, but these cannot be assumed and they require scaffolding. When students are provided with a clear description of the progression expected for their own development this could be helpful.

The Challenge

It is important in ILEs (and in all schooling) that learners' real and perceived learning needs are met. All students interviewed in this study were able to talk about their own learning and learning needs. Their descriptions of learning in their new schools allow further insight into what they needed, valued or preferred in terms of learning management and support.

Some students were not ready for the freedom and independence conferred in an ILE. They had expectations of what learning should be like, and expressed cogent arguments and explanations of what would work best for them and their learning. Essentially the challenge is that schools provide an instructional learning environment which does not entirely clash with students' expectations and prior experiences of what learning is, and which allows students to continue to develop new and innovative approaches to their own learning. The more self-directed environments often associated with ILEs are not bad or wrong, but if any school loses its flexibility by not allowing for structure that some particular students require then the school is moving away from the student-centred learning it purports to advance.

Schools need to meet the challenge to assist *all* students in developing meta-level or recursive understandings of learning and assessment *as applied to them.* That is, teachers and learners can work together to develop strategies that suit individuals and support them to learn. This requires student and teacher knowledge of student strengths and interests, daily rhythm of energy and focus and learning preferences such as group, collaborative, teacher-directed, individual and student-led. The voices of students may help those working in schooling contexts understand how to better meet this challenge.

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Chapter 10
Te Puna Mātauranga Kiritoa: Teachers' Collective and Individual Resilience in a Māori Modern Learning Environment

Leeana Herewini, Ngārewa Hāwera, and Bronwen Cowie

Abstract This chapter introduces the notion of Puna Mātauranga Kiritoa (PMK) as a Māori name to adequately capture the intent of a Māori Medium Modern Learning Environment (MLE). Puna encapsulates the idea of a spring or source, mātauranga speaks to teaching and learning/knowledge, and kiritoa addresses the concept of resilience or being strong in your skin. This name was developed by the researchers and kaiako (Māori term for teachers) who were our research partners as part of a two-year Teaching Learning Research Initiative (TLRI) where we worked with a group of 106 Year 4 to 6 students and their six teachers (kaiako) as they grappled together to understand what it meant to be, to do and to learn pāngarau (mathematics) in their particular space. This grappling included understanding why this space had been developed in the way it had been, which was to allow teachers to work to their strengths to improve learning for students (ākonga). The research team worked within a Kaupapa Māori framework and interacted with kaiako as partners in the research process. Data were generated via interviews with kaiako and ākonga, classroom observations and project team meetings between kaiako and researchers. Findings illustrate that teaching and learning with a large number of ākonga and kaiako demands resilience from both kaiako and ākonga. Kiritoa was incorporated into our description of the teaching and learning environment because the word *kiritoa* conjures images of courage and links to notions of resilience. Furthermore, kiritoa is about being strong in one's skin; being confident and firm in one's identity. During the TLRI study, we observed many examples of ākonga (learning), and kaiako (teachers) acting with courage and confidence in a new teaching and learning environment. These notions of kiritoa inform our view of resilience presented in this chapter. Collaboration is a critical component of working in a PMK/MLE. Our findings intimate that collaboration between ākonga was a valued outcome, as was collaboration between ākonga and kaiako, and between kaiako. The intricacies and demands of effective collaboration are complex, requiring time, patience and resilience, when working in a large space with over 100 ākonga. The development of a PMK/MLE

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provides an opportunity to explore, trial, negotiate and collaborate to better meet the demands of teaching and learning pāngarau differently. We hope our work offers other Māori medium settings some insights and the confidence to make sense of the potential of an MLE in their context as a setting for pursuing their aspirations.

Glossary of Terms

Ākonga	Students
Kaiako	Teachers
Pāngarau	Mathematics
Tongikura	Prophetic saying
Niwha	Fortitude, resilience
Kāhui kaiako	Syndicate or cluster of teachers who work together
Kura	School
Whānau	Family
Tumuaki	Principal
Mokopuna	Grandchildren

Introduction

Findings from a two-year Teaching Learning Research Initiative (TLRI) study undertaken from 2018 to 2020 inform this chapter. We, the first two authors, set out to explore the teaching, learning and achievement in pāngarau (mathematics) of ākonga (students) in a Māori medium (MM) Modern Learning Environment. Our research partners were kaiako (teachers) from Te Wharekura o Rākaumangamanga located in Huntly, Aotearoa New Zealand. The title of our research project, Māku anō e hanga tōku nei whare (I will build my own house) guided our approach to the research. "Māku anō e hanga tōku nei whare" is the first line of a tongikura (prophetic saying by a monarch) by Tāwhiao (Second Māori King), which makes reference to building a house fashioned from trees not known for their building potential (trees such as hīnau, māhoe and pātate). This tongikura implies making the best of the available resources. Building a thriving learning environment is a value that the kura holds in relation to optimising the resources and potential of their kaiako and ākonga. As noted in the final TLRI report (Hāwera & Herewini, 2020) a modern interpretation of the tongikura for our research study and this chapter positions kaiako and community as key to determining ways to advance the aspirations of tamariki (children) mokopuna (grandchildren) and the community in a new kind of environment.

This chapter introduces the notion of Puna Mātauranga Kiritoa (PMK) as a Māori name to capture the nature of a MM MLE. *Puna* encapsulates the idea of a spring or source, *mātauranga* speaks to teaching and learning/knowledge, and *kiritoa* addresses the concept of being resilient. Puna Mātauranga Kiritoa (PMK) as a name, was developed with six kaiako (teachers) and their 106 Year 4 to 6 ākonga (students) to understand what it means to be, to do and to learn pāngarau (mathematics) in their particular MLE space. As we reflected together as kaiako and researchers, we came to appreciate that resilience is required by kaiako and ākonga to ensure all in the PMK flourish and thrive.

Resilience and our focus on kia niwha te mahi, (acting with fortitude/resilience/moral courage), aligns with the intent of the tongikura. "Māku anō e hanga tōku nei whare" implies taking action to meet the demands of the situation and embrace possibilities. It aligns with a focus on kaiako and ākonga being empowered, taking control of their own affairs, determining their own needs and working to build for the future, using the local available resources. Doing and making the best with what you have, involves a high level of flexibility, creativity and adaptability. In turn, these skills ultimately demand resilience, perseverance and determination. In this chapter, we draw attention to both *kiritoa* and *niwha*. *Niwha* is a Māori word used conceptually to conjure images of bravery and courage while *kiritoa* was developed in the research to highlight both individual and collective resilience. We propose a PMK as a thriving and flourishing context that is founded on individual resilience which in turn, enables and fosters the kind of collective resilience we observed. "Māku anō e hanga" as a metaphor, is further exemplified through these concepts as it is up to kaiako and ākonga in their PMK to explore and present a kaupapa Māori response (a response by Māori for Māori in their particular context) to teaching and learning pāngarau.

Background: Learning in Māori Immersion Contexts

This chapter focuses on teaching and learning pāngarau (mathematics) in one Māori Medium (MM) kura (school). Activities undertaken in the 1970s highlighted the high level of motivation and commitment by Māori to protect and sustain Māori language and customs (Huebner, 1984). Petitions in 1975 to the Aotearoa New Zealand Government requesting te reo Māori be taught in all schools were an attempt to revive te reo Māori me ōna tikanga (Māori language and customs). In 1982, the formation of preschool centres known as Kōhanga reo where te reo Māori was the prime language spoken, was followed by the establishment of the first Kura Kaupapa Māori (Māori language schools) in 1985. Māori medium education (MM) is deeply committed to the revitalisation of Māori language and customs. In MM settings students are taught all or 80% of curriculum subjects in the Māori language. The development of the first MM pāngarau curriculum document in 1996 and its more recent update, *Te Marautanga o Aotearoa* (Ministry of Education, 2008) created space for Māori knowledge and the development of new vocabulary, terminology and

registers across a range of curriculum areas (Trinick, 2015). Teaching and learning pāngarau programmes in MM settings have existed now for thirty years in Aotearoa New Zealand.

During the last decade, many schools/kura within Aotearoa New Zealand have become Modern Learning Environments (MLEs). A cursory review of the literature captures the evolving language used to describe these environments. For example, the OECD (2017) report describes these environments as, "an organic whole embracing the experience of organised learning for given groups of learners" (p. 16).

In Aotearoa New Zealand, the term "Modern Learning Environment" initially described these spaces, with newer terms, such as Flexible Learning Environments and Innovative Learning Environments, appearing more recently. The first two chapters of this book provide further information about these developments. Originally, one of the suggested benefits of MLEs included greater flexibility for ākonga in learning (the spaces and tools they used, and who they learned with) (Bisset, 2014; OECD, 2017; Osborne, 2016; Wright, 2018). MLEs are strongly promoted as sites for developing students as twenty-century learners who need to acquire skills for collaboration, innovation and problem solving (Ministry of Education, 2020).

Within MLEs, the boundaries dictating where learning takes place are extended (Hāwera & Herewini, 2020), because MLEs are promoted as places of personalised learning where ākonga have choices with what, where and with whom they might learn. Exercising such choices requires both initiative and self-management. Typically, MLEs also offer increased access to digital technologies. The affordances of MLE environments, including rapid advances in technology infrastructure, increased the need for students to be able to think more deeply and broadly (Bolstad et al., 2012). To reap the benefits that MLE environments offer, kaiako need to consider how to provide diverse ways of teaching and learning. This demands considerable flexibility, innovation and collaboration.

Research on MLEs has highlighted that collaboration is an important, and, at times, challenging feature of such environments (Bradbeer et al., 2019; Osborne, 2016; Wright, 2018; Wright & McNae, 2019). Some challenges for teachers include how they work in small groups within a large number of students in large open spaces. Groups of ākonga working collaboratively can result in increased noise which can be distracting for both ākonga and kaiako. In addition, while some ākonga thrive in collaborative situations, others prefer to work more independently.

Working within a team, kaiako (teachers) are well-positioned to lead and teach their area of passion and interest. It is assumed that kaiako leading from a position of strength ensures ākonga have access to a range of kaiako expertise and passions. As kaiako lead from their strength they are more likely to deliver content creatively, knowledgeably and with commitment.

Resilience (Niwha)

In this chapter, we are interested in the need for, and nature of resilience, as it relates to kaiako and ākonga engagement and enjoyment while learning pāngarau in an

MLE. Although the challenges and advantages might be similar to those found in many single-cell classrooms, the complexity of the educative process is markedly magnified by the increased size, physical arrangements and greater expectations of flexible teaching and learning within an MLE (Hāwera & Herewini, in press). We propose that the concept of resilience, both individual and collective, offers a new, different and generative way of thinking about kaiako and ākonga teaching and learning together in a PMK.

Gu and Day (2007) locate the origins of resilience in psychology, but note that the social work literature advances a view of resilience as multidimensional and multi-determined, best understood as a dynamic process evolving within a social system of interrelationships (p. 1305). They argue that resilience is not an innate quality, but is rather a construct that is relative, developmental and dynamic. It is one that connotes positive adaptation and development in the presence of challenging circumstances. It is both a product of personal and professional dispositions and values, and is socially constructed. An implication therefore, is that resilient qualities can be learned or acquired. This development of resilience can be achieved through providing relevant and practical protective factors. These factors include caring and attentive educational settings in which school leaders and teachers promote positive and high expectations, productive learning environments, a strong supportive social community and supportive peer relationships (Gu & Day, 2007). Importantly, this view of resilience as a social construct diverts attention from individual attributes and individual responses to challenges that may be best met collectively (Johnson et al., 2014).

Gu and Day (2007) assert also that it is difficult to demand that students *be* resilient if their teachers do not demonstrate resilience themselves, hence our research focus on both kaiako and ākonga. Within this focus and our understanding of resilience as a social construct, we align ourselves with Masten (2001) who argues that resilience is made up of ordinary rather than extraordinary processes. Examples of these processes include the nature of day-to-day relationships between kaiako and the dynamics both promoted and supported by the physical arrangements of the MLE. How ākonga respond to the challenges of pāngarau tasks requiring problem-solving and group collaboration skills, are also relevant (Johnson et al., 2014). In our view, this perspective offers a more positive and generative outlook on human development and adaptation than a focus on extraordinary and negative experiences. It also resonates with the tongikura that guides the PMK and the context for this chapter.

Waiti (2014) writing from Aotearoa New Zealand, examined resilience strategies employed by whānau (families) in relation to wellbeing, with a particular interest in the cultural components of resilience. He notes that there is limited information related to indigenous and Māori understandings of resilience in the literature. Such literature, he argues, focuses on individual rather than collective resilience. He points out that resilience may operate at multiple levels, and argues that indigenous resilience is ecological in that it "may include individual, family, community, national and international (across Indigenous populations) levels of resiliency. Thus, each level can influence another, and all contribute to the overall theme of Indigenous resilience" (p. 72). He suggests that Indigenous researchers adapt the term resilience

to suit the needs and aspirations of indigenous populations and states that: "A holistic and strengths-based approach of Indigenous resilience, as well as its consideration of colonisation, cultural traditions and beliefs, provides a culturally relevant lens from which to view resilience in Indigenous populations" (Waiti, 2014, p. 72). In this chapter, we seek to present a view of resilience aligned with Kaupapa Māori and with ākonga and kaiako experiences of teaching and learning in a PMK/MLE when learning pāngarau.

Study Background

The TLRI study on which this chapter is based, drew upon a Kaupapa Māori research methodology. This methodology is strengths-based, centring on respectful relationships and culturally embodied narratives which align to Māori worldviews (Pihama et al., 2002; Smith, 1999, 2011). Kaupapa Māori has origins in critical theory which emphasises ensuring that research with Māori is transformative (Pihama, 2015; Smith, 2011). Kaupapa Māori affirms Māori ways of knowing and being as right and valid and guides researchers towards honouring local communities and their knowledge. Te Wharekura o Rākaumangamanga is a strong supporter of Kingitanga (King Movement). Therefore, a Kaupapa Māori approach aligns with and supports the cultural values and aspirations of the kura.

Over 2018 and 2019, two researchers supported six kaiako through a reflective process to establish a series of inquiry questions to guide their exploration of teaching and learning pāngarau in their MLE/PMK. A Kaupapa Māori approach was reflected in ways the researchers honoured te reo Māori and supported the kura and kaiako to realise their goals and aspirations. The collaborative reflective process was informed by the literature, teachers' and researchers' experiences, an online survey and focus group interviews with ākonga.

The MLE/PMK building was L-shaped with a breakout room in its centre. Cupboards along some of the walls provided limited storage for kaiako and ākonga. During the study, there were 106 ākonga with six kaiako working in the space. The research was conducted with the active support of the kura leadership team.

Data were generated through observations, student focus group interviews, interviews with kaiako, online surveys of all ākonga in the PMK, and discussions during project hui (team meetings). Next, we present data from 2018 to highlight 2020 notions of kiritoa/resilience.

Kaiako Background

The PMK was established in 2017 with one Pouārahi/Syndicate leader appointed. Discussions with kaiako in 2018 revealed that they were grappling with a range of issues as they sought to adjust to the PMK space where, as a newly formed team, they worked together to support the learning of a large number of ākonga. This

Table 10.1 Teaching experience in this PMK

Year	New to this PMK	Taught in a PMK before
2018	2 kaiako	4 kaiako
2019	1 kaiako	5 kaiako

Table 10.2 Length of teaching experience

Taught 0–5 years	Taught 5–10 years	Taught more than 10 years
1 kaiako	3 kaiako	2 kaiako

combination of factors required kaiako to be resilient and resourceful. As per the guiding tongikura, the kura relied on the expertise of incumbent kaiako to lead the new PMK. Amongst them they varied in their length of teaching time and prior experience within a PMK, as set out in Table 10.1.

Table 10.1 shows that most kaiako had some previous experience in a MLE teaching space in another part of the kura prior to taking up a teaching position in this PMK.

Table 10.2 shows that 5 out of 6 kaiako had a minimum of 5 years teaching experience before working in this PMK.

Findings

The findings focus on aspects of resilience. The first part addresses how students (ākonga) and teachers (kaiako) learned how to make use of the learning spaces. The second section focuses on collaboration as a foundational function, while the next part concentrates on aspects of communication. The final section is the decision-making about pāngarau learning activities and choices. All aspects use the lens of resilience (niwha) to explore the ideas.

Learning How to Share Space and Resources Requires Resilience

The L shape of the PMK building space, which included only minimal partitions marking out areas, meant a high level of organisation was required by kaiako and ākonga to know what was happening, where people were meant to be and where they actually were. These challenges were compounded by other timetabling separate from the PMK. This was for ākonga to participate in learning English in another part of the school at various times during the week. Tracking and providing meaningful learning experiences in pāngarau for learners was difficult at times. Kaiako also

commented that the spatial configuration of the PMK space posed further challenges regarding the need to share the space and resources:

> I don't think any of us mastered the art of having a fluid, free flowing space….. That is really hard…..For a start we would have needed more breakout areas. It's a sanity thing, you need to know where your stuff is, you don't want to be looking for the whiteboard pen….. You need everyone to put equipment back. (Kaiako P1)

Kaiako talked about the way in which they had to continually adapt the way they worked in the shared space as they sought ways of working effectively within it. Kaiako P1 explained, "Every term we change, because we are still finding what works". Kaiako P2 emphasised kaiako focus was on the "best ways" to use the environment and resources:

> Everyone has had to try and work out the best ways to work in this environment. It's not just how to teach in this environment but how to use the environment that we have. … It is constantly changing even now. … We have to share everything. It would make it so much easier if we had a resource room. (Kaiako P2)

Two kaiako talked about drawing imaginary curtains or walls as barriers for both space and noise. "Sometimes you put up imaginary curtains" (Kaiako P1).

Noise was identified by ākonga and kaiako as a challenge in both 2018 and 2019. In 2018 only one of the eight ākonga from the focus group mentioned the level of noise, "Tino noisy tērā atu taha" (That side is really noisy) (ākonga T, 2018). In 2019 noise during the learning of pāngarau was raised by four of the seven tamariki in 2019, with ākonga J saying: "Kāre e pai ki a au te hāmama ngā tamariki, ngā kaiako hoki". (I don't like it when children are shouting and kaiako too). There was complete agreement among all kaiako that managing noise levels needed careful collaborative planning, with Kaiako P3 commenting, "It comes to planning… how are we going to plan for lesson noise, it comes to collaboration". In 2019 Kaiako P2 raised the issues of noise in a somewhat different way. She reported, "I discovered I was a loud teacher. … I definitely catch myself. … Kaiako X put it in a nice way that I had to laugh at myself". We can see in this comment that Kaiako P2, as a consequence of working in the PMK, was able to see herself in relation to others in a way that would not have been available to her, or even important, in a conventional single cell classroom.

In our view, this comment provides compelling evidence of both individual and collective resilience/kiritoa in that kaiako P2 is brave enough to acknowledge that talking loudly was something she did, but realised she needed to modify after her kaiako colleague was prepared to tell her she was loud. We see this as an acknowledgement that noise levels are a collective responsibility that the teachers can address together. However, the matter of acceptable noise levels needs to be considered in relation to literature which suggests that talking and debating is an important part of learning pāngarau (Hāwera & Taylor, 2006; Hunter et al., 2018). This was especially so in the TLRI project which focused on developing investigative tasks where most ākonga would interact and work together. These tasks offered an opportunity for ākonga to verbalise their thinking and share ideas with each other as a strategy for making sense of tasks, and developing and retaining new learning. This focus had

developed over a two-year period with Kaiako H1 reflecting the importance of kaiako modelling aspects of talking mathematically, saying, "What I am hearing, we need to model how to talk". As noted earlier, ākonga talking about their pāngarau learning does produce larger volumes of noise which does require thoughtful management in a PMK/MLE.

Collaboration Requires Resilience

While kaiako acknowledged their PMK team was still developing collaborative ways of working, they could also articulate the strengths of working in the PMK. Kaiako P1 commented that, "There are a lot of opportunities to work on different people's strengths; that's cool". This point is reinforced with Kaiako P3 stating that:

> This is one of the drivers of why we are an MLE, is that we collaborate. We come together as a kāhui kaiako (learning community)... Actually, if we are a kāhui kaiako, we draw on each other's strengths. … We stay true to the kaupapa, making use of our strengths, which means we don't need to know it all across the curriculum. (Kaiako P3)

A kāhui kaiako is conceptualised as a collective whereby the strengths of each kaiako are better utilised. The kāhui kaiako met to plan, discuss and share ideas with some ideas accepted, some adapted and others rejected. There were tensions as collaborative planning time was very intensive, with this leading to one kaiako commenting that in some contexts kaiako might just agree for the sake of agreement to various ideas. Kaiako H1 saw this as a lack of commitment toward the intent of the PMK, saying:

> It's because of the dynamic of working and sharing ideas. An idea will be deliberated, thrown out and you have six teachers and some teachers may just agree. It is a time thing. If you go the easy track and you agree, you aren't putting your heart into it. (Kaiako H1)

Finding time to meet as a team was identified as a difficulty by other kaiako, as Kaiako P2 explained, admitting that "I found it hard getting together. There was always one person missing".

As they streamlined processes and sought to work more collaboratively, kaiako reflected and acknowledged, "Each term we get better" (Kaiako R1). Kaiako P1 summed up the changes as, "We had to simplify things. We are getting braver. We are becoming more collaborative". Here we see Kaiako P1 link increased collaboration with increased bravery, which other kaiako indicated was associated with a greater sense of collective responsibility that fostered resiliency for all kaiako. In other words, these kaiako were signalling a growing sense of community and vision of their kāhui kaiako.

It should be noted too that of the 99 ākonga who completed the online survey in 2018, 42% appreciated being able to work with others. By mid-2019, this had increased to 52%, suggesting ākonga were becoming more comfortable with working and learning with others in a flexible way in the PMK.

Kaiako Communicating Regularly Builds Resilience

During 2018, kaiako reflected on the importance of understanding the rationale of their PMK with one commenting, "What are we here for; is a huge thing. It actually takes a big conversation" (Kaiako P1).

When we talked with kaiako in March 2020 they acknowledged their growth and learning from 2018 to 2020. They emphasised that the intention of a PMK demands a high level of self-management and resilience from kaiako and ākonga in order for all to flourish (Hāwera & Herewini, 2020). This notion of flourishing is important as it highlights the importance of everyone thriving and succeeding in a PMK.

Reflecting on two years of working in this PMK, Kaiako H1 asserted that being able to talk honestly with each other in the knowledge that this would not undermine personal and group relationships, was essential for being able to work collaboratively for the benefit of the team:

> We should be able to talk about each other's flaws to help benefit us. If we can't do that, it doesn't seem to be set up well. … X is not going to hold a grudge as we have worked together for a while.

Kaiako P1 commented, "It is good if you can argue". She reported she, "found it hard to give feedback" but this wasn't always the case. Her challenge was that, "People keep taking things the wrong way……. It is something I need to practise". These comments highlight the personal responsibility required to develop and improve the skills of an effective team member while recognising the importance of maintaining integrity with personal relationships.

One kaiako commented, "It challenges teachers to shift their mindsets, because teachers are stuck in their ways. Trying to break out of barriers" (Kaiako H1). One kaiako commented kaiako needed to be better prepared for working in a PMK, saying, "A lot more preparing kaiako. I don't know what that would look like. There is still more to know" (Kaiako P1).

Tasks and Choices to Build Resilient Learners

As part of the TLRI study, kaiako presented ākonga with investigative pāngarau tasks designed to encourage collaboration, promote the use of equipment, offer opportunities for self-management and allow for differentiated learning. Kaiako and researchers together planned the investigative tasks to use. Kaiako appreciated the opportunity to both share the mathematics involved in the tasks they planned, and get feedback from colleagues. Kaiako were also positive about debating and reviewing decisions about whether to include mathematics equipment would enhance the development of ākonga conceptual understanding of the pāngarau ideas. In these meetings, kaiako raised concerns too about ākonga who may not have the pāngarau knowledge needed to engage with the mathematics tasks. Kaiako P2 reflected, "I'm wondering …. I worry about where the kids who need practise with whakarea [multiplication]

and tango [subtraction] and tāpiri [addition], where do they get that practice?. ….
All those little skills, where do they fit in?" As acknowledgement of this concern,
kaiako decided that they would strive to quickly recognise ākonga struggling with
mathematics ideas and organise small group learning situations in context.

Pāngarau time was also arranged so that ākonga could choose the task they wished
to engage with. Initially, kaiako were unsure about offering choice, but, as Kaiako
M1 pointed out, "The more we just jump in and let it go, the more the kids can
practise being self-directed and the more we can anticipate what to expect. … I think
we need to take some risks and maybe make some mistakes and get better". It takes
resilience on the part of kaiako to relinquish previous ways of teaching pāngarau and
to adopt approaches which may involve sharing pedagogical decision making with
ākonga where this could include co-constructing tasks and negotiating the teaching
timetable.

As ākonga were now able to select an investigative task, the pāngarau groups
became mixed ability instead of the more familiar ability groups. This MLE/PMK
has ākonga from Year 4–6, so it was therefore conceivable there would be a group of
Year 4, 5 and 6 ākonga. Kaiako M1 commented on the implications of this, saying, "I
think all my kids learned something but I don't think some were extended as much as
they could've been. … I don't think I did enough for them… they already knew some
of the stuff we were doing". However, Kaiako M1 described one of the strengths of
working on investigative tasks as, "Ka kite ngā tamariki ko te raweke te ako, inā hoki,
ehara mā te kaiako te akoranga e āta whāngai i ngā wā katoa" (Children saw that
using materials involved learning and also that it wasn't up to the teacher to provide
the learning all of the time).

All kaiako had participated in Te Poutama Tau (Numeracy Development Project)
and were accustomed to teaching ākonga in large ability groups with task content
aligned to Stages of the Numeracy project. The move therefore to mixed ability
groups, was seen as a risk. This took courage. In Kaiako M1's comment, we see
an appreciation of the challenges involved, but also a benefit. For some ākonga, the
change in programme style to investigative tasks was unsettling. Ākonga D said,
"He pai te mahi a Kaupae" (I like it better when working in Stage groups) whereas
ākonga T commented, "He pai ake ngā mahi (the work was better). Ākonga D, 2019,
stated, "He pai – i te mea ka taea te mahi tahi" (It is good, because you can work
with others) while ākonga J noted "He pai te noho ki tētahi kaiako" (I like staying
with one kaiako). From this, we can see that some ākonga preferred working with
others with similar understandings and with the one kaiako, while others enjoyed
the chance to work with their peers on different kinds of mathematical/investigative
tasks.

Discussion

The *kiritoa* component of the Māori name for an MLE, Puna Matauranga Kiritoa,
inspired the contents of this chapter. Kiritoa relates to the development of resilience or

the building of a range of skills when learning in a dynamic PMK. This chapter offers a view of resilience as both collective and individual and illustrates some of the ways it involves ordinary rather than extraordinary processes (Masten, 2001) within the PMK setting in our project. Influenced by Waiti's (2014) notion of Indigenous resilience, we propose a PMK as a thriving and blossoming context founded on individual resilience. In turn, it enables collective resilience embedded in relationships and is ecological in nature. Both individual resilience and collective resilience were part of kaiako and ākonga PMK interaction experiences. We describe these interaction experiences as adaptive, changing and responsive.

Over time, kaiako developed and demonstrated confidence within themselves and in others to offer critical and constructive feedback and commentary to each other in the knowledge they were all seeking ways to advance the aspirations of tamariki (children) mokopuna (grandchildren) and the community in this new environment. This discussion explores the systems or structures kaiako grappled with as part of their working and learning in a PMK from a resilience perspective.

Systems and Structures

A PMK as an open dynamic space for learning, demands new ways of operating when kaiako have been used to working in single-cell classrooms. The layout and design of MLE is critical. Features such as storage space and access to break-out spaces can have an impact on how kaiako prepare and are able to work with ākonga. Although these features might appear simple and minor in nature, they affect how prepared and organised kaiako feel about teaching. Not having enough storage space, for example, can be an issue. It was important to kaiako to know where, for example, their whiteboard pens were located as searching for and returning equipment is an unnecessary time waster. When there are multiple kaiako using one large space, systems to ensure functional and working relationships in an MLE/PMK have to address simple things like ensuring equipment is easily located, available and returned promptly for others to use. While kaiako in this study expected and accepted a level of flexibility is required when working with others, it reduces unnecessary angst if equipment is returned in a timely manner.

Noise in a PMK is an area for consideration. Large groups might produce a large volume of noise which may distract other kaiako and ākonga in the PMK. Kaiako displayed resilience as they learned to adjust to loud speaking colleagues and/or groups of excited ākonga. Resilient behaviours that evolved over time, showed kaiako to be considerate and thoughtful regarding their use of voice for instruction and managing learning. For ākonga, the ability and opportunity to verbalise their thinking and to share ideas supports them making sense of, and sustaining, their pāngarau learning. In this PMK, ākonga were encouraged to verbalise their pāngarau ideas alongside other ākonga, creating, at times, a lot of noise. The tension of encouraging talk and the volume of noise it created required management and thought by both kaiako and ākonga. Break-out rooms which offer sound reduction, headphones or

spaces designated for high noise or low noise can support ākonga and kaiako to engage meaningfully in dialogue without disturbing others (Ministry of Education, 2014; Murphy, 2016). In a PMK, resilience is required by both ākonga and kaiako so that learning dialogue and noise levels are mindful of maintaining a suitable environment for all members.

Kaiako noted the importance of talking at length about the purpose of their PMK. It is important for teachers to understand and be reminded of why their PMK was established. Benade (2017) notes that many MLE were developed to enable kaiako to work to their strengths to enhance learning for ākonga, and this was the case for this PMK. This form of organisation did not require kaiako to be experts in all curriculum areas, but it focused instead on team expertise and strengths as a collective. Reviewing the purpose of their PMK and ways of working is one way in which kaiako are more likely to skilfully combat the challenges experienced in a PMK.

Collective Resilience: We

Collective resilience can be understood in dynamic terms as emerging from interactions between people, in this case between kaiako and kaiako and kaiako and ākonga in their PMK. One example of such an interaction was when kaiako regularly met to review and plan tasks. Seeking a high level of agreement required a commitment to the subject at hand and willingness to compromise. Collective resilience highlights the way in which kaiako sought to honour each other's perspectives and enact their shared vision and commitment to offering ākonga the best possible pāngarau learning experiences in their PMK.

Working collaboratively in a PMK requires kaiako to be brave. The nature of a PMK working environment means that teaching practice is observable and deprivatised. Benade (2017) acknowledges that this can be unsettling for some kaiako with Hāwera and Herewini (2020) observe that,

> While kaiako initially felt somewhat exposed in their teaching and learning practice in a large room shared with others, they were appreciative of the opportunities afforded by the PMK environment to observe the pedagogical approaches and interactions of their colleagues with ākonga. (p. 6)

Teaching in a PMK, requires a high level of mutual trust amongst all kaiako. One benefit of rich opportunities for new learning or ako (teaching and learning) that strengthens team practices and new approaches for supporting ākonga learning. Kaiako acknowledged that over time, they became braver and more comfortable within such a teaching space. The notion of kāhui kaiako was embedded as an important feature of kaiako supporting each other and enabling a strengths-based approach to utilise the passions and interests of kaiako in this PMK.

An ethic of care when teaching and learning pāngarau was evident as kaiako created a welcoming and inviting classroom community that maintained high expectations and engaged students in learning pāngarau (Anthony & Walshaw, 2007). Not

only was an ethic of care extended to ākonga but in this PMK, kaiako showed care and concern toward each other. Examples of care and concern for each other were when kaiako were thoughtful about how and what to communicate with each other while learning to share space, time and resources responsibly. These displays of an ethic of care suggest acts of resilience do not have to be severe responses to significant events, but can be found in a series of mundane or ordinary moments, accrued over time, supporting both kaiako and ākonga to act with confidence to ensure positive outcomes for all.

To prosper in a PMK kaiako and ākonga need to communicate honestly and openly. Hence, building the skills of dialogue is an essential component for kaiako working in a MLE/PMK, as communicating honestly and with integrity strengthened the way in which this PMK worked. Fortitude or resilience is evident as kaiako became more confident and clearer in their communication with colleagues. Fortitude is required to say things that may be difficult to say and for the listener to hear. These skills can be learned with supportive navigation if required. There are moments where reconciliation may be required which is an important aspect in the development of resilience or kiritoa.

Individual Resilience: I

Collective resilience is founded on individual resilience, and so individual kaiako and ākonga resilience and its development was important in this study. One example of individual kaiako resilience was the acknowledgement by one kaiako that she needed to improve how she communicated. This recognition demonstrates that she had identified and viewed this as her responsibility. A second area which highlighted kaiako and ākonga resilience and adaptability related to sharing space. At the individual level, kaiako reconciled with, and accepted, the need to learn how to share the physical environment. At an individual level, this meant they were not always able to set up equipment in a certain area or way. Kaiako had developed strategies of being able to block out other kaiako. At times they constructed imaginary curtains or walls to remain focused on working with their group of ākonga.

The kaiako developed and introduced pāngarau investigative tasks to explore an alternative approach to teaching, support ākonga engagement and to encourage them to debate the pāngarau ideas inherent in the tasks. For some ākonga and kaiako, the investigative approach proved challenging as it was unfamiliar and they were accustomed to lessons that were largely teacher-directed. Hāwera and Herewini (2020) noted that some ākonga required support to transition to an approach that required them to be active in their learning. This not only demanded a level of perseverance and resilience from ākonga but also in kaiako in supporting them through the transition to a new approach to teaching and learning pāngarau.

Closing Remarks

Kiritoa as a concept arose as part of describing pāngarau teaching and learning in one Māori Medium PMK (MLE). This chapter has explored the notion of resilience as a way to reflect the concept of kiritoa that is aligned with Kaupapa Māori philosophy. A commonly shared view of resilience positions it as an adaptation to adversity or traumatic events, whereas this chapter presents a view of resilience as kaiako meeting the challenge of ongoing everyday and ordinary rather than extraordinary events (Masten, 2001). In this chapter, we have proposed and illustrated that resilience from an indigenous perspective is ecological, and operates at both an individual and collective level.

Kiritoa arose from the need for kaiako to retain their focus on the reason their PMK/MLE was established, which was to allow each of them to utilise their strengths to better support ākonga learning of pāngarau. Kaiako talking honestly about their aspirations for how things can be better is an important strategy if they are to thrive in a PMK/MLE. At a practical level, the negotiation and enactment of agreed levels of noise and ways of using the space and various resources are both challenging and important as these aspects impact on kaiako and ākonga focus and engagement. When communicating mathematically is a valued activity there needs to be a tolerance of and clear guidelines to enable productive and meaningful talk. As collaboration is required the ability to listen reflectively, to communicate concerns clearly, and to be adaptive and flexible demands resilience. Individuals need to be prepared to support others to do this and to demonstrate kiritoa in response to challenges. Kaiako who inquire into and reflect upon their teaching practice, their leadership and or communication skills show they are willing to open up their practice to scrutiny as part of improving it. To do this they need to demonstrate courage and acts of resilience as a collective and as individuals.

The tongikura, "Māku anō e hanga tōku nei whare" which framed our study and this chapter, positions kaiako, ākonga and the school community as determiners of their destiny and responses to any situation. "Kia niwha kia toa hoki koe ki tōu kiri", or "act with fortitude and be strong in your own skin", offers a view of the individual and collective resilience that was observed, acknowledged and achieved as demonstrated by these kaiako and ākonga in their PMK.

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Chapter 11
Thinking About the Future for Learning: ILE Realities and Possibilities

Liz Reinsfield

Abstract The emergence of Innovative Learning Environments (ILEs) has led to research interest in secondary teachers' evolving professional identities and practice, when they are motivated to design learning to accommodate their students' learning needs. Learner-centred and responsive teaching approaches can accommodate students' academic interests and learning needs within social contexts marked by rapid change, as precipitated by evolutions in digital technologies. These have led to trends affecting teachers' patterns of work. The project reported here shows how changes to learning spaces can affect both teachers' thinking and the ways in which they might design learning. The interpretive, qualitative research project enabled exploration into teachers' perceptions and lived experiences through interviews, observations and teacher-generated resources. The project's findings extrapolate ways in which teacher thinking can support the learning of those who will face the realities of uncertain and rapidly technologised futures. The findings imply challenges for pre-service and secondary teachers' practices and professional development if they are to reshape and use affordances providing access to the technologies of flexible and well-provisioned physical spaces and digital resources. This chapter ends with suggestions for supporting current and future teachers to prepare for schooling within this century.

Keywords Technology education · ILE · Pedagogy

Introduction

The emergence of Innovative Learning Environments (ILEs) has led to a focus on the ways in which teachers develop their pedagogical responses to accommodate students' learning needs. School structures are also changing to accommodate new ideas about teaching and learning (Leggat, 2015; Wright, Chap. 2). There is a correlation between high-quality ILE models and improved student outcomes, particularly

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when there are interdisciplinary, collaborative approaches to teaching, coupled with sustained professional learning and supportive school structures (Blackmore et al., 2011; Darling-Hammond et al., 2002; Osborne, 2016; Reinsfield, 2019a, b; Wright, 2018). This chapter considers existing Initial Teacher Education (ITE) programmes and their role in preparing student teachers for the types of practices they are likely to experience in the future. This is currently pertinent given the paucity of research in this area and it is difficult for student teachers to be placed in ILEs to see such practices first-hand because they are still relatively uncommon.

There are various factors fundamental to the successful implementation and enactment of innovative and responsive educational practice. Educational change is a complex process. The move to flexible, large, and well-provisioned spaces means that teachers will need to reshape their thinking and pedagogical practices, navigating a range of potentially unfamiliar challenges. In such contexts, teachers might feel forced or rushed in their need to change (Handal & Herrington, 2003). Some teachers can be suspicious of reform and understandably concerned that their changing practices can negatively affect their students' learning outcomes. In such situations, teachers may rely more heavily on their own beliefs, on what they perceive to be their teacher identity, defaulting to routine practices rather than potentially riskier, unfamiliar and/or student-centred pedagogical approaches (Reinsfield, 2018a). For example, innovation in teaching can be represented through an increased engagement in differing pedagogical practices, which include real-world learning opportunities for students, resulting from engaging in personalised learning programmes (Organisation for Economic Co-operation and Development (OECD), 2014).

Learner-Centred and Responsive Pedagogies

There has been growing international attention focusing on learner-centred approaches to pedagogy because such approaches better recognise students' academic interests and needs (McCombs & Whisler, 1997; Onchwari et al., 2009; Tabulawa, 2003; Windschitl, 2002). A learner-centred perspective allows a teacher to acknowledge students' worldviews, as represented by their knowledge, skills and cultural context, which is valued in Aotearoa New Zealand (McCombs & Whisler, 1997; Reinsfield, 2019a). Within a frame of learner-centred pedagogy, the expectation is that it encourages students to reflect and assess their learning, positioning teachers to provide opportunities for students to engage in self-directed, critical and authentic learning. Self-regulated learners have been described as confident, diligent, proactive and resourceful, knowing what they can and need to do to achieve academically.

