Technical Report 2/2017

"In the real world...": Teachers' perceptions of ILEs

ILETC phase 1 teacher workshops

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TECHNICAL REPORT

"In the real world...": Teachers' perceptions of ILEs
ILETC phase 1 teacher workshops

Our Lady of Sion, Law Architects.

Overview

- How do teachers perceive and define ILEs?
- Do teacher mind frames reflect actual practice?
- What are teachers understanding of deep learning?
- What are teachers reflections about their transitions into ILEs?
- What support is required to enable teachers to undertake change in their practices?

Drawing on the principles and attributes of design thinking, a series of research-led workshops in Australia and New Zealand were developed to capture rich data of teachers' lived experiences and their insights on teaching in innovative learning spaces, as revealed through reflective and speculative activities. The workshop format also provided a reciprocally useful experience for participants by structuring activities that provided insights into the experiences of others, enabled individual reflection and prompted further contemplation of problems and solutions through group discussion and rumination.

This technical report presents findings of the teacher workshops. The data obtained as described in this report has allowed findings that are distinctive and inform the project with useful information. Key findings include:

- Teachers define a learning environment that is innovative as one with adaptable spaces and ubiquitous resources and technologies, which can evolve and change to support transitions between different types of student-centred learning. Participants identified changing teacher practices through transforming teacher mindsets and resistance as a barrier to effective use of innovative learning spaces.

- Teachers' mind frames seemed to reflect their day-to-day practices. Key elements that supports teachers' practices are flexibility of space to meet varying learning needs, the ability to use different teaching approaches regardless of the space, as well as the use of technology within the space.
- Teachers' perceive student deep learning as creativity, critical thinking, character, collaboration, citizenship, and teacher as learner. Elements of the physical environment that would enhance student deep learning include a variety of space, moveable furniture and fit outs, access to a range of tools and materials for hands-on activities to meet a range of teaching approaches.
- Teachers transitioning into innovative spaces are concerned with configuration of the new space, the use of furniture in that space, and how students transition into the space. Two important considerations are the mindsets and lack of professional development for teachers.
- Support required to enable teachers to undertake change in their practices include human resources, tools, equipment, resources, facilities and assets. Teachers noted the importance of the cycle of improvements to ensure that its direction-setting and resourcing processes, core activities of learning, its enabling systems and infrastructure are continuously monitored and improved.

This technical report constitutes an evidence-based platform to inform subsequent phases of the ILETC project. The integration of the qualitative data from the workshops together with quantitative data from Phase 1 survey (see Imms, Mahat, Byers and Murphy, 2017) and scholarly literature (forthcoming) provide a strong knowledge base that responds to the project's initial assumptions surrounding the use of innovative learning environments in Australia and New Zealand.

Contents

Marist College Bendigo Champagnat (senior centre), Y2 Architecture. Photography: Leon Schoots.

Introduction

This report presents the findings from a series of workshops conducted in Australia and New Zealand as part of an Australian Research Council Linkage project. The Innovative Learning Environments and Teacher Change (ILETC) project brings together researchers in education, architecture and design, along with 15 partner organisations, to examine the support required to assist teachers realise the possibility of space as a component of their pedagogic practice, and examine the impact of this 'change' on student learning. It works from the assumption that a range of facets exists that contribute to 'best practices', whilst also acknowledging that there are substantial gaps to actualising these in the classroom. To aid in strategically overcoming this, ILETC will build an evidence-base of 'what works' for teachers transitioning to innovative learning environments (ILEs), design strategies to fill perceived gaps, and test this suite of strategies for effectiveness and applicability across the widest possible array of Australasian schools.

The ILETC project conducted workshops between November 2016 and May 2017 in each of the project's geographic regions. The purpose was to establish existing teachers' perspectives and insights on concepts central to this project. This information, when combined with literature reviews and a preliminary principal's survey, will ensure ILETC is addressing the most pressing needs faced by teachers when inhabiting ILEs. These unique workshops were structured around 'design thinking' principles by a team of researchers from the School of Design, Monash University.

An underlying principle of design is that from the outset you invest in getting to know your stakeholders: you hear stories, you empathise with challenges, you question your own assumptions and 'surface' the needs of those you are designing for. To this end, reciprocity is built into the workshop design to ensure the value of participating extends beyond data gathering. For the teachers, the creative workshops offered a space for reflecting on and sharing experiences with peers in an informal learning context. For the project team, the sessions provide valuable teacher perspectives on the challenges and opportunities of occupying innovative learning environments in schools. Development of and findings from the workshops will be published in academically focused scholarly publications.

St Michael's Parish School, Ashburton Stage 1, Y2 Architecture.

Research questions

The workshops were developed with two key aims. Firstly, to raise awareness about the project and encourge teachers and principals interested in ILEs into the project community. Secondly, to test the research hypotheses and key assumptions against teachers' lived experiences. Workshops were more than information sessions or focus group discussions, as they focused on the insights that could be gained from teacher-to-teacher exchanges. The participatory teacher workshops alongside the principal survey and systematic reviews of the literature, ensures the teachers' voice informs the project's data collections. Consequently, each workshop was developed to focus on a particular area of interest relevant to the project and responded to a key research question. Table 1 summarizes the five workshop foci and research questions.