Self-regulation can be supported by teachers exploiting students' interests, by offering scope to pursue creativity and innovation, or through research and experimentation. They also seek support and advice as they require it (Zimmerman, 1990). Zimmerman argued that self-regulated learners can solve problem, take responsibility for their learning, plan, set goals, reflect and be adaptive. With appropriate

support, self-regulated learners are likely to experience confidence and self-belief as learners. However, this state of well-being can depend, amongst other factors, such as the professional skill of teachers to design an environment that fosters such a climate for learning. The design of an environment is impacted on what a teacher values for learning, their teacher identity, and subsequent use of pedagogical practices.

Secondary Teachers' Professional Identity and Pedagogical Practice

Teachers' identities and how they describe their practices can be viewed via Hoyle's (2008) observation "that one of the defining characteristics of members of a profession is the ability to function effectively in uncertain and indeterminate situations" (p. 285). The professional identity of teachers appears to have a direct correlation with their emerging professional practices (Biggs, 2006; Dakers, 2006; de Vries, 2005; Fox-Turnbull & O'Sullivan, 2013). These practices evolve within specific school contexts in tandem with their own sense of professional belonging (Guskey, 1988; MacGregor, 2017; Roche & Marsh, 2000; Shavelson et al., 1976). Teachers' identities inevitably influence their engagement and use of a range of pedagogies and tools. This is particularly applicable to teachers' uptake and use of digital technologies in their practices, or when teachers find themselves in schools where they must collaborate and teach in teams, applying different kinds of curriculum provision than they may have previously experienced.

The term "effective pedagogy" is presented in the *New Zealand Curriculum* (NZC) (Ministry of Education, 2007, p. 34). The NZC outlines that "there is no formula that will guarantee learning for every student in every context" (MoE, 2007, p. 34), and also communicates that students learn best when they feel supported and safe in their school or classroom. With such advice, teachers are encouraged to consider their own contexts and work out how to provide optimum conditions for learning. This might include reflecting on their own actions, designing the learning focus to meet identified needs, facilitating and supporting students' collaborative practices and recognising students' prior experiences as valuable classroom assets. Put together, these actions offer substantive learning opportunities. Such opportunities for enacting a range of pedagogical approaches are likely to be mediated by the school's context, what it values and privileges through resourcing and curriculum design (Reinsfield, 2018a) (see Chap. 2). Parents can thus make decisions for their children based on, perhaps, the ethos and values they think the best match their children's needs, and/or their social expectations. Community expectations can therefore have the potential to enable, moderate or limit teachers' innovative classroom practices (OECD, 2012; Reinsfield, 2018a).

Education has traditionally focused on the development of students' competencies, in particular their understanding of content knowledge and practical skills. There has been a growing expectation however, that education develops students'

capabilities to adapt to rapid social and technological change and contributes to the generation of new knowledge (Fraser, 2000; Reinsfield, 2018a). To foster a climate of innovation for learning in which these expectations can be met, teachers are likely to need to encourage students' creative, critical and reflective thinking, about issues such as the influence and role of digital technologies in our lives.

Digital Technologies in ILEs

Policy documents, like the Aotearoa New Zealand School Property Strategy (Ministry of Education, 2011) assert that ILE's are a means to develop "a world-leading education system [able to provide] all Aotearoa New Zealanders with the knowledge, skills and values to be successful citizens in the 21st Century" (p. 2). Twenty-first century skills are recently associated with future-focused conceptions of learning, which harness the use of digital pedagogies, are learner-centred in nature, and designed to emphasise critical and creative thinking in a variety of ways (Leggat, 2015; MoE, 2016a; Organisation for Economic Co-operation Development (OECD), 2013; Reinsfield, 2018a). The use of digital technologies can transform learning to enable students' participation in a developing global and digital community (Dakers, 2016; de Vries, 2009; Feenberg, 2006; Wallace & Hasse, 2014), but the reported research was also focused on engagement with and enactment of the technology curriculum. This was particularly pertinent because the technology curriculum had just been revised, to emphasise the place of digital technologies. Teachers need to be supported to develop a learning context to know the distinction between the use of digital pedagogies, and the role of digital technology in the curriculum. This need is observed in schools but also has ongoing implications for ITE teachers' understandings of such practices (see Chap. 3).

One of the roles of ITE programmes is to expose student teachers to changes in educational thinking and practice. There are existing tensions however, between espoused and research-informed best practice, and the types of teaching that student teachers might observe when they enter schools for their professional experience (Reinsfield, 2018b). The emergence of ILEs signals another tension for ITE programmes, especially as many student teachers will not be placed in schools of this nature during their time at University. The next section describes the research project, which explored technology teachers' practice in secondary schools in Aotearoa New Zealand.

The Project

This chapter, reporting findings from an interpretive, qualitative research project in which I (Reinsfield, 2018a) applied multiple case study methods to contextualise and communicate the nature of six teachers' practice, four of whom worked in a

junior secondary ILE. Observational, self-report, and visual data collection methods helped me understand the influences on secondary teachers' perceptions and practice at individual, interpersonal, and organisational levels. I had direct contact with participants in their school consider how social arrangements and rules affected teachers' practices in their professional context (Patton, 2001). I used Nvivo 11 for coding and assuring trustworthiness, while Activity Theory acted as my interpretive analysis framework. It helped me conceptualise the school's internal operations, its department settings, and established teachers' shared understandings within their own community of practice (Wenger, 1998).

Activity Theory

Socio-cultural theorists have used Vygotsky's (1978) first generation of activity theory, centring on the concept of mediation and represented in triangular form. Vygotsky's mediated triangle can be used to situate teachers as participants of an activity. In the context of my research (Reinsfield, 2018a), teachers' engagement with differing pedagogical practices presented opportunities to develop new understandings about the potential to transform teachers' thinking. They recognised that meaningful activity is seldom accomplished in isolation, and that "the mind does not work alone" (Pea, 1993, p. 47). From this perspective, individuals' knowledge and meaning-making were perceived to result from collaboration with others in their professional community, as represented by joint actions (such as teaching or professional learning discussions), shared artefacts or the use of common language.

Cultural artefacts and the tools and knowledge required for their sustained use are passed through the generations (Barab et al., 2004). For example, how teachers engage with and use digital technologies to enable their practice, can be represented in different ways. Individuals' understandings of the use of digital technologies are likely to limit, moderate or enable their engagement in an activity. Cultural boundaries (or discourse) in a school can also affect ways that teachers foster students' developing, new, or significant knowledge, and subsequently share that knowledge with others—such as student teachers. A secondary teacher's practice is socially embedded and likely to be reflective of explicitly stated rules, and the valued practices within a school community. The way that teachers' practices are therefore reflective of their sociocultural context—in this case an ILE. In newly conceived learning environments such as ILEs, teachers' engagement in new praxis is likely to be influenced by their prior knowledge and motivation to develop further understanding. However, there can also be conflicting individual or collective actions, and motives can counter shared goals within the community.

According to Engeström's (2001) model, elements of an activity system are goal-directed and consist of instruments, subjects, objects, rules, community, division of labour, and outcomes. These elements and their interactions are represented in Fig. 11.1.
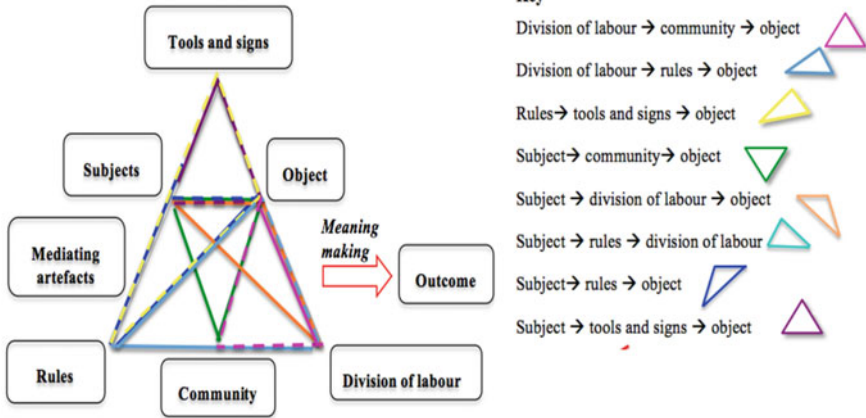
Fig. 11.1 A sub-activity system

The elements and their application in Reinsfield's (2018a, b) research are outlined in Table 11.1, as the mediators for an activity system, which can be used to understand human activity from a holistic perspective (Kuutii, 1991).

An activity system highlights multiple perspectives, customs, and motivators (Engeström, 2001). The element of division of labour, for example, acknowledges that participants will have experiences that mediate their professional responses.

Activity systems can aid the acknowledgement of rules and conventions, as determined by the discourse in a school. The notion of "contradictions" is a key principle in activity theory and can identify tensions in a phenomenon, and as a means to develop understanding, facilitate change, or to motivate new learning (Kuutii, 1991). Contradictions can occur as the result of socio-historical circumstances within or across activity systems and at different stages of an activity (Engeström & Sannino,

Table 11.1 Activity theory as an interpretive framework

Activity system element	Explanation
Tools and signs	The theoretical ideas and resources available for teachers' developing understanding of new praxis
Mediating artefacts	The conceptual and physical resources that represent teachers' learning processes
Subjects	Secondary school teachers in an ILE
Objects	Teachers' perceptions and engagement with the curriculum
Rules	The discourse determining the sociocultural environment
Community	Secondary school teachers, school community and the influence of political agenda
Division of labour	Teachers' roles in the department, use of pedagogies
Outcomes	Representations of teachers' pedagogical understandings

2011, Kuutii, 1991), or in Technology Education as a consequence of socio-economic constructs that attribute value-like tensions in students' conceptual or practical skill development within a curriculum (Engeström, 1987; Reinsfield, 2018a). Identifying contradictions can recognise existing challenges to practice and support conceptual change (Roth, 2013; Singer & Voica, 2008). According to Vygotsky (1978), human learning is an "outside-in" process described as internalisation and externalisation, where knowledge can be transformed from a social context to an inner psychological conception. Key here is an interest in "how interpersonal activity, including tools/and or language, became transformed into intrapersonal, mediated thought", or how teachers' thinking impacts their practice. The next section considers the factors influencing teachers' meaning-making practices when engaging with the official curriculum.

Findings

Reinsfield's (2018a) findings indicated that there are persistent tensions that continue to influence secondary teachers' pedagogical practice. How these tensions are navigated can depend on the nature of the school that they teach in. Of particular interest was a newly established ILE school where staff had already been involved in professional learning that focused explicitly on teaching in larger, more open classroom spaces than they would have been used to. I observed a range of professional discussions, which reviewed past professional experiences and what staff needed to think about and plan for in the new learning spaces. All teachers were expected to use digital technologies to enable students' learning. The factors highlighted as enabling or limiting teachers' practice included community expectations for learning, wider organisational issues, and the nature of the integrated curriculum.

In this school, teachers were regarded as both generalists and curriculum specialists and worked as part of a team to deliver an integrated curriculum to students in Years 7 to 10. Research observations equated to learning where two curriculum areas (e.g., Technology Education and Mathematics) were combined into modules connected via a common topic or project. Participant teachers indicated that when working with other teachers, much of their planning time was spent establishing the role of their learning area in delivering the integrated curriculum. Teachers supported colleagues' understandings of the curriculum practices needed to support teaching as it is conceptualised in the *New Zealand Curriculum* (Ministry of Education (MoE), 2007, 2017). This finding has implications for ITE programmes, where secondary teachers' learning about the curriculum has traditionally been siloed into specialist areas.

Participant technology teachers' use of digital technologies highlighted both their perceptions and ways that they designed learning. For example, there was a school-wide expectation that all students used their devices (in the place of books), and used equipment like 3D printers when students were learning about the technological area of designing and developing material outcomes. One participant signalled some

professional tension that resulted from teaching in a school where computer-aided design and manufacturing equipment (CAD/CAM) was readily available and could produce an outcome overnight, and without human intervention. She explained that it was still important for students to be encouraged to develop manual skills and rationalised her concerns, stating that the senior high school was

> … Getting some quite technical equipment, he's getting a big laser cutter and CNC machine... so we'll go down there as well and it'll be great for big projects. You might spend two terms designing something on a CAD package and then he'll press a button, go home and it'll be made in the morning and that's an okay thing but it's good to have some hand skills. (Final Interview E, Line 421)

This teacher positioned technology education as a subject underpinned by innovation and/or sustainable practices and described a tension between a future-focused conception of a subject that could make a difference to society, versus a traditional perspective, which valued an emphasis on quality outcomes to be sent home to parents.

Two of the participants felt that they were required to moderate the pedagogical risks that they were taking because of their community's expectations about the learning that *should* occur when students were studying technology education. One asserted there were continuing tensions for teachers because

> The unsustainability of the secondary model perpetuates the content cramming philosophy. The process-orientated [approach] is really good and technology teachers are really good at teaching procedural knowledge. There have been a couple of readings lately that suggest that procedural knowledge doesn't actually help the students… It's actually the social knowledge and the conceptual knowledge that changes the way that they think about the world. So that's our challenge really. (Baseline Interview E, Line 147)

All of the participant teachers acknowledged the need for them to continue to learn professionally. For example, one teacher described the range of strategies he used to remain current in his practice, stating

> I talk to others, Technology Online is my friend, I read papers, I just draw upon all of the stuff that I've learnt in the past too and always reflect and think about my practice and how I can do better. I learn from students, if things are working or not working. I don't ever do the same unit or the same project again. (Baseline Interview F, Line 187)

All teachers suggested a need to empower learners and be responsive to their needs, thereby changing the power dynamics between themselves and their students. One teacher stated that

> Our focus [is] on sustainability, enterprise and empowerment… We've [also] got the other [focus] which is innovate, design and make but really we've got to explore how those two fit together… We really want to empower our students and make them understand that they have a voice in the technological process and that technology is not done *to* them or doesn't need to be done *to* them [Emphasis added]

> ...We want our students to be able to solve problems and make stuff to solve those problems that makes a difference to them, to the community, to the world, and present that to an authentic audience. (Baseline Interview E, Line 187)

This teacher's classroom environment consisted of a large open space, shared with two other teachers who were working with their own groups of students. It was at times difficult for the students to hear over the noise from the other groups. The learning context was entitled a "Formula One" project and focused on the collaborative production of a car. This lesson began with teacher-led discussion about the planning processes required for the production of their Formula One car. The students then transitioned to an activity where they were required to conduct online research about electric motors. The lesson is represented as the activity system in Fig. 11.2.

This teacher's lesson was strongly influenced by the subject-rule and subject-community objectives. She emphasised her rules and described her classroom expectations by emphasising the need for students to get out their equipment (e.g., laptops). The lesson content focused on the making of a predetermined practical outcome—namely a car that would be collaboratively produced by the students. In the final phase of the observed lesson, the teacher changed the nature of the learning by directing students to do some independent research. She limited them to research about electric motors and provided the hyperlink to a website, stating

> Okay, you've got ten minutes and I'm going to get you to report back, and find out what you can about electric motors… Types of electric motors, fastest electric motors are good, any electric motors, okay? It could be the electric motor that's in your computer... (Lesson Observation E, line 65)

During her final interview however, the teacher reflected upon this lesson and indicated that she had cancelled that project. She explained

> I thought, it's not working and this school is about being flexible, we don't have to struggle to the end of the year, so I sat down and had a bit of a counselling session with the students and I asked "What's going well, what's not going well, how many of you guys want to continue?" They didn't really care and I said, "Oh well, next semester, you choose something else".
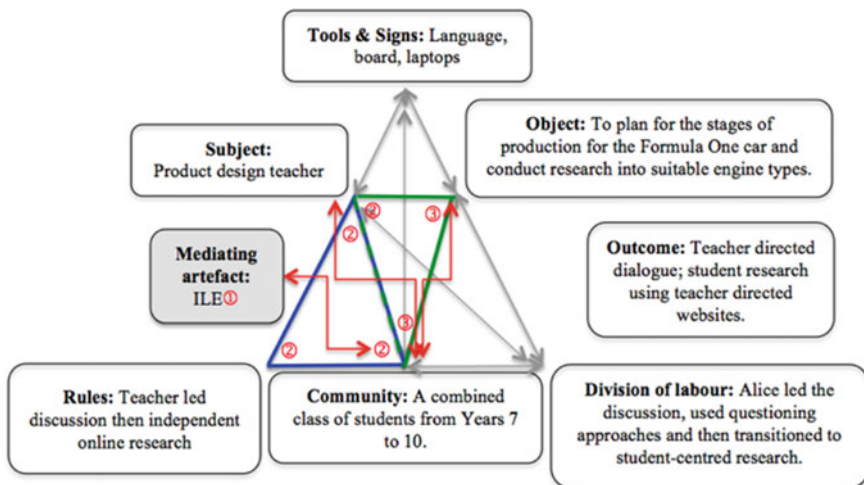

Fig. 11.2 Activity system representing the lesson observation

…[Next term] I just did a making class and we just did some more basic stuff, it was a different group of kids and we did some 3D printing and we did some laser cutting and we did some basic wood materials and it was pretty much saying this is what we'll make and this is how we'll make it and there was flexibility, I mean after, they made something on the 3D printer they could make whatever they like.

It's a culture thing and it's [about] building capability. We've had some students make some good little projects but it's the exception rather than the rule. (Final Interview E, Line 5)

The same teacher also described a project that she felt had been more successful. She indicated

I did a Maths [and] Technology module and we did a whole load of small things. We did a puzzle that's got pins on and three circles and you've got to get them to the other side. It was a great project and we got the kids to work out the minimum number of moves and how many moves would be required if you had one more disc and then they worked out the formula for it, so it was fantastic. (Final interview E, Line 389)

She reflected upon the lesson observation, stating

I just had so much on my mind at that point, trying to set up the workshop and having kids here and it just shows you that you can't multitask like that and you're not doing the best job that you can and you've got to really focus on the kids in front of you. (Final Interview E, Line 94)

She also reflected that if ideas for learning are

Student generated, then they work and maybe that was the problem, I was saying, "We're making this car"… (Final Interview E, Line 227)

Whilst this teacher had established a reputation in the technology community for her work in the subject, her transition to a newly established school context had caused some professional tension. Her espoused perceptions advocated for learning that was flexible, and learner-centred but the reality of managing this approach alongside her other professional responsibilities was affecting her practice. Such contradictions highlighted opposing views and actions, which identified tensions in practice and provided insight about the potential for future change.

Interestingly, there were consistent tensions between the teachers' perceptions of the nature of technology and the need for them to interpret and adhere to a curriculum (MoE, 2007) that was not well understood. The objects used to support teachers during school-based professional learning focused on best practice, made assumptions about teachers' understandings, or did not directly connect to the enactment of the curriculum—in a deliberate manner. The rules imposed, such as the curriculum structures and community expectations, directly affected teachers' practice.

The influence of the subject-community-objective elements was evident during the department meetings. Specifically, these relationships were noticeable when teachers discussed the challenges they experienced when ensuring that the "essence" of technology education was maintained within an integrated curriculum in the newly established environment. The tensions, which support recommendations for change (Engeström, 1987) included the:

– propensity for teachers to make decisions about the nature of learning, without consulting students
– the differing levels of teacher engagement and interpretation of the curriculum (MoE, 2007), and
– the need for teachers to navigate disparity (as a tension or contradiction) between curriculum theory and practice.

There was evidence of a disparity between teachers' espoused perceptions and practice, and there were differing ways of thinking and attitudes towards their own practice, as the result of teachers' previous professional experiences. Teachers' capacity to make meaning of the curriculum (MoE, 2007) determined whether they felt empowered to take pedagogical risks, replicate, or retreat to previously established practice. It was apparent that curriculum structures were impacting on students' experiences of technology education.

Discussion

Government policy encourages teachers in Aotearoa New Zealand to be legitimate curriculum decision-makers (MoE, 2007). The tensions that exist between policy (in this case the curriculum) and practice (teaching and learning in schools) are socially organised and mediated by teachers' perceptions of the curriculum and their understanding of professional praxis. Participants' understanding of the curriculum was closely aligned to their past experiences as specialist teachers of technology. This finding is pertinent in light of the recent changes to the technology curriculum, where the role of digital technologies has been emphasised as a means to enhance learning. While developing students' digital capabilities is to occur primarily through the technology learning area, it is also expected to be embedded across the curriculum to (MoE, 2017). Such curriculum modelling was observed in Wright's research (2018), and addresses ideas Kiernan (2018) summarised. Kiernan predicted that the way that digital technologies are developing, 85% of the jobs that will exist by 2030, have yet to be invented. It is crucial that schools take heed of such trends to facilitate learning that positions students to cope in the future workplace.

Uncertainty about the future is likely to lead to opposing forces in meaning and meaning-making about what and how teachers should teach. Subsequent decision-making might unite or destabilise teachers' evolving understandings, which in turn can lead to a consolidation of thought or alternatively, a resistance to the dominant discourse in their school context (Mortimer & Scott, 2003). The need to foster staff culture and develop a shared vision was a pervasive idea within this research.

Staff Culture and Community Involvement

My research identified the importance of teachers working collaboratively, enacting an integrated curriculum, and being adaptive practitioners. Teachers in the new ILE were required to assess students' conceptual and real-world understandings in new ways and provide learning opportunities that facilitated deeper learning (Allen et al., 2016). In such contexts, teachers needed sound pedagogical knowledge and a commitment to constructivist approaches (Goodwin & Webb, 2014; Saxton et al., 2014). The kinds of things the ILE intended to foster were constructivist approaches to learning that valued collaboration, individual autonomy, active engagement, personal relevance and pluralism. The school leaders understood that such approaches acknowledge students' interests, allows them to make sense of their learning, and gives them spaces to actively create their own knowledge (Archambault, 1974; Cook-Sather, 2002; Duckworth, 1996; Lebow, 1993). Learning may take the form of problem-based learning (PBL), inquiry learning, and experiential learning and lead to an environment where there is less intrusive teacher guidance (Barrows & Tamblyn, 1980; Berwald, 1987; Boud et al., 2013; Kirschner et al., 2006; Kolb & Fry, 1975; Lombardi, 2007; Papert, 1980; Peacock, 1997; Snape & Fox-Turnbull, 2013). Ways to foster such an environment are discussed in the next section.

Establishing an Innovative Environment for Learning

Participant teachers in the ILE had the unique opportunity to foster a learning environment that could be construed as constructivist, innovative and future-focused in nature. Such approaches can translate to learning spaces where students' points of view are sought and valued, assumptions can be challenged, and personal meaning developed by working in ways that focus on a bigger picture for learning (Brooks & Brooks, 1993). Reinsfield's (2018a) research identified that whilst teachers' rhetoric might align with policy intent (such as the *New Zealand Curriculum* or learner-centred pedagogies), there can be organisational factors impeding curriculum implementation. This was surprising, as it was anticipated that in a newly established ILE, the school structures would be more responsive to the types of adaptive practice than a more traditional school might not be able to accommodate.

The recent review of the technology learning area in the *New Zealand Curriculum* provides an opportunity to conceive pedagogy differently and re-position students' learning so that it can be inclusive of creative, innovative, and critical thinking approaches, in a more purposeful and self-regulating manner. It is time for secondary schooling to be viewed not only as a means of preparing students for the *known* future workforce, but also for the *unknown* roles that might require different ways of thinking (Reinsfield & Williams, 2018). According to Reinsfield and Williams (2018) a technological way of thinking emphasises problem-based and critical thinking and can encourage students to focus on new or emerging societal issues that have personal meaning. The continued emergence of and engagement with new technologies means

that teachers have a unique position in which to explore unique teaching approaches, should they choose to think in a technological rather than technical way. A *technical* way of thinking when using digital tools might solely value a pre-determined and sequential approach to a task, focused on skills in its use, as determined by the teacher. A *technological* way of thinking implies criticality and creativity, and manifests iterative or responsive approaches to learning, which are meaningful, and determined by the learner (Reinsfield, 2018a).

From 2020, Aotearoa New Zealand schools are required to provide opportunities for students to engage with a range of digital technologies, to enable learning and develop capability for the future. To enable such a focus however, teachers and student teachers need to be exposed to, embracing of, and become habitual users of digital technologies, as modelled in their pedagogical practice. There was evidence to suggest that establishing a new environment requires wider understanding of how teachers' practice might be limited, moderated, or enabled by their previous professional experiences (MacGregor, 2017; Reinsfield, 2018a), to foster a climate that can exploit students' potential for learning—identifying the need for organisational structures to ensure that teachers can be supported as adaptive professionals who take risks and reflect upon their practice in meaningful ways.

The purpose of identifying contradictions and commonalities is to determine some of the historically accumulated tensions in (technology) education, with a view to propose strategies that can assist teachers to navigate these tensions and transform their practice (Engeström, 2001). By comparing networks of interacting activity systems, tensions were identified to represent the differing interpretations of the teachers' understandings for practice (Gee & Green, 1998). The factors in each school represented common themes despite the fact that the ILE was newly established and staff had experienced professional learning to develop their understanding of future-focused pedagogies. These commonalities included teachers' identities and the challenges they faced when making meaning of the curriculum concepts for their own specialist area. The school's community expectations were used to rationalise a technical approach to their subject, and there was some hesitation to engage with some of the aspects of the curriculum that were perceived to be more challenging (MoE, 2007). This suggests that these views communicate legitimate concerns about how the curriculum continues to be interpreted and enacted (Meyer & Land, 2003).

The Future for Learning

Future-focused approaches have the potential to engage students in authentic learning, which can make a difference to their school and local community and foster understanding about the way that technology interacts with the wider society. Such approaches can develop students' understanding of societal or global issues. However, the reported findings suggest that for the participants involved, there were enduring and outdated understandings about their learning area—in their school community. In turn, such views influenced their practice. There were particular

implications for motivated teachers because collegial, parental and students' under-standings had to be navigated with a view to designing learning in their subject to address how it is conceptualised in the curriculum (MoE, 2007).

It could be assumed that when teachers are appointed for their expertise and philo-sophical attitudes towards contemporary pedagogies, that they would feel confident to interpret and enact the curriculum. There is a continuing need to consolidate teachers' understanding of the technology curriculum, and its association with the use of digital technologies within an integrated curriculum. There is however, a risk that teachers' practices might further entrench or continue to perpetuate outdated understandings about the nature of teaching in a secondary context. The next section provides some recommendations regarding the influence of such issues on Initial Teacher Education.

Recommendations for ITE Programme Design

In Aotearoa New Zealand, the Teaching Council, the regulatory body for education, has recently released new regulations for Initial Teacher Education programmes (Teaching Council New Zealand, 2019) requiring providers to prepare students to be future-focused and adaptive practitioners. There are challenges however, when student teachers need to be prepared for practice which is not well understood (Reins-field, 2019b). Initial Teacher Education providers can, like some schooling contexts, be constrained by customary practice or practitioners' differing levels of engage-ment with new praxis. The findings from this research suggest an urgent need for ITE programmes to review and deliberately plan to:

- embed generic pedagogical approaches, such as e-learning, to model and extrapo-late the pertinence of such practices in contextually specific ways (e.g., for Primary teachers)
- support ITE lecturers to think in technical, technological, and deliberate ways to enable connections between theory and practice
- support student teachers towards becoming adaptive professionals, who critique their own and others' practice, and advocate for constructivist and learner-centred pedagogies
- expose and provide opportunities for student teachers to collaboratively plan across curriculum areas to develop their understanding of the evolving nature of professional practice in both ILE and traditional schooling sectors, and to exploit the potential that a future-focused approach to learning can provide.

Conclusions

The ever-evolving nature of education means that there is an ongoing need for practitioners to reflect on, and critique their own and others' pedagogical practice.

The emergence of ILEs has accelerated this process in Aotearoa New Zealand and imply necessary changes to existing and student teachers' professional practice. The research upon which this chapter is based indicates an urgent need for student teachers to be exposed to research-informed and future-focused practices, so that they are well-positioned to make deliberate choices about the types of learning that will support students in a technologically mediated future. To facilitate such change, however, ITE educators will be required to engage with and develop both their technical and technological ways of thinking, to ensure their student teachers' success in the profession.

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Chapter 12
'Jump in off the Deep End': Learning to Teach in Innovative Learning Environments on Practicum

Check for updates

Emily Nelson and Leigh Johnson

Abstract   The advent of innovative learning environments (ILEs) raises challenges for initial teacher education, but as yet, such challenges have been under-addressed within policy and research. As ILEs become more common, preservice teachers (PSTs) find themselves in practicum placements in these environments. However, as change in schools is occurring more rapidly in schools, initial teacher education (ITE) programmes can struggle to respond to these emergent developments within a policy and guidance vacuum. We work as teacher educators within a small regional primary initial teacher education (ITE) programme. Grappling with potential implications of ILEs for our ITE programme, we noticed our PSTs were already negotiating such spaces on practicum. We therefore undertook research to learn more about how these PSTs managed to adapt to ILEs during their professional experience, despite the more conventional image of learning and teaching underpinning their teacher education programme at the time. We hoped to both understand how the ILE practicum worked from their vantage point, and how we might adapt our programme to more explicitly support PSTs since ILEs are emerging as enduring features of their professional practice landscape. We therefore conducted focus group interviews with a small number of our final year primary PSTs to explore their experiences of learning to teach in an ILE. We identified a number of potent forces, components and relations—or affects—that influence PSTs' capacity to act as teachers in the social assemblage of the ILE practicum. 'Learner agency' emerged as a particularly influential force. While we concur that learner agency is foundational to engaged learning at school, we noticed that the notion of learner agency also constrained PSTs teaching on practicum in ways that disrupted how we thought about the ILE practicum. Our analysis suggests that learner agency, a foundational material, pedagogical and relational force of ILEs, has implications for ITE curriculum, pedagogies and practices.

Keywords Practicum · ILE · Initial teacher education · New Zealand

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Introduction

Increasingly, preservice teachers (PSTs) enrolled in our small regional initial teacher education (ITE) programme were undertaking their practicum placements in innovative learning environments (ILEs). Broadly, ILEs couple multiple teachers to larger groupings of children than a traditional classroom arrangement might have. The larger learning spaces are more open and flexible to re-configuration than traditional classrooms. As part of these spatial design features, a robust digital technological infrastructure supports learning and teaching in ILEs. These newer learning environments are underpinned by a particular view of learning promoted by the OECD (Dumont et al., 2010). And, while ILEs remain a minority, they are an increasing configuration for learning and teaching across Aotearoa New Zealand's education sectors (Carvalho et al., 2020).

ILEs, as an increasingly prevalent type of school in our geographical area, meant we needed to rethink not only our practicum structure, but also our ITE curriculum and the pedagogies we promote within the preparation programme. We moved from an assumption that good teaching and learning is good teaching and learning whatever the context, to an observation that ILEs were qualitatively different, requiring different competencies and skills of our PSTs. A key ILE feature, especially the retro-fit environments of our geographical area, is their bespoke design.

Our initial research focused on the experiences of PSTs who were, for the most part, successful on practicum in these spaces. This was our starting point for our learning around how to position our programme to respond to these emerging sector-wide changes (Nelson & Johnson, 2017). We identified key anchoring practices that PSTs draw on to adapt to teaching in an ILE and the generativity of conceptualising ITE and practicum as entangled, producing harmonics or practices that bridge the traditional theory–practice gap of tertiary learning versus school-based learning (Nelson & Johnson, 2021). However, a paucity of research into the implications of ILEs for initial teacher education remains. This is particularly perplexing given that teacher preparation for these spaces is highlighted as essential (Benade, 2017; Deed et al., 2014; Kedian & West-Burnham, 2017).

Current Landscape: ILE Research and Initial Teacher Education (ITE)

A considerable research base explores support needs for teachers' transition from traditional classrooms to ILEs (Alterator & Deed, 2013; Byers et al., 2014; Imms et al., 2016) and even supporting beginning teachers within these spaces (Whyte, 2017). Bradbeer (2016) highlights the importance of teachers' focusing on working together in the spaces between. This view recognises a gap between espousing and actualising the kinds of teacher collaboration endemic to ILE pedagogical practices. However, research into the implications of ILEs for preservice teacher education,

although signalled as vital (Kedian & West-Burnham, 2017), is in its infancy. Some tertiary institutions offer courses in these spaces and some have investigated adapting their tertiary environments to align with the flexible and polycentric nature of ILEs (see, for example, Benade & Lewis, 2016), but a broader articulation of the implications of ILEs for ITE is largely absent within education policy and ILE scholarship, particularly in Aotearoa New Zealand.

We argue it is imperative to take stock of what preparing PSTs for these environments might mean, both, pragmatically, and theoretically. What are the anchors that will assist PSTs to critically engage with ILEs during practicum and in their teaching career?

We focus our research on the ILE practicum. While there is an extensive research base on practicum and supporting PSTs to convert their practical experiences into professional learning, the field has yet to fully address the same concepts in ILE practicum contexts. Blackmore et al. (2011), however, identify the need for PSTs to experience ILEs in their preservice education and point out that they need the support of scaffolds to distil the learning from these experiences. Deed et al. (2014) note the importance of bridging the theory–practice gap and positioning ITE programmes to respond to the kinds of changes in education provision that ILEs might bring. Even experienced teachers struggle with transitioning to ILEs. We noticed in our research that our participating PSTs described their experience in ILEs as immersive and embodied. Such experiences are not easily distilled. Their embodied descriptions intrigued us so we looked to the theoretical literature to engage with this emergent 'flavour'.

In this chapter, we focus on the embodied affective experience of teaching within ILE practicums as a social assemblage where discursive and material forces, or affects, have an impact on PSTs' capacity to act as teachers. We explore these affects identified through focus group interviews and consider what these mean for ITE.

Exploring the Forces at Work in an ILE Practicum Through New Materialism

We use new materialism (Coole & Frost, 2010) to theorise our work in this ILE practicum space. Three ideas in particular are important to us:

(1) that the materiality of space matters;
(2) that both human (such as teachers) and non-human entities (such as desks) exert agency; and
(3) no hierarchy exists between human and non-human; one does not hold dominion over the other.

In the context of this research, these ideas mean that the material aspects of the ILE space influence the PSTs' experience of that space; that the non-human aspects (such as tables, rituals and how the ILE is organised) exert agency in the same way that the human players do. This means the human is not acting against the inert backdrop

of a classroom or ILE but within the mix, or the assemblage, of the ILE. These are challenging ideas and require a certain amount of 'squinting' to keep in mind because they are so different to thinking of humans as actors and the environment as the thing acted upon. However, we find these ideas really useful in assisting us to get a sense of how the non-human material elements influence PSTs' experience of the ILE practicum.

Wright (Chap. 1 of this book) calls attention to the materiality of classrooms and by extension learning and teaching, embodied within furniture and spatial design and how these affect teachers and students. An additional idea that underpins new materialism and our theorising is that matter is in a continual state of becoming,

> [with] objects forming and emerging within relational fields, bodies composing their natural environment in ways that are corporeally meaningful for them, and subjectivities being constituted as open series of capacities or potencies that emerge hazardously and ambiguously within a multitude of organic and social processes (Coole & Frost, 2010, p. 10).

A destination and a final state is always deferred. This idea resonated with our findings. Our participants were telling us that the ILE practicum was like jumping in the deep end of a swimming pool; once they had jumped, they needed to keep swimming in the immersive waters. One participant described this embodied and continual state of becoming as 'managing transitions, volume, distractions, placement, learner agency, whether children are able to work independently or whether they need to be sort of near you, especially in that space where they could get lost, maybe' (PST6).

Using new materialism as we do, is a political act. It attends to how the mundane spatial aspects of learning environments influence the shaping of the ILE practicum and how these are echoes of the 'global economic structures and technologies' (Coole & Frost, 2010, p. 3) that have given rise to ILEs. This is particularly important for us because practicum is a high-stakes assessment event for PSTs, and ILEs are advocated as the way of the future; an alignment of schooling with twenty-first century competencies and work (OECD, 2017).

A key concept from new materialism in this chapter is 'affect' because it helps us unpick the embodied experience of teaching in an ILE that our participants describe. In the psychological domain, affect is synonymous with emotion. However, in the new materialism domain, affects are forces of encounter that can, but do not always, produce emotions. As Charteris et al. (2017) contend 'rather than internalised emotion, affect is openness to movement and flow through encounters' (p. 812). The notion of encounter is important and links to experience of ILEs as embodied and immersive. Affect can be propelled through 'force encounters' (Seigworth & Gregg, 2010) between human and non-human entities in a social assemblage. For example, the potential that emerges from an encounter between a preservice teacher, a group of students, a workshop and a breakout room within an ILE. Attending to 'embodied affective engagements' represents a pressing need for education research (Mulcahy, 2012; Strom & Mills, 2020) and, we would argue, analysing PSTs' experiences of learning to teach in ILE practicums.

The Study

Six of 18 final year PSTs within our ITE programme volunteered as participants in a focus group to share their experiences of teaching within an ILE practicum. The small number of participants reflects the boutique nature of our regional programme. The six participants had, between them, already undertaken ten different ILE practicum experiences during their teaching qualification. The majority of practicum experiences occurring in ILEs were in years 2 and 3 of a three-year programme. The participant PST group comprised five females and one male. Their ages ranged from 21 to 33. Four identified as New Zealand European, while two identified as Māori.

Given the breadth of their ILE experiences, the research represented an opportunity to explore how PSTs developed an increased familiarity with ILEs beyond our initial study conducted in 2016 (Nelson & Johnson, 2017). Interview questions for the focus groups sought to understand the characteristics and operation of participants' practicum ILEs spatial design features and how these influenced teaching and learning possibilities. We also wanted to know participants' experiences of planning for learning and teaching, integrating digital technologies, classroom management practices, support and guidance practices and learner agency practices, particularly when compared with conventional classroom-based practicum experiences.

We adopted a view of research as 'assemblage' (Mulcahy, 2012), a new coming together of humans, objects, spaces and places, thoughts and expectations, in states of being made and unmade (Jackson & Mazzei, 2012). According to Feely 'analysing how a problematic social assemblage works in the present can also allow us to think about ways to alter the assemblage and to make it work differently' (Feely, 2019, p. 17).

We viewed the combined ILE experiences of our participants as a single 'ILE practicum assemblage' for the purposes of our analysis, using Feely's 'assemblage analysis' approach to extract themes and emergent ideas. The assemblage analysis involved identifying affects—components, forces and relations—at work in the assemblage, mapping flows or connections between these components and exploring reterritorialising and deterritorialising processes at work in the assemblage. Reterritorialising forces are those that 'stabilise and maintain order within an assemblage' (Feely, 2019, p. 12), while deterritorialising forces are 'subversive processes' that 'allow for change, creativity and novelty' (p. 12). We were looking to see how the ILE practicum as a relatively new phenomenon, was regulated and at what points it destabilised more traditional practices of practicum, such as full management.

Findings: The ILE Practicum Assemblage

In this section, we provide an overview of the material and discursive forces of encounter identified through data analysis. These forces of encounter were identified by participants as influencing their experience of teaching in an ILE practicum.
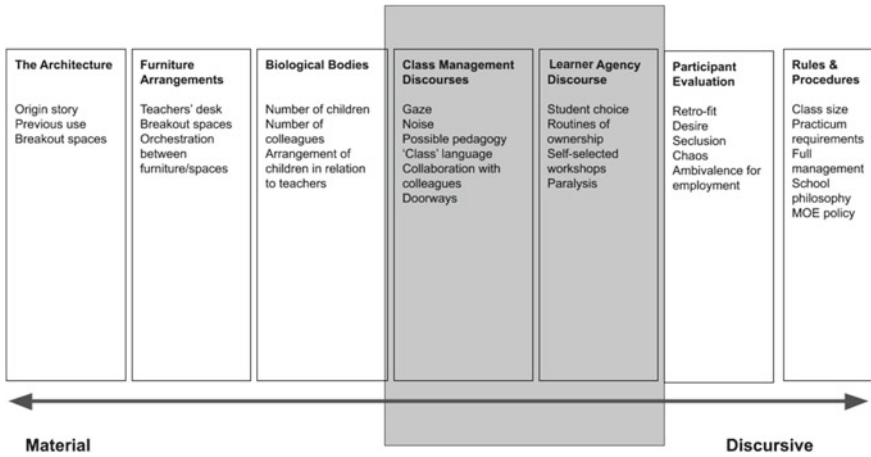
Fig. 12.1 Material to discursive forces operating in the ILE assemblage

Figure 12.1 lays these forces out along a material to discursive continuum. The continuum includes forces related to the ILE (architecture and furniture) through to rules and procedures of the ITE provider (practicum requirements) that shaped PSTs' bodily capacity to act as teachers in certain ways in the ILE practicum.

Figure 12.1 positions 'Class management' and 'learner agency' adjacent to each other as discursive forces (within a shaded box for the purposes of this chapter). In operation, the two discourses set up competing relations between PSTs and primary school students. Class management discourse promoted teacher-centric surveillance expectations, commonly known as 'gaze' (Foucault, 1977). Gaze included participants being able to see all students at once, and manage noise and transitions within the ILE. Learner agency set up expectations that PSTs would teach in response to students' 'choice and voice'. The problematic interaction of 'gaze' and learner agency will be expanded on in the following sections. Teacher-centric practices associated with conventional classrooms and ITE programmes, operate in tension currently with the ILE philosophy that prioritises learner agency. PSTs have to be able to pivot operationally between teacher-centric practices and enacting learner agency in an ILE.

Learner Agency as a Potent Discursive Force

Participants described the high importance of learner agency in the ILE.

> It's massive, it's huge. Hugely important to encourage, promote faster … Just them getting on and knowing what they need to do. Like, in my class they had like a weekly timetable that they would go and they would fill it in individually for them, so they could write down what workshops they're going to go to and what they need to have completed by Friday.

> They were starting to get into that routine of ownership and knowing when due dates are. I thought that ran really well. (PST6)

Here, learner agency is viewed as part of a 'routine of ownership' which focused mainly on establishing and reinforcing practices of senior primary students working independently within the hub. This independence was essential to enable the teachers and the other students to make choices and work in ways that they preferred within the material spaces of the hub. This material force was structured by timetabling and due dates. When asked what they did to support the development of learner agency, participants identified the importance of reinforcing the routine of ownership with their students:

> Giving them some degree of choice in what they complete first. You give them what needs to be completed and they pick what they're going to do first, or what they're going to focus on for that chunk of the day. And giving praise when things have been completed or have been worked on. (PST5)

Learner agency discourse influenced PSTs' capacity to act pedagogically. PSTs' selection of pedagogical approaches to engage with learners was made within the constraints of teaching that had to promote or honour learner agency.

> I think you have to allow more opportunities for student agency in an MLE so you've got to let go of some of the control and provide work where you don't have to be standing in front of them. So, it's not the traditional sit at your desk, teacher stands at the front and talks at you. It's 'we've got all of these things and now you've got a choice of what you're going to do and where'. I think that's a huge difference. (PST2)

However, the option to invoke their positional authority as a teacher was always present, and sometimes deployed by PSTs especially in relation to class management and managing student behaviour:

> I think when you're in control you get to know the kids and you know their learning styles and you know who they can work well with. I know you're trying to support learner agency and ownership of their own work but you have to sometimes step in and be like, "You don't work well with them, they distract you; you need to think about who you're going to work with next." Or sometimes create learning areas where certain kids can go. I know you don't really want to but sometimes… (PST4)

Even within this example though, a sense emerges of the preservice teacher apologising for intervening, as if this is acting against the notion of learner agency.

A student's capability to participate agentically in their own learning in an ILE is described as 'make or break':

> Some children will thrive on that student agency, getting choice … but there are those kids that get lost ...they need a little push … (PST3)

There appears to be an acceptance that ILEs will not suit all students and some will get lost. How can we engage with PSTs to be able to give this 'little push?' What are the professional skills, dispositions and ways of interacting that we could promote for PSTs in ILEs in our preservice curriculum?

Workshops

Workshops, in the context of ILEs, refer to flexible groupings of students meeting face-to-face with a teacher in a physical space within the ILE at a set or agreed time. Students can either opt in to a range of workshops offered, suggest the focus of a workshop and/or join a workshop convened by the teaching team.

Participants identified workshops as a widely used pedagogy within ILEs that they would like to see integrated more into their preservice curriculum.

> If you're going into an ILE at least you [should] know what a workshop runs like. (PST5)

The challenge of workshops as a pedagogical approach for PSTs is to respond flexibly to: student choices, student learning needs, in the moment teacher decision-making and the monitoring of student progress. This is a challenge for experienced teachers and as the above participant identified.

> Then the kids started to work better in that kind of space and they were able to introduce workshops, and so the planning was collaborative between the teachers, and the students could opt into the workshops which I thought was good. (PST5)

Such descriptions suggest that workshops operate differently from what we know as lessons. Four participants commented that the planning, management and implementation of student workshops was initially hard to get used to and they would have preferred guidance in this area prior to being placed in an ILE practicum school:

> I think it would be of benefit maybe to write down what a workshop looks like and how you could run them; especially in year one, before your first practicum. (PST5)

Workshops as a practice of ILEs have subsequently influenced our ITE programme focus too, where increasingly, teacher educators spend time teaching PSTs how to convene and implement workshops as a responsive pedagogy, usually within literacy and numeracy teaching.

Responding Pedagogically in the Moment

Related to workshops, but not exclusively, PSTs described how they needed to respond pedagogically 'in the moment' and 'bounce ideas with colleagues'. In such cases, conversations with learners and colleagues were more frequent and immediate, usually focused on student learning progress and PSTs' own practice decisions.

> Two minds are better than one. You bounce off each other and you've got someone there to prompt you to reflect in the moment. I know we have to reflect anyway, and we do, but it sort of gives you space to do it right then and there. (PST6)

The pedagogical practice in the ILE deterritorialised the ITE practicum requirements for PSTs to reflect on student learning and the impact of their teaching on student learning 'on the spot'.

> I think it was a lot more beneficial in terms of having that on the spot reflection time because you had that teacher there that saw the lesson and then you had the other teacher who would be like, Oh well I saw something different. (PST2)

These experiences resonate with Bradbeer's (2016) notion of in situ professional learning in ILEs, with reflection transformed from a daily and/or scheduled regular practice of the practicum to an in-action process with colleagues.

This in situ reflection and planning alters the power dynamic between the preservice teacher and the associate teacher. Traditionally, there is a novice/expert power relation between the preservice teacher and the mentor teacher. The preservice teacher rehearses their planning ideas with the mentor teacher before embarking on teaching. The dynamic shared in our research was of the PSTs acting as fully functioning members of the collaborative teaching team, making plans, sharing ideas and picking up responsibility alongside their colleagues:

> I kind of feel too like you're always constantly bouncing ideas off with the other teacher. Sometimes when you have a teachable moment it would just come through discussion and then the other teacher will just pop something out and then you pop something out and it just keeps going. (PST4)

'Popping something out' requires drawing on a solid canon of pedagogical possibilities and a sound understanding of relevant curriculum. This changes the planning, teaching and reflecting cycle of a conventional practicum where a preservice teacher could expect to go home, re-group and return with a plan the next day. 'Popping out' is immediate. A new slant on responsiveness emerges when teachers are expected to engage with learner agency in this way. Perhaps a sense of playfulness and lightness emerges through the notion of 'popping out' as an ILE pedagogical practice. However, the pace of decision-making is also more rapid (Alterator & Deed, 2013) and introduces a challenge for supporting PSTs in an ILE practicum.

Class Management: Gaze, Doorways and the Agency of Space

In Fig. 12.1, class management discourses are positioned next to learner agency discourses in the shaded box. Space exerts agency, and in this way, co-produces pedagogical possibilities. Many ILEs are 'under construction', both in philosophy and organisational approach. Teachers are encouraged to experiment with how the space will operate physically and pedagogically. This process is always evolving and often, PSTs report that they are involved in this evolution as part of their ILE practicum. As Wright (Chap. 1 of this book) suggests, where furniture and room design are not ideal, teachers and students are forced to interact in sub-optimal ways. In the ILEs, participants referred to, the position of doorways between spaces, as material affects, generated challenges for maintaining gaze (maintaining lines of sight with all students in order to maintain order within the learning environment)

and a sense of order in the ILE, even when responsibility for the environment was shared with colleagues that influenced how they could teach:

> [In my] second experience … a lot of the work was done in one classroom. They pretty much used the other room as just a breakout space. Everything was done in one class. They did everything, the transitions, and then once the kids had to go off and do independent work they could decide whether or not they wanted to work in that classroom or outside. And as a teacher … you had to go into the other classroom to get their attention to come back into the classroom. If they had one big classroom and maybe a few breakout spaces it would probably be a little bit easier to do that. You can see what the kids were up to instead of trying to stand in the doorway, have a look at both classrooms and go, 'Come on, come on'. (PST4)

A sense of the 'comptroller' emerges here with the material force of linked rooms and activity zones separated by doorways making management more complex and difficult. It is interesting to note that the participants valued the spaces that were advantageous for their own practice, such as breakout rooms:

> Especially in the class that I was in, there was that room that you would go in with the door; you could shut it and you could work in there with a small group. It was more secluded and more intimate I suppose. (PST5)

A sense of relief emerges through appealing to 'seclusion' and 'intimacy' when the preservice teacher can close a door and create a controllable space within the larger hub in which to focus their teaching.

Contrasting with the seclusion and intimacy breakout spaces offered, gaze was facilitated within spaces where PSTs could maintain oversight of students (and their colleagues) within the ILE as a whole:

> You were able to be more aware of what was going on in the other classroom when the wall was bowled down; you had a better overview of what was in the space. It was also loud; it was noisy. But, I think pros and cons and weighing it up, I think being able to see what's happening is helpful, for me personally. (PST6)

One participant contrasted the materiality of a retro-fitted and purpose-built ILE hub:

> Yeah, that's something that I would have desired; a space that was maybe purpose built, rather than all these old classrooms and we'll make it into this new space. It needed a bit more work to make it work. (PST6)

We are interested in the idea that retro-fit spaces needed 'more work to make them work', especially in that our PSTs are placed largely in retro-fitted ILEs in our geographical area. In our preservice work, we may need to provide research-informed foundations to support PSTs to interpret and respond to retro-fit spaces.

A focused discussion of the influences that spaces had on pedagogy and class management, revealed a keen sense of fit between form and function on the part of PSTs. It gives a sense of the influence the space exerted on the embodied experience of teaching:

> I think going back to the question you said the first time, about what was different to the other classroom, I think the amount of children and not having things like other classrooms; because there was so many children in there. There wasn't a bookshelf and there wasn't desks – if children wanted to work at a desk and put their things in their desk. Like, they all had their tote trays and sometimes it was quite chaotic; trying to manage them and make sure they got their book and their pencil, when they were all trying to get it out of the tote trays. (PST5)

The provided furniture created new class management challenges for participants orchestrating teaching and learning within the ILE, for it obstructed some potentially useful ways of undertaking learning.

> More kids. More bodies in the room, so more things to manage. Yeah, I don't know how to say more than that really. Noise was a factor. Distractions. Social groupings. (PST6)

These are all aspects rehearsed in the ILE literature which review how to support teachers to transition from conventional classrooms to ILE teaching and learning spaces. A further question inquired: 'What did it require of you?'.

One participant linked the spatial design of the hub with a heightened sense of the importance of transitions and class management strategies to respond to larger groups of students.

> I think your management strategies have got to be pretty spot on. There's obviously roughly double the children in there sometimes, sometimes even triple if you're in a three, whatever. I think it's really important to encourage students to be self-driven in those environments. (PST1)

Class management strategies in an ILE include being able to prepare students to be self-driven. To encourage learner agency, PSTs need to understand what learner agency looks like and how to support it in practice. Class management strategies at times seem to rub in awkward friction (Benade, 2017) with participants promoting learner agency. However, data suggest that class management is put to work to facilitate and bring out the potential of learner agency.

Positioning PSTs Agentically as Teachers in ILEs

We wanted to unpick how learner agency influenced the positioning of the PST in an ILE in relation to their colleagues. This has been explored earlier in the chapter in relation to responding pedagogically with colleagues to students' emergent learning needs. In this section, we focus particularly on PSTs' positioning as a colleague within the collaborative organisation of an ILE.

Participants identified that being positioned within a collaborative group of teachers assisted their own agentic participation in the ILE as PSTs. They noted favourably the value of feedback from multiple colleagues, the generative potential of bouncing ideas off multiple colleagues and conversations about next steps being more immediate. This support is more embodied from the outset, occurring whilst teaching or in the interstices of teaching.

> I think it was a lot more beneficial in terms of having that on the spot reflection time because you had that teacher there that saw that lesson and then you had the other teacher who could be like, Oh, well I saw something different. (PST2)

> I kind of feel too like you're always constantly bouncing ideas off with the other teacher. (PST4)

The practice of 'bouncing ideas off' with colleagues again conveys the relational character of collaborative practice as generative and playful. One participant described how this support could also occur at the end of a school day and lessen the tiredness of teaching:

> I think with the ILE you feel like you have two mentor teachers sometimes, which is really cool. You've got two brains to pick from and at the end of the day when you're all three of you sitting there and chatting it's nice to hear both sides and all that. It's just the extra support. It's almost less tiring at the end of the day because you've had support throughout the day. (PST3)

Collegiality as a social force encounter eased the physical tiredness PSTs experienced as part of their practicum teaching. ILEs invoke less formalised feedback to PSTs, and more ongoing collaborative support. This feedback takes the form of daily conversational, reflective and informal collegial interaction.

The participants conveyed the sense of embodied knowing that emerges from creating their own knowledge through experience. They did not believe that this could be adequately prepared for in advance. When asked how the ITE programme could help prepare PSTs for ILEs, participants responded that they needed to, 'Jump in off the deep end' and that the 'the process of finding your way, … is almost more important than the… [destination]' (PST5).

Understanding Learner Agency

It is not only the PSTs' agentic participation in an ILE that comes into play as a force in their practicum experience, but also their own understanding of the idea of learner agency and how it is implemented within an ILE. Participants linked 'learner agency' primarily with student 'choice'.

> For me it was about student choice. They had the option of, for example, which workshop to attend, say, for maths, after a full class activity they would decide where their learning needs to be strengthened and then they'd go to that particular workshop. So, a little bit of choice and a little bit of ownership on them to actually choose the right one. "If I'm really good at that I'm not gonna go to that workshop even though it would be easy for me, kind of thing." Take some ownership and do something that you need to improve on. (PST1)

PSTs were told by associate teachers that learner agency had to be built and what learner agency would look like in the context of particular ILEs. As one participant advocated, 'Got to build that agency'. However, they are not always given guidance as to how the foundations for learner agency were established prior to their practicum.

When PSTs are placed into ILE for their practicum at the beginning of the year, there is considerable value to them. PSTs can see that developing learner agency is a process that takes place over time and must be deliberately and actively fostered:

> So it was the start of this year. So it meant that the class was still trying to get into those routines and expectations set. So, that did make it quite hard not to be able to take on workshops and see that work in the classroom. (PST5)

Workshops are not implemented typically at the beginning of the year until the organisation routines of learner agency are established and embedded in the ILE. A sense emerges here of needing to set up the ILE routines and expectations from the start of the year. This set up includes how key pedagogical innovations, such as workshops, would work and would be taken up by students within the hub. This set up discourse is familiar, dovetailing with the beginning of the year set up in a conventional classroom. The contextualised differences could form a preparatory message in the ITE curriculum for teaching in ILEs.

The Impossibility of Full Management

ILEs disrupt some of the traditions of practicum, particularly the practice of full management where PSTs take full teaching responsibility for the class for a designated period of time. Full management does not translate well to an ILE. ILEs 'deterritorialise' (Feely, 2019) full management in favour of a more relational and dynamic approach where PSTs engage in ongoing collaborative teaching as part of an overall team.

> I think in a single cell when you're in full control as well I always found my ATs would just leave because they want you to have control of the classroom. But something might happen during that time and they're not there. Whereas in an MLE you've always got somebody. They're not just gonna walk out and leave you in charge of 60 kids. (PST2)

The unit of work in an ILE is collective; full management is an individual challenge. PSTs repeatedly emphasised that they do not teach alone in an ILE, and would not be expected to take full responsibility for all students in a learning hub.

> I would never be in charge of 60 kids by myself. They never take 60 kids just by themselves for a full day so we're not going to do that. May take on more responsibility but never do everything ourselves. (PST1)

Taking on more responsibility in a collaborative team was experienced as supportive. The supportive aspect is that as the PST acts agentically, they do so knowing they have the support of their colleagues.

> Having the opportunity to step in and be the teacher, or the lead teacher anyway, is a great opportunity to try those things. But in doing that, you've always got their support there as well at the same time. (PST1)

The PSTs described full management as an expression of relational agency, being the lead teacher at times, where they collectively negotiated decisions and actions collaboratively with their colleagues alongside them.

> You play to each other's strengths as well and that's always handy. (PST3)

A sense of responsibility to hub colleagues also produced a sense of purpose. PSTs addressed their areas of weakness and focused their professional learning in order not to let their colleagues down.

> If something's your weakness you're learning from someone who has that strength, so you're constantly working on your professional development because you don't want to let down your team member. 'Okay, cool, what can I do to help you out so I'm not dragging?' (PST4).

Participants identified an emotional support component to the collaborative relationship at the heart of teaching in an ILE practicum:

> I think sometimes when you're having not the best day, we've all spent a little bit of time in the ILEs, and you know one teacher's down you've got that support. You don't have to go in and pretend for the entire day. You can just support each other when things aren't going really well and stuff like that. (PST3)

Participants also invoked the support of ILE colleagues to assist them to address 'disturbances'. Participants expressed a sense of relief that a colleague could keep the ILE focused while the preservice teacher resolved a disturbance involving students:

> I think too if there's something that's happening, like there's a disturbance, one teacher can actually go out and deal with it while the other teacher's still in control of the class for so many minutes until the teacher has dealt with a disturbance. If you're in a single cell you're like, um, I don't know what I'm doing, everyone's in class, the office is ten metres away, I can't... (PST4)

Teaching in concert with other colleagues, even when PSTs are to a certain extent demonstrating their competence, was viewed as a support:

> Having just that extra person, even though you've got more children [in the classroom space], it's not so bad to be able to deal with things that come up every now and then. (PST4)

It is interesting that participants' perceptions of competence is often linked to their ability to manage students' behaviour and classroom organisation. The participants paint a picture of competence in a conventional classroom as individual success and contrast it with competence in an ILE as the ability to fit in and work collaboratively within a team, taking on increasing responsibility as appropriate.

ITE Enfolded in the Assemblage

Given the potent influence of learner agency in the ILE practicum, how might ITE programmes prepare PSTs' content knowledge, confidence and capability to promote

learner agency in ILEs? There are three key points to addressing this question, that relate to: curriculum content knowledge; confidence; and learner agency. Each is addressed in turn.

Firstly, content knowledge for PSTs in ITE is typically developed over successive years of their teaching qualification. Their curriculum content knowledge within the first year is at a beginning understanding level and as such limits them in their ability to recognise whether students are deploying agency in ways that best promote their learning.

> I suppose that's a case of maybe gradually moving into that, but that's hard; that's hard sometimes, when there's children in the class that are ready to do their own thing. (PST6)

The lack of depth in content knowledge can impact on PSTs' ability to interact fully in the process of learning as a junior colleague within the ILE. If we recognise the fact that quality implementation of learner agency in any setting is underpinned by the students themselves having a solid understanding of learning progressions, it becomes vitally important for PSTs to have the curriculum knowledge and capability to conference with learners early on in their teaching degree in order to maximise the potential of learner agency in an ILE.

Participants commented that when engaging in feedback with students, they needed to be able to state, '*This is where you are. This is where you need to be*' *(PST2)*. The realities of dynamic grouping practices in the ILE mean that progressions of learning are paramount content knowledge, particularly in literacy and numeracy. These tend to be prioritised in the preservice curriculum. Primary students also need to know what quality looks like and then be able to assess themselves against curriculum progressions to support their agency.

Secondly, the idea of preparing PSTs' to be confident in an ILE practicum is very much interconnected with other forces in the social assemblage, including the ability to display teacher dispositions that put them on an equal, yet novice footing with their senior colleagues. One participant noted '*I think for teachers, you just need to be adaptable and flexible*' *(PST3)*. However, we see these as dispositions that need to be both scaffolded across time and grounded in the development of strong curriculum knowledge.

The third key idea for preparing PSTs is around the capability to promote learner agency within an ILE setting. Along with knowing what learner agency looks like and what it represents in terms of learning, it is necessary for PSTs to be able to engage with students in conversations that promote ownership of learning and responsibility for learning. Being able to ask questions that promote deeper thought about personal responsibility are essential. An example from our data suggests that those skills are not always present in PSTs.

As a PST, these are generic skills that can be learnt across all courses but need to be contextualised for ILE practicum experiences. How do you have conversations when you are 'on the move' or 'reacting in the moment to students' who may not necessarily be part of your workshops or home group? Potential in this area exists for ITE programmes.

In order to foster learner agency in ILEs, we view the development of teacher agency, and what this might look like for PSTs, as essential. PSTs are challenged to promote learner agency at the same time as demonstrating their competence during an assessed practicum and also while they work to collaborate with their colleagues in an ILE hub. Our analysis suggests that PSTs 'wait' to teach until they know the choices the students are making, but these choices seem mostly to be around *when* they opt into a workshop not *if* they will opt in, or what the focus will be. Participating PSTs indicated they were not making the choices around what workshops and/or choices are offered. This can be disempowering for PSTs but within a guise of agency for all. We refer to this zero-sum game as 'paralysis'. Participants' understandings of 'learner agency' set up an expectation that they must privilege students' learning preferences, assessment of their own needs and de-centralised working practices, at times over their own. Wright (Chap. 1 of this book) describes this as a move from teacher-centrism to learner-centrism. Our analysis suggests that this transition is a constant tension in the ILE practicum for PSTs. Understanding teacher agency in an ILE is a vital challenge for supporting PSTs to participate agentically as teachers whilst fostering the agency of their students.

The research evidence around the efficacy of ILEs as a schooling configuration is in its infancy. ITE programmes must make the most of this deterritorialised space. It is space that is up for grabs, to promote enduring and theoretically grounded ideas of learner agency as reference points for PSTs' action. However, as demonstrated in this chapter, the influence of gaze expectations operates in tension with learner agency, producing an 'awkward friction' (Benade, 2017; Lefebvre, 1991) for PSTs on practicum in an ILE. They work to demonstrate the management competence expected on practicum. At the same time, they do this in the upscaled and sometimes fragmented spaces of retro-fitted ILEs, whilst also working to promote learner agency. The collaborative relationship with colleagues bridges these tensions, supporting PSTs to decipher how to act amongst the multiple discursive, material and social force encounters at work in the ILE.

We have taken the approach of starting with the successful experiences of our PSTs as a base for considering what is important from their vantage point. In our ITE programme, we have reconsidered our expectations around individualised planning for stable groups as well as full management which we now refer to as 'orchestral co-teaching' (Nelson et al. 2021). We integrate spatial design typologies as reference points for negotiating a diverse range of learning environments on practicum and have developed a toolkit of noticing, a framework of reflective questions to attune PSTs to the material, discursive and social forces at work in ILEs (Nelson & Johnson, 2020).

Framing this chapter with concepts of new materialism has enabled us to attend to the influence of human and non-human forces at work in the ILE practicum assemblage. The assemblage includes workshops, collaboration, learner agency, and how these require a PST to navigate the intricacies of power relations and how they manifest in each bespoke ILE. If PSTs struggle to adjust in an ILE during practicum, the stakes are higher given the complexity of the context. We worry about the cognitive load of all the things that need to be deciphered. On the other hand, we

are also heartened by the embodied support of the collaborative teaching experience, as a bridge into a fast-paced, distributed world of learning and teaching that involves bouncing off, popping out and jumping in the deep end of innovation.

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Part IV
Possibilities for Partnerships

Chapter 13
Enacting a Vision: One School's Transition to Becoming an ILE

Garry Falloon

Abstract Using the OECD's (Educational research and innovation: innovative learning environments. Centre for Educational Research and Innovation, 2013) Innovative Learning Environment (ILE) model as an analytical lens, this chapter examines one school's ILE transition, highlighting the complex and interconnected nature of factors guiding its evolution. It begins by exploring definitions and understandings of ILEs, and alignment with arguments promoting their potential to better-prepare students with the skills, capabilities and competencies deemed important for leading productive and fulfilling lives in the 21st Century. The associated concept of key competencies informs curriculum in many countries and has been linked with a move to (re)develop classrooms to reflect designs thought more suited to supporting the development of these capabilities in students. It is argued ILEs are specifically designed to allow students to work more flexibly and collaboratively. Curriculum is often planned to utilise a range of technologies where students work in teams on project or problem-based learning tasks, designed to build capabilities including self-management, learning independence, problem solving and critical and creative thinking. However, innovative learning environments demand more than just changes to the design of physical teaching spaces. Outcomes from this study indicate the critical importance to successful ILE establishment of challenging teachers' often entrenched beliefs about the purpose of schooling, and the need to empower and harness the talents of all staff towards achieving a clearly articulated and understood vision. This chapter uses data excerpts from nearly seven years of research to provide unique insights into this process, identifying key knowledge useful to understanding the complex interrelationship between curriculum, pedagogy, technology, and physical learning space design in the development of ILEs.

Keywords Leadership · ILE · School culture · Competencies · Pedagogy · Curriculum · Digital technology · Transition · Primary · New Zealand

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Introduction

Considerable variation exists in conceptualisations and definitions of Innovative Learning Environments (ILEs). Some definitions emphasise the design of physical 'bricks and mortar' environments that are argued to support more flexible learning options for students. Early examples in Australia and Aotearoa New Zealand referred to ILEs, Flexible Learning Spaces (FLS), Flexible Learning Environments (FLEs), or Modern Learning Environments (MLEs), often emphasising physical layout, spaces, and facilities (e.g., NSW Department of Education, 2020; NZ Ministry of Education, 2020; Osborne, 2019). Despite different labels, these conceptualisations focus on physical and infrastructure attributes of spaces—and the learning affordances these are purported to offer teachers and students. However, some studies indicate the physical design of spaces has little impact on the nature or quality of teaching and learning that happens within them (Blackmore et al., 2012; Haplin, 2007; Mulcahy et al., 2015), suggesting more profound and transformational changes are needed to facilitate the type of skills and competencies expected in ILEs. This chapter reports methods and key outcomes from a series of studies spanning nearly seven years, during which I worked and researched alongside teachers in a medium-sized primary school as they evolved their teaching and learning philosophy, pedagogy, curriculum, technology infrastructure and physical learning spaces. Their aim was to create an innovative learning environment deemed capable of supporting '21st Century' competencies. Significantly, physical space design and infrastructure were secondary to this transformation. At its core was a fundamental rethinking of the type of teaching and learning needed to better prepare students for future life, and development of a set of learner capabilities and virtues that defined the school's culture and everything that happened within it. The chapter details and reports this school's journey, unpacking the complex interaction between leadership, school change, curriculum renovation, and technological and infrastructural development that defined the transition.

What is an ILE?

As described in Noeline Wright's earlier chapter in this volume, historical conceptualisations of learning environments have focused mainly on the design of physical classroom spaces. However, while policy statements and much early literature target physical attributes of learning environments, other conceptualisations take a broader view. For example, OECD reports focus less on space design and more on the nature of teaching and learning happening within them. They also describe the sort of changes needed to learning design and pedagogy to facilitate outcomes enabling students to thrive in increasingly unstable future environments. The original OECD Learning Environment Model (Fig. 13.1) depicts this more holistic perspective, reflecting the contribution of educators, resources, students and content (curriculum) to defining the characteristics of learning environments of any type. Differentiating ILEs from

others, the OECD describes them as "innovative, powerful and effective" (2013, p. 25), combining physical, social, pedagogical, curriculum and assessment changes which conceptualise them as *communities of learning*. However, despite rhetoric claiming improved student outcomes through more adaptive approaches to teaching and learning possible in ILEs, little empirical evidence presently exists supporting such arguments. As Hood (2019) points out, although it is theorised that ILEs can contribute to raising achievement because they can more readily support the needs of learners, there is sparse information on the nature or strength of the relationship between the quality of school facilities and educational outcomes.

This lack of evidence is particularly concerning given the level of government investment in renovating existing classrooms and building new facilities aligned with the ILE concept (Blackmore et al., 2011; Brooks, 2011; Gislason, 2010). Mahat et al. (2018) highlight dangers making assumptions that "removing or reconfiguring walls (will) break down existing teacher power structures and increase student empowerment and collaboration" (p. 15), casting doubt that open space classrooms like ILEs will adequately support the learning needs of all students. In the absence of a robust empirical base supporting the ILE concept, it is therefore pertinent to critically evaluate arguments justifying the massive investment being made in them by governments across the globe.

Rationale for ILEs

Most discourse explaining the rationale for ILEs stems from the OECD's work on the nature of skills and competencies needed by young people entering diverse and rapidly changing future environments (e.g., OECD, 2002, 2004). Much of this derives from Rychen and Salganik's (2001, 2003) early work in the Definition and Selection of Key Competencies (DeSeCo) project, which argued the need for education to look

beyond the prevailing fixation on content knowledge acquisition, towards models that better equip young people with holistic competencies that "involve the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and resources) in a particular context" (OECD, 2005, p. 4). In brief, these competencies comprise three broad categories—an ability to use tools interactively (e.g., technology, language, information); an ability to interact and contribute in heterogeneous groups; and an ability to act autonomously. Central to all competencies is an individual's ability to "think for themselves as an expression of moral and intellectual maturity and to take responsibility for their learning and for their actions" (ibid., p. 8). These are at the core of what are now popularly known as 21st Century skills.

Young et al. (2019) emphasise the important interaction between innovative teaching space design and innovative teaching and learning practices, in creating classroom settings "that facilitate a variety of collaborative, participatory and independent teaching and learning approaches aimed at supporting the development of 21st Century skills" (p. 2). They claim the spatial affordances of contemporary innovative learning environments may stimulate and support pedagogical transformation, creating *deep learning* opportunities for students aligned with the type of competency development described above. According to Young et al. (2019), ILEs provide ideal venues "to build new relationships with and between learners, their family, communities and teachers, and deepen human desire to connect with others and do good—contributing to the development of skills needed to thrive in a modern world" (p. 3). This assessment is supported by other researchers, who associate the potential of ILEs with opportunities for different approaches to teaching and learning. These include methods aligned with more student-centred pedagogies and project-based and personalised learning that afford students greater flexibility and choice and allow them to undertake deeper investigation into areas of personal interest and relevance (Kariippanon et al., 2019; Patrix, 2017). In such environments, it is argued students have greater autonomy and opportunity to build valued so-called 21st Century competencies, including "creativity, innovation, communication and problem solving skills, which are deemed increasingly crucial for workplaces of the future" (Kariippanon et al., 2019, p. 2).

However, despite ILEs becoming increasingly common in schools, little is currently known about how effective they are for enhancing student competencies; whether or not the disruptive challenge they present can stimulate or support teacher pedagogical change, and if they contribute in any way to improving student outcomes (Campbell, 2019; Kariippanon et al., 2019). Literature suggests evaluating the impact of ILEs on these and other educational outcomes is complex, due to the multidimensional and multifaceted nature of learning interactions and programmes that occur within them. Regardless, general agreement exists that for ILEs to yield the sort of outcomes they were originally set up to deliver, substantial changes are needed to current curriculum and teaching practices (Campbell, 2018; Kariippanon et al., 2019; Mahat et al., 2018; OECD, 2013).

This chapter reports methods and key outcomes from a series of studies during which I worked and researched alongside teachers and their principal, as they evolved their school to create an innovative learning environment they deemed capable of

supporting '21st Century' competencies. While early research at this school focused on emerging mobile digital devices in the school's curriculum, it was apparent that this was embedded in a much broader *learning ecosystem* transformation. This reflected fundamental shifts in teachers' thinking about their role and how this played out in the education of students. To help conceptualise this process and the nature of the ILE ecosystem that resulted, I used an 'ILE-specific' revision of the OECD's Learning Environment Model as a broad starting point to identify and understand the changes that occurred in each of four key areas—resources, learners, content and educators (teachers). The model was significantly refined through more nuanced interrogation of data pointing to the complexity of this process, however the main categories served as a useful initial 'lens' through which to understand school changes. The next section briefly details the elements of the model and its development process.

The OECD Innovative Learning Environment Model

In 2013, an OECD study identified the attributes, characteristics and functional processes underpinning the planning, development and operation of innovative learning environments. The study spanned several nations, initially applying a modified version of the original learning environment model as a starting point from which to understand the transformations occurring in selected schools, as they developed into environments better aligned with expected 21st Century capabilities and competencies. Drawing on De Corte's (2010) work, these were identified as "adaptive competencies… (or) the ability to apply meaningfully-learned knowledge and skills flexibly and creatively in different situations" (OECD, 2013, p. 45). These capabilities are seen as vital for better-equipping young people to "cope with the social, communication and emotional demands of rapidly-changing environments" (ibid, p. 45). It is argued schools that foster these capabilities better enable students to develop values, attitudes and skills needed to live actively and productively in future societies, careers and workplaces (see Beverley Cooper's excellent summary earlier in this volume).

However, the revised model (Fig. 13.2) remains generic in an effort to avoid imposing a singular design or approach, acknowledging ILEs' situated nature across different countries. Figure 13.2 depicts four primary components of learning environments comprising their "pedagogical core" (OECD, 2013, p. 23), defined as resources (with what?); learners (the who?); content (the what?), and educators (with whom?). These are interwoven with pedagogical and organisational factors linking "elements in the pedagogical core" (OECD, 2013, p. 24). These links identify distinct characteristics of learning environments in different contexts and provide a 'baseline' from which each could be assessed (or not) as being 'innovative'.

Over the course of the OECD research, the model was refined through deeper insights into commonalities and differences between the ILE approaches, strategies and outcomes in each school. This process resulted in a range of common principles

that appeared to guide ILE design and development and provided more detailed information setting these schools apart from those following more traditional pathways. The common principles are as follows:

1. The centrality of learning and learner engagement. Innovative learning environments recognise learners as core participants, and encourage and support them to develop self-regulation and understanding and efficacy in their own activity as learners;
2. Learning is a social and often collaborative activity. Recognition of the social nature of learning, expressed through use of different learner organisational systems, arrangements and groupings, with an emphasis on collaboration;
3. Understanding learners' emotions and motivations. Educators understand what motivates learners, and the important role cognitive and emotional dimensions play in successful learning;
4. Acknowledging individual learner differences. Recognising and accepting that learners differ in abilities, backgrounds, capabilities and motivations, and educators reflect this through learning programs that are appropriately demanding and challenging, but without excessive overload;
5. Assessment closely aligns with learning aims, with a concentration on formative feedback. There is clarity of expectation, and assessment strategies emphasise formative feedback supporting learning;
6. 'Horizontal connectedness' is apparent across subjects and in and out of school activities. Learning programs are inter- and trans-disciplinary in nature, linked to wider community and societal contexts, and allow learners to build transferable knowledge and skills.

The study also identified the attributes of enabling factors that played a crucial role in establishing and sustaining ILEs. These included leadership, using data and information for evidence-based decision-making, committing to a learner-centred culture
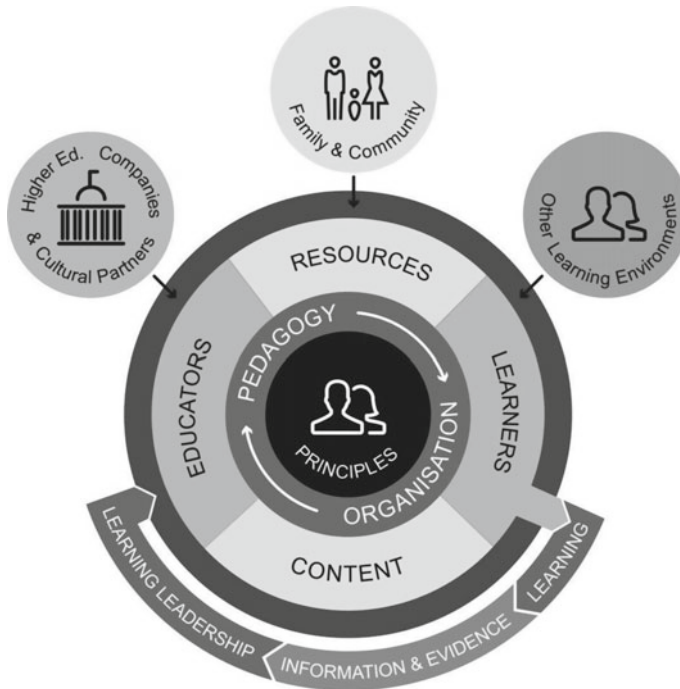
Fig. 13.3 The ILE learning environment model (OECD, 2013)

across the organisation, and establishing external partnerships. Most important was adopting distributed leadership approaches that recognise teachers as professionals and acknowledge their important role in "an on-going process that involves strategies for implementation as well as the guiding vision [for ILEs]" (OECD, 2013, p. 102). Teacher professional learning is seen as crucial "for passing from vision to implementation" (p. 116), when it offered specific opportunities to build a range of teacher capabilities: leadership skills; relational strategies with students; adapting or creating learning content and resources; enhancing digital literacy skills; and developing pedagogical and learning organisation strategies. Establishing partnerships and networks sustained ILEs in the research schools and extended their boundaries beyond the confines of classrooms. Networks included links with higher education, businesses, families, communities and other professional bodies. Such strategies supported schools in developing interdisciplinary learning models, which generated greater understanding of the connection between school learning and life beyond the classroom.

The components of the revised model (Fig. 13.2) were later merged with new elements as illustrated in Fig. 13.3. The revised model better represented and conceptualised ILEs as *learning ecosystems* and captured the important contribution of leadership, evidence-based decision-making and external partnerships, to establishing and sustaining them. This revised model (Fig. 13.3) became the basis of the data coding framework in my study.

Fig. 13.4 A typical flexible learning space at the school

The Research Context

The School

This chapter reports a synthesis of data collected between 2011 and 2017 from a range of studies in a single school. The school is a contributing primary (years 1–6) in a small town in regional Waikato, New Zealand. In 2011, the school's roll was approximately 300 students. By 2018, it had grown to nearly 530. This corresponded with an increase in teaching staff, growing from about 16 in 2011, to over 25 by late 2017. The school has a diverse student profile, broadly comprising 25% Māori and Pasifika students, 65% European, and 10% Asian and other ethnicities. The school's principal and most of the leadership team commenced in 2008, and their arrival catalysed a new direction for the school which was focused on building a strong and consistent understanding and commitment to future-oriented learning. They developed a new school-wide learning values and virtues framework, transformed curriculum and pedagogy, and, as the school grew, created new physical custom-designed teaching spaces compatible with the New Zealand Ministry of Education's learning environment (re)building programme[1] (Fig. 13.4). To a significant extent, it was this cultural transformation and strong and unified commitment to future-oriented student learning that led to the school becoming the community's 'school of choice'.

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[1] See   https://www.education.govt.nz/school/property-and-transport/projects-and-design/design/designing-learning-environments/ for further details.

The Classrooms and Teachers

Over the seven years of studies, data were collected from more than 500 students and their teachers in most classrooms across the school. The principal, senior leadership team, and parents were also consulted and interviewed over time. However, the majority of time was spent in the junior (new entrant-year 2) and senior (year 5–6) spaces. Interestingly, apart from three beginning teachers joining the study as the roll grew, the same lead teachers were involved in every year of the research. These teachers were experienced practitioners with between 15 and 30 years' experience at the time of final data collection in late 2017. One also held a senior leadership role as Assistant Principal (junior school), while another was team leader. This teacher has since assumed the Deputy Principal's position. Participant consistency, and the benefits of being able to seamlessly integrate into classrooms and school life, provided me with unique opportunities to gain deep insights over time into the cultural transformations happening in the school. I could examine the thinking behind the changes, the evolution of curriculum and pedagogy, and the process and impact of physical learning space redevelopment.

Data Methods and Collection

The study's original focus concentrated on introducing iPads to senior classrooms (y5/6) to align with the school's intended Bring Your Own Device (BYOD) programme. Through a research grant from the University of Waikato, I supplied 20 iPads for trialling. From these, data were collected to inform possible wider BYOD implementation. To assist with data collection, I developed a method of iPad display recording to capture students' verbal interactions and physical (touch) responses with apps they used. This method meant I gathered highly authentic user data, no matter where students were or who they were working within the large classroom spaces. Over time, this provided hundreds of hours of recordings for analysis, and the results of these studies are available in other published chapters and articles (such as Falloon, 2013a, b, 2015, 2016, 2017, 2019; Falloon & Khoo, 2014). The display recordings were supplemented by semi-structured student, teacher, principal and parent interviews and surveys. These methods collected information relating to students' work processes and practices and responses to changes or developments happening in the classrooms. Interviews and surveys offered perspectives that showed how they aligned with the school's ILE vision. The parent data showed how parents perceived and understood the changes taking place. I also spent hundreds of hours observing and working with teachers and students. This produced dozens of digital pages of observation notes, hundreds of images and video recordings, and hours of audio-logged reflections.

Research Questions

The study's original focus was building understanding of the learning possibilities and potential of using iPads in the large classrooms, rather than transformations or practices indicating teaching and learning that aligned with principles outlined in the OECD's ILE model. However, it became apparent that the decision to explore the BYOD strategy and more actively investigate how devices might contribute to teaching and learning in the classrooms, was integral to wider school transformation goals. This transformation reflected a stronger emphasis on learning competences and skills described as 'future-focused' (see Beverely Cooper's earlier chapter). Changes to curriculum, pedagogy, resourcing, leadership and organisational structures were similar in nature to those outlined in the OECD model. I have therefore selected and re-evaluated original data seeking the understanding of how changes and initiatives undertaken in the school during the research period facilitated transitions to ILE/future-focused competency development. I also sought to identify and build understanding of processes and strategies used in the transition. To analyse the selected data for this chapter, I used key elements of the OECD model as a basic coding framework to respond to the principal questions:

1. What evidence indicating changes and initiatives between 2011 and late 2017 facilitated the school's transition to becoming an innovative learning environment that supported future-focused competency development?
2. What initiatives and strategies were key to facilitating this transition, and how?

Coding Framework and Data Selection

The elements of the OECD model were used as broad themes through which selected data were evaluated to identify and understand 'ILE-focused' decisions and developments. These were further refined to the school's context through the development of descriptors. These provided greater detail of educator (teacher) leadership, content (curriculum), resource (infrastructure, technology, physical space, etc.), pedagogy, information-use, and partnership developments during this time. Data were selected based on these criteria:

1. Data aligned with each theme were from different sources;
2. Defensible interpretations and inferences could be made supporting alignment with the themes;
3. Data were from studies spanning the duration of the research. This was important for illustrating the impact of changes, over time.

During coding, it became apparent that overlaps in sample data existed between elements of the OECD model. This reflected the interrelated nature of decision-making at the school, illustrating how developments in one element 'triggered' or were closely related to progress or actions in another.

Fig. 13.5 The school's
learning COGs framework

Fig. 13.6 The learner
virtues framework

Findings

Findings are organised around a *core theme* that emerged across all data categories, that is, the centrality of the school's learner virtues and attributes frameworks ('COGs') (See Fig. 13.5) to leadership decision-making and to curriculum, pedagogical, resource (especially technology) and professional development initiatives. This section begins by outlining these and their importance to this school's development pathway.

The Learner Virtues and COGs Framework

The central pillar to the school's progression as an innovative learning environment was the development of learner virtues and attributes frameworks known as the *Learning COGs.* Figure 13.5 illustrates these in the form of a wall chart, copies of which were in every classroom in the school. The COGs were supplemented by *Learner Virtues* (Fig. 13.6). These outlined the qualities expected of students at the school and were targeted by teachers through curriculum and modelled in pedagogy. The Learner Virtues comprised Respect (trust, courtesy, consideration, kindness);

Honesty (truthfulness, courage, humility, responsibility); Co-operation (consideration, patience, unity, trust); Self-discipline (independence, responsibility, orderliness, detachment); Creativity (enthusiasm, confidence, flexibility, determination); and Excellence (commitment, perseverance, humility, determination).

The Learner Virtues were rewritten in 'junior speak', 'senior speak' and sign language, and aligned to the different levels and needs of students. The Learning COGs provided 'aim points' for curriculum and mapped the desired outcomes from teaching and learning across the school, focusing on five areas. These were making a difference, building effective thinkers, communicators, and technologically capable and active learners. In addition to academic capabilities, the COGs also reflected broader outcomes from learning and attitudes towards positive engagement beyond the school. These included developing thinking, information and technology literacy skills, and a willingness and self-motivation to participate and contribute to community and society. In classrooms, the COGs were represented as intermeshing (Fig. 13.7), "reflecting their interrelated nature… they don't work in isolation. Each one builds on or affects the others in some way, they all link… that's why we decided on cogs…" (Principal interview, 2014).

The virtues and COGs (Figs. 13.5, 13.6 and 13.7) were fundamental to school and teacher decision making and planning. They were the result of extensive whole staff professional reading and development, and school community consultation over an extended period. The inclusive nature of this process was crucial, and in many ways

Fig. 13.7 The intermeshing COGs demonstrating integration of the COGs and virtues

reflected the consultative approach the principal and senior leadership team took to transforming the school's culture:

> …we needed to get everyone onboard with this. We did lots of PD (professional development) with staff, role modelling with ourselves… we talked about what it looked like, would feel like and sound like… that's how we took it back to the children… we did role modelling with them and we unpacked it all. We also talked to our community, the parents. We needed to get them to understand the direction we were taking… and why. That's been a real challenge… (Principal, interview, 2014).

The important contribution COGs and Learner Virtues made to the culture of the school was well understood by teachers and reflected in planning as core competences to be targeted through revised curriculum and pedagogy (Fig. 13.8 below).

Fig. 13.8   A teacher's planning

They were also well understood by *some* parents; "in terms of the values system and all the COGs… the kids live and breathe it… I even get it at home… it's great they're working on these things" (Parent, interview, 2015). However, specific initiatives associated with implementing the COGs framework, such as the school's move towards BYOD and greater integration and use of digital resources in curriculum supporting the 'technologically-capable' goal, appeared less well understood and accepted by the school community. Parent engagement was seen by staff as a significant challenge and an important area to address through ongoing communication. Understanding the COGs and Virtues frameworks is central to understanding the rationale for developments in each of the elements of the OECD's ILE model. The following sections briefly detail key findings for each of these.

Content (Curriculum)

Evidence from all studies identified curriculum transition towards problem and project-based learning that focused on building higher order thinking skills, through requiring students to work collaboratively to construct, justify and defend responses to scenarios or learning problems. In the senior school, often this involved students using a range of skills to access and synthesise information from different sources, and apply this to construct defensible outcomes in learning tasks (see Fig. 13.9, next page). In this unit, after completing online and newspaper-based research exploring

SWSW Chart - Cyber Safety Vehicle Check
(you need to include at least 2 strengths and 2 weaknesses for each vehicle, for each audience)

VEHICLE	S (Strength)	W (Weakness)	SW (So What?)	ORDER (JUNIOR)	ORDER (MIDDLE)
POSTER	Nice and colourful Big letters	Not like posters Not interesting	Make it interesting and colourful		
PLAY	Love a play Like the acting	Boring for them Nerves on stage	Nice and exciting Well directed		
MOVIE	Like watching movies Not as nerve wracking	Not enough practice. Putting the wrong things in	Be careful what we put in. Get lots of practice		
STORY BOOK	Like reading Make interesting	Won't understand Not too much info but just enough info	Not too long Make illustrations in the book		
SLIDESHOW (KEYNOTE)	Decorate it Add music	Too Short Too long	Not too long Add animations		
SONG	Like music Played again	Sound difficulties Words wrong	Get words rights		

Fig. 13.9 The SWSW matrix used in the Cybersafety unit

Cybersafety, year 5 and 6 student groups summarised the strengths and weaknesses of different 'vehicles' for delivering key messages about the topic to different audiences (e.g., junior and middle school children, parents etc.). They then ranked these and explained, justified and gained feedback from the class on their decision, before designing, developing and presenting their outcome to a selected audience.

In the junior school there was a similar emphasis although it was approached differently because there was a need to establish important literacy and numeracy knowledge and skills as the base to develop more independently-focused learning in the senior school.

Curriculum and pedagogy at the junior school level was more structured, although it still reflected an emphasis on Learner Virtues and COGs through problem-based tasks integrating core numeracy and literacy knowledge. The upper section of Table 13.1 illustrates one example drawn from a study integrating computational thinking, coding and geometry. Pairs of 5-year olds used Scratch Jnr. to respond to a range of 'geometry challenges' set by their teacher, whereby they built and tested code that programmed the sprite to draw a range of geometric shapes (e.g., squares and rectangles of different dimensions, upper and lower case letters etc.). The data sample was taken from a published study that evaluated and reported on the type and sophistication of the children's thinking while completing this work. The results demonstrated significant benefits for strategic problem solving, collaboration, and thinking skill development (see Falloon, 2016). A comparable approach was used in a latter study involving simple circuit-building simulations (Falloon, 2020) that yielded similar outcomes (Table 13.1, lower section). Notably, focus group data suggests students were acutely aware of the emphasis on developing thinking skills and problem-solving strategies, and appeared to understand the importance and relevance of these to school and beyond-school learning. The consistent and coordinated emphasis on, and the embedding of learner virtues and COGs into curriculum from the time students began at the school, was instrumental in building a culture of '*it's just how we do things here*' that permeated all activities.

Educators (Teachers)

Data associated with the role of teachers identified evidence of their developing understanding about curriculum and pedagogy and its relevance to meeting students' future needs. Evidence also identified changes or transitions that might be needed to better-align it with the future-focused orientation of the school as an ILE. Again, these data closely aligned with the COGs and Learner Virtues frameworks and held significant influence over teachers' curriculum and pedagogical decisions. It was apparent that considerable work had taken place envisioning the future of education and the school's role in delivering this. This envisioning involved numerous staff meetings and professional development opportunities, where staff were exposed to research and new experiences beyond the school that challenged their beliefs and understandings, highlighting the shortcomings of conventional schooling for

Table 13.1 Examples of problem-based learning in the junior school (from Falloon, 2016, 2019)

Analysing (using general thinking and computational knowledge to understand challenges, and predictive thinking to identify and rectify possible errors, prior to creating and testing code)	C&M were working on their upper case T challenge. They had tested 6 for the upstroke, and were discussing the length of the left crossbar	"I think we should make it 10, M (C)… No… 'cos if we make it 10 that way, it'll be too long… the top's smaller… (M) What d'ya mean? (C)… Well, look at the board… see, it's littler… the top bit… if we make it 10, it'll look like a cross, not a 'T'…(M) Oh…ok… (pause)… what d'ya think we should make it then?" (C)…
Analysing (using general thinking skills & computational knowledge to analyse and rectify errors after testing)	H&C were working on their upper case T. They had tested their code as shown, and were analysing the result. They were discussing the action of each block	"That one's good, eh, C… (H) (referring to 'home' block) Yeah, it put it back to the start… (pause)… let's see… it goes down first… then up… across… back… ummm… back to the middle… (C) It didn't go far enough… it stopped! Try making it 10 (H) (referring to right crossbar. C changes 9 to 10, then tests)… Not enough, it needs to be more. Try 11 (H)"…. (they continue this pattern, increasing by 1 until they reach 16)

Table 13.1 (continued)

Student J arranges the circuit as shown and D manipulates the switch	D: On… off… on… off… (closes and opens the switch, repeatedly)… (pause)… it goes well, J… J: Yeah… see, it's a like a circle… the power can go right round (C) (sic) now… (long pause, D continues to open and close the switch)… D: What's the next challenge, J?… J: I'll go take a look… (J moves to screen to read challenge 3)…	…and here's your whole circuit (R)… …we got it working… it was fun! (J)… Why do you think it worked? (R)… (pause)… 'cos the power could go from the battery to the switch to the light… around the whole circle (J)… (indicates with finger)… …as long as the switch is down (D)… So what happened when you put the switch up? (R)… …it stopped… the power stopped… just like in my bedroom… when I turn on the light (D)…
T is inspecting circuit connections after the pair had completed their controlled series circuit, but the bulbs appeared not to illuminate	(T wriggles wires, checking for connection) T: I think it should be going… they seem to be OK… we did it like this before… (pause)… A: Maybe the light doesn't go there… (P) (pause)… maybe we've put it in the wrong place… T: I don't think so… (pause)… it has to go with the other one… and it has to go with the battery… (P) (pause)… A: Mmm…	Here you say 'we did it like this before'. What did you mean? (R)… …well… we connected them the same as we done (sic) in the second one (T)… (pause…) …it was like we did on the app, too… (A) So that idea came from the app? (R)… …yes… when we made the circuit with the dancer… (A)

building students' future competencies. These conversations and experiences were fundamental to firming up thinking behind the Values framework, which teachers saw as applying to them as well as students.

Such events were fundamental in establishing a collective vision and purpose for the school, one that reflected a broad perspective, equally emphasising personal and skill development alongside excellence in academic achievement. This collective vision permeated through to the taught curriculum, where shifts occurred in teachers' thinking about the sort of outcomes valued from their teaching:

> I think the work we did changed my thinking… it's changed from concentrating only on knowledge-based outcomes… we were regurgitating the knowledge… facts and things like that… but now it's more about thinking about things strategically… like if I design a task or something like that, I'm being more strategic in what thinking I want the kids to get out of it, or what I want to get out of it, like skills rather than knowledge alone… or what end product you want to get out of it. Knowledge is important for sure… but that can take really different forms… it's not just about facts… they're not the 'be all and end all' (Year 3/4 teacher interview, 2015)

Teacher modelling of learning attributes was important to enact the school's future-oriented vision as represented by the Virtues and COGs. Teachers saw themselves as needing to model commitment to life-long learning, risk taking, being comfortable with disruption (resilience), being prepared to 'give it a go', and willingness to work with and learn from others (collaboration). This also extended to their use of digital technology which, for many, represented a major transition.

It was apparent that the progressive move to BYOD challenged some teachers' traditional pedagogical assumptions, requiring them to make a paradigm shift in thinking towards more independent, student-focused learning. As one teacher succinctly commented, "it was a new way of teaching… I wasn't used to it. We had all talked about the changes we needed to make… but making them was different… uncomfortable at the time. It took me a while to adapt, but I think I'm getting better at it…" (Year 1/2 teacher, interview, 2016). The 'technologically-capable learners' COG was important for guiding teachers' thinking about how technology can best supplement their students' learning, identifying the '6Cs' of *consume, create, collaborate, communicate, connect* and *curiosity* as key purposes and areas where the newly-provisioned iPads could be put to best use. For some teachers, the '6Cs' also linked closely with the broader mission and purpose of the school, and did not necessarily involve using digital technology. This perspective was reiterated by the principal, who saw the capabilities implied in each as applicable to everything happening in the school.

Pedagogy

Transitions and developments in pedagogy mirrored those in teachers' understanding about their role and changes to curriculum. To a greater or lesser extent, they were simply a manifestation or enactment of these, *in practice*. While there was general

recognition that pedagogical changes needed to reflect more student-centred methods and greater digital technology integration, there was also understanding that this did not mean abandoning useful and effective traditional methods. Pedagogy could best be described as 'blended', with teachers combining teacher and student-centred methods according to learning requirements and the age of students. However, they needed flexibility to respond to learning opportunities presented during units, while also maintaining structure and a focus on planned outcomes. Central to this was teacher organisation, which provided a solid foundation supporting worthwhile 'excursions' into related but unplanned learning. This was supported by teacher understandings of theoretical models such as Inquiry-based pedagogy that demonstrated knowledge of the active role teachers must play when adopting such approaches. Implementing BYOD also supported learning flexibility, through facilitating whole class instant access to 'learning-ready' information from different sources. This afforded teachers the freedom to follow new areas of inquiry with their students and provided worthwhile opportunities to build valuable research and information skills:

> Having the iPads, they've got information on demand. You can offer so much more with what they want to know and what they want to find out. They ask completely different questions than I can even imagine sometimes, and where they want to take something. We don't go down every road… but they come up with some awesome questions that are really worth exploring. It's great for research… (Y5/6 Teacher A, interview, 2016).

There was also a strong emphasis on developing students' accountability for learning, that is, taking responsibility for themselves as autonomous learners within the broader context of the classroom as a learning community. The deliberate teaching of strategies to promote accountability and learning independence occurred across the school, the results of which were apparent in the actions and strategies adopted by students. Additionally, while individual accountability and independence were promoted, classrooms were also seen as learning communities, within which each student (and teacher) was expected to take an active role in supporting others' learning. This reflected in collaborative group and peer teaching occurring at all levels. This included directly teaching and practising strategies about giving and receiving constructive feedback. Figure 13.10 illustrates this process in the study of thinking skill development through coding (Falloon, 2016). It shows pairs of students giving and receiving feedback on their draft code, as they learnt how to blocker code for later use of Scratch Jr. in the geometry unit.

In senior classes, collaboration often extended beyond the classroom as students used their devices to work together after hours, network, and get feedback on their work from parents, grandparents or interested others who did not live with them. The data excerpt in Table 13.2 from a 2015 study illustrates how students used cloud-based services for collaboration in and out of school time.

Fig. 13.10 Junior students giving and receiving feedback on their draft code (geometry unit)

Leadership

While the principal led the change process and was instrumental in plotting the vision and direction of the school in becoming an ILE, he understood he could not achieve this alone. He recognised both existing and newly recruited staff as having the dispositions and skills to implement the necessary changes. This helped him establish a strategic leadership team with devolved responsibilities for leading aspects of the change process. He not only understood the importance of adopting this distributed approach for maximising 'buy in' of staff to the ILE concept, but also recognised the practical contribution particular staff could make in supporting colleagues' transitions. The team comprised both senior leaders (Principal, AP) and teaching staff, including beginning teachers. Much early work of this team revolved around designing and delivering professional learning and other formative experiences to not only challenge existing assumptions about teaching and learning but also examine what this might 'look like' in a school reflecting ILE principles. While this process took time, establishing and accepting this as the collective vision for the school was vital for ensuring a successful outcome from the change process, and appeared to be well understood by staff.

The professional approach of the principal towards staff was an important strategy which motivated and engaged the teachers as meaningful contributors to the change process. He saw his role as one of nurturing talent towards the collective vision of the school as an ILE, through strategies that empowered staff as leaders in their own right:

…it's all about letting people loose… I've got a delegation thing that I've given her (teacher), I said to her, 'these are the big drivers, these are the key things I want to see achieved this

Table 13.2 Data excerpt from the 2015 study on device-supported, cloud-based collaboration (from Falloon, 2015)

Survey question or focus	Scenario	Typical uses (from focus group)	Likert response summary (percentage of responses at each rating)
15. How often have you used Google Docs *in class* so you can do your work with others using more than one iPad at a time?	Collaborating *locally* using Google Docs and 2 or more devices (at school, in class)	Working on stories or reports, preparing visuals (slides), editing/providing feedback, drafting camp supplies list	
16. How often have you used Google Docs *at home* so you can do your work with others using more than one iPad at the same time?	Collaborating *at a distance* using Google Docs and 2 or more devices for school work (at home, remote locations)	Completing homework, working with others on projects and tasks, preparing for and researching upcoming topics, working on topic extension material, preparing blogs	

year… what are your thoughts? How do you think we can achieve these?' So it's a scale of one to ten… one being none, and 10 being total… so my delegation for you is eight, which is go ahead… and just touch base with how things are going regularly, which gives her legs to be creative... (Principal, interview, 2014).

The team approach reflected the principal's commitment to empowering his staff as professionals with the agency and skills to lead important components of the ILE development process. Implementation was well supported by opportunities for staff to participate in external and internal professional learning and through participating in and presenting at relevant conferences. Joint academic publications were also produced, reporting outcomes from curriculum initiatives associated with the school's ILE development (e.g., Falloon et al., 2016). The importance of the vision establishment phase cannot be overstated. It resulted in a common goal understood and accepted by all staff and became the cornerstone of the school's collective action.

Resources

Resource decision-making reflected the school's vision for digital technologies making a substantial contribution to curriculum. At the same time, it helped build digital literacy and information skills deemed important to future learning. Infrastructure and equipment developments such as robust wifi, BYOD and mobile device pods, meant teachers had ready access to mobile technology and systems enabling whole class use. This overcame previous provisioning and reliability issues. Readily available and reliable digital technology was essential to not only implementing the strategic plan but also supporting teachers' efforts to reform curriculum and pedagogy to align with more student-focused methods.

Paralleling digital technology improvements were improvements to buildings and classrooms that conformed to the government's modern learning environment (re)building programme. The new spaces reflected a merging of the standard Ministry design with local teacher input, incorporating 'customised' facilities and breakout spaces that responded to teachers' preferences and recommendations (Fig. 13.11). While most spaces could accommodate up to 3 classes (approx. 75–80 students), they also contained soundproof dividers enabling separation of groups. Teachers saw the design, layout and digital infrastructure of the new environments as supporting the school's move towards the ILE model. They believed the new spaces supported greater flexibility in how students learn, enabling the skills of multiple teachers to be combined, and by facilitating more collaborative learning opportunities. However, teachers did not perceive the new environments and resources as necessarily superior to other options and understood the importance of establishing a solid foundation in the 'basics' as essential for independent and collaborative work. This extended to encouraging students to be critical in their assessment of the suitability of learning 'tools' for different purposes.

Fig. 13.11   The new spaces included breakout rooms and soundproof dividing doors

Use of Information

The importance of access to an expanded array of digitally-sourced information, and the capacity of digital devices through their assistive functionality to support students' understanding of information, was apparent in classrooms. Advantages from this were associated with development in both the 'technologically-capable' and 'effective communicators' COGs and centred on the '6Cs' capabilities detailed previously. The ability for students to connect with and receive feedback from distributed audiences through using technologies was consistent with the school's vision of expanding learning beyond the classroom and supported collaboration and creativity goals. Access to and debate of quality research and information underpinned the school's vision setting phase, and continued to inform its ongoing trajectory as teachers built their own knowledge:

> …we looked at different types of competencies… [examining] lots of research about competencies that kids needed for the future. That gelled our thinking about the sort of school we wanted to be… the sort of values and skills we wanted to build in our kids… (Principal interview 2014).

Partnerships

It was clear that one of the most significant challenges the school faced in enacting its ILE vision was securing external support through partnerships with parents. While some parents understood and accepted the school's direction, this was no means universal. Although the principal and teachers were acutely aware of the

need for parents to "join them on this journey" (Focus group, 2016), building under-standing of this across the school community was difficult, and very much viewed as 'work in progress'. Despite numerous communication opportunities, meetings, and involving parents in student conferences where developed strategies, skills, knowl-edge and capabilities were shared and explained, parents' reluctance to acknowledge and accept the rationale behind the ILE concept remained. Much of this resistance appeared to emanate from the parents' own experiences of school, where there was a perception that *traditional methods had worked for them*, so there was no need to change. Developing a supportive parental partnership backing the ILE concept was clearly a difficult undertaking.

Discussion

The original OECD model depicted four components comprising learning environ-ments of any type. These were resources, learners, educators and content (Fig. 13.1). Differing 'blends' of these were combined in pedagogies and learning organisa-tion structures that defined the nature of curriculum and learning programmes oper-ating within educational institutions. Later studies further defined the original model to align with the emerging movement towards Innovative (or Modern) Learning Environments (ILEs). Notably, the revised model (Fig. 13.3) conceptualised ILEs as *complete institutional environments*, rather than concentrating only 'bricks and mortar' classroom designs or other infrastructural developments, as reflected in many government ILE policies and guidelines (e.g., NSW Department of Education, 2020; NZ Ministry of Education, 2020).

The holistic nature of the revised model in which ILEs were conceptualised as *complete institutional environments* provided a useful lens through which to under-stand the changes happening at the study school over the seven years. The model acknowledged ILEs as comprising far more than physical spaces, displaying under-standing of the complex interrelationship between educational leadership and vision, institutional organisation, curriculum and pedagogical transformation, and resource and infrastructure development. Analysing data through this more inclusive frame revealed the multifaceted nature of change processes at this school, as it enacted its future-focused ILE vision based on its own virtues and learner COGs frameworks. The principal elements contributing to this process are depicted in Fig. 13.12. In place of the generic OECD principles, at the core of the model are students and the school's learner COGs and virtues. These are the focus for leadership, teaching and learning, and infrastructure and physical space innovation and development.

Distributed leadership harnessed the talents and knowledge of staff and supported them to assume responsibility for specific initiatives within the ILE development process, helping solidify engagement across the school. At the same time, the leader-ship approach provided teachers with freedom to explore alternative ways of teaching and learning.
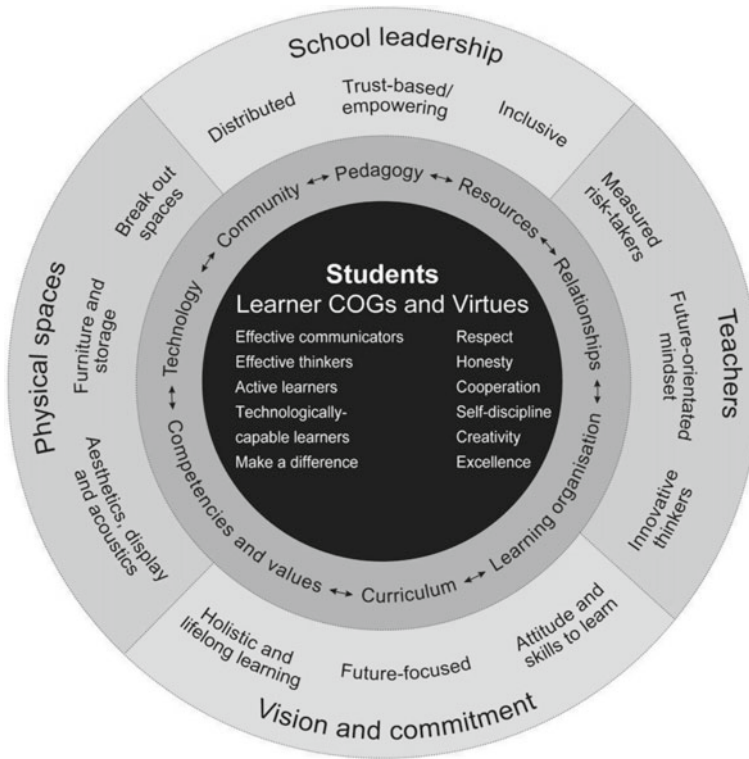
Fig. 13.12   The school's ILE development model

In many ways, the school's rebuilding and remodelling that created multiple, large flexible learning spaces, paralleled and complemented changes already underway. It was apparent that the Ministry of Education's building programme provided teachers opportunities to reshape pedagogy and curriculum into student-centred designs that built COG learner competencies and virtues. However, these developments occurred after completing initial groundwork, and several related initiatives, including the learner COGs and virtues and BYOD programmes, were already well underway. Put simply, what drove this school's trajectory was not the advent of flexible learning spaces, but a genuine belief in the importance of a learner-focused, competency and virtues-based curriculum, and the need to revise pedagogical methods to facilitate this with students. 'Bricks and mortar' and technological resources and infrastructure supported this transition, but by themselves, were not the catalyst for changes. While some elements of the ILE development approach in this school differ from those in the original OECD depiction, there is consistency in the view that ILEs comprise more than just physical spaces. Compatible with the original OECD studies, this chapter provides evidence that authentic ILEs result from a 'bottom up' reconceptualisation of the purpose and nature of schooling, requiring a complete rethink and

reconstruction of curriculum and pedagogy aligned with both academic knowledge and competency-based outcomes.

Conclusion

As Maddux and Cummings (2004) point out, "Fads are a serious problem in education. Fads are destructive because they quickly become abandoned, and therefore, some promising innovations are dismissed before they have been given a fair trial" (p. 511). Only time will tell if the 'ILE movement' will fall victim to the infamous 'pendulum syndrome' where, "unrealistically optimistic claims and expectations for each emerging educational innovation (are) followed by too-hasty, wide adoption in schools. Inevitably the innovation fails to live up to initial, over-hyped expectations, resulting in disillusionment by teachers, parents and policy makers" (Maddux & Cummings, 2004 p. 512). While it is not the purpose of this chapter to make this call, or indeed to offer judgement on whether learning within this school is superior to other approaches to ILEs or even a continuation of traditional schooling methods, as Noeline Wright points out earlier in this book, it is clear that changes are needed to the 'industrial', one-size-for-all education models that are well past their 'use-by' date. While traditional markers of academic improvement in numeracy and literacy in this school are promising, they do not acknowledge progress in the key areas the OECD ILE model targets, namely, the core competences embedded in the COGs and learning virtues model. There is a desperate need to set a new research agenda for studying and evaluating the 'learning contribution' ILEs can make to holistic student development. Discourse must move from the current fixation on narrow, standardised measures, to approaches that recognise the full benefits of a reconceptualised view of valued outcomes from learning in effective ILEs. Whether or not the ILE movement will survive long enough for this to happen in the current climate of *back to basics* and increased standardised assessment is a matter of conjecture.

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Chapter 14
A Portrait of Teaching and Learning in Innovative Learning Environments

Check for updates

Suzanne Trask

Abstract A key consideration in the transition to innovative learning environments (ILEs) is teachers' readiness to make use of open, flexible spaces to support positive change in terms of learning behaviours, achievement and wellbeing for all learners. To accomplish this, teachers are forging different teaching and learning partnerships with colleagues and students. However, the act of inhabiting flexible spaces does not automatically translate to changed practice. This chapter uses the technique of portraiture within narrative methodology to story the experiences of senior secondary science teachers and learners in ILEs. Data are drawn from case studies of eight teachers and their Year 11 (15–16-year-olds) science classes from three secondary schools in Aotearoa New Zealand. To begin, the ILE setting is described and teacher/student characters are introduced. A portrait is then developed as a chronological narrative of a single session to depict what teaching and learning could or might look like in an ILE. As a story accomplished by an interweaving of data from multiple case studies, the intention is not to pledge fidelity to any single experience or school context. Rather the intention is to offer a hypothetical picture, composed by borrowing the most salient features from each of the cases. Serving as a stimulus or departure point for the development of the reader's own practice, the portrait aims to highlight possibilities and constraints, and the best and worst aspects of practice and partnerships in ILEs. Overall, the portrait demonstrates the way flexible spaces permit movement and social flow which, when teamed with affordances in curriculum, assessment and digital technologies, open possibilities for collaborative practice and student-directed approaches. Together, they are more likely to enable diverse learners to engage with science at senior levels. Although set in the context of science, the strategies and experiences have relevance to teaching and learning in other contexts.

Keywords Secondary science · Teaching practice · ILE · Partnerships

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Introduction

An *innovative learning environment* (*ILE)* is an education ecosystem made up of teachers, learners, physical space and material resources (OECD, 2013, 2017). The term *ecosystem* is significant, signalling interconnectedness between people and place. The word *innovative* communicates an often-unchallenged assumption of doing things differently; of re-examining and reframing teaching and learning for a new age. Physical attributes of ILEs in New Zealand schools often include open or flexible spaces which accommodate large groups of students and teachers (Dovey & Fisher, 2014; Wright, 2017). Design features include good acoustics with optimal ventilation, temperature and lighting (Ministry of Education, 2017; Sheerin, 2008). Wired and wireless technologies support digital pedagogies, enabling students to access the Internet as needed. There is often no focal point or "front of the room" in such spaces (Bisset, 2014; Dovey & Fisher, 2014; Osborne, 2013). Instead, agile features such as moveable fittings, furniture and sliding walls (Ministry of Education, 2016a, 2016b; Wright, 2017) allow for different work configurations. The spaces can support team teaching approaches and cater for group or individual learning (Campbell et al., 2013; Gislason, 2009; Lovejoy, 2014; Prain et al., 2013). In ILEs, emphasis is placed on "personalising learning to meet individual students' needs" (Cardno et al., 2017, p. 122). In other words, ILEs are aspirational spaces (Wright, 2020, this edition)—designed and resourced to facilitate student-centred, rather than teacher-led approaches.

However, significant pedagogical and social adaptations are required for a transition to ILE (Alterator & Deed, 2013; Cleveland, 2016; Osborne, 2016), and the transition can challenge and change perceptions of who and what a "good teacher and learner" is and does (Deed et al. 2014b; Dovey & Fisher, 2014; Lovejoy, 2014; Trask, 2019). Dovey and Fisher (2014) go so far as to claim that "just as the classroom reproduces teacher-centred pedagogies, the irreversibility of the open plan can coerce teachers into new pedagogies" (p. 58). Perhaps this idea links with Lackney's (2008) suggestion that many teachers have "poor environmental competence" (p. 134) and that teachers in new learning spaces often continue with more traditional ways through a lack of understanding of how to effectively use space for "pedagogical advantage" (p. 133). More recently, Imms and Byers (2017) note that while "the reconceptualising and inhabiting of new spaces ha(s) moved at an unprecedented pace, teachers' abilities to utilise them efficiently ha(ve) not always matched this growth" (p. 141). These comments suggest a gap between policy intentions and what is implemented to help teachers understand what these changes mean for their pedagogical practices (see also Cooper, 2020, this edition). Perhaps more realistically, Leiringer and Cardellino (2011) argue that a school is a complex environment and that inevitably there will be differences between intended design and end use of learning spaces. They warn that redesigned learning spaces do not necessarily result in improved educational outcomes such as student motivation and attainment. Lovejoy (2014) identifies issues such as time demands for planning in team-teaching

environments, fears that team teaching a large group of students will have detrimental effects on individual student–teacher relationships, and issues of noise and distraction as teachers compete for the attention of specific student groups within the open-plan environment.

In some cases, teachers and students have no choice about inhabiting ILE or flexible spaces—they must make a shift if their classroom spaces are transformed. Sometimes, in newly built or rebuilt spaces, the inhabitants can end up feeling as if they are just "making do," (Wright, 2020, this edition) and that ILE spaces are in some ways even *less* flexible than conventional classrooms. The key ideas of classroom space being *constitutive* in the sense that it sets up expectations for how learning could or will happen, and that space impacts what teachers and students perceive is possible to do and not do, is central to the narrative in this chapter (Bligh & Crook, 2017; Burr, 2015; Trask, 2019). How do we inhabit and use ILE to facilitate positive change in terms of achievement and wellbeing for priority learners and all learners?

In this chapter, the technique of portraiture is used to show how teachers and learners might experience and use open-plan ILE spaces, and how the spaces themselves might support or constrict certain configurations for teaching and learning. In addition, the portrait will demonstrate the practical outworking of key ILE philosophies such as personalised pathways and learner autonomy support. As well, it will illustrate teachers' cultivation of purposeful, responsive, pedagogical partnerships in ILEs.

Portraiture

Portraiture is a storying technique pioneered by Sara Lawrence-Lightfoot. Lawrence-Lightfoot set out to portray the stories of six American high schools as "life drawings," capturing the character and culture of each and illustrating "the mix of ingredients that made them good schools" (Lawrence-Lightfoot, 2005, p. 5). Portraiture, she argues, is a creative endeavour that requires attention to both "empirical description and aesthetic expression" (p. 10). It is distinguished from other methods for documenting and presenting research findings by affirming creativity and aesthetics and by treating the researcher's voice as integral to the production and composition of the piece (see also Chapman, 2005; Lawrence-Lightfoot & Hoffman Davis, 1997; Quigley et al., 2013).

The portrait developed in this chapter draws on case study research conducted in three ILE secondary schools in Aotearoa New Zealand. It depicts a group of Year 11 (15-year-olds) science learners and their teachers working together in a science ILE during one 100-min session. Data were collected via interviews with teachers and students, participant observation, audio and video recording of lessons and document collection. Inductive, thematic analysis pertained to the question: *What does learning in an ILE look like*? Rather than the resulting portrait being a representation of a single case, it is important to note that this "life drawing" was crafted by blending data to illuminate cross-case themes from the three schools. While events and episodes

described in the portrait are authentic, they are a synthesis of separate happenings. Direct quotes from teachers and students are interspersed throughout as soundbites. However, the teacher and student characters were created by blending aspects from up to four participant stories. The ILE space that the characters inhabit is an imagined ideal, constructed by adopting the most enabling structural and design features from each school. The intention of the portrait then, is to not to pledge fidelity to any single person, conversation or school context, but to offer a hypothetical picture, accomplished by interweaving cases while emphasising salient features from each.

A Portrait of Teaching and Learning

The portrait begins with a brief description of the (fictitious) school and (imagined) science spaces to set the scene. Next, teacher and student characters are introduced. Then the portrait is developed as a chronological narrative of teacher and learner actions and interactions. The ensuing session reflection highlights and discusses key themes featured in the portrait.

The Imagined School Context and Learning Space

The school is a mid-socioeconomic status, co-educational secondary school in urban New Zealand, catering for 1200 students from years seven to 13 (11–18-year-olds). The buildings have been rebuilt as ILEs, following issues with water tightness leading to high moisture levels in the fabric of the building, necessitating new buildings. The school timetable contains three 100-minute sessions per day. Year 11 students have three science sessions per week. Student autonomy and choice are key philosophies in the school, and students are given many opportunities to lead their own learning.

Science takes place in two adjoining rectangular laboratory spaces, adjacent to a larger commons space. Opening from each space are small storage rooms for specialist science equipment. The laboratory spaces can be divided from the commons and from each other by floor-to-ceiling glass sliders. Students are grouped at whiteboard (write-on surfaces) tables arranged in the centre of each laboratory space. Each space is equipped with a large wall-mounted whiteboard and data projector. Benches and sinks used for practical work run along the non-slider walls. Both spaces link to a shared breakout room which seats about eight to ten students.

Teacher One (T1)

This is T1's first teaching position and second year in the school. Her subject specialty is senior biology. T1's previous teaching experience was limited to practicum experiences during her initial teacher education. She explains that practicum was helpful for building confidence, but, she says, was conducted in "very traditional labs, you couldn't really translate a lot into this [ILE] kind of environment. We never went

into anything really specific for open plan learning, I don't think it was ever really mentioned." On practicum, T1 worked with associate teachers who were each in charge of their own space. She describes the way that "each teacher had their own room," which in her view was "quite cool" as "you could set up your room how you wanted it." Recalling her first visit to the ILE school during the employment process, she exclaims, "literally in the interview I had a thought of, 'where the hell are the walls?!'" Nevertheless, as a beginning teacher "at the start of my teaching process and straight out of uni," T1 described herself as prepared "to be eager and enthusiastic and adaptable."

Teacher Two (T2)

Teacher two (T2) is a science teacher and physics specialist with 17 years of experience. T2 found it stressful to adjust to the new spaces following the rebuild. He mourned the loss of his old laboratory space. He confesses that "I had a headache probably four out of the five days for that first term that we were here 'cos I just had difficulty handling it." In the old cellular-style laboratories (labs), he saw himself as quite a good teacher, able to use skills honed over his many years of teaching. T2 takes pride in the execution of a well-structured lesson and engaging students with discussion and demonstrations. In the new spaces, he feels he can't (or shouldn't) practice as he would like to. As a result, he doesn't see himself as being as effective. He explains that he would like science learning to be more teacher-led. He prefers to give students notes: "I know that's traditional; write it on the board." But in the new learning environment, he limits this approach, "cos you just can't talk all the time, because there's another class next to you." Over time, T2 has taken steps to adapt. Comfortable with digital pedagogies, he has, for example, started making online videos to explain concepts so that students are able to access this learning at home or school, any time.

The Science Learning Leader (LL)

Arriving at the school 3 years prior to the rebuild, the LL managed the transition to the new spaces. A chemistry specialist, she described her teaching and learning approaches in the former cellular classrooms as "tending towards traditional," although "quite innovative" in some pedagogical approaches such as science inquiry. She describes the effect of the rebuild for her as "stepping out of the box." It was as if removing the walls facilitated a degree of separation from more traditional practice. She talked about having to "re-learn how to teach." Navigating her own necessary readjustment and reorientation in the new spaces while simultaneously leading a team, was not easy.

Similarly, the rest of the science staff have been evolving their practice. The LL notes that staff were comfortable in their old labs, where everyone had their own space. Not everyone was open to change. She noticed the significant grieving process

as staff adjusted to their new reality, having to step by step find their way. "Yeah," she says, "it's still challenging for staff." Nonetheless, she is focussed on moving forward to serve students in a twenty-first century society. "The old system might well serve the teachers, but does it serve these kids who are growing up in a society that's changing and it's so dynamic and it's moving forward quickly? When you sit down and ask yourself that question it's quite easy to conclude that yes, schools need to adapt, and schools need to change." Therefore, according to the LL, the role of a teacher has changed. She is articulate and enthusiastic about her vision for science learning in the new spaces, arguing that:

> There's a lot less of your traditional teacher, with your direct instruction and standing at the front. There's a lot more student choice in what they do and when they do it. So, it's more group facilitation and more monitoring, individual feedback, than traditional "standing there and delivering." Your role is almost exclusively talking to small groups and individuals.

Student self-management of learning and choice are key philosophies, along with connected learning. This is about being connected to the students themselves, across curriculum areas as well as connected to students' lives and communities outside school. The overall aim is to better cater for diverse learning needs and to raise achievement, and according to the LL, learning is most effective when students are given choices and a role in leading their learning.

The LL has been instrumental in forming teacher teams that might work well together. At first, and despite her deliberate manoeuvres, she notes that even though T1 and T2 shared a learning space, they chose not to collaborate. They continued practising as they always did: in their labs, with the sliding doors shut. LL sees T2 as a "more traditional" teacher. The LL recognises that T2's conception of science as a "fact-based, concept-based" subject is associated with a preference for teacher-led approaches. She acknowledges and appreciates that T2 above all, is interested in supporting student achievement. She also understands that there are multiple factors affecting whether teachers have the desire and/or ability to co-teach, such as the question of ownership of "my class" and of the day-to-day, hour-by-hour and minute-by-minute pedagogical decision-making processes. One of the arguments for maintaining a sense of ownership of space and a class group is that teachers worried it "would be more difficult to make relationships with the kids." Another concern was that "with collaboration, you have to meet." Teachers in LL's team at first insisted that "the only time you can meet is if you've got a non-contact at the same time which is rare, so you've got to meet after school, or before school, and there are already so many meetings at school."

The LL read about teacher transition and adaptation to ILE, but struggled to find information that could practically and immediately be put to use in her department. She was direct with staff and shared her struggles: "I don't want to know about the theory, I want to know - what can I do in my class to make learning better?" In the end, the whole team agreed that "It looks like we won't find anyone to tell us how to do that. It looks like we're just going to have to do it." While acknowledging the

feelings of loss and that teachers "can't practice as they used to," the LL orchestrated discussions about the challenges and opportunities of collaborative practice and flexible, personalised learning pathways in department meetings.

When T1 and T2 began team teaching, they found that shared ownership of students and space opened up opportunities for students to make more learning choices. In addition, T2 pointed out the advantages to team teaching, such as "bouncing ideas off each other" and sharing the workload. The LL proudly reported that T1 and T2 now "wouldn't go back to the traditional way of doing things."

The Students

T1 and T2 teach 52 Year 11 science students. In this year level, most students are in their first year of achieving credits towards the NCEA (National Certificate of Educational Achievement). They undertake a range of internally (for example, research or practical) and externally (for example, examination-based) assessed tasks. Classes are mixed-ability and made up of learners with diverse aims and interests. On leaving school, some students take up university programmes while others take on apprenticeships or enter employment. Some will study science at Years 12 and 13 and others will choose a different path. Even though T1 and T2 team teach this large class, each is responsible for their own group to keep track of progress, mark assessments and report to parents.

The Learning—An Overview

Students are working and learning within the science curriculum strand related to physics. At the beginning of the session, each teacher conducts a physics examination revision activity with their own group in separate areas. Students then transition to work on one of two different learning tasks for much of the session. The first is a practical investigation related to heat loss and insulation overseen by T1. T2 leads the second task—a research investigation where students demonstrate understanding of the physics of an application. Within these two tasks, students can make their own secondary and supported learning choices. For example, they can choose the context within a given topic or question, the mode for presenting their learning evidence (digital or paper-based) and they can choose (within reason and rules) where they want to work. For each of the two tasks, there is also a teacher-led option; many students still prefer this model of structured, scaffolded group learning. Students spend four weeks on a task before swapping to complete another task. Teachers also offer invitational revision workshops on externally examined topics in biology and chemistry. The session ends with teachers and students back in their separate areas with their own teacher.

The Science Session

It is nearly 1.30 p.m. and class is about to begin. The slider that divides the labs from the commons is closed, while the slider between labs is open, merging the two spaces into one. T1 spent part of her lunchtime preparing physics revision questions, writing them on her whiteboard as a starter activity. T2 quickly copies the questions onto his own whiteboard, and then they confer, standing together between the two spaces. Rather than formal meetings, the LL encourages teachers to work together in more spontaneous, informal, ongoing ways, such as before class, after class, via email or sharing resources. Time for shared planning is limited, so T1 and T2 make the most of what they have. T1 explains that team teaching is not always easy, and that it involves much give and take. "You have to have really good collegial relationships" she remarks, "and you have to be willing to actually work with other people and not be in your own little bubble 'cos the little bubble thing doesn't really work here." But she enjoys the feeling of support and camaraderie: "There's that solidarity within the last ten minutes of a Friday afternoon, when you can look at each other and roll your eyes."

Pharrell William's *Happy* plays over the loudspeakers to signal the end of lunch. Students have until the song ends to be in class. T2 slides the door to divide the spaces but leaves a small opening of about 2 m. Each teacher is standing in their own space, greeting students and chatting with them as they settle. In this team-teaching environment, one way of maintaining relationships and fostering a sense of class identity is the established routine of beginning and ending sessions as separate groups.

Once class is underway, students work in pairs to discuss answers to the revision questions before each teacher works through answers with their group. As students reflect on their understanding of the material covered, they are expected to use this self-assessment to make decisions about their personal next steps for revision. Some will decide they need to attend a workshop or pick up an extra homework sheet. Some will plan to revise this same section using online material or using their science workbook. Both teachers remind students to record their next steps in their online shared Learning and Achievement Calendar.

As the teacher-led revision continues, they can both be heard talking to their separate classes. There are a few students in each area having quiet conversations. These run underneath the teachers' voices; not too distracting, but nevertheless there. T2 scoots over and slides the door fully shut. The noise goes away. T2 explains how he notices and responds to noise: "When I feel it's noisy sometimes, I don't realise that my class is not that noisy, but the noise is coming from other spaces. Then I slide the door" he says, laughing. "So, it's good that [the spaces] are flexible." Although the two groups of students are visible to each other through the glass dividers, there is surprisingly little interaction between the two. One young man describes the way that, "you just forget about everyone else around you, in all the other classrooms, and then it's like normal. All the distractions are gone, kind of, 'cos you're used to it." He is suggesting the possibility of a kind of learning-focussed "turning in," while tuning out nearby movement and activity.

The revision session comes to an end at 1.50 p.m. T1 checks that T2 is ready before opening the slider. T1 sits on a stool in the space between the two classes so that all can see and hear. She addresses the large group to remind them of the learning plan. Students working on the research task are required to provide an account of the physics related to a chosen application. Many students find it easy to decide on an aspect that interests them, as they can integrate knowledge and contextual understanding from other curriculum areas, such as physical education. LL remarks that many "sports kids" enjoy examining the physics concepts associated with activities such as CrossFit movements, mountain biking or skydiving. There is a scaffold for anyone who is unsure about making their choices. The scaffold takes the form of suggested contexts, paired with relevant starting resources. The teacher-led option is for students who prefer this style of learning, but also for those who are thinking about taking physics in Year 12. In this scaffolded topic, students study applications of electromagnetism in motors and loudspeakers, supported by T2 who will start with "frontloading" of conceptual knowledge, before students complete the associated research investigation.

T1 continues to explain happenings for the session. Some students will work with T1 in her lab to carry out practical work for the heat and insulation investigation. Some will gather in T2's area to work with him and the Year 12 electromagnetism learning. Others will collect a laptop and work independently on their research, either in the breakout room or at a free table in one of the labs. Just before T1 releases the students to begin work, she signals that two separate workshops will run in the final 20 min of the session as further revision for mock examinations.

There is a relaxed feel as students move and organise themselves according to their learning choices. Twenty-four students follow T1 to work on the practical investigation, who oversees collection of equipment and begins to move around supervising groups. Twelve students cluster around the data projector screen in T2's area to learn more about electromagnetism. They begin listening and taking notes as T2 stands at the projector screen and talks through his slides. The remaining students are working independently. Some remain at their tables while others gather in the breakout room. A group of three has chosen to move to an empty table at the edge of the adjacent commons.

Although noise and distractions sometimes prove problematic, it seems as if the very visibility of the issue is an advantage. The responsibility is with the students, and in most cases, they have the power and desire to act. "Sometimes it can get quite noisy, so you just need to put music in, or just focus on what you're doing, not get distracted," says one. "It's very easy to do what you want and get distracted, and just talk, but I just want to pass," says another, laughing. Two students are sitting together playing Clash of the Clans on their devices. They admit that yes, they have work they need to carry on with right now, however, they defend their actions, claiming that with the longer sessions time of 100 min: "It's like, the bell doesn't go for ages, so we can spend 20 min playing games and still get heaps of work done." One student is sitting on his own at an empty table in T2's lab. He has headphones on, playing music, and standing beside him, one can hear a throbbing beat. He explains that he prefers to work by himself: "I like it, just independence, no one's disturbing me, no-one's

getting in your way of learning, so, if I don't learn, well then that's my own fault." Another student is sitting alone, laptop on his knees, on the floor in the adjoining commons. "It's more quiet," he says, "and so I can actually do some work, and not get distracted by everyone." A group of friends are monopolising the breakout room, laptops open but idle. They are interacting noisily and eating chocolates as they plan their pre-ball party. Others, who would perhaps prefer this to be a quiet, less busy space, listen in, while feigning productive attention to their work.

There is yet more energy and noise coming from T1's area. A student from another class in the commons wanders in just to visit, but T1 shoos him away. The sliders to the commons space are pulled fully shut. Students involved in the practical investigations stand at the benches. They can choose to work alone or in pairs on their own investigations or join the teacher-directed group. The LL mentions that some students who can otherwise be inconsistent in their application to work are noticeably more motivated and on-task when part of a wider group. Students have been tasked with investigating the suitability of different materials as insulators. One student is busy wrapping the sleeve of a bright pink puffer jacket carefully around a beaker of hot water. Puffer jackets are non-uniform items, but students much prefer them to the regulation school jackets. A school jacket also lies on the table, ready for testing. The student is determining which fabric most efficiently traps body heat by recording changes in water temperature over time. The plan is to use the findings to argue for school puffer jackets in a report to the school's Board. A chaotic accumulation of beakers, tinfoil, Pink Batts (a building insulation material), polystyrene and wool insulation materials, thermometers and timers is spread over the benches in front of another pair. They are part of the teacher-directed group who are studying the effectiveness of home insulation materials. One of the students explains that he "didn't know what to do" so it was easier to let [T1] "figure it out for us." But he adds an extra motive; "also, 'cos my house is quite cold, sometimes."

It is peaceful in the next-door commons. A teacher is with a large group from a different class who all seem to be focussed on their workbooks. Another group of seniors are bent over their devices around another table. Somewhere in the distance there is music playing.

As T2 finishes with his electromagnetism group, he assigns a reading for their research task and begins to visit those who are working on their own. He sits down to talk with individuals and enters a quick record of the learning conversation in their Learning and Achievement Calendar. It is not easy to manage a number of students on different learning pathways, yet T2 says he manages to find time because, "the students know that it's more on them to get through the work, so they're not as needy, they're not constantly calling you over. I do actually have the time to sit down with students." Both teachers track progress using the school's online Learning Calendar tool, but students still do "belong" to a teacher. "We're accountable for our class," declares T1. "I still write my classes' reports, I mark my classes' exams, so I make it really clear to the kids that they have a teacher who's responsible for them. They do belong, so if there's a parent question or whatever, we know who needs to manage it."

Sometimes, however, students need individual teacher attention during class time but are reluctant to compete for that. While T2 is busy with others, one student is waiting, sitting quietly, doing nothing. She has finished her research investigation but wants to ask the teacher what she could do to improve her final grade. She looks over at the teacher. She waits. She wants T2 to notice her. In the end, instead of approaching T2, she takes out her phone and begins texting. Another student is keen on his chosen research topic and has been busy during this and previous sessions looking at information on websites. But he has made little tangible progress with his research task and has only five lines pencilled in his book. T2 arrives to take stock. It becomes obvious as they talk that the student has read, processed and remembered information from many sources, but has little idea of how to structure this information into a written piece. To help him to capture and configure this knowledge, T2 suggests that they conduct and record an interview about the work—which the student could then transcribe. They agree on a time slot for this in the next session and the student settles back to his reading with renewed enthusiasm.

As signalled earlier, the final 20 min of the session is for examination revision. Those doing the practical work with T1 begin to pack up, and T1 opens the slider to issue an invitation to attend revision workshops. T1 speaks loudly across the spaces: "Alright! If you would like to join a workshop on acids and bases, (T2) will meet you over here (gesturing to T2's area). If you would like to do some genetics revision, we are going to move into the breakout, where it's a bit quieter. It's going to be a refresher of the content for exams, OK?". At this point, a student says vehemently and audibly, "No thanks!". This public rejection (which in a more traditional environment could possibly be construed as rude), elicits no observable reaction from either teacher. It was an invitation, after all. The vocal dissenter later justifies her choice: "I'm interested in civil engineering, and I only need physics and chemistry for that, so by dropping biology (genetics) and not studying for that, I can focus more on the other two." Part of the new reality for students at this school in this ILE is that they are offered learning choices and are assisted as far as possible to engage in independent and self-directed learning. They are encouraged to think about their interests and goals, what credentials they might eventually need and what is achievable. Depending upon their situation, however, teachers do have a say in guiding students towards appropriate choices. T2 adds clarification: "We do guide some students as to what choices they need to make. Some students aren't quite ready to make or have that responsibility."

The workshops are intimate gatherings, and totally focussed. The teachers sit too, writing on whiteboard tables as ideas are developed and explained. Students are "carpentered" to the desk (McDermott, 1976, p. 43) with forearms on tables, crowding close, taking notes. There is no behaviour management needed, no "making" the students listen. All are focussed, presumably because they have chosen to be there. This said, some students are required by teachers to attend a workshop, or to work with teachers individually. "Sometimes," says T2, "those who are struggling, they have no choice (about attending workshops)." He explains that "you cannot just leave it as it is" if students are falling behind.

The teachers wind up the workshops. Students are asked to pack up and move to be with their own teacher to end the session. Sliders are closed once again. Both teachers remind students of options for next learning steps. Various follow-up or revision activities are on offer for homework, with students expected to think about what they need to do to progress and choose the appropriate activity, recording this in their Learning Calendar. There are sets of revision questions on the online learning platform. Links to teaching videos are available. If more help is needed, students can arrange to see a teacher and revisit the work. A milestone test waits for those who feel ready. T1 explains the philosophy that underpins the learning choices, digital access to resources and facility for formative dialogue via the online Learning Calendar: "They need to be able to manage themselves or attempt to manage themselves. They need to be organised and they need to be reflective." Students agree: "We can access all our work at home. If we don't finish it in class or if you are away for some reason you don't fall behind because you can access it at home." "All our work is on (online learning platform) and we can, like, talk to the teacher. Yeah…they can comment on parts of your work so you can change it."

T2 invites his class to share their work any time for feedback. T1, on the other hand, finds the constant emails and work-sharing to be intrusive. For her, this boundary-less accessibility means a "teacher" identity sometimes outstayed its welcome. She recounts how her home life changed positively when a colleague suggested that she remove the school emails and work-sharing alerts from her phone. "I was checking them at home, and I was emailing them at home, and I was thinking I have to respond to this kid, and I have to do this, and [colleague] said **'you don't!** They'll be there tomorrow, and you don't have to do it, that night.'".

It is 3.10 p.m. and class has ended. Music plays as students are released and a brief noisy rush ensues. Three students follow T2 back to his shared, glass-walled office adjoining the larger commons. They continue talking to him about their work. "You're literally surrounded by them," bemoans T2 good-naturedly after they leave, "talking to them and having academic mentor conversations with them and pastoral meetings and guidance from 8am till 3:30pm" At this moment, yet another student comes bowling up to tell T2 where he will be working and what he will be doing the next day. "Case in point!!" says T2.

By 3.25 p.m. everyone has dispersed. The science spaces and commons are empty. There remains the mixed odours of damp paper and warm sock-feet, and that singular, matchless silence familiar only to teachers who finally get to pause and draw breath at the end of a busy school day.

Session Reflection and Conclusion

The portrait illustrates ways in which teachers and students might inhabit and experience a science ILE environment. Many of the strategies and actions portrayed can and do take place in cellular classrooms. However, the portrait highlights ways that flexible spaces (in interaction with other dimensions such as digital technologies and contexts for curriculum and assessment) impact on what teachers and students could

and did do, what they wanted or tried to do and what they could not or did not do. It illustrates the practical outworking of key ILE philosophies of personalised pathways and learner autonomy support, as well as teachers' cultivation of purposeful, responsive, pedagogical partnerships.

This session reflection discusses five key themes which could be broadly categorised as: the design and resourcing of flexible space, teacher transition to ILE, teacher collaboration in facilitating and tracking student-led learning pathways, issues and challenges for shared spaces, and establishing and maintaining group identity.

The first theme is the design of *enabling* learning spaces. As argued in the chapter introduction, space exerts a constitutive force. This means that as we inhabit space, it "constructs" us in the sense that spatial and material resourcing has an impact on what we are able to do and think we are able to do (Burr, 2015; Holstein & Gubrium, 2000). An enabling learning space is one that is genuinely flexible or agile. Agility is a feature of flexible spaces described by Dovey and Fisher (2014) which contemporary ILEs seem to possess to greater or lesser, and most certainly variable, degrees (Trask, 2019). The ideal and imagined portrait spaces are an amalgamation of the most enabling features noted across the three case study schools. In the portrait, sliding glass walls allowed areas to be opened or sectioned off, meaning that it was easier to reconfigure spaces to offer teachers and student choices in where, how and with whom, they taught and learned. The spaces were enabling for practical work, as the science areas had easy access to necessary equipment which otherwise must be locked away. Dedicated practical areas were integral to, rather than separated from, the rest of the science learning areas and larger commons. If practical areas are physically separated from more general science learning areas, this can lead to a decline in the amount of practical work and demonstrations conducted due to reduced spontaneity and being able to tap into teachable moments. There is also reduced opportunity for teachers to "randomly blow stuff up" or "do things on the fly" (Trask, 2017). In learning space design then, it is important to include teacher and student voice and to plan for usability in terms of flexibility, safety and accessibility, especially where subject areas such as science require safe, dedicated practical areas furnished with specialist apparatus.

Significant pedagogical and social adaptations are required when teachers transition to open, flexible ILE spaces. This is a second key theme illustrated primarily through the learning leader's narrative. A shift to new ILE spaces following a school rebuild is not always wanted or welcomed by existing staff, and as T2's experience shows, the transition can be stressful. Leiringer and Cardellino (2011) point out that teacher transitions to rebuilt flexible spaces are different from transitions to new school builds. They argue that in a new school, one must "opt in" by applying for a teaching role, and as such, teachers could be more likely to possess both the inclination and ability to adapt. Those in schools being rebuilt have no such choice, unless they leave. A repositioning must take place as certain possibilities for practice and action are enabled while others constrained. Sometimes, teachers are less able to experience themselves as "good" teachers in the way that they used to be, and this can contribute to the sense of grief that the LL described. Additionally, teachers

can be under pressure from school administration to negotiate and take on "innovative" identities (Trask, 2017, 2019). T1, for example, who was new to teaching, did not perceive her transition to be a "massive curveball." For experienced teachers T2 and the LL, they faced rethinking what being a good teacher meant. The LL described feeling as if she needed to "basically open the book and start again." Time and breathing space are important during a transition such as this—for discussion, observation, reflection, trial and error in the planning to work together, negotiating ownership of new spaces and new practices with students. A vision and capable leadership, which the LL exhibited, is crucial. T1 and T2 found ways for old and new methods to co-exist. For example, T2 was able to keep his preferred traditional teacher styles while providing differentiated support for students in a revitalised digital space.

Open, flexible ILE spaces are intended to enhance student-led learning, and this is the third key theme featured in the portrait. The role of student choice as a motivational and achievement aid is well-reported (Høgheim & Reber, 2015; Katz & Assor, 2007; Patall et al., 2010; Seiler, 2013; Walkington & Bernacki, 2014), and the representation of supported learning choices is in keeping with research literature evidence demonstrating synergies between personalised learning and flexible spaces (e.g. Bolstad & Gilbert, 2012; Cardno et al., 2017; Wright, 2017). Choices were available for students to different degrees along dimensions specified by *what, where, how* and *why* to learn across a range of contexts and modes. Opportunities for individual or group work reflect students' different learning motivations and orientations. Students could opt to use online or printed resources or learn with others or alone. There were also workshop sessions. Students had choices, but appropriate targeted support was available, and teachers intervened or directed students where needed. Teachers worked hard to balance the fluidity that the flexible spaces enabled, with their responsibility to ensure everyone remained on track. Adler et al. (2018) stress the significance of this central teacher role—as motivator and provider of practical support for process management and in negotiating challenges that students may encounter.

Presenting students with choices in a small number of pre-structured learning tasks is one form of autonomy support that can be extended to students (Patall et al., 2010). The teacher-directed inquiry groups offered a safe and structured option. On the other hand, task choices can include more open and less structured options. Adler et al. (2018) note that one form of autonomy support that teachers can extend to students in open inquiry learning is acknowledging student ownership by respecting their questions and enabling them to make their own choices when conducting inquiries. What the portrait doesn't show is the way flexible spaces can support movement and social flow, enabling easy access to other experts. This is useful, for example, if students are undertaking cross-disciplinary or cross-curricular inquiries. Teachers can also collaborate to offer targeted learning support in other ways. Students in workshop sessions were described as being "carpentered" to the table, which means that they were leaning in, concentrating on the goings-on (McDermott, 1976). The brief but focussed (mostly optional) workshops managed to unite self-directed or personalised learning ideals with effective teacher-as-expert approaches. At other

times, teachers were expert-enablers who visited and proffered support to individual students. For instance, recording an interview in which a student articulates thinking and then later transcribes, is a legitimate way of structuring knowledge to provide evidence of learning.

Not all students used all class time available to focus on-task-related ends. A fourth theme highlighted in the portrait and by literature on twenty-first century competencies and personalised learning (e.g. Deed et al., 2014a; Griffin et al., 2012; Ministry of Education, 2015; Voogt & Roblin, 2012), is the level of independence and self-management students need to exhibit. Students are positioned as in charge and able to make their own learning decisions. However, they still need solid support when necessary (Katz & Assor, 2007; Yonezawa & Jones, 2007). There are many challenges associated with supervising and supporting different students on different learning tracks. Systems need to be in place and rules understood by all. There can be problems associated with noise and distractibility in open spaces, although as seen in the portrait, students and teachers were mostly proactive in exploiting the agility of spaces to mitigate issues by closing glass sliders and moving away from distractions. However, as pictured in the episode involving the use (or misuse) of the breakout room, managing space sometimes necessitates prior planning and intentional rule-setting if students are to be provided with a peaceful escape. Digital devices were used for learning, but constant access to games proved distracting for some. Therefore, sometimes, students need to have no choice. For any "tail enders" in the portrait, teachers acted as "taskmasters" to safeguard progress and achievement.

Finally, the fifth theme of cultivating a sense of class identity and group cohesion is important in any teaching and learning context. Shared spaces influence teachers' feelings of relationship with students and ownership of students as "my class." In the portrait, it was important to maintain a feeling of "I'm your teacher." From students' points of view, it was important for them to know that "I matter" to someone. The portrait illustrates ways teachers might collaborate and work with a large group of students to support flexibility and learning choices while at the same time maintaining a relationship with a class of their own. Teachers had to be mindful of boundaries, however. There are risks to teacher wellbeing associated with (over) accessibility. Unless they set limits, teachers in the portrait felt constantly available even at home.

In sum, the technique of portraiture has been used to weave together data from three different ILE school contexts. Although set in the context of science, the strategies and experiences pictured have relevance for teaching and learning in other ILE contexts. Serving as a both a reference and departure point for the reader's own practice, the portrait aims to highlight constraints and affordances; and the best and worst aspects of practice and interaction in ILE spaces. There is something to be learned from all (Carlone et al., 2010; Hackmann, 2002; Lawrence-Lightfoot, 2005).

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Chapter 15
Culturally Located Learning: The Potential of ILEs for Māori Student Success

Emily Nelson and Maurice Rehu

> **He Mihi**
> *Kimihia, rangahaua, kei whea rā te oranga.*
> *Kei ngā Huia Kaimanawa kua whatungarongaro i te rā nei, ēnei ō mātāmuri e tangi tonu nei, e mōteatea tonu nei. Moe iho i te aroha.*
> *Ko wai rā e ngunguru nei? Ko te ao Māori e ngunguru nei. Ka puta, ka ora, tihei mauri ora.*

Abstract This chapter illustrates how one state primary school with a predominantly Māori student community appropriated the potential of ILEs for culturally located learning. Physical and pedagogical design decisions, made cumulatively between 2015 and 2017, linked school design to te ao Māori, responding to their students as Māori.

The case study school, Richmond School, initially aimed to document the school's move from conventional classrooms to collaborative learning pods, guided in their design by the school whakataukī. This initial focus morphed to explore how the school, through spatial and pedagogical design, enhanced students' sense of identity, belonging and potential. The ILE policy context (see Cooper, Chap. 3), a commitment to te ao Māori, and school design, coalesced to support Māori student success at the school.

The chapter explores three broad themes:

(1) how ILEs were appropriated as an environment for Māori success through a focus on culturally located practice and enhancing student mana and identity;
(2) how embedding important cultural reference points within learning spaces and the design of learning spaces co-opted spaces to teach; and
(3) how partnership between the school and community, and between the staff was fostered through iterative ILE design.

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The three themes of this chapter provide rich detail of the Richmond School development story from the multiple vantage points of students, staff and Board of Trustees community members. We showcase how the school re-conceptualised itself, uniquely, as a school-wide ILE, taking guidance from a valued whakataukī to refocus learning environment design, pedagogy and relationships to respond to their students as Māori. We conclude by reflecting on the findings of the study in relation to the potential of ILEs to support culturally located learning and aspirations for Māori students succeeding as Māori.

Keywords Māori learning · Culturally localed learning · ILE · Primary schools

Introduction

Educational policy in Aotearoa New Zealand espouses a liberal view of education committed to equality of educational opportunity for all (Penetito, 2010). However, for Māori (the indigenous people of Aotearoa New Zealand), the reality fails to live up to the rhetoric (Berryman & Eley, 2018).[1] Ongoing effects of colonisation continue to produce achievement disparity for Māori students and schooling remains predicated largely on dominant European New Zealand values. Contemporary policy aims to transform education in ways that honour Te Tiriti o Waitangi (Treaty of Waitangi) and support Māori students to succeed as Māori.[2]

At the same time in Aotearoa New Zealand, educators are challenged to prepare students as twenty-first century learners and future citizens. ILEs have emerged as a global policy initiative advanced to better prepare young people with the competencies required for twenty-first century life and work (Abbiss, 2015; Organisation for Economic Cooperation and Development, 2013). Traditional 'eggcrate' classrooms, representing conformity, and signalling a factory model of schooling, increasingly make way for upscaled flexible learning hubs. These learning ecosystems reflect shifts in twenty-first century working arrangements including a need for young people to develop adaptive expertise and life-long learning competencies in societies characterised by continuous change (Organisation for Economic Cooperation & Development, 2013, 2017). As Cooper (see Chap. 3) notes, economies have recognised the importance of teachers' pedagogic skills and adaptive expertise to the challenge of creating the learning and competencies with students that ILEs promise. Aotearoa New Zealand has been no exception with the majority of its schools now 'in-transition to ILEs' (Carvalho et al., 2020, p. 307).

Still largely characterised as traditional spaces with largely teacher-centred pedagogies (Imms et al., 2017), the opportunities for socio-spatial design—the physical, the pedagogical and the relational features of ILEs—Aotearoa New Zealand learning environments remain open to innovation. To date however, little attention has been paid to 'wider socio-material and political implications' (Stewart & Benade, 2020,

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[1] te ao Māori: the Māori world.

[2] whakataukī: a Māori proverb.

p. 129) of spatial design in ILE initiatives, including 'Māori-centred perspectives and desires for school reform' (Stewart & Benade, 2020, p. 130) and the potential ILEs offer to 'shape a just and equitable future' (see Cooper, Chap. 3) for all learners. From this perspective, ILEs represent an opportunity for the development of culturally located learning through attending to socio-spatial design.

Attending to socio-spatial design possibilities, conceptualises space as socially produced, political and dynamic: interactions between the physical and social where the space influences the social and the social influences the space (McGregor, 2004). McGregor (2004) argues that the 'physical architecture of schools reflect and maintain political, technological and social influences from wider society' (p. 2). As McGregor (2004) argues, 'space is not a neutral untidy backdrop to adult and pupil interactions, it is (re)created through politics and ideology' (p. 4); it brings together the physical, the social and the political (Lefebvre, 1991). Spatial design can act as an 'architecture of resistance' (McGregor, 2004), an opportunity to disrupt existing inequitable patterns of schooling and transform these through enacted socially just practices. In the chapter, we focus our attention on how the Richmond team explicitly designed the spatial and the social as an architecture of resistance to policy narratives that do not work for Māori learners, creating instead 'fertile conditions for change' (see Cooper, Chap. 3) to cultivate Māori student success.

Policy Backdrop

In their physical and social design, ILEs disrupt the 'familiar grammar of schooling' (Tyack & Cuban, 1995, p. 106, as cited in Gislason, 2010, p. 130) and leverage space as an 'element of the curriculum' (Byers et al., 2014, p. 6). However, with their instrumental and generic global origins, ILEs risk homogenising educational provision within a neo-liberal economic imperative. This runs counter to the significant social justice challenges facing Aotearoa New Zealand. Currently, policy shifts articulated in *Ka Hikitia* (Ministry of Education, 2013), focus national expectations on Māori achieving educational success as Māori. Durie (2003) makes explicit that.

> As Māori [means] being able to have access to te ao Māori, the Māori world – access to language, culture, marae … tikanga ... and resources ... If after twelve or so years of formal education, a Māori youth were totally unprepared to interact within te ao Māori, then, no matter what else had been learned, education would have been incomplete. (p. 199)

Through *Ka Hikitia* and its supporting competencies framework *Tātaiako: Cultural Competencies for Teachers of Māori Learners* (Ministry of Education, 2011), educators within state schools are challenged to develop equitable approaches to education that foster Māori student potential and success. However, in state schools (publicly funded schools required to implement the national *New Zealand Curriculum* or *Te Marautanga o Aotearoa*)—this concept is seen more in policy rhetoric than enacted in practice (Berryman & Eley, 2018; Jones, 2012).

We argue that ILEs open up opportunities for culturally located socio-spatial design to bring to life the aspiration to decolonise schooling and support Māori students to succeed as Māori. As Byers et al. (2014) highlight, 'physical classroom space is linked to and embodies specific pedagogical practices and shapes student learning experiences' (p. 7). The design of ILEs opens an opportunity to promote values and messages that enhance the likelihood of Māori student success by making culture visible and valued in learning environment design (Alton-Lee, 2003; Wall, 2016).

The promise of ILEs as a potential policy innovation for Māori student success through socio-spatial design is signalled in the Ministry of Education's (2020a) Innovative Learning Environment Assessment Tool (Ministry of Education, 2020a). The assessment includes a design prompt—'Is the cultural diversity of a school's community recognized in the design of a school or its surrounding environment?'. With OECD (2013) definitions of learning environments placing emphasis on the 'particular social profiles, family experiences, knowledge and expectations, and cultural experiences and values' (p. 22) learners bring to their schooling, opportunities exist within socio-spatial design to make these funds of knowledge 'manifest within the educational setting' (OECD, 2013, p. 22). This chapter presents how, against this policy backdrop, the staff, students and community of Richmond School (Napier) engaged with the potential an ILE development offered, to establish Māori-centred perspectives and desires for Māori student success into reality in their school.

The School and the Study

Richmond School in Napier, is a Decile 1 state primary school. The Ministry of Education defines a decile 1 school as 'the 10% of schools with the highest proportion of students from low socio-economic communities' (Ministry of Education, 2020b, School Decile section, para. 2). At the time of the research, 73% of the school's 150 students were Māori, 23% Pasifika (including 22% Samoan) and 4% Pākehā (Education Review Office, 2016). Within the school, among the 17 staff (including school leadership, teaching staff, learning support staff, pastoral care staff and office staff), nine (53%) identified as Māori, one as Samoan (6%) and seven as Pākehā (New Zealand European) (41%). The language of instruction in the school was English, although six staff were fluent or conversant in te reo Māori.

The instrumental case study design (Stake, 2008) enabled us to examine the Richmond School ILE development as a vehicle to understand the larger question of 'what practices in the development of the school's ILE, fostered Māori students to succeed as Māori?'. Three research questions guided the research:

1. How and why did the ILE develop?
2. How did te ao Māori influence the development of the ILE?
3. What were the ILE's effects on learning, teaching and the development of the school as a learning community between 2015 and 2017?

Emily (external researcher) and Maurice (school principal at the time of the study) worked together as co-researchers. We used broad ethnographic methods (Smyth et al., 2014) to enable the naturalistic development of the case study to emerge in negotiation with participants. Data were generated through: semi-structured group and individual interviews; analysing existing school documentation; a school tour; and informal conversations with 15 participants between June and December 2017. Participants included three Board of Trustees members, three Senior school leaders, six middle and senior school students (Years 4–6) and three, mostly non-teaching role school staff (with pastoral care and office responsibilities). The broad prompt 'tell me about the journey Richmond School has been on to develop innovative learning environments' initiated the interviews.

The six participating students had experienced the transition from conventional classrooms to learning 'pods' in 2016. These students, in a group photo-elicitation interview (Capello, 2005; Clark-Ibanez, 2004), shared a series of photos and/or video snapshots that they had prepared, to illustrate their favourite spaces in the ILE. This helped anchor their reflections on the changes in the school.

We identified emergent themes and constructed a narrative structure that preserved the chronology of the ILE development. The analysis, presented to the Board of Trustees as the culmination of the project, also served to inform the ongoing development of the school. The Board of Trustees endorsed the veracity of the analysis. They then gifted a mihi to accompany all dissemination of the research, asking that identifying the school acknowledges the collective innovation of the school staff, community and students.

ILEs as Potential Environments for Māori Success

Prior to this research, Richmond School enjoyed a reputation as innovative and achieving success with and for its Māori students. A large number of visits from educators nationally, indicate its innovative status. At the same time, the school was a preferred provider by the Ministry of Education for students experiencing significant life challenges. Another mark of innovation was its Apple Distinguished School status and the school's promotion of its pedagogical innovation on Te Kete Ipurangi (TKI) (www.tki.org.nz). TKI is a national hub for educators and others interested in Aotearoa New Zealand education.

However, a consensus emerged among staff that despite this positive reputation, 'mainstream' or western approaches to schooling had not adequately supported their students to succeed as Māori. The teaching team identified a need to change their practices and put their students and their identity at the centre of their pedagogical and spatial design approach. As one teacher noted:

> We had to do things differently in order to meet the needs and engage our tamariki [children] because I guess for too long we were doing things you know, the mainstream way and expecting different results. (MB)

In line with a national persistent achievement disparity between the highest and lowest achievers described as the 'long tail of underachievement' (OECD, 2011), the staff at Richmond School recognised that this 'big tail' was reflected in their school. This became an impetus for change to focus on their students' identities and a foundation for pedagogy, relationships and school design. As the Principal argued:

> We've got Māori kids, Māori communities, Samoan kids. Russell Bishop's [Te Kotahitanga] work you know 'What's good for Māori is good for all, what's good for Pākehā is not good for all.' It was always the tail, no matter how much people did around their teaching practice, we still had this big tail and it wasn't changing. (MR)

The teaching team committed to practising in culturally responsive, holistic and strengths-based ways.

> So we started to look at how do we capture our whole child, Te Whare Tapa Wha [Māori health and wellbeing model [(Durie, 1994)] how do we capture all that stuff? We have to provide opportunities in our learning programme that allow our kids to build mana [prestige]. Build on their strengths, not always see deficit, not always see 'we can't achieve'. So that was starting to just be shifts in our curriculum. (MR)

This work acted as the precursor to exploring space as an element of curriculum. At the same time, it initiated the centring of students and their identities as focal points for teaching and learning at Richmond School. A key innovation was the decision to re-conceptualise the whole school as an ILE, a set of three inter-connecting learning pods unified by the existing school whakataukī:

> Ko te manu e kai I te miro nōna to ngahere, Ko te manu kai I te mātauranga, nōna te Ao. (The bird that eats the miro berry owns the forest. The bird that feasts on knowledge owns the world.)

In this initiative, the school became depicted as the forest (depicted in Fig. 15.1) providing a learning ecosystem for the manu (the students).

The students journey between Te Kōhanga (nest) junior school, into Te Ngāhere (the forest) middle school and finally into Te Ao Mārama (the world of light and understanding) senior school in the canopy of the ILE. The staff and the community focused on supporting the manu[3] to feast on knowledge during their time in the ILE. The Principal described the role this metaphor played:

> We established that the whakataukī was the best way for us to enact our journey for our kids, ILE, student agency, ako [reciprocal learning and teaching], tuakana teina [expert to novice peer support] ... so it was unpacking - if they were in the nurturing nest, what would it look like, sound like, feel like for a child? (MR)

The question 'what will this look like, sound like, feel like?' formed a central development question throughout the ILE development amongst the staff.

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[3] manu: Māori for bird.

Fig. 15.1 The ILE emerges from Te Ngāhere

Within each of the interconnected learning pods, activity zones were designed to communicate how learning would look, sound and feel. The activity zones distinguished ways of learning, thinking and working; enacting space as an element of curriculum (Byers et al., 2014). These activity zones, initially inspired by Mark Osborne's (2015) interpretation of the *Campfires in Cyberspace* work (Thornburg, 2004), were adapted by the Richmond teachers (Table 15.1). They designed their

Table 15.1 ILE learning pods and activity zones

Te Kōhanga	Te Ngāhere	Te Ao Mārama

• Te Kōhanga
  • Play
• Rākau
  • Formal learning
• Māhuri
  • Transition from ECE
	• Papatūānuku
	  • Foundations
	  • Construction
	  • Quiet space
	• Ranginui
	  • Creative space
	  • Transforming abstract to concrete
		• Tamanui-te-rā
		  • Creativity
		  • Spark, light, dark
		  • innovation
		• Tāwhiri-Mātea
		  • Challenges posed
		  • Central meeting space
		• Tangaroa
		  • Ideas flow
		  • Quiet space
		• Tane Mahuta
		  • Calm
		  • Productive

activity zones to reflect the school whakataukī, the characteristics of ngā Atua[4] and concepts drawn from te ao Māori. The activity zones provided a physical framework for students' identity building, emotional literacy and self-management as learners.

The spaces of the school-wide ILE provided a coherent vision for learning. One senior leader described how the activity zones worked to codify knowledge that could enhance students' knowledge of their identity as Māori, their feelings of belonging to school and their learning.

> Instead of using the MLE concepts linked back to how Mark Osborne had laid them out, [we] took the Atua as the spaces and the dispositions. So Tangaroa, under the sea it's one of the special spaces. So instead of having a cave where it's quiet and I need my quiet space, they took a space and they called it Tangaroa ... Tangaroa is the quiet space, it ebbs and flows, you listen, you hear, you feel. And into Tane, and again, it's about this is really strong, this is our base, this is where we come and meet as a team, Tane Mahuta, and this is where it starts. Because it was Te Ao Mārama, they wanted Tamanui-te-rā, the sun, and its ability to spark light and dark and challenge. So, in here it's a noisy place where we're challenging each other, it's construction, it's building and Māui caught the sun, caught Tamanui-te-rā, he was innovative. So this is the space for you to make, so it became where a lot of the maker space, play stuff happened, there's Lego, a whole range of things. (MR)

By incorporating the characteristics of ngā Atua and valued concepts within the spatial design of the ILE, students and teachers were able to bring these into both the learning process, and into the identity development of students through their ongoing discussions within the pods.

> So those conversations with the kids, they started to see... 'aha', so if we take that as a learning environment, with Tane, Tangaroa, Tāwhiri, the kids coming into that space and seeing what were traditionally three classrooms, now one big learning pod from 20 something odd kids to 55. Two teachers and a learning coach. All of a sudden it was like 'ooh, I kind of like this'. (MR)

The coherent narrative of the spatial design provided a way for Māori students at Richmond to learn and participate in their culture and strengthen their identity as Māori. For non-Māori students, immersion in spaces where aspects of te ao Māori were so explicitly expressed, enabled them to learn about Māori as tangata whenua (indigenous peoples of the land) in Aotearoa New Zealand. In each space, students were encouraged to connect their own learning behaviours to the valued attributes of ngā Atua and the concepts embodied physically in the activity zones, for example, as depicted in a student mural of Tamanui-te-rā in Fig. 15.2:

Grounding spatial and pedagogical design to the school whakataukī responded explicitly to the identity of students as Māori. This linked the design of the ILE to te ao Māori and promoted valued culturally located messages. This is a strategy found to have a positive impact on learning and Māori educational success (Wall, 2016). Teaching staff also designed this move to counter the deficit language of the National Standards policy of the time where students' achievement was periodically categorised as 'well below', 'below', 'at' or 'above' expected standard. This (now abandoned) policy was argued by one senior leader as deficient because it:

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[4] ngā Atua: Māori deities and guardians.

Fig. 15.2 Tamanui-te-Rā mural painted by students

> Didn't take into consideration who our Māori kids were and what made them important. You can be below the standard in reading, below the standard in writing, below the standard in maths, then that person lost all their mana [prestige]. 'Cos all [they've] been told is 'I'm below and I can't do anything well. If I'm above the standard in kapa haka [Māori performing group], I'm above the standard for art, it didn't mean anything'. (MR)

Staff adopted a mana-enhancing[5] approach to curriculum, pedagogy and relationships within the physical ILE design. Mana-enhancing practice involves taking every opportunity to increase the mana of students by acknowledging their strengths and potential. This became a foundation for pedagogy, curriculum and relationships. At Richmond, the mana-enhancing approach was formalised through their adoption of *Te Ara Whakamana Mana-Enhancement Framework* (Marshall & Osborne, 2017) a year before this study took place. Te Ara Whakamana draws on cultural metaphors and archetypes in the form of Atua [deities] and other te ao Māori characters of renown (such as Māui). The framework was used to teach emotional literacy and foster identity development with students.

Pedagogical practices of ako[6] and of observation became central practices, with teachers charged with noticing students' learning stages and their interests. This led to differentiated, personalised and next-step decisions about their learning.

> It's quite interesting when you hear our team talk about different things. It's almost unique in each learning pod because each group of students are being responded to for their needs, instead of everything being too prescriptive everywhere. It alters, it pulsates, it cross pollinates... then the teaching team talk about how they then alter their practice to meet those needs or urges within that. (MR)

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[5] mana: respect, dignity.

[6] ako: reciprocal nature of teaching of learning—a both/and approach.

The differentiated activity zones provided pedagogical guidance for this personalised pedagogical approach, with teachers noticing how the students grouped together and communicated with each other in these different spaces in different ways.

The individualised nature of the learning programmes, and absence of formal furniture such as desks in each pod, created spaces in which students could manage their own emotions with dignity. Whereas in a conventional classroom, individual student and peer behaviour might be highly visible, in open and personalised ILE pods, students managing strong emotions were able to blend into the background more naturally. An example of this occurred where a small raruraru[7] erupted between three boys with one leaving the classroom described by one of the staff with pastoral care responsibilities:

> Whereas something like that, just three, the three that are involved, the others didn't even see it, they didn't know it was happening. And it gives them the freedom, like that boy, to just walk out. Quite often, a 5 minute walk around outside is enough to calm them, without them being interrogated, 'what happened, what did you do, why?' All those other questions. And it teaches them that regulation really, like they will have learned their limits a lot better. So just, instead of lashing out because they're angry, [...] they do whatever they need to do, they come back and they're ready to talk about it, most times. (TT)

The level of excitement generated within the school by the innovation of the ILE, rippled into the community. One Board of Trustees member conveyed this excitement, saying:

> In terms of the classrooms, when I saw it initially, my God, I went back to work, do you know that they've got bean bags? They use bean bags. Do you know that they've got their own café bar? I said, what's that all about? I thought because I'm from that era where you have the whiteboard and the desk and everyone sat in a row and everyone got their pens and pencils out, not an iPad. (MM)

Connecting to the aspiration of owning the world, the Board of Trustees member also identified the affordances of digital technology integration for extending the learning ecosystem the students could participate within beyond the classroom, observing that:

> We should be ensuring that our kids are able to walk in two worlds really well, that's the Māori world, te ao Māori, and te ao Pākehā. But in the same token, they should be global citizens so you know [...] and engaging with other cultures, it's not foreign, it's not something that's foreign to them. And it's like they're just part of the global world, it's accessible so that's what I'm seeing happened. I mean, their TVs, I remember [the Principal] going we need these TVs, I was thinking where are we getting all this money from? As a board member, that's what you should be doing. I was thinking, my God, the bloody TVs are bigger than my TV at home. It's... you know, it's I was thinking who gets a TV that big, but anyway, it happened. And why wouldn't you be giving the best resources possible to ensure the best education out there, which is reflected within the data. (MM)

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[7] raruraru: commotion.

Turangawaewae—Bringing Partners Together in a Space of Belonging

In order to establish a physical space that indicated that whānau and community were valued as partners at the heart of the school, the school cafe was renamed 'Turangawaewae'. A senior leader described the purpose of the space in this way, 'Turangawaewae, our kids need a base and a place to stand in our community. Where they feel safe, heard, listened to. Where they have power to be who they are' (MR).

Turangawaewae, the base at the geographical centre of the school, had multiple purposes. It functioned as a space for eating, a space for learning and a space for connecting with whānau. As two students (S1 and S2) described:

> You can have breakfast in it and without anyone bumping into you, you can just eat it in there (S1). It's another pod where my brother works in (S2). Turangawaewae. Yeah. There's kai in there if you have no lunch … and there's like nuts, there's bars, raisins (S1).

Reconceptualising the cafe as Turangawaewae, promoted the centrality of belonging and connection with, and within the school.

> Used to be 'the breakfast club'. What's the breakfast club? It has that connotation, or negative connotations that you can't afford breakfast, you have to come here to eat. It's more than that, it's a social world, it's a café. We go to meet, we catch up with people, we eat, people come in and work, there's books and we just said, 'oh don't worry about books... if kids want to read books, let them in there. We want our kids to own this space. (MR)

Whānau were welcome within Turangawaewae to talk with each other and to spend time with their children. One staff member with pastoral care responsibilities explained:

> It's open to whānau if they want to come in. So, we have a few whānau, like ... we have a lot of kids with custody and parenting... court orders. We also have a dad who goes out on the fishing boats a lot and him and mum aren't together anymore, mum's got the kids … but quite often he'll come and he'll bring fish and chips for his four kids and all the cousins. We want them to feel welcome too. I mean, we've got their kids for six years. (TT)

Placing this space of belonging at the centre of the ILE signalled that all could come together in the heart of the school, to belong through connection.

Partnerships: A Collective Journey

The physical design of the ILE was supported by a collective culture of experimentation and partnership amongst the staff and community. The staff began their collective journey by identifying the values that would unite them and form the foundation of their learning culture. One teacher summed up this collective focus:

> It was all about just bringing everyone together and building that whanaungatanga, that unity and kotahitanga and so the values were all about aroha, manaakitanga, whānau, within us building that culture first. (WM)

The mana of each member of the school was paramount in the school's model of shared leadership and responsibility:

> Everybody has mana, whether it was their way of communicating with others, whether it was how you run an office, you know, you all had something to give and it was all valued. And I guess that's where our kaupapa Māori kind of just started to [emerge]. We collectively knew a lot of things and we worked together as a team firing stuff at each other, challenging each other, trialling different things. (WM)

The staff were encouraged to experiment pedagogically, and also to challenge each other to ensure that teaching practice aligned with their shared vision. As one senior leader pointed out:

> We can only achieve what we can as a team, and as a team, if we're all... he waka eke noa. If we're all going in that same direction we can make progress so much quicker. If we've got people that believe in a vision, then they have ownership of the vision and they're almost self-guided, self-directed. If we have a clear path for where we're heading, it's easier to try and get there. (MR)

There was a strong sense of the role of individuals as part of the collective in the school, captured by one teacher's comment that 'Everyone has a different perspective on the kaupapa or on the child. It wasn't always just the teaching team, it was always, mostly, all of us' (WM).

Participants likened their collective efficacy and collaboration to acting as a whānau (extended family) and developing whānau-like relations as a key practice for supporting Māori student success. All staff participants in the study articulated a shared sense of responsibility for the personal and educational wellbeing of all students. The quote above indicates this sense of sharing. Their sense of responsibility flowed through into educational decision-making which included office staff, the caretaker and the learning coaches. One of the office staff described it this way:

> All meetings are open and all professional development's open across the board, like, you know, I've been to a couple, like going to ULearn [educational conference] and then a couple of times we went as a school [...] One of them I went to was a workshop, not a lecture, and it was you had to go introduce yourself, and a couple of teachers just turned their back on me because I said I was the office manager, oh what would she know? Yeah. And it was like that doesn't happen here. (LB)

Within the school, this shared and valued decision-making was expressed by one teacher as a core commitment to enhancing the mana of all.

> Everybody has mana, whether it was their way of communicating with others, whether it was how you run an office, you know, you all had something to give and it was all valued. And I guess that's where our kaupapa Māori kind of just started. (WM)

Having shared decision-making as a core commitment referenced the needs of the students for stable and unchanging relationships. School needed to be consistently positive environments expressed by a pastoral care staff member as:

> We need to be that one, unchanging kind of adult, in these kids' lives, because things just happen just like that. They'll go home today and something's happened. You know, tomorrow will look different to today again. (TT)

At the time of our research, a critical mass of educators, whānau and Board of Trustees members used their significant capacity as Māori, to support their Māori learners to succeed as Māori. As one senior leader observed:

> Yeah, because sometimes, I know for me, I forget that this is not everybody's upbringing or everybody's view point, like it's, like in my family that's what we do. You go to the kitchen first and you just slide in or you pick up the broom and then whilst in there, all the conversation, that's where you hear everything. You know exactly what's happening. (MR)

This quote indicates that the collective participation processes that are familiar in te ao Māori within whānau[8] or on the marae[9] might not be a shared reference point for non-Māori staff members. The collective commitment of staff extended to engaging with each other, and with the school's community in whānau-like relationships. This whanaungatanga created a culture of openness in the school. For example, learning conferences happened during class time and visitors were welcome in the learning pods any time. One senior leader put it like this:

> I like the open learning vibe, so we try to be as transparent as possible, doors are always open, people can come and go as they feel comfortable. Yeah, and just making these shifts, and again with [school] orientations [with] whānau, new people coming in ... you can't hide everything that could be going wrong … everyone knows we are here for our community and who knows who's going to be walking through your door at any moment and what's going to be happening and I like that. It's warts and all, some days are outstanding, other days are like ahhh. But because we're that open with our whānau and community and people we visit, it's almost like you start creating an opportunity. (MR)

Spaces Teach

Embedding important cultural reference points within the spatial design of the learning pods through the activity zones meant that the spaces 'taught' in a pedagogical sense. The school's whakataukī created a coherent educational narrative for students and their whānau. As one teacher noted, the coherent story linking the spaces 'gives a little bit of concrete, for them to establish the abstract'.

The nature of the spaces communicates acceptable behaviour and ways of working in each. One comment in particular illustrates this:

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[8] whānau: family.

[9] marae: Māori meeting house.

> Quite often [it's] the loud boys that like the quiet room. So if you see the boys outside of here, like that... Yeah, so those boys are all loud. Just in the playground, boisterous. But they always gravitate to the quiet space [in the learning pod]. And they're often the ones you'll hear say 'oh, shush'. 'Be quiet', 'hurry up'. And we always thought they'd like the louder spaces and that, it's quite funny. Kids surprise you, eh? (TT)

Cubby holes are also quiet spaces. These were designed for students to use for storage, but students used them as work spaces where they could huddle and work together on iPads. One of the students talked about working in the cubbies in the Tane Mahuta activity zone of Te Ao Mārama, saying:

> My favourite changes are in Tane Mahuta because it used to be a... bag room, there used to be... where you put your bags and they had toilets and stuff. It's another quiet space and it has six cubby holes.
>
> E: And what happens to the cubby holes?
>
> S: Heaps of people work in them.

The Richmond staff continually connected the students (and their emotions and identity) to the dual nature of ngā Atua through Te Ara Whakamana 'mana wheels' as they negotiated their own ongoing learning challenges. The dual nature of ngā Atua refers to the strengths and the human weaknesses associated with each Atua depicted within the mana wheel. One staff member outlined how the dual nature of each Atua was used to connect with students' emotional states as follows:

> So we'll go through **Rongo-mā-Tāne**, and he's the God of peace … and productivity, that's one of his traits. So we say, when you're in that state, 'what does that look like for you? When you're happy? When you're feeling good, when things are working, how do you look?' Then we go on to **Māui**, and those are challenges and difficulties, 'what are you having trouble with? what do you find challenging?' Then, we go through to **Rūaumoko**, God of earthquakes and I explain that funny feeling in your tummy. A lot of kids don't understand nervous, or anxious, or resentment or frustration, that kind of stuff. So, when you get that funny yucky feeling in your tummy. 'So what happens when that happens? or what causes it?' Talk them through it. Then **Tūmatauenga.** Most people think he's just angry because he's the God of war, but we explain 'no there's more to him. There's strategy, he's a problem solver you know. He doesn't just go out and fight, he has to make a plan'. So, kids are thinking there's more to him. Even our kids that we think are naughty, that have been put in this box for so long, they just think that's it for them. 'No, you're so creative, you're so this. One person... ten million things. Yeah, you're not confined to one way'. (TT)

The embeddedness of the Atua and their characteristics filtered through spontaneously into how the participating students described the spaces, their learning and the self-regulation of their learning within the ILE pods. For example, students interviewed from within Te Ngāhere and Te Ao Mārama (the Middle and Senior school pods) discussed the guiding characteristics of the activity zones:

> My favourite space was Tangaroa [Atua of the Sea] and in Tangaroa we get, it's a real quiet place where only Year 6s and a couple of Year 5s are allowed in, and it's really quiet because it's a flow room. A flow room is where you flow your ideas so... like if you've done a bubble map, which is yeah, and then you just put them into a flow map and then [our teacher] will come read it and ask us to do like a video of something and it's like an art room, kind of, and we have a lot of sea art and stuff.

One student described learning in their favourite activity zone, Ranginui (Sky Father), saying:

> My favourite working space is Ranginui because we get to do making here and imagining stuff that we want to make and... and... we get to bake and make because we have our own little kitchen.

Another student focused on the opportunities for creativity ('blue sky') in the same space, saying:

> My favourite changes are in the Ranginui, because we get to create while we learn. You get to, while you're creating, you can learn from your mistakes. And then how you will improve your strategy and what kind of strategy you will use next time.

Common areas for collective student meetings were associated with characteristics of Tāwhiri-Mātea (Atua of meteorology), 'a place in which Tāwhiri-Mātea flows ideas to us and that's our meeting room where we meet and start off our days.'

And finally, one student, in connecting with Tamanui-te-rā (the Sun), identified it as 'an imagination room where you can imaginate what you want'. In other words, it's a space where sparks of insight emerge.

In this way, te ao Māori guided ways to value ways of thinking, relating and learning within the ILE space. Taking guidance from te ao Māori was an iterative and recursive process. Increasingly, as the ILE took form, the staff looked beyond mainstream theories to te ao Māori for pedagogical guidance in their continued innovation. As one teacher and senior leader pointed out, while other researchers and practitioners in educational research identified key ideas about learning, Māori also had such knowledge:

> In the holidays we attended Mark Treadwell's Conceptual Curriculum … it goes back to looking at the way the brain is designed for learning. I know Nathan Mikaere Wallace points it out, Treadwell pointed it out, Hattie's influence also plays along the same line … But when you look at the Māori perspective, our people have been doing that ... Mason Durie's Te Whare Tapa Wha for generations and we've got the research to support it. (SK)

It was unclear how important it was that the ILE development was led by Māori educators. However, their grounding in te ao Māori formed a strong foundation. It also represented the key tension of the case—the pace of change was fast. Ensuring all staff possessed the knowledge to support the design and aspirations of the ILE innovation formed an ongoing challenge as one teacher identified:

> It's one thing to be cultural and to embrace culture, it's another to... because this is where you need to compromise and collaborate... when you're collaborating. You've got new teachers coming into the school, because not everyone comes in with the same understanding or the same knowledge or the same page. (MB)

By the end of 2017, the next phase of the ILE development centred around integrating both te ao Māori and other world views linked to the identities of the students, into the everyday pedagogies of the school. One teacher described the next step:

> I think our next step is breaking down that mana, [Mana Enhancement programme] … to be teaching and learning in a way like that, that is just every day. So that our Māori kids are achieving as Māori. Our Samoan kids are achieving as Samoan. That we are being culturally responsive to them every day. So how can we do that? Do it through our stories, do it through the values that come from you know our Samoan kids .... and the same with te ao Māori, Māui, Rangi, Papa, ngā Atua, ngā Atua wāhine. (WM)

The question for the next phase of the ILE development became: How can we turn our curriculum to be culturally responsive in an everyday way where we're doing things, they're learning things that way? (WM).

Student Success Through Culturally Located Design—Reflections

Space was used as an element of curriculum (Byers et al., 2014) at Richmond School, explicitly communicating a coherent, and evolving cultural narrative to support students' emotional literacy, learning and identity development. Māori student success was achieved not only through ongoing collective commitment to enhancing their mana linked across time with the wisdom of their tīpuna (ancestors), but also through culturally located spatial design, pedagogy and relationships. Cooper (see Chap. 3) notes the importance of collective teacher efficacy for 'the successful embedding of initiatives to support improved student learning and achievement across a wide range of competencies' (p. X). It may be that this collective commitment led to bullying among students almost disappearing during the 2015–2017 period and an improvement in relation to students' literacy and numeracy achievement. One of the valued indicators of success that staff valued were the frequent anecdotal comments visitors made about students' engagement in their learning and their ability to articulate their learning.

The Richmond School ILE development organically and cumulatively advanced school design, curriculum and pedagogy by drawing on te ao Māori for guidance to promote learners strong in their cultural identity and learning that was aimed towards social justice (Cooper, see Chap. 3). Staff were tasked by the school leadership to respond to student identity as their central challenge, through spatial design, curriculum, pedagogy and relationships. Such a commitment promotes a sense of wellbeing and belonging for students that is positively associated with achievement (Ministry of Education, 2013; Osborne, 2016a, 2016b). The staff created this environment by including specific spatial design features in the ILE such as murals (see Fig. 15.2), activity zones linked to ngā Atua, embedding whanaungatanga through the mana-enhancement emotional literacy framework, inviting whānau into the learning pods any time and communicating the value of belonging through creating the Turangawaewae cafe space in the centre of the school. As evidenced by the student participants discussing their learning, these promoted cultural messages were taken up by them in how they navigated the learning process, talked about themselves as learners

and provided evidence as to how the ILE socio-spatial design responded to students' identity as Maori.

For the Richmond team to grow their capacity to respond to their students, it was paramount they all owned the vision. Collective ownership generated a shared responsibility to the mahi,[10] tamariki[11] and whānau, rather than arbitrary account-ability to the principal or central agencies. The self-managing schools model of Tomorrow's Schools supports the self-determination of school leaders and staff to design learning environments and pedagogical practices that best connect with the particular needs and aspirations of their students and communities. Berryman et al. (2014) highlight the autonomy school leaders possess under Te Tiriti O Waitangi in Aotearoa New Zealand, saying 'Under the Treaty of Waitangi and within their own sphere of influence, school leaders have the power and the mandate through Ka Hikitia to make more of a difference for marginalised students, especially Māori students' (p. 9).

The principle of agency influenced a flexible and fluid approach to school design in the form of coherent learning pods within the ILE unified by the school whakataukī. The spaces themselves, further divided into activity zones that supported certain types of learning, activity and relating, provided flexible scaffolding for students to self-select activities and working relationships as a central part of their learning. Adopting a personalised learning approach for students within the open and flexible learning environment design, supported their mana and dignity.

The characteristics of ngā Atua encoded within the physical and social spaces of the ILE further made possible intergenerational connections across time for students. In te ao Māori, relationships that promote mana and parity of esteem are fundamental. All staff members were valued for the unique role and contribution they brought to the school's learning environment and student wellbeing. Placing students at the centre created a shared mandate on which to act, critique and encourage each other. This combined with a collective responsibility for student success, focused attention on innovation and commitment to students, becoming the forefront of decisions and action.

A commitment to partnership was brought to life through placing the students and their needs at the centre of decisions, as well as recognising the unique viewpoints and mana of all staff, whānau and community members. This partnership was imple-mented through the everyday structures of working within the school ILE: critiquing taken-for-granted practices, multiple feedback loops and engaging with whānau as learning partners to assess alignment between teachers' and community perceptions.

Developing culturally located learning in the ILE development was enacted through 'mahi nga tahi',[12] collective decisions that individuals then took forward into action. This collective commitment to students' success as Māori was shared by all staff. Where possible, particular staff members shared their indigenous knowledge

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[10] Mahi: work.

[11] Tamariki: children.

[12] mahi ngā tahi: working together.

with colleagues. Through these collective design decisions, the Richmond ILE development contributed to the process of decolonising schooling for their students. Māori ways of knowing and relating were enacted through deliberate attention to spatial design, curriculum and pedagogy. Enhancing student mana, identity and belonging were embraced as foundational to the kaupapa of the school.

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Part V
Conclusion

Chapter 16
Educational Change and the Social Project of Innovative Learning Environments in Aotearoa New Zealand

Brett Bligh

Abstract The term 'innovative learning environments' (ILEs) describes a body of work associated with the Organisation for Economic Co-operation and Development (OECD), which has had a substantial impact on many education systems. As with other 'learning environment' initiatives, a bundle of design suggestions, ideas, and frameworks is put forward for the purpose of shaping educational change: in this case, in pursuit of 'twenty-first-century learning'. Earlier scholarship on ILEs has investigated the achievement of outcomes, documented experiences in particular schools and theorised issues viewed as particularly important for making ILEs 'work'. In the present chapter, in contrast, I trace how the overarching initiative has unfolded across an entire polity—Aotearoa New Zealand—where ILEs have had government support for a significant period of time. Treating the preceding chapters in this volume as expert submissions to a principled enquiry, I conceptualise 'ILEs in Aotearoa New Zealand' as a *social project*. I contrast points of commonality and difference between the official OECD 'international movement', the preceding history of learning environments in the country, the recruitment of existing schools by policy mandate, and how aspects of the ILE framework are subsequently institutionalised and localised. At each stage, I consider the key predicaments being posed to stakeholders, the core concepts used to guide action, the ethos expressing how those concepts should be pursued 'correctly', the gradual sedimentation of artefacts and routines, how institutional engagement is framed and handled, and those aspects of stakeholders' lived experiences that propel ongoing development and change. I highlight, among other things, a significant conceptual fragmentation between changes in 'educational practice' and 'physical estate', the fraught development of a 'horizontally connected' ethos, and the increasing centrality of community relations and cultural values to the success of the project. I conclude by suggesting directions for further research on the topic.

Keywords ILE · Social project · Educational change · New Zealand

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Learning Environments and Built Pedagogy Stereotypes

Consider the attention given to 'learning environments' in educational scholarship and policymaking, and you will quickly reach the conclusion that deliberation of the topic is both slippery and unpredictable. Part of the slipperiness derives from the fact that the underlying metaphor is promiscuous. Interfaces of digital platforms; socially supportive relationships offered by educational institutions; constellations of artefacts assembled by individuals to support their own development—all these and more have, at different times, been described as 'learning environments'. The alternative formulation of 'learning spaces' has, over time, been rendered no less ambiguous, encompassing as it does explorations of the digital, conceptual, and developmental. Particularly divisive is the extent to which these environments or spaces of education are positioned as 'physical' (cf. Bligh, 2019b). Too often an issue neglected entirely, where physical space does receive recognition, it can sometimes become so foregrounded on the policy terrain as to become resented by educational researchers and those practitioners working at the chalkface. Part of the unpredictability, on the other hand, arises because of how different aspects of the learning environment oscillate between the core and periphery of educationalists' attention at different times and in different places. The issue of 'physical space', for example, might get neglected in one decade and thrust to prominence in another; be seen as unaffordable at one moment and a vehicle for economic stimulus at the next; receive that stimulus investment in one region of world geography, or educational sector, while being starved of resources in another; here be regarded as peripheral to learning but there as crucial; and so on.

It has sometimes been seen as a matter of irony, against that backdrop, that an ongoing proliferation, across much of the globe, of digital technologies and cloud services has been accompanied by a renewed interest in educational environments and spaces conceived in *highly* 'physical' ways (Bligh, 2019b; Goodyear et al., 2018). The irony arises, of course, because it would certainly be possible to interpret the 'anytime, anywhere' discourses of a digitalising society as suggesting the abolition of physical classrooms or institutional campuses; yet these institutional environments have, on the contrary, received renewed attention (Crook & Bligh, 2016). One reason seems to be a conviction that place-based educational institutions can serve as an excellent vehicle for preparing students for the challenges of tomorrow's 'society'— a society conceived not only as digitised but as mainly based around knowledge work. Yet, it is suggested, such potential will *only* be realised if those institutions can be reconfigured, in ways that allow them to escape their historic role of providing an education suited mainly to an industrial economy now seen as fast disappearing (Benade, 2019; Wright, 2018).

Such convictions—that 'learning environments' (a) are an important locus for educational change and (b) encompass important 'physical' aspects—typically lead to a focus on questions of *how* and *how much.* By what mechanisms do *learning spaces* affect, improve, enhance, or support *learning*, and how do we know? It is often immediately necessary, when such questions are posed, to face down the siren call

of spatial determinism—the search for what Goodyear (in press) calls 'direct effects on learning and instruction'. As I have remarked previously (Bligh, 2019a), certain powerful stakeholders persist in looking for 'absolute or universal knowledge about learning spaces' (p. 6). In doing so, those decision-makers get repeatedly frustrated by context and difference: the dissenting value systems of (other) stakeholders, different accounts of 'effectiveness', failed attempts to transplant designs from one place to another, or the difficulty of codifying locally generated knowledge into some 'lessons learned' framework to guide more generalised action.

I have elsewhere suggested that, rather than looking for direct effects from replicable 'designs', it is likely more fruitful to understand particular educational spaces as mediators of particular educational practices (Bligh, 2019b). I mean to suggest an acceptance, in other words, that spaces sit between real educational actors and their actual objectives; and that the relationships between these different elements (actors, objectives, spaces) are myriad and emergent, rather than categorical, with space as a vehicle for practice rather than a determiner of outcomes. I have also suggested a range of recurring *ways* in which particular spaces, or ecologies of spaces, might mediate the concrete objectives of some particular educational practice (Bligh & Crook, 2017; Bligh, 2019b). To consider just a few examples, particular spaces might facilitate particular kinds of action while obstructing others (an 'enabling' mediation), invoke cultural references that invite specific feelings and behavioural norms (an 'associative' mediation), or accommodate the rhythms of a community's practice and thereby, perhaps, invite a relation of 'ownership' (a 'socially integrative' mediation).

Yet such a particularised view remains marginalised in institutional decision-making; in the real world of governmental policy, funding landscapes, institutional decision-making, and stakeholder discussion, detailed consideration of particular spaces, on a case-by-case basis, is often positioned as an unwarranted luxury. Instead, wide-ranging initiatives of *change* in institutional environments are often mobilised via the discursive power attached to what might be called *built pedagogy*: attempts to embody particular constellations of educational and/or societal values in architectural stereotypes (Bligh, 2019b).

Such built pedagogy stereotypes are platforms for change that seek to circumvent the continued absence of absolute or universal knowledge about spaces themselves: instantiate those stereotypes in a given location, it is claimed, and you will also import a range of (desirable) practices and thereby achieve some (also desirable) outcomes. The stereotypes themselves operate at quite disparate levels of granularity: with some focusing on rooms (e.g., 'flexible learning spaces'; Goodyear, in press), some on buildings (e.g., 'learning commons'), and some on whole institutions (e.g., 'innovative learning environments', the topic of the present volume). Such examples—being promiscuous metaphors for uneasy constellations of practices, technologies, and spatial designs, which oscillate in and out of the attention of senior policymakers—remain slippery and unpredictable in exactly the senses explained above. Yet their 'bundled' nature, and their infusion with a strong sense of moral imperative, renders these stereotypes both attractive to policymakers pursuing

change and highly visible to practitioners, in ways that the existing scholarly literature often fails to grasp and that I wish to highlight in the present work.

Innovative Learning Environments

Innovative learning environments (henceforth, 'ILEs') have been defined, as elaborated throughout the rest of this chapter, in various ways. But, at heart, they are an attempt to re-shape educational institutions into something better suited for the needs of what is labelled 'twenty-first-century learning' (Wright, 2018). ILEs are an important object of study if we wish to understand the change in learning environments, because the underlying model has been formulated within development programmes of the Organisation for Economic Co-operation and Development (OECD) and, in the wake of extensive backing from that organisation, has been adopted in various ways across many polities (OECD, 2006; 2017). The model, however, should not be understood as static and unchanging. Indeed, it is explicitly acknowledged, within OECD reports, that the 'vision' of the ILE is something that stakeholders are supposed to engage with, own and further develop as part of the process of change (OECD, 2013). The current volume provides an outstanding overview of how that vision has been instantiated (engaged with, owned, and further developed) in many institutions across Aotearoa New Zealand—a polity in which ILEs have been taken seriously by both government and school stakeholders for a considerable period of time.

What we might call the core ILE mission is one of systemic educational change. In the canonical OECD documentation (cf. OECD, 2013, pp. 11–13), emphasis is placed on educational institutions (1) fostering new relationships between learners, educators, content, and resources; (2) combining visionary educational leadership with the ongoing professional development of teachers; (3) developing extensive partnerships between educational institutions and outside bodies; (4) implementing 'innovative learning principles'; and (5) exploiting outside 'pumps' of knowledge innovation in their geographical region, especially from industrial sectors such as technology and scientific research and development. Yet ILEs are also a packaged 'bundle', whose elements include, among other things, physical spaces, pedagogical change imperatives, guiding visions of future employment, and access to advanced technologies. The following description of ILEs, for example, highlights how such elements are often seen as intertwined when they are manifest in school institutions:

> Innovative learning environments (ILEs) are a shift away from cellular arrangements of learning and teaching where one teacher holds pedagogical responsibility for a class of children (25–35 individuals) in one classroom to multiple teachers (between 2 and 4) taking shared responsibility for larger and more flexible groupings of students (90–120) within spaces designed as open and adaptable 'learning hubs.' These spaces differ from conventional schooling arrangements and are predicated on the assumption that traditional school design favors conventional visions of teaching and learning, which do not adequately prepare students for twenty-first-century work. What is required instead is student-centered, inquiry-based, and technology-integrated learning within physical spaces flexible enough to support this personalized approach (Nelson, 2019, p. 1).

ILEs, then, are a form of 'learning environment' stereotype, highly visible in policy terms and with many real examples of implementation across the globe (e.g., OECD, 2017). Unsurprisingly, therefore, there is an emergent but rapidly growing field of academic scholarship on the topic, which offers a range of valuable insights that can provide a starting point for understanding how 'organisational change', 'learning environments', and 'physical spaces' are seen as intertwined and re-shaping educational practices together.

One strand of ILE research searches for evidence that the desired outcomes are actually achieved. The quasi-experimental work of Byers et al. (2018a; 2018b), for example, suggests that ILEs do have a discernible impact on student attitudes to their learning experiences, engagement, and academic outcomes. Notwithstanding that, as Byers et al. freely acknowledge, it can be dangerous to generalise simplistically from such findings, this strand of scholarship serves an important legitimating role for systemic change initiatives that are, after all, costly in terms of human effort and financing. It also reinforces the strong sense of purpose at the heart of the ILE enterprise.

Another strand of scholarship seeks to understand how ILEs are instantiated at an institutional level (e.g., Campbell, 2020). Such work, which Imms et al., (2016) call a 'snapshot' approach, involves positioning knowledge about particular ILE settings as emergent, tentative, and gradually unfolding, and thus typically prioritises holistic, longitudinal exploration undertaken with reference to the insights of disparate stakeholders. One particularly detailed 'snapshot' is provided by Wright (2018), whose work examines how a particular school in Aotearoa New Zealand engaged in a sustained effort at *becoming* an ILE over several years. While any focus on a particular institution inevitably occludes a range of issues concerned with ongoing change, contestation, and institutional power across wider ILE *initiatives*—which, as highlighted above, might be operating as governmental programmes across a polity—such work laudably takes contextual situation and ongoing development very seriously. This strand of scholarship is particularly valuable in emphasising the need to take an integrated view of institutions and the protracted struggles that are necessary there when undertaking, over time, what are typically very ambitious visions for change.

A third strand of investigation, meanwhile, seeks to disaggregate how ILEs work (or should work) in practice, and does so by focussing on a range of particular issues positioned as having great import. Examples of such scholarship focus on relationships between ILE initiatives and initial teacher education (Nelson, 2019; Nelson & Johnson, 2017), the development of learner agency (Charteris, 2019), and school design processes (Liu, 2018). Such a prismic separation of issues, of course, comes with risks: especially those of conceptual dispersal and of obscuring how the highlighted issues must necessarily interlock within actual ILEs. Yet such scholarship makes a valuable contribution because theorising these issues promises insights into nurturing the ongoing development of historically embedded values and practices, which will be so necessary for fostering the deep level of cultural change required in ILE initiatives.

The present chapter, however, sets out to contribute a kind of analysis that has been relatively unusual in this literature: an understanding of how the stereotype of 'innovative learning environments' has served as a vehicle for systemic change in many educational institutions when adopted across a polity, and how the associated vision has been engaged with, owned, and further developed as that change has unfolded. The privileged opportunity for me to do so has arisen from an invitation by the editors of the present volume to 'summarise' and 'signpost' the preceding chapters, which collectively present an important account of ILEs and their development across Aotearoa New Zealand. That collective account, which I attempt to engage with in what follows, encompasses extensive engagement with issues such as how practice and theory have jointly developed within educational change initiatives, the implications for different aspects of educational leadership and practice, the ongoing centrality of contextual and sociocultural factors, how to account for what considerations (and which voices) are being included and excluded, and the framing of pedagogy as an interlocking set of partnerships. Particularly valuable is the deep engagement with ILE initiatives *across the polity* of Aotearoa New Zealand which has, as already established, engaged extensively with the idea of ILEs for some time. By 'summarising' and 'signposting' such a rich seam of materials, it is my hope, I can illustrate how the strong sense of purpose, struggles for change by institutional stakeholders, and different conceptualisations—both of the 'learning environment' and of important but more particular educational issues—have become intertwined and developed together over a period of several years.

Adopting the Lens of 'Social Project'

My approach, in what follows, will involve presenting a narrative arising from a *principled enquiry*, in which the preceding chapters are positioned as submissions emphasising aspects of a whole whose overarching contours I wish to trace. By using the term '*enquiry*', I mean to signpost the underlying assumptions (a) that each textual submission represents the considered position of those with significant expertise—the authors of the preceding chapters each have much more insight into their own topics than I do—but (b) that it will be valuable to disaggregate particular aspects of these accounts and reassemble them into an overarching synthesis. Labelling the enquiry as *principled*, on the other hand, denotes that I will use a definite framework to support that process of disaggregation and reassembly.

The framework I use will involve conceptualising ILEs as a 'social project', a concept I derive from the tradition of activity theory, and in particular from the work of Blunden (2010, 2014). Activity theory is a mature social theory used across many fields of scholarship (Engeström, 1999; Kaptelinin & Nardi, 2006). It is, moreover, often used in research on educational settings, where it is typically valued for how it helps researchers locate a phenomenon in its sociocultural context, grasp complex and dynamic situations, and understand change and development over time (Bligh & Flood, 2017). Perhaps the most fundamental tenets of activity theory are that

human subjects' *activity* (sustained, collective effort) needs to be distinguished from their *actions* (time-bound pursuit of definite goals); that activities are regulated by the objectives (often problematic) towards which they are oriented; that activity and actions are mediated by artefacts that sit between subjects and their objects (or goals) in tripartite relationships; that particular activities emerge from social, cultural, and historical precedents; and that those activities continue to develop over time as subjects, in attempting to enact the activity in their actions, experience and respond to the structural problems they encounter.

The concept of 'social project' is intended as a unit of analysis for *activity* (rather than action) within activity theory, meaning, in other words, that human activity can be seen as divided up into a number of social projects. Blunden ([2010](#), [2014](#)), who also uses alternative formulations such as 'project' and 'collaborative project', sees social projects as arising when two or more people come together to address a constraint on their freedom arising from their position within existing social relations. Social projects persist for highly varied amounts of time, with some failing to establish themselves within the social formation in any meaningful way. Those that *do* persist *develop immanently* (according to an internal logic) through various *stages of development* (periods of uneasy stability punctuated by ruptural change) into *institutions* that come to form part of the social relations. The social backdrop against which other social projects are formed, then, is an aggregation of those institutions developed by prior social projects.

Blunden's full conception of social projects—having been developed out of a Hegelian re-interpretation of activity theory, undertaken for the purposes of rendering the theory better suited for intervening in interdisciplinary debates across broad swathes of academia and activism—is complex and has manifold implications. Yet, as I initially read the preceding chapters, I came intuitively to adopt the position that a social project of considerable scale and complexity was underway *across* many educational institutions in Aotearoa New Zealand; different aspects of which were being highlighted in the different chapters. I, therefore, decided to develop, based on my own exegesis of Blunden's work (but especially Blunden, [2014](#)), an instantiation of 'social project' as a conceptual framework suited to this enquiry—a framework which, I hoped, would be rich enough to mediate my disaggregation and reassembly of the 'submissions', while also being sufficiently abbreviated to be manageable.

That instantiation emphasises six main aspects of social projects, which will furnish a structure for my narrative in the subsequent sections and can be labelled as follows:

- *Predicament*: how constraints on freedom within a social structure are *posed* to the social project at a given stage in its development. Subjects each feel and understand problems in their own ways, but also accept, to differing extents, that by participating in a social project they are confronting those problems in ways understood and conceived across that project.
- *Concept*: a common purpose towards which a system of actions is to be oriented. Concepts disclose the ideals and motivation inherent in the project and suggest overarching strategies for confronting predicaments. Over time concepts usually

come to develop a variety of names, official definitions, and tacit meanings, but they are not *reducible* to linguistic phrases or psychological constructs. Concepts within social projects are collectively developed, explored, and contested.

- *Ethos*: a set of ethics mediating between the concept of the project and the actions undertaken. Projects develop ethics as attempts to promote 'correct' conduct, with such 'correctness' developing in relation to dominant concepts. The ethos of a social project serves to help subjects to choose and evaluate their actions; it typically incorporates direct exhortations to pursue a concept, indirect mechanisms to regulate actions (via recognition or incentive), and propagated ethics incorporated from other projects within the broader social formation.

- *Sedimentation*: the production or appropriation of mediating artefacts that each 'objectify' elements of the concept or ethos of the project. Sedimented artefacts are used within projects to pursue action; among other things, they may describe routines or constrain how a given action unfolds.

- *Engagement with institutions*: unfolding relations with other social projects within the social formation (which appear, from the standpoint of this project, as 'institutions'). Social projects seek, as the preceding aspects of the framework highlight, to address the predicaments that confront them by developing concepts and projecting them into the social formation. Since the social formation is comprised of other social projects, doing so means pursuing change *with* and *through* other institutions. Yet those other institutions are also dynamic and have their own logics, and so a variety of relations between social projects can be developed, of vastly differing degrees of desirability (Blunden discusses examples of engagement such as exchange, command, colonisation, and solidarity).

- *Lived experience*: the process of encountering and confronting crises as the social project is enacted. Such crises are experienced by subjects who participate in the social project and may arise within the project or its relationships of engagement to other institutions. Blunden emphasises that crises can be manifest very differently, depending on the locus from which they arise and the extent of their implications. For present purposes, I shall emphasise merely that, in confronting and seeking to overcome such crises, subjects re-shape both the social project and the predicaments it confronts, often in unpredicted ways.

In what follows, I shall attempt to map the contours of 'Innovative Learning Environments in Aotearoa New Zealand' as a social project. Doing so will involve tracing, at different stages, the key predicaments being confronted, the core concepts being pursued, the ethos guiding action, the sedimented artefacts used in the project, how the social project engages with other institutions, and the lived experiences driving ongoing change and development. Based on my reading of the preceding chapters, it seems to me that there are four stages of development that need to be considered. Latterly, I shall engage, in turn, with the *history* of learning environments in Aotearoa New Zealand, thereby disclosing the sociocultural precedents on which the social project seeks to build; the deliberate *introduction* of ILEs into the polity's educational system; and the experience of *institutionalising* ILEs over time to adapt to the realities of the social formation. Each of those topics receives considerable

attention in the preceding chapters and is sufficiently different from the others to be positioned as a 'stage of development'. Before examining those stages, however, I first need to consider how the *international* social project of ILEs, as posed by organisations like the OECD, was conceived in the preceding chapters. As we shall see, it is that conception and its prestige as an 'international movement' that shaped the action taken subsequently.

The 'International Movement' of Innovative Learning Environments

Figure 16.1 provides a graphical overview of the extensive programme of work carried out under the aegis of the OECD, over a number of years, and given the name 'Innovative Learning Environments'. The figure, an outcome of my process of disaggregating the preceding chapters and reassembling a narrative synthesis, introduces a format that I shall reprise again in subsequent sections. Importantly, the figure provides an overview from the standpoint of the submissions in this book and does not represent how ILE priorities might be conceived in other settings or by OECD decision-makers. That is a particularly important point because, as we shall see subsequently, *how ILEs were presented to and understood by* stakeholders in Aotearoa New Zealand had a large impact on the idea when it was introduced there.

Figure 16.1, in short, portrays a social project mobilised to confront several predicaments, such as a need to prepare learners for a 'rapidly changing world'. The ILE project comprises some core concepts, including 'innovative learning environment' itself; an ethos used to pursue those concepts, such as imperatives for horizontal connectedness and distributed leadership; and a collection of sedimented artefacts to be used to guide action—including an OECD 'Learning Environment Model' and the invocation of particular digital technologies. The project attempts to change the social formation with and through other institutions: engaging with senior policymakers via the OECD and UNESCO and striving to ensure that relevant
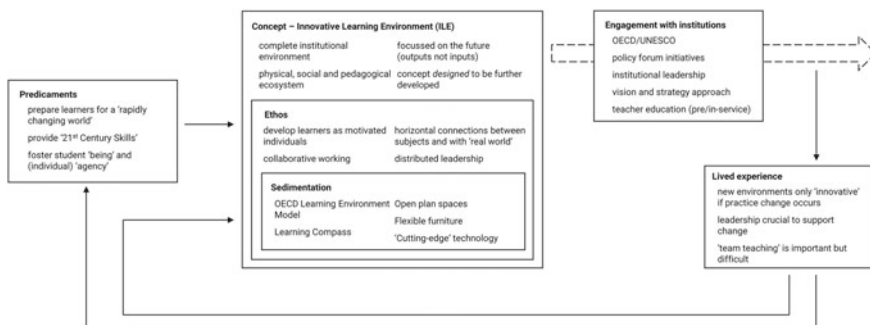

Fig. 16.1 The 'international movement' of innovative learning environments as a social project

concepts are cascaded downwards via institutional leaders and teacher education initiatives. Lived experience is, over time, highlighting the centrality, for embedding the core concepts in the wider social formation, of 'practice change' strategies, school leadership, and team teaching. Attempts to respond to such experiences will likely, over time, lead to development in how the predicaments are posed and in the formulation of the project itself.

Several aspects of this social project will be consequential in the subsequent account and need to be highlighted in particular.

Predicaments

It should be immediately obvious that the *predicaments* are posed in global and somewhat inexorable terms. Cooper (Chap. 3) provides a valuable overview of the 'strategic directions' associated with ILEs, which emphasises 'global' and 'worldwide' educational policy responses to twenty-first-century economic changes, with reference to examples from several polities. The OECD, in particular, is positioned as an institutional actor with extensive expertise in addressing such challenges; Falloon (Chap. 13), for example, emphasises its decades-long focus on developing a better understanding of changing educational 'competencies'.

Additionally, there are extensive references to issues of 'being' and 'agency'. Cooper (Chap. 3) usefully highlights the mobilisation of arguments that education is increasingly seen as concerned with developing who students 'should be', for example, while Charteris and Smardon (Chap. 4) emphasise the centrality of agency in relation to proactive engagement in educational decision-making. The notion of 'twenty-first-century skills', a concept arising from a neighbouring social project with much influence on ILEs, also reflects these priorities. Cooper (Chap. 4) emphasises, for example, that visions of 'twenty-first-century learning' see particular dimensions, such as knowledge, skills, and character, embedded within a framework of 'meta-learning', in which people 'embrace challenges', 'adopt a growth mindset', and thereby 'improve achievement and the self-perception of their abilities'.

Yet, overall, the 'agency' being emphasised is most comfortably positioned in relation to individual learners. While Cooper (Chap. 3) notes exhortations that students will go on and contribute to making their countries fit for the future, such contributions seem more about adapting or furthering than critiquing or challenging the existing direction of travel. Interestingly, Fallon (Chap. 13) notes that, to some extent, students are being equipped to 'cope' with the demands of rapidly changing societies.

Concepts

To respond to such predicaments, this social project has developed the eponymous *concept* of 'innovative learning environments'. That concept, most fundamentally,

orients action towards a *complete* or *holistic* construct encompassing physical, social, and pedagogical aspects (sometimes presented, in a diagrammatic model, as graphically intertwined). Many preceding chapters purposefully emphasise the importance of understanding the ILE, as described by the OECD or in influential international scholarship, as an 'ecosystem' or 'organic whole' that links these different aspects (Cooper, Chap. 3; Edwards, Chap. 9; Herewini, Hawera, and Cowie, Chap. 10; Fallon, Chap. 13; Trask, Chap. 14). However, the ILE concept is not totally encompassing: it focusses, as Cooper (Chap. 3) correctly highlights, on educational 'outputs' more than 'inputs'. In other words, the project of ILEs is focussed on achieving excellent *outcomes from* education, rather than on other issues, such as universal access, that are the object of many other projects working in fora such as UNESCO.

Ethos

Descriptions of the *ethos* of the project fundamentally orbit around themes of learner-centredness and how to achieve it. 'Correct teaching', in this project, recognises students as people, with their own emotions and motivations, while 'correct learning' is both collaborative and appropriately challenging; these ethics, as Cooper's account (Chap. 3) makes clear, are propagated from prior research projects, and it is on that basis that they derive their eminence.

There is also a strong ethic of *horizontal connectedness*—by which is meant, as both Cooper (Chap. 3) and Falloon (Chap. 13) emphasise, forging links between different school 'subject areas' and between in-school and out-of-school contexts. That definition is important because, as elaborated below, the notion of 'horizontal connectedness' has come to have a wider range of meanings in Aotearoa New Zealand. There is also an emphasis on teacher professionalism: often expressed via an ethic that teachers will take on distributed leadership in areas such as vision setting, planning, and co-ordination.

Sedimentation

In some ways, the *sedimentation* of the social project might be considered surprising—not so much in what is covered, but in the relative degrees of emphasis accorded to different artefacts. Prominent artefacts include graphical models and checklists focussed on learners (the 'learning compass', reproduced by Cooper, Chap. 3) and the (holistic) environment itself (the 'Learning Environment Model', in Falloon, Chap. 13). Yet, while the social project certainly seems interested in aspects of the physical environment, with open plan spaces, flexible furniture, and 'cutting-edge' technology being mentioned (Edwards, Chap. 9), these are seldom the real focus of attention. As Falloon notes:

> OECD reports focus less on space design, and more on the nature of teaching and learning happening within them. They also describe the sort of changes needed to learning design and pedagogy to facilitate outcomes enabling students to thrive in increasingly unstable future environments.

As I mentioned earlier in the chapter, the extent to which learning environments are positioned as 'physical' is often contentious. It seems plausible that there is a deliberate effort to sediment artefacts in ways that avoid that aspect of the environment coming to dominate the project.

Engagement with Institutions

The actions of *engagement with institutions*, conversely, might be readily anticipated by those familiar with the OECD and its projects. The OECD itself, as Cooper emphasises (Chap. 3), is crucial for the project: providing resourcing for ongoing work, including evaluation initiatives focussed on comparative analyses; and, along with other bodies such as UNESCO, serving as a dissemination route for reports and other outputs. The OECD is also a venue for various policy forum initiatives (Cooper discusses the International Policy Dialogue Forum, for instance), at which senior decision-makers are engaged with differing degrees of regularity. Where issues are considered particularly salient, particular reports are produced: for example, on approaches to institutional leadership, vision and strategy formulation, and (as Fallon emphasises especially) initial teacher education.

Lived Experience

Properly understood, the *lived experience* of ILEs, of course, incorporates the aggregate of crises, large and small, encountered by all those who try to enact the project at every level. Yet the most visible ways in which such experiences feed back into the social project of ILEs at the international/OECD level is, as Cooper emphasises, via a number of longitudinal research projects taking place across several countries (including Aotearoa New Zealand).

Emergent concerns emphasise discrepancies between design and enactment, and the inadequacy of merely labelling a school as an ILE; one expression of which is that 'a design may be deemed 'innovative' but it only becomes an ILE once its inhabitants (teachers and students) teach and learn innovatively within them' (Mahat et al., 2018, quoted in Cooper, Chap. 3). It is for this reason that an increasing emphasis is being placed, as my initial overview highlighted, on strategies to support 'practice change', school leadership and team teaching.

The focus of the present narrative, of course, is not about how the social project of ILEs is developing at an international level, but rather about the introduction and

institutionalisation of its concepts across Aotearoa New Zealand. Introducing ILEs there necessarily involved projecting those concepts onto the *existing* framework of 'learning environments' in that polity. For that reason, I turn next to how the history of such learning environments is represented in the preceding chapters.

A Schematic History of Learning Environments in Aotearoa New Zealand

Figure 16.2 purports to provide, using the same graphical format as before, a schematic history of 'learning environments' in Aotearoa New Zealand. It should be clear that the subject matter of the present section is *not* a single social project per se, and thus that the figure aggregates many projects over a significant period of time. Constructing such a composite picture stretches my framework to the limits of its validity; were the history of schooling across the polity to be the overall focus of the chapter, then I would approach the analysis differently. Yet, for present purposes, it seems legitimate and useful to frame aspects of prior projects—predicaments, concepts, and so forth—in a way that shows how they provide a particular historical backdrop for the introduction and institutionalisation of ILEs. In doing so, I aim to be true to the activity theory tenet of historicity: that deeply embedded precedents of practice form the conditions in which change occurs and shape how attempts to change practice are received and co-opted.

Overall, I wish to highlight that 'learning environment' projects in Aotearoa have historically confronted predicaments concerned, to reprise a vocabulary introduced above, with issues of educational 'input'—such as ensuring access to schooling. A range of preceding initiatives, often derived from 'international movements', have had varying degrees of impact over decades, and these have elicited very mixed reactions from teachers, students, and the wider public. A strong ethos of 'learner centredness' is interpreted, in this context, as encouraging the formation of strong teacher–student relationships. A parallel ethos, which Wright (Chap. 2) calls 'making
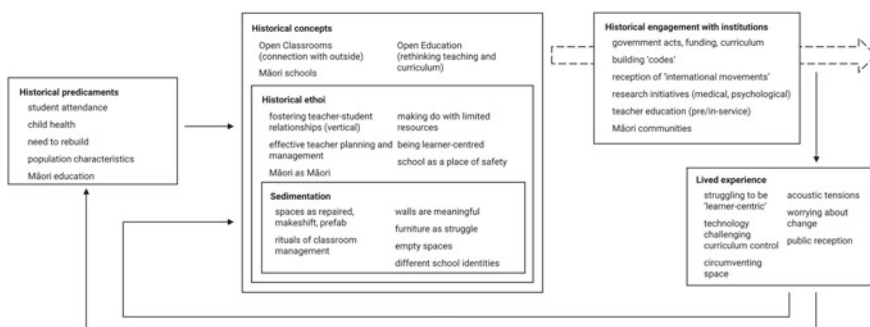

Fig. 16.2 A schematic overview of learning environments in Aotearoa New Zealand

do', underpins a creative appropriation of the physical spaces of schooling: necessary because those spaces, as actually sedimented, have been manifestly less-than-ideal for mediating wider educational objectives. Learning environment projects across the polity have typically worked with and through a range of other institutions, including, on the one hand, governmental initiatives that aim to codify universal knowledge and, on other, local communities whose disparate concerns tend to pull schools towards having different 'institutional identities'. Once again, in the rest of this section, I shall highlight some particular aspects of this schema of consequence to the later analysis.

Historical Predicaments

The historical *predicaments* that have shaped 'learning environments' in Aotearoa New Zealand are incisively described by Wright (Chap. 2). There has been a very longstanding emphasis on problems of low attendance and poor student health, with these arising partially from the more general state of *public* health and, at times, against a backdrop of child labour. In more recent decades, such predicaments have been complemented with a focus on accommodating bulges in population demographics and dealing with serious challenges to school estates arising from disasters, such as earthquakes.

Furthermore, particular schools have been established, at different times, in response to perceptions of educational need for particular sectors of the population—a notable example being the 'Native Schools' (sic) set up from the early twentieth century onwards for Māori students and the ongoing development of such institutions as distinct social projects over decades.

The common thread, as characterised above, is that these are predicaments concerned with educational 'inputs': how to ensure that all children can and do get accommodated within some institutionalised 'learning environment'.

Historical Concepts

Particularly pertinent *concepts* orienting projects over recent decades have, as Wright (Chap. 2) emphasises, sought to circumscribe what it would mean for a learning environment to be 'open', 'modern', or 'flexible'.

Wright draws particular attention to the concepts of 'Open Education' and 'Open Classrooms', which have very different meanings. The notion of Open Education directs attention towards reimagining pedagogy; Wright emphasises that 'espousing this philosophy meant teachers rethought their views of control, ideas about curriculum and ideas about pedagogical practices'. The concept of Open Classrooms, on the other hand, orients action, in highly specific ways, towards the re-design of the physical environment. More specifically, 'Open Classrooms' orients design

practices, wherever possible, towards removing exterior walls, which the concept positions as barriers between the building interior and the 'fresh' outdoor environment (exposure to which is positioned as bringing health benefits). That emphasis on 'open' classrooms was sometimes succeeded by a focus on 'open-plan' schooling: a pivot towards greater emphasis on *internal* room configuration that also means eradicating walls (this time, to make larger classrooms).

Somewhat separately, as Herewini, Hawera, and Cowie (Chap. 10) and Nelson and Rehu (Chap. 15) each emphasise, there has also been a growing conceptualisation of culturally Māori education, though arguably that conceptualisation directs attention more towards pedagogy and community relations than to the built environment (Wright, for example, documents Open Classrooms examples in Māori institutions that seem little different, in their physical form, to those elsewhere).

This persistent conceptual demarcation between *developing pedagogical practice* and *re-designing physical space* is, I suggest, an important precursor to how ILEs would later be re-conceptualised and introduced.

Historical Ethoi

While descriptions of the particular *ethoi* (plural of ethos) predominating at different moments are heterogeneous, a common thread is an emphasis on how attending school should *feel*.

One longstanding ethic emphasises that school should be a place that *feels safe*; a clear response to some of the most pressing predicaments being posed which has, as Reinsfield (Chap. 11) emphasises, been propagated down to the present day. A strong ethos, in recent decades, of striving to be *learner-centred*, as also emphasised by Reinsfield, has built on a long-established notion that teachers should act as *guides* for students through their period of compulsory education (a period to some extent, as discussed by Barnard and Ferrier-Kerr, Chap. 8, seen as a 'rite of passage').

Yet this ethos of awareness and responsiveness in relation to *students* has typically been accompanied by a notion that teachers carefully plan for classroom practice as *individual* practitioners, rather than in close collaboration with other teachers. I thus characterise this ethic, in contrast with that of ILEs, as one of *vertical connectedness*.

Another core way for teachers to 'correctly' mediate their practice uses an ethic which Wright characterises as 'making do' (Chap. 2), in which people relate their educational objectives to the built environment plant available and, in many cases, seek to subvert aspects of the latter in pursuit of the former. This ethic proceeds from a recognition that the physical learning spaces of schools are expensive (or underfunded) and, therefore, that those actually available are perennially inadequate (or unsuitable). That recognition, in turn, is taken as tacit permission to creatively reappropriate the available spaces. Teachers, sometimes together with students, engage in 'working out' how to make the best use of available spaces: in doing so, they rearrange and repurpose them. For particularly 'underserved' subject domains, enacting this ethic has involved appropriating corridors, halls, and outdoor spaces, and thereby

escaping from other spaces viewed as overly constraining; Luton (Chap. 5) and Coleman and Thomson (Chap. 6), for example, each provides insightful accounts of this occurring in drama education. Making do, in turn, has important implications for how learning environments in schools come to *feel owned* by their denizens (see Bligh, 2014); it is, to reprise a vocabulary I have used elsewhere (Bligh & Crook, 2017), a core aspect of the space's *social constitution.*

Sedimentation

The *sedimentation* associated with learning environments has varied, at different moments, from prefabricated to 'makeshift' and from cramped to open-plan. Wright (Chap. 2) provides an astute overview of some of the different permutations. One common thread is a sense of inadequacy that I have elsewhere called viewing space as *impeding* (Bligh & Crook, 2017). Furniture has often been seen as something to struggle *against* (Wright describes it as often heavy, standardised, and wooden). Walls, on the other hand, have attracted significant but varied meanings—whether positive, as protective barriers against noise or cold, or negative, as signifiers of over-crowded conditions (Nelson and Rehu, Chap. 15, for example, disparage a history of 'eggcrate' classrooms). This sense of inadequacy is not unique to Aotearoa New Zealand but, nonetheless, should not be ignored: ethoi starting from the presumption that spaces are problematic have often been well-founded.

Sedimented alongside these aspects of the built environment have been *rituals* of classroom management—such as teachers and students together moving chairs and tables as an act of preparation for particular practices (Luton, Chap. 5)—which are every bit as entrenched and meaningful as the spaces and furnishings themselves. Another layer of sedimentation takes shape at the 'school institution' level, with Reinsfield (Chap. 11), in particular, highlighting that particular schools have long-established reputations (for being 'traditional' or 'innovative', for example) that influence community relations, including parental decision-making about where to send their children.

Historical Engagement with Institutions

Turning to the issue of *engagement with institutions*, it is clear that state bodies have been important collaborators. Indeed, prior social projects concerned with learning environments have, to some extent, had their concepts *stipulated by* governmental authorities, such as the Ministry of Education and Education Review Office. Such relationships are commensurate with what Blunden (2014) calls project 'colonisa-tion' (p. 19). Several chapters discuss how such bodies have sought to influence

school environments via legislative acts, funding structures, and curriculum stipulations (Wright, Chap. 2; Luton, Chap. 5; Coleman and Thomson, Chap. 6; Barnard and Ferrier-Kerr, Chap. 8; Reinsfield, Chap. 11).

Reflecting the concept-level divide between the built estate and pedagogical development, established above, the government has set *building* 'codes' for schools, which have stipulated precise requirements in policy priority areas, while seemingly overlooking other aspects of school provision (Luton, Chap. 5). Importantly, state institutions have often sought to valorise, and impose onto schools, knowledge derived *externally*. Wright, for example, discusses the influence of commissioned research initiatives led by those with expertise in medicine or psychology, rather than education per se, and also how school building codes (including those for 'Open Classrooms') were sometimes derived from developments in other sectors, such as hospital design.

Also valorised—importantly, from the standpoint of the subsequent narrative— have been concepts from overseas. Open schools, for example, were a concept imported from the Open-Air Schools League, which Wright characterises as an 'international movement' which engaged in active international lobbying, including across the Commonwealth. (I have characterised ILEs, above, as an 'international movement' to draw attention to the parallels between the two initiatives.) Initial teacher education, on the other hand, has provided a less unidirectional vehicle for institutional engagement, serving as a point of relationship between schools, universities, and government.

Another tendency, somewhat countervailing to the one above in its emphasis on locally developed knowledge, has been to collaborate with local communities in attempts to 'embed' schools—not only within communities as people and territories but within their sociocultural value systems. Interestingly, the chapters which most strongly emphasise such community engagement are those concerned with *Māori medium* schools, where, in recent times, local concepts, identities, and forms of knowledge have been co-created with local communities over protracted periods (Herewini, Hawera and Cowie, Chap. 10; Nelson and Rehu, Chap. 15).

Lived Experience

When examining the *lived experience*, we must start by acknowledging that the crises experienced have been many and varied. Yet the preceding chapters highlight several recurrent tensions that have influenced how previous projects have unfolded in notable ways.

Two such tensions are concerned with challenges to teacher professionalism. Firstly, teachers have engaged in an ongoing struggle around *being* learner-centric. Previous projects, such as those of open-plan classrooms, have implored teachers to reject teacher-centrism on the basis that it represents an 'industrial' model of education. While teachers have largely *understood* the argument, that has not always meant that they have been able to make the attendant changes to their practice (highlighted

by Wright, Chap. 2), especially in the face of new challenges to classroom management posed by noisy open-plan spaces. Secondly, teachers have struggled when confronting the challenges of technological change and, in particular, the effects of that change on their *control* of how educational practices unfold and the information that students use. These experiences, as we shall see below, are exacerbated by the recent turn to ILEs.

Other experiences concern how learning environment projects are received by stakeholders. Occasionally, public commentary on the more radical initiatives has been hostile—Wright memorably describes some examples of responses to open schools as 'vitriolic'—and parents have demonstrated an ability to 'vote with their feet' by sending their children to different schools. Teachers, in particular, may feel caught in the middle of such crises; especially where, as Reinsfield (Chap. 11) highlights, they disagree with (or fail to understand) new concepts themselves. It is important to acknowledge that such reactions are not necessarily ill-founded, with attempts to 'open' the indoor environment to exterior elements in cold climes, leading to complaints about always being 'freezing', seeming particularly misconceived in retrospect.

Importantly, teachers have thus become used to *worrying* about educational change and how it might be *imposed*: Barnard and Ferrier-Kerr (Chap. 8), for instance, refer to teachers feeling 'vulnerable, insecure and exposed'. Such worries have, over time, come to dovetail with teachers' own ongoing redefinition of their professional identity. The ethos of 'making do', in particular, has come to symbolise everyday teacher resistance to particular aspects of the imposed learning environment.

It is against *this* backdrop that we need to position the introduction of ILEs to Aotearoa New Zealand.

Introducing 'Innovative Learning Environments' to Aotearoa New Zealand

In this section, I turn to consider the deliberate introduction of 'innovative learning environments' into the educational system of Aotearoa New Zealand. By purposefully revisiting points made in preceding chapters, I aim to highlight how the social project of *ILEs in Aotearoa New Zealand* emerged as a contested amalgam, in which aspects of the 'international movement' of ILEs interacted with the rich seam of historical precedent in the polity.

Figure 16.3 provides a graphical overview of the content I unpack further below. To permit easy comparison, the illustration's format is broadly similar to the other diagrams in the chapter. Yet some minor modification is necessary to accommodate the actual narrative. Given the historical precedent discussed above, it should be unsurprising that ILEs were largely introduced by government agencies, who, seemingly based on their own reception of an 'international movement' at the policy level, stipulated key aspects of what would occur. Those government agencies thus
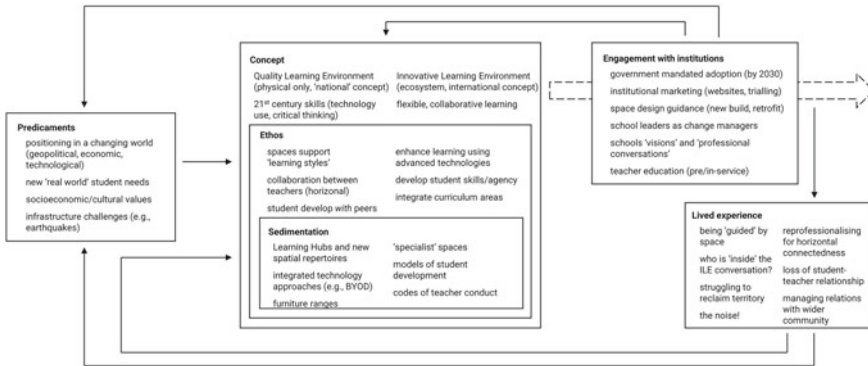
Fig. 16.3 The 'introduction' stage of the social project *ILEs in Aotearoa New Zealand*

explicitly worked to re-frame both the social projects of schooling and the very predicaments which were understood as being confronted. To reprise vocabulary from earlier, this is a relationship of project colonisation: one social project (government work on ILEs) substitutes its concepts into others (schools), in this case as a precursor to recruiting existing institutions into a new project (which I call *ILEs in Aotearoa New Zealand*).

A distinct strength of the present book is that the preceding chapters construct detailed narratives from the perspectives of those school-based stakeholders (institutional leaders, teachers, students, surrounding communities) who, having been recruited into the new social project, actually enact and develop it in practice. On the other hand, there is a lacuna about how the high-level policy process unfolded as a social project in its own right—which inevitably produces, in turn, a scotoma (blurred area of vision) in my own narrative. For present purposes, then, the extra (and deliberately unidirectional) arrows in Fig. 16.3 should be taken to indicate merely the direct policy influences as they were experienced by school-based stakeholders.

Engagement with Institutions

Given the above proposition that existing school institutions in the social polity have been deliberately *recruited* into working on ILEs by government bodies, it makes sense to commence the exposition of this particular stage of development by first considering the issue of *engagement with institutions*, before moving on to explore the attendant implications for other aspects of the social project.

Most immediately, educational stakeholders were recruited (and are still being recruited) into the new social project by mandate. It is commonplace, in the preceding chapters, to note either that many stakeholders have had no choice in the transition or that there is a government expectation for all schools across the polity to 'be ILEs' by 2030 (Cooper, Chap. 3; Coleman and Thomson, Chap. 6; Barnard and Ferrier-Kerr,

Chap. 8; Trask, Chap. 14). Yet such imperatives have often been accompanied by the softer power of incentives and marketing. Schools requiring funding for new classrooms, for example, have been invited to 'trial' aspects of an ILE in those new spaces (Luton, Chap. 5), and a Ministry of Education webpage has been used to amplify positive success stories (subsequently withdrawn, possibly since its content was seen as hyperbolic). In other cases, earthquake damage has been taken as an opportunity to rebuild school estates along ILE lines (Coleman and Thomson's case study, Chap. 6, is situated in such an institutional circumstance). The common threads are a desire to frame *good examples* that might influence aspirations elsewhere; to reinforce such short/medium-term *encouragement* with longer-term policy *imperatives* ('by 2030'); and, importantly, to frame *school leaders* as both target audience for persuasion and locus of institutional change.

Institutional leaders, once recruited, have been expected to establish new institutional 'visions' (Coleman and Thomson, Chap. 6; and discussed in depth by Falloon, Chap. 13) and lead 'professional conversations' about those visions within their institutions (Barnard and Ferrier-Kerr, Chap. 8; Falloon, Chap. 13). In the case examined by Falloon (Chap. 13), that was accomplished via 'establish[ing] a strategic leadership team with devolved responsibilities for leading aspects of the change process'. In parallel with these developments, a range of documentation has been produced by governmental bodies, much of which emphasises 'physical' aspects of the learning environment. Luton (Chap. 5), for example, mentions the New Education Infrastructure Design Guidance document, which sets out detailed standards for the acoustics, thermal comfort, and air quality of ILE spaces. There has also been a repeated emphasis put on teacher education, and especially *initial* teacher education, as a vehicle for changing practice in ways commensurate with ILE values. Yet, as Nelson and Johnson (Chap. 12) make clear, to some extent this emphasis on teacher education has often taken a broad and aspirational form rather than having been worked out in detail. The latter contrasts markedly, of course, with the elaborate guidance made available about built environment issues.

Predicaments

As alluded to above, the introduction of ILEs has involved re-framing those *predicaments* to which educational systems and their components are seen as responding. Perhaps unsurprisingly, some such predicaments seem newly posed in ways that echo those of the broader 'international movement' of ILEs (cf. Fig. 16.1). There is much recognition of imperatives that each learner, for example, 'is an active participant and citizen in creating a strong civil society, is productive, valued and competitive in the world' (quoted in Cooper, Chap. 3), and that they should be shaped into 'confident, connected, actively involved, [and] lifelong learners' (quoted in Coleman and Thomson, Chap. 6). Indeed, the broader vocabulary of 'twenty-first-century learning'—as established before, an established OECD talking point—is also referenced as being newly emphasised alongside ILEs (Charteris and Smardon,

Chap. 4; Coleman and Thomson, Chap. 6; Nelson and Rehu, Chap. 15). Posing such predicaments signals a relative shift to focussing on educational 'outputs' which, as preceding sections have established, is more a hallmark of the ILE 'international movement' than of historical precedents in Aotearoa New Zealand.

Yet we should not imagine that ILE rhetoric has been imported wholesale. On the contrary, historically accreted predicaments about cultural values have continued to resonate as ILEs have been introduced: the ongoing relationship between 'liberal education' and a national history of colonisation, for example, is positioned centrally by Nelson and Rehu (Chap. 15), while infrastructure challenges are discussed in relation to earthquakes by Coleman and Thomson (Chap. 6). The constellation of predicaments posed, then, is a complex amalgam. Quite how *this* particular constellation of predicaments came to be accepted within the dominant educational discourse within the period of time under consideration, however, is not entirely clear and would be a very worthwhile topic for future research.

Concepts

That lack of clarity, at least from the standpoint of those stakeholders whose narratives furnish this edited volume, extends also to the core *concepts* associated with the introduction of ILEs (Barnard and Ferrier-Kerr, Chap. 8, note a quick succession of different terms deployed by government agencies). Yet one fault line within the conceptual framework of this new social project is perfectly clear: a demarcation between re-shaping 'physical space', on the one hand, and 'pedagogical practice', on the other.

One particularly important term, in this regard, is *quality learning environment* (QLE), which needs to be understood as distinct from that of ILE. As the Ministry of Education information website emphasises:

> The concept of quality learning environments (QLE) is not a direct replacement for innovative learning environments (ILE). ILE is a term used in New Zealand and internationally to refer to the wider ecosystem of people (social), practice (pedagogical) and physical/property. QLE relate to the physical (only) learning environments (MoE, 2021).

Thus, QLE and ILE are different but interrelated concepts: with ILE an *international* concept framing a *variety* of pedagogical priorities, and QLE a *national* category orienting attention towards the *physical* environment and attendant *standards* by which it might be evaluated. Such conceptual demarcation, of course, has firm precedent in Aotearoa New Zealand, as the previous section established. Yet it can also be seen as a sensible response to the fact that, as Eames and Milne (Chap. 7) point out, the core ILE principles 'indicate little about the physical spaces'.

Other core concepts also seem to be international categories augmented with a more specific national content. Concepts such as flexible and collaborative learning (among others) are appropriated from earlier initiatives supporting teachers to be learner-centric, while the local instantiation of 'twenty-first-century skills' bears

some similarity to the equivalent OECD concept, but with, as Reinsfield (Chap. 11) acknowledges, a particularly strong emphasis on technology use and critical thinking. While advanced technology is often seen as a core component of contemporary learning spaces (Crook & Bligh, 2016), in this conceptual framework opportunities for students to use technology are being positioned as *ends* in themselves as well as means.

Ethos

The *ethos* of the social project, perhaps unsurprisingly given the above changes, appears more as a set of distinct ethics, only some of which are integrated into a coherent ethos at this stage.

Some of those only 'partially integrated' ethics seem propagated from elsewhere and, perhaps as a consequence, still more espoused than understood and internalised. Much discourse in the social project petitions teachers, for example, to ensure that technologies are used in ways that bolster 'digital literacy' or nurture 'digital community' (Reinsfield, Chap. 11); emphasises the integration of curriculum areas (Edwards, Chap. 9), sometimes with technology as a core mediator between those areas (Eames and Milne, Chap. 7); or leverages claims that new furniture configurations will allow teachers to better support students' different 'learning styles' (Wright, Chap. 2). Yet such ethics seem, at this introductory stage, hesitant: expressed through phrases such as 'there is an expectation that' (Eames and Milne) or that 'ILEs have the scope [to]…' (Edwards, Chap. 9). My reading is not so much that teachers oppose per se the introduction of such ethics, but rather that the initial impact on practice is nascent and loosely understood.

However, another set of ethics, which I shall collectively refer to as *horizontal connectedness*, seems more directly enacted and integrated into the core ethos more quickly. One aspect of that ethos involves valorising teachers *working collaboratively* with each other, in both planning and enacting their work. Variously positioned as involving 'co-teaching' (Charteris and Smardon, Chap. 4), developing 'collegial relationships' (Barnard and Ferrier-Kerr, Chap. 8), or as bringing together, with reference to a school unit, the 'PMK team' (Herewini, Hawera and Cowie, Chap. 10), there is abundant evidence in the preceding chapters that this imperative is taken very seriously indeed from the very point that a school is recruited into the ILE project.

Another aspect of this *horizontal connectedness* is the forging of *peer relationships* between students, within what Cooper (Chap. 3) refers to as 'a developing conceptualisation of space, grouping and class'. Such relationships are variously conceived as being 'student centred' (Charteris and Smardon, Chap. 4; Coleman and Thomson, Chap. 6; Eames and Milne, Chap. 7; Barnard and Ferrier-Kerr, Chap. 8; Trask, Chap. 14) or as about the correct pursuit of the concept of collaborative learning (Cooper, Chap. 3; Charteris and Smardon, Chap. 4; Luton, Chap. 5; Coleman and Thomson, Chap. 6; Barnard and Ferrier-Kerr, Chap. 8).

Overall, this *horizontally connected* ethic, by comparison with the preceding historical ethos (which emphasised forging supportive teacher–student relationships), impels a profound ruptural change in local practice. Yet, while the change certainly *echoes* the priorities of the 'international movement', the actual nuance of meaning here is much more directly concerned with the integration of *practices* and collaborative *relationships* than is emphasised in the OECD project.

Sedimentation

The *sedimentation* associated with the social project at this stage is, like the concepts and ethos being 'objectified', also bifurcated: in this case between appropriated physical artefacts and locally developed models of pedagogy and student development.

The appropriation of physical artefacts is mainly evident in discussions of spatial design and technology. Introducing ILEs typically means, in this polity, adopting space designs from elsewhere in ways mostly determined by guidance on *quality learning environments*. For example:

> There are 'Learning Hubs' or large shared classroom spaces surrounded by breakout spaces. These spaces afford teachers and students opportunities to undertake a range of different learning activities. With three teachers sharing each teaching space in a hub, there is a focus on collaboration and co-teaching […] (Charteris & Smardon, Chap. 4).

Certain recurring spatial design repertoires, then, are seen as useful for a *wide variety* of educational purposes, with the notion of introducing and using 'central areas' surrounded by 'breakout spaces' described several times in the preceding chapters (e.g., Herewini, Hawera and Cowie, Chap. 10; Nelson and Johnson, Chap. 12). Different aspects of the 'central' areas are discussed in varied ways: as 'L-shaped' (Herewini, Hawera and Cowie, Chap. 10), or as 'open-plan' and lacking a front-facing focal point (Trask, Chap. 14). Yet such overall configurations are certainly perceived as a 'standard Ministry design' (Falloon, Chap. 13), which a range of specialist, private-sector furniture manufacturers are seeking to accommodate in their catalogue ranges (Wright, Chap. 2). This situation leads to immediate questions in some institutions about how such standard spaces might be customised to suit local circumstances and preferences (Falloon, Chap. 13). Installations also include a range of 'specialist spaces', such as drama studios with lighting rigs and theatre curtaining (Luton, Chap. 5). Such dedicated provision, given how such discipline areas have routinely been overlooked before, is typically well-received. Yet the spaces themselves are not, in reality, always well-matched to local practices (Coleman and Thomson, Chap. 6). Similar tales of appropriation are provided in relation to technology. Room-integrated technical systems, mobile device 'pods', and Bring Your Own Device (BYOD) policies are all introduced (Falloon, Chap. 13; Coleman and

Thomson, Chap. 6), but teachers are seen as being 'supported to develop' an understanding of how to use these artefacts (Reinsfield, Chap. 11), rather than having been integral to their introduction.

Recruitment into the ILE project does, however, seemingly generate an intense focus on reimagining students and the work of teachers and developing (often quickly) local models. Falloon (Chap. 13), for example, documents how a school pursued 'the development of learner virtues and attributes frameworks known as the *Learning COGs*' (Chap. 13, emphasis in original). The framework, an attempt to objectify those aspects of institutional ethos concerned with student skills and agency, is the product of extensive work by a range of local stakeholders. On the surface, the work of teachers is subjected to a more centralised re-framing: via the introduction of the national *Our Code Our Standards* government framework (Cooper, Chap. 3). Yet, in reality, project participants moved very quickly to localise such imperatives, with Nelson and Johnson's description of how participants developed a specific pedagogy of 'workshops' (Chap. 12) providing a detailed and highly instructive example of how that was accomplished in one setting.

Lived Experience

Unsurprisingly, given the fragmented and unsettled nature of the social project at this stage of its development, a broad range of crises are described in the preceding chapters. Yet broad themes can be identified: concerned with spatial 'influence' and how new pedagogical practices re-shape relationships between the various stakeholders involved.

Some prominent crises are concerned with reacting to (or against) new physical spaces. In some accounts, new spaces are positioned using the metaphor of nudging: as 'enabling constraints (Nudges) that is intentional interventions to guide someone towards a certain decision' (Cooper, Chap. 3). Yet such attempts at nudging do not go unnoticed or unquestioned. On the contrary, new physical classrooms are often experienced as highly problematic and frustrating by their denizens, with the issue of *noise* being very frequently mentioned as an urgent issue requiring amelioration in practice (Barnard and Ferrier-Kerr, Chap. 8; Edwards, Chap. 9; Herewini et al., Chap. 10; Reinsfield, Chap. 11; Nelson and Johnson, Chap. 12; Trask Chap. 14). More widely, there develops a sense in many locales that only some stakeholders are being positioned *inside* the 'dominant conversation' about ILEs (Coleman and Thomson, Chap. 6), and that others are simply having spaces imposed on them. Out of this sense develops both a degree of resistance to change and a desire to engage in the 'pedagogical reclaiming of territory' (Barnard and Ferrier-Kerr, Chap. 8).

The latter experiences dovetail with a wider set of struggles about practice development and stakeholder relationships. The above account has already emphasised that the move towards an ethic of *horizontal connectedness* is taken very seriously at this stage of development. Enacting that ethic leads, fairly quickly, to crises, wherein divergent beliefs between teachers need to be managed if they are to work

in teams rather than individually (Barnard and Ferrier-Kerr, Chap. 8). Doing so also poses issues about how students and teachers might benefit from their initial training experiences, given the relatively unstable situation (Reinsfield, Chap. 11).

Yet the most fundamental practice problems directly challenge the ethic itself. Pursuing a specifically *horizontal* connectedness prioritises certain forms of collaboration and can serve to fracture other important relationships and partnerships: particularly those that teachers have historically had with their students and other stakeholders, such as parents (Edwards, Chap. 9; Trask, Chap. 14). Where ILE spaces are manifest as large open-plan settings, with several teachers roving around, students can struggle to identify 'their' teacher or to ask for help—sometimes resulting in students finding it easier to search for help using Google than to ask a teacher verbally (Edwards, Chap. 9). There are also concerns that some students are advantaged more than others in ILE settings, with some struggling to self-regulate in the new setting (Charteris and Smardon, Chap. 4; Edwards, Chap. 9). Conversely, forms of pedagogical connectedness are seen as increasingly bound *within* institutional boundaries, with Eames and Milne's chapter (Chap. 7) providing a sustained emphasis on the importance of continuing to value those pedagogical opportunities arising *outside* the institutional premises.

Against this backdrop, relationships with parents and the wider community seem occasionally strained (Edwards, Chap. 9; Fallon Chap. 13). Those parents who feel— sometimes on well-founded bases—that they do not understand or approve of the direction of change to institutions, or that they have been inadequately consulted, can occasionally come to play an antagonised role within the social project. Edwards highlights cases in which some parents sought to send their children to a different school as a consequence of such antagonisms (Chap. 9).

Many of these crises can be understood, in different ways, as attempts by stakeholders to develop and utilise 'spatial agency', which Charteris and Smardon (Chap. 4) characterise as the capability to read spatial intentions, to deliberately manipulate how one reacts, and to re-frame both the material spaces and the design intentionality behind them. Attempts to develop such agency, and the consequent development of the social project itself, become central as the project moves on to a stage of the development concerned with institutionalisation.

Institutionalising Innovative Learning Environments in Aotearoa New Zealand

Having characterised the social project of ILEs in Aotearoa New Zealand as having an 'introductory' stage of development, triggered by existing school institutions being 'recruited' into a project driven by state bodies, I now turn to what happens subsequently. I refer to this next stage of development as 'institutionalisation': a term I use because of a distinct sense, in earlier chapters, that stakeholders deliberately become involved in *finding means* to address crises being encountered and then
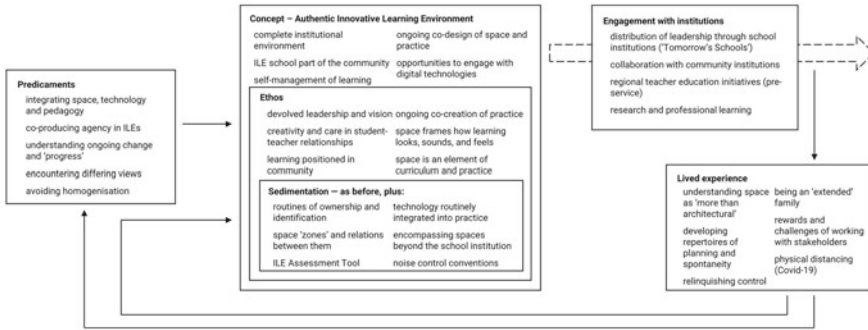
Fig. 16.4 The 'institutionalisation' stage of the social project *ILEs in Aotearoa New Zealand*

embedding those means so that others can use them. Blunden (2014) also uses the term institutionalisation to describe how projects develop, though in a slightly different sense. In Blunden's account, institutionalisation refers mainly to 'mainstreaming', or embedding practices more widely (p. 8), whereas the stage of development I describe below involves mainstreaming certain practices across (and into) a 'community' while *at the same time* localising new concepts and structures and thereby *breaking away* from the interpretations of state bodies.

Figure 16.4 provides a graphical overview of how I perceive this stage of development, using the same format as before. It should be apparent immediately that the predicaments being posed, in contrast with those highlighted in Fig. 16.3, are more concretely about practice and less globally aspirational. There is a sense that 'global challenges' recede to the periphery of attention and are supplanted by urgent issues challenging the identity of the social project. Importantly, the predicaments posed relate closely to the lived experience of the *preceding* phase of development ('introducing' the social project). That change reflects, in my view, that the social project is starting to develop *immanently*, as a product of its own internal logic. As a consequence, the dominant conceptual framework and ethos are being redeveloped, and the range of artefacts being sedimented into the project is being augmented.

Predicaments

The actual predicaments posed at this stage primarily concern the ongoing development of the social project itself. They orbit around the broad themes of integration, agency, and gauging progress.

Predicaments of integration arise from participants' experiences that different aspects of the ILE project are contradictory. Given my analysis in the preceding sections, it should be apparent that these problems are genuine and run throughout the structures of the project. At this stage of development, therefore, it becomes foregrounded that, as Cooper puts it, 'the whole context needs to be considered;

that is, the physical space, the social aspects and the pedagogy experienced by the learners' (Chap. 3). Another urgent predicament is how to integrate the views of disparate stakeholders into the project, and in particular what Falloon calls 'securing external support through partnerships with parents' (Chap. 13). Many such parents, in particular, remain sceptical about the very concepts of innovative learning environments, with Fallon reporting a parent focus group 'where there was a perception that *traditional methods had worked for them*' (emphasis in original).

Such challenges of how to integrate disparate aspects into a coherent project lead, in turn, to other predicaments. One is how to deal with encounters with different views. Where contributions are conceived as reflecting 'outdated understandings' (Reinsfield, Chap. 11), it is recognised, the temptation to be dismissive needs to be avoided. Reinsfield emphasises instead a realisation that 'collegial, parental, and students' understandings had to be *navigated* with a view to *enact their subject*, as it is conceptualised in the curriculum' (Chap. 11, my emphasis). Such concerns dovetail into the broader predicament of *avoiding homogenisation*. School stakeholders do not relish the prospect of being puppets, whether of government policy or an 'international movement'. Nelson and Rehu, for example, highlight that 'ILEs risk homogenising education provision to a neo-liberal economic imperative running counter to the significant social justice challenge facing Aotearoa New Zealand' (Chap. 15).

The issue of agency, then, is posed centrally within the social project at this stage, with 'physical spaces' often serving both as a mediator in the co-production of that agency and as the object of co-design initiatives within particular schools (Charteris and Smardon, Chap. 4). Yet the development of such agency often involves struggles to find useful or appropriate resources to guide progress; Trask (Chap. 14), for example, documents teachers' struggles to find information from elsewhere that they can *actually use* in developing their new practices. In the absence of such resources, there is a sense that developmental initiatives can struggle to determine their direction or to gain traction. The issue of *understanding* ongoing change and progress, therefore, becomes foregrounded; there is, it is felt, a 'desperate need' for ongoing evaluative work as the social project of ILEs unfolds (Falloon, Chap. 13).

Concepts

What I am calling the 'institutionalisation' of *ILEs in Aotearoa New Zealand* involves considerable conceptual innovation and development. Most obvious is a determined attempt to overcome the preceding conceptual division between different aspects of the learning environment (cf. QLE and ILE, above). Instead, ILEs are conceptualised more 'authentically' and 'holistically'. Falloon (Chap. 13), for example, comments on the 'holistic nature of the revised model in which ILEs were conceptualised as *complete institutional environments*' (emphasis in original). Nelson and Rehu (Chap. 15) make a similar point about what they call 'a school-wide ILE'. There is an attempt, in tandem, to ensure that cultural values and the surrounding community

are understood as integral to that 'complete' or 'school-wide' framing. Deploying an indigenous term which implicates the valorisation of culturally embedded sources of wisdom, for example, Nelson and Rehu emphasise the increasing importance of 'taking guidance from a valued whakataukī to refocus learning environment design, pedagogy and relationships to respond to their students as Māori' (Chap. 15). This conceptualisation, in other words, views the school *as a part of* the community and as a locus of community values.

Other aspects coming to the fore of the conceptual framework at this stage are the ongoing co-design of space and practice, and the 'self-management' of learning. Trask (Chap. 14) positions each of these issues as important for enabling participants to view the project as 'an evolution' rather than a fixed end-state. It thus seems appropriate to understand co-design and self-management as forming part of the conceptual framework of the project rather than its ethos. These issues, additionally, exist in tension with other aspects of that same framework. *Self*-management, for example, seems to express a pole of individuality somewhat at odds with the values of 'community' and 'holism' emphasised in the concepts of 'complete institutional environments' or community framing. 'Student self-management of learning and choice are key philosophies', argues Trask, before going on to contend that 'learning is most effective when students are given choices and a role in leading their learning'.

We should also establish that 'breaking away' from the influence of state bodies or international movements is a process rather than an event. Project participants working in an 'institutionalisation' phase are not, of course, suddenly free from external influence, even while working to develop the project imminently. It is clear from the preceding accounts that government bodies continue to exert influence on the social project at this stage, most directly in the stipulation that schools provide 'opportunities for students to engage with a range of digital technologies', once again with a fixed deadline (Reinsfield, Chap. 11). Such opportunities are now positioned (by the government) as an end in themselves, and school institutions are positioned as needing to respond to this imperative.

Ethos

The *ethos* of 'institutionalisation', in contrast with the 'introduction' stage, demonstrates a considerable development of focus and much greater coherence between component elements.

One core aspect of the ethos is that leadership and 'visioning' responsibility should be devolved to a greater number of institutional staff. Barnard and Ferrier-Kerr, for example, document the increasingly central role of 'middle leaders' in leading change, facilitating 'robust and open professional conversations', and managing relationships between others where divergences of opinions arise (Chap. 8). That ethic complements an increased emphasis on the ongoing co-design of space and practice, and especially a gradual increase in what Charteris and Smardon characterise as 'students' decision making around the use of classroom spaces' (Chap. 4). The

common thread is one of promoting agency, with Charteris and Smardon's chapter providing an extended analysis of how 'spatial literacy' and 'spatial agency' develop as stakeholders work to adopt new practices within the ILE project.

The ethos at this stage also sees a return to values of care and community. Herewini, Hawera and Cowie, for example, document how:

> An ethic of care when teaching and learning pāngarau [mathematics -BB] was evident as kaiako [teachers -BB] sought to create a welcoming and inviting classroom community that maintained high expectations and engaged students […] Not only was an ethic of care extended to ākonga [students -BB] but in this PMK kaiako showed care and concern toward each other. Examples of care and concern for each other were when kaiako were thoughtful about how and what to communicate with each other while learning to share space, time and resources responsibly. These displays of an ethic of care suggest acts of resilience do not have to be severe responses to significant events but rather a series of mundane or ordinary moments, accrued over time […]. (Chap. 10).

By suggesting a 'return to' such ethics, of course, I aim to highlight that this aspect of the ethos reflects a historical precedent, from prior 'learning environment' projects in Aotearoa New Zealand, which had been temporarily submerged during the 'introductory' phase of ILEs.

Other accounts foreground how this ethic of care and community interacted with that of devolved responsibility. Nelson and Rehu, for example, notice that the 'physical design of the ILE was supported by a collective culture of experimentation and partnership amongst the staff and community', with a sense of 'collective responsibility […] evoked multiple times in interviews' (Chap. 15). It is interesting that both chapters that I invoke here consider explicitly *Māori* school settings. While I do not wish to imply that this ethic is absent elsewhere, it is, nonetheless, noteworthy that discussions of such settings do seem to indicate a relatively rapid shift towards such priorities. As I shall elaborate further below, it is as though those schools—like those in Maori settings—whose prior histories involved developing particularly strong community relations are able to move through some of the crises of the 'introductory' phase and on towards the stage of 'institutionalisation' more rapidly.

A final aspect of the ethos I wish to highlight involves a struggle to correctly conceptualise the role of 'physical' space within the ILE. On the one hand, space is increasingly conceptualised as an element within curriculum and practice, rather than as a novel add-on supporting the 'new' or the 'different'. Eames and Milne, for example, document the increasing struggle to support what they call 'purposeful design', in which teaching and learning, a range of different spaces, and technology are aligned together—in the case they describe, to support the integration of learning across different spaces using mobile technologies (Chap. 7). On the other hand, the discourse about space undergoes a marked shift. As described above, during ILE 'introduction' physical space tends to be approached as something handed down and conceived in lived experience as 'enabling constraints' used to nudge old practices. By the 'institutionalising' stage, however, that rhetoric has shifted. Physical space is now seen as a product of the community that proudly reflects the concepts and ethos that are being developed. In one case, school stakeholders took inspiration

from earlier work to purposefully design 'learning zones' throughout the school that 'were designed to communicate how learning would look, sound and feel' (Nelson and Rehu, Chap. 15).

Sedimentation

As Fig. 16.4 indicates, I perceive the *sedimentation* occurring at this 'institutionalisation' phase to involve *augmenting* rather than supplanting the existing constellation of artefacts. Learning Hubs, BYOD approaches, furniture ranges, specialist spaces, models of student development—all of these artefacts, having been markers of the introduction of the ILE project, remain in currency during the institutionalisation stage. That is partly, of course, because of the effects of state regulation on the practice of investment lifecycles; replacing some of these artefacts is thus rendered prohibitively expensive in financial terms. Yet it also reflects that many of these artefacts, with the partial exception of rigid teacher codes of conduct, have been found useful. The focus at this stage, therefore, seems to involve introducing *additional* artefacts, as part of attempts to mediate those crises encountered in the recent past. Many of those new artefacts, as elaborated below, concern routines and conventions of practice sedimented both through repetition and ongoing discussion with others.

One such new form of sedimentation involves increasingly well-developed routines of ownership and identification. Ways are found so that, as Charteris and Smardon put it, the 'politics of who gets to decide how the spaces are used is made explicit' (Chap. 4). The contribution by Trask provides an incredibly evocative exploration of how such routines and conventions can be made to work as ILEs become increasingly institutionalised. Sliding a door symbolises a change in the flow of control between teachers and students; movement between areas indicates the kind of action that is expected; noise is no longer a mere problem but has become also a means. To cite but one example:

> Pharrell William's *Happy* plays over the loudspeakers to signal the end of lunch. Students have until the song ends to be in class. T2 slides the door to divide the spaces but leaves a small opening of about two metres. Each teacher is standing in their own space, greeting students and chatting with them as they settle. In this team-teaching environment, one way of maintaining relationship and fostering a sense of class identity is with this established routine of beginning and ending sessions as separate groups (Chap. 14).

Such routines rely, in turn, on a variety of other artefacts that have been introduced. I established above that spaces are now conceived as regulating learning via *proudly reflecting* the concepts and ethos, and this phenomenon is reflected in the sedimentation of additional and purposeful design into (and onto) the ILE spaces already introduced previously. Nelson and Rehu provide an example of how that has been accomplished in one setting:

> Within each of the interconnected learning pods, activity zones were designed to commu-
> nicate how learning would look, sound and feel. The activity zones distinguished ways of
> learning, thinking and working; enacting space as an element of curriculum […] (Chap. 15).

Those 'activity zones' are, of course, themselves constellations of particular physical
artefacts, including the positioning of furniture and equipment, the use of particular
colour schemes, proximity to doors, and so forth. Some of those artefacts also serve
other purposes within project sedimentation at this stage, and I highlight in Fig. 16.4
the particular prominence of conventions for noise control and for integrating digital
technologies into practice. Yet, overall, they are an attempt to add extra 'layers'
of meaning onto spaces—which, in some cases, is accomplished quite directly by
renaming them (Nelson and Rehu, Chap. 15). Such routines and conventions are
developed *within the community* to enable people to move between different moments
of practice, either by reconfiguring the space or by moving from one location to
another. Importantly, some of these artefacts also allow for routines of movement
between spaces on school premises and those outside—such as, in Eames and Milne's
example (Chap. 7), a local 'visitor centre' used as a base for science projects. Such
sedimentation supports the concept, outlined above, that the school is part of the
surrounding community.

Once again, however, we should not imagine that institutionalising ILEs allows
stakeholders to develop as they see fit. The Ministry of Education, for example,
is discussed as recently having introduced an 'Innovative Learning Environment
Assessment Tool' (Nelson and Rehu, Chap. 15). Yet it is well-received, in the
preceding accounts, that this tool increasingly foregrounds issues—of culture,
school community and the surrounding environment—that seem well-aligned with
the concept of 'authentic' or 'holistic' ILE that is being foregrounded at this
stage by school stakeholders. That may be, to some extent, a product of how
'institutionalising' ILEs seek to engage with other institutions.

Engagement with Institutions

As the social project of *ILEs in Aotearoa New Zealand* enters its 'institutionalisation'
phase, the priorities in regard to engaging with other institutions involve moving
beyond government mandates and towards fostering, over time, more involved and
bi-directional forms of understanding within and between institutions. To a great
extent, of course, doing so arises out of the direct pursuit of concepts such as 'co-
design' and 'community embeddedness'. Yet engagement with other institutions is
also important in maintaining the identity of the overarching project. That is because
'localising' away from the interpretations of government bodies and the 'international
movement' comes with various risks—such as forking the project into multiple,
disconnected fragments, potentially with each school moving towards comprising
an entirely distinct social project.

One core form of institutional engagement involves forming 'bridges' with the surrounding local community. As established already, those chapters focussed on *Māori medium* schools document such bridge formation happening particularly quickly, and thus those chapters also give the fullest exploration of how such connections have unfolded over time. Nelson and Rehu (Chap. 15), in particular, position the unfolding of relationships between the school and surrounding Māori community as a central focus of their chapter; with one core aim being to ensure that the community plays a role in ensuring that the 'journey' on which students travel through the ILE is appropriate for 'Māori values'. Yet such engagement does not happen only in Māori institutions. Eames and Milne, for example, highlight an ongoing partnership with a local community centre and how goals have been developed for student work to contribute to 'community expo' events (Chap. 7). These are initiatives taken in pursuit of co-design and community embeddedness.

Other relationships of institutional engagement are maintained via networks of schools and universities. Such relationships are not 'local' in quite the same sense as those maintained with stakeholders from the surrounding community, but, nonetheless, there are sometimes perceived advantages to forming 'regional' networks. One such regional network, discussed by Nelson and Johnson, has been formed to try to ensure that pre-service teachers 'were experiencing innovative learning environments (ILEs) when undertaking their practicum placements' (Cap. h12). The underlying motivation, as Nelson and Johnson also explain, is a sense that the attendant challenges of learning to teach in ILEs 'have been under-addressed within policy and research'. For that reason, some schools have also become involved in investigative work which sits at the intersection of 'research, professional learning and change agendas' (ibid.). That so many of the preceding chapters in the current volume draw on such work is a testament to the developmental relationships forged between schools and universities over recent times. This very book, of course, is both a product of such relationships and potentially a means to stimulate further conversation within the project.

Encouragingly, state bodies such as the Ministry of Education seem increasingly to recognise the importance of 'self-determination' and 'self-managing' as a key principle for ILEs. Evidence for that can be found, as Nelson and Rehu document, in the *Tomorrow's Schools* model that aims to enable 'school leaders and staff to design learning environments and pedagogical practices to support the particular needs and aspirations of their students and communities' (Chap. 15). While the notion of introducing a centralised model for self-determination certainly carries some internal tension, where schools engage with such models within their local, regional, and research networks, there is at least the possibility of maintaining a coherent social project over time while also escaping centralised diktat or unnecessary homogeneity.

Lived Experience

I am positioning 'institutionalising' as the most recent stage of development reached by the social project at the time of writing. While the structural contours dominating at this stage can, as I have shown above, be traced in reasonable detail, the dynamics developing *around* those contours are still described only nascently in the preceding chapters. It is thus still too early to map those dynamics in detail or to speculate about the forms taken by the 'next' stage of development. For that reason, my analysis in this section must be regarded as somewhat hesitant and partial. Yet some emerging themes can be discerned in the preceding submissions and it is worth highlighting those below.

One aspect of the lived experience that is remarked upon in the preceding chapters is a struggle by stakeholders, who—having now firmly grasped that space is not just about architecture or estates investment—wish to conceptualise how new spaces affect their practice and helps them develop their agency. School stakeholders are, over time, developing more confidence and fluency with core ILE concepts; yet doing so has led to frustration where aspects of what is becoming official ideology are not realised in practice. In some cases, practitioners have reflected on a new physical space and concluded that, in Coleman and Thomson's words, it 'does not meet the requirements of an ILE' (Chap. 6). Where everyday discussion comes to emphasise innovation, opportunities, and potential and yet these raised expectations are not realised, the sense of disappointment can be severe. Coleman and Thomson's work emphasises the attendant crises as being about feelings of 'dissonance' and a perception that a particular educational discipline (drama education) has been misunderstood and then 'put back in its box'. In some cases, such frustrations critique the very boundaries of the social project, with Eames and Milne, in particular, making a strong case that the extension of ILE work into 'off-premises' community spaces remains seriously unfinished business (Chap. 7). Such experiences seem a potential ground for what Blunden (2010) calls immanent critique: an attempt to develop a project further by holding it true to its own stated principles (p. 4).

The lived experience also incorporates a range of struggles concerned with 'planning' teaching in advance, and then controlling how events unfold in practice. That many spaces within ILEs are resourced and tailored for specific forms of practice means a greater necessity for booking and timetabling; that teaching is now undertaken in teams brings a need for negotiating pedagogical priorities and teaching content; that groups within open-plan spaces may be engaged in different tasks means that care must be taken to ensure that adequate forms of support are provided. Moreover, advance planning can be important to ensure that avoidance of spatial disruption and rule-breaking (Trask, Chap. 14). Yet teachers are also aware that teaching is an unfolding interaction and that innovation requires effort and a willingness to experiment. These poles are often experienced as being in tension. As Coleman and Thomson ask, 'Tasked with vast amounts of logistical organisation, prior to teaching, where is the time left to innovate teaching practice?' (Chap. 6).

Other poles of tension involve difficulties of allowing others to 'take control' (Charteris and Smardon, Chap. 4) or 'managing transitions' between different forms of practice (Nelson and Johnson, Chap. 12).

Another set of crises relates to the management of those complex relationships between stakeholders which, as the preceding account has emphasised, are increasingly important to the development of the social project. Relations between people around ILEs are occasionally likened, in the preceding chapters, to an 'extended family' (Nelson and Rehu, Chap. 15). While such family-like relations are in keeping with the core concepts and ethos, they do require careful interpersonal management, whether in dealing with interprofessional relationships (Eames and Milne, Chap. 7) or in allowing students to be 'positioned as in charge' (Trask, Chap. 14). There is also a sense that such difficult issues need to be addressed persistently, over time, or else that the ILE could become seen as a fad with disillusionment subsequently setting in (Falloon, Chap. 13).

Finally, there are crises arising from sources external to the social project. The preparation of this book coincided, of course, with the outbreak of the Covid-19 pandemic, which has had an unprecedented impact on educational practice across vast swathes of the globe. It is difficult, at the time of writing, to predict the influence of physical distancing on the development of practice in ILEs, and how that might unfold over the short, medium, and long terms. But, as Wright (Chap. 2) correctly highlights, the history of 'learning environments' in Aotearoa New Zealand has been influenced before by health emergencies—which were, after all, used to justify the introduction of 'Open Classrooms' in previous decades—and it seems at least plausible that the pandemic might be a harbinger of significant change to the physical estate across the social project.

Conclusion

I began the present chapter by remarking that the issue of 'learning environments' has long been slippery and unpredictable. It is difficult even for those scholars who devote attention to the topic—let alone for practitioners and other local stakeholders—to fully demarcate what the term means and to track or anticipate the sharp turns in policy emphasis or funding. Yet senior policymakers across many polities persist in using 'learning environments' as a vehicle for stimulating change, with the international reception of the OECD project of 'Innovative Learning Environments' a key case in point. It should be admitted that the social project of *ILEs in Aotearoa New Zealand* has been associated with a period of relative funding stability; the polity's national government has fairly consistently supported the initiative over a considerable period of time. Yet that has not meant that the issue has been easy to grasp for those involved, with even the core concepts undergoing development and revision as the project has unfolded.

My overview of ILEs acknowledged that there exists, of course, a rapidly developing body of scholarship on the topic. I categorised such work into three main

strands. The first examines the achievement of desired outcomes, thereby legitimating the effort and reinforcing a strong sense of purpose while occluding differences between settings and how desired outcomes evolve over time. The second examines particular schools using a 'snapshot' approach, highlighting important contextual contingencies and the necessity of struggle, while inevitably treating somewhat statically those wider initiatives framing the work being undertaken in a given school. The third seeks to disaggregate particularly 'important' issues, such as agency or design processes, in ways that offer deep insight while risking fostering a fragmentary understanding of how those issues interact.

In the present chapter, I have sought to make a contribution by providing a principled overview of how ILEs have been (and are still being) introduced *across the polity of Aotearoa New Zealand*. My opportunity to do so arises mainly from the privilege of being invited, by the editors, to write a final chapter 'summarising' and 'signposting' the work in the present volume—which presents a range of insightful narratives, derived in many cases from research in school institutions, from across the polity. By treating the preceding chapters as submissions to a principled enquiry, and by analysing those submissions through a 'social project' lens derived from work in the activity theory tradition, I aimed to assemble a synthesis narrative that would highlight the development of an overall social movement.

My hope is that the preceding sections have adequately summarised the earlier work in the book. Inevitably, my account foregrounds some issues at the expense of others, and I feel I should pre-emptively apologise to those authors who might feel I have overlooked or attached unanticipated spin to aspects of their own analyses; the production schedule of the book did not allow for member-checking. Overall, I sought to trace issues of predicament, concept, ethos, sedimentation, institutional engagement, and lived experience through four disparate moments: the official 'international movement' supported by the OECD; the historical backdrop in Aotearoa New Zealand leading up to the introduction of ILEs; the stage of 'introduction', at which schools are recruited by government bodies; and the subsequent 'institutionalisation' of the social project as it develops its own logic. Below I would like to conclude by making a few overarching comments which, I hope, signpost some pertinent issues requiring further investigation.

With regard to the *predicaments* that 'learning environments' are seen as addressing, there has been a shift away from a historically dominant focus on educational 'inputs'—such as attendance and health—towards issues such as agency. Yet attempts to pose predicaments about broader 'outputs', such as bolstering the geopolitical position of the country, have largely failed to gain traction, while even OECD talking points about agency have been significantly re-framed and re-interpreted in more culturally appropriate ways. There seems a need, therefore, for more scholarship exploring those predicaments, whether societal or more local, that genuinely *motivate* ILE stakeholders. It seems plausible that ILEs are being used as a vehicle for 'educationalisation', wherein educational institutions are being tasked, perhaps inappropriately, with solving what are very broad problems within a social formation (cf. Tröhler, 2018). The extent of those predicaments that key stakeholders feel ILEs *can actually address* would thus be a useful topic to unpack further.

The *concepts* of ILEs are clearly undergoing extensive development on an ongoing basis. The 'introductory' stage of ILEs is marked by conceptual framework seriously fragmented between 'practice' and 'physical environment' issues, which seems both a product of how educational change has historically been managed in the polity and also of the surprising lack of emphasis on the latter in core OECD documentation. There seems a need for more understanding of how pedagogy and physical space can be re-imagined in ways that are *less conceptually separated*, and also—given how 'ILE' and 'QLE', discussed above, are actually formulated—a need to critically reflect on how framework components are given weight in change initiatives as a consequence of their provenance in 'international' or 'national' source material.

The *ethos* of ILEs has—to some extent predictably, given the conceptual development it attempts to shadow—demonstrated considerable instability. In particular, it has been extensively reformulated between the 'introduction' and 'institutionalisation' phases. One noteworthy issue has been the attempt to support 'horizontal connectedness' during the introduction of ILEs. If anything, stakeholders, in pursuit of following guidance from elsewhere, have perhaps been slightly *too* ready to disparage their own prior expertise, with the consequence that a sudden loss of vertical relationships has been felt very deeply. While that experience has resulted in an ameliorated ethos during the more recent 'institutionalisation' stage, there remains a need to understand how stakeholders, when being recruited into 'learning environments' projects, can be supported to better appreciate the value of their existing historical practice *in relation* to newly suggested models.

The largest moment of rupture in the *sedimentation* of artefacts does seem to occur as planned: at the point where the ILE project is introduced, and new stakeholders are recruited. After that moment, artefacts are gradually augmented or added or imbued with more elaborate local meaning. Yet the introduction of such ostensibly well-resourced environments has unanticipated impacts, most noticeably by temporarily submerging that ethos of creative subversion—which Wright (Chap. 2) calls 'making do'—that has hitherto been so central to educational practice across the polity. Having been confronted with the fruit of unprecedented financial investment, stakeholders doubtless feel that the ground for creative reappropriation has shifted. This poses in turn, a range of issues relating to stakeholder agency, with some early indications in the preceding chapters that some teachers are indeed returning to a 'making do' ethos as the project becomes institutionalised. While the present volume provides significant insight into how stakeholders came to read and manage spaces (a core theme, for example, in Charteris and Smardon's chapter, Chap. 4), there is clearly a need for greater understanding of the extent to which stakeholders can come together to challenge or re-shape *the direction* of the social project overall over successive stages of development.

Turning to *institutional engagement*, the initial approach to recruiting stakeholders to the project—via policy mandate—is entirely unsurprising, given both prior history in the polity and how the 'international movement' seeks to influence educational systems. Yet it also produces outcomes of occasional stakeholder rejection that are not merely *also unsurprising*, but which also closely mirror prior historical precedents documented by Wright (Chap. 2). Resultant attempts to render ILE schools

more obviously a part of their surrounding community, and to devolve aspects of leadership, are doubtless a step forward from the point of the stakeholders involved; and it is also at this point that the social project begins to develop in ways that are more convincingly immanent (i.e., arising from the internal experiences of those participating and their attendant attempts to foster change). Yet, conversely, such attempts at localisation also threaten to fracture the ILE project that has been, so far, developing across the polity. There is, therefore, a need for more investigation of the extent to which attempts to form local and regional partnerships with communities, other schools, universities and the *Tomorrow's Schools* programme work to preserve a coherent identity for the project; or, conversely, the extent to which a process of forking has taken hold that might result in a range of disparate social projects emerging out of the present initiative in the medium term.

In tandem with this priority arises a need to better understand whether those school institutions recruited *later* into the social project must necessarily travel through the 'introductory' stage first before attempting 'institutionalisation', or whether they can learn from the experiences of others to leapfrog some of the early crises. As established above, some schools—primarily those embedded in Māori communities—do seem to engage with community stakeholders more quickly than others. Perhaps institutional support across the social project can help other project recruits to avoid some of the more egregious crises that others have experienced and transcended already.

Finally, I would like to comment on the different ways in which space mediates educational practice. I have, as mentioned earlier, written about that topic several times before—associating different forms of mediation with different research programmes (Bligh & Crook, 2017) or conceptualising them as different ways of thinking and talking, which stakeholders can discuss and consider together (2019b; Bligh, 2019a). What has become clear in the preceding account, however, is how distinct forms of mediation have dominated conceptions of practice *at different moments* as the social project has unfolded: with the 'introductory' phase dominated by 'enabling constraints' views of space; and the 'institutionalisation' stage has been more concerned with mediational mechanisms of feeling, representation, and ownership. Further exploring how different aspects of the ILE environment come to mediate practice in different ways as the social project matures could represent a significant contribution to the emerging scholarship on learning environments.

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