The workshops were publicized widely to partner and non-partner schools in each educational partner jurisdiction, emphasizing the project's interest in hearing from teachers and principals about their experiences in ILEs. In particular, the research was seeking to understand teachers' perspectives, rather than promoting a particular approach or theory for pedagogy in ILEs.

Table 1: Workshop focus and research question

Location	Workshop Focus	Key research question
Sydney, Australia	ILEs and teacher practice	How do teachers perceive and define ILEs?
Auckland, New Zealand	Teacher mind frames and belief systems	Do teacher mind frames reflect actual practice?
Christchurch, New Zealand	Student deep learning and the ILE	What are teachers' understanding of deep learning?
Canberra, Australia	Journey maps	How do teachers perceive their transitions into ILEs?
Brisbane, Australia	Teacher change	What support is required to enable teachers to undertake change in their practices?

Stonefields Primary School, Jasmax Architecture. Photography: Alex de Freitas.

Methods

Workshop design

The activities were developed by one of the project's chief investigators, Professor Lisa Grocott and her team from the School of Design at Monash University, using design thinking methods which involve generative, collaborative activities to explore assumptions, surface beliefs and propose ideas. Each workshop began with a brief introduction to the project, intentions of the workshop and the activities involved. The activities in each workshop varied according to the topic.

'Design thinking' is a general term used for creative exercises that enable spaces for new ways of seeing possibilities. Some core tenets of design thinking are that the process be human-centred, work with ambiguity and make ideas tangible (Meinel & Leifer, 2011). Embodying these attributes, design thinking workshops engage stakeholders directly with ambiguous prompts yet tangible materials. These workshops usually has participants move between divergent, expansive thinking exercises and convergent, solution-oriented modes of thinking. As a participatory method, design thinking in research presents a technique for co-creating with the community a better understanding of the research landscape.

For the purpose of Stage 1 of the ILETC project, design thinking was deployed as a mindset more than as an innovation strategy. This meant mindfully designing human-centred engagements whereby participants would be asked to: show (not tell) what they were feeling and playfully experiment with how to prototype their ideas (Royalty, Oishi, & Roth, 2014). To do this, theory and practice intersected to develop creative, highly engaging activities designed to examine a specific research question relevant to the project. The development of the design thinking format sought to capture the rich data of teachers' lived experiences and their insights, as revealed through reflective and speculative activities. The workshop format sought to provide a productive experience where the structured activities facilitated insights into the experiences of others in order to prompt individual reflection and encourage further contemplation of problems and solutions through group discussion and rumination.

The central aim of these workshops was to test the research hypotheses and key assumptions of the project to inform subsequent data collections. To augment, rather than confirm the nature of data collected from the survey and systematic reviews, the workshops had to

acknowledge the complexity of eliciting deep insights in a relative short window of time. In this assumption-testing research phase, the focus of the 90-minute workshop is less on new ideas as on methods that probe teachers' current beliefs, as well as prime participants to feel open enough to interrogate their, at times, tacit understanding (Sanders, Brandt, & Binder, 2010). Using the framework developed by Sanders et al. (2010), each workshop played with an adapted sequence of methods that had participants move between: a) making tangible things, b) talking, telling and explaining, and c) acting, enacting and playing. As an example, to make tangible things the teachers might create fictitious teacher profiles or co-create a future change machine. Synthesising post-it notes under emotional responses might facilitate how the teachers come together to talk, tell, and explain their experiences. And once primed to share their understanding the teachers might play a journey map board game or enact deep learning with toy figures. These creative methods of making tacit knowing visible provided participants with a chance to personally reflect and create something tangible that they could then speak to as a group. This provided a natural catalyst for countless stories being shared, lessons learned and tips discussed.

Sample

Overall, there were 153 participants at the five workshops, consisting predominantly of teachers and principals. Other participants include staff from professional development agencies, government offices, and partner organisations. In the main, teachers and principals came from metropolitan schools and from a range of types of schools. Table 2 provides a breakdown of participants by workshops.

Table 2: Breakdown of participants by workshops.

	Sydney		Auckland		Christchurch		Canberra		Brisbane	
Participants	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Principals (Assistant/Deputy)	17	39.5	14	31.1	19	43.2	5	45.5	0	0.0
Teachers	10	23.3	25	55.6	17	38.6	5	45.5	6	60.0
Other	8	18.6	6	13.3	7	15.9	1	9.1	4	40.0
Not given	8	18.6	0	0.0	1	2.3	0	0.0	0	0.0
TOTAL	**43**	**100**	**45**	**100**	**44**	**100**	**11**	**100**	**10**	**100**
School Type	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Primary (Full) *	22	51.2	13	27.7	19	43.2	8	72.7	3	30.0
Contributing **	0	0.0	17	36.2	2	4.6	0	0.0	0	0.0
Intermediate	0	0.0	6	12.8	8	18.2	0	0.0	0	0.0
Secondary	13	30.2	2	4.3	6	13.6	1	9.1	4	40.0
Combined (composite)	1	2.3	2	4.3	3	6.8	2	9.1	1	10.0
Special	1	2.3	0	0.0	0	0.0	0	0.0	0	0.0
Other	6	14.0	4	12.7	5	11.3	1	9.1	1	10.0
Unable to determine	0	0.0	1	2.1	1	2.3	0	0.0	1	10.0
TOTAL	**43**	**100**	**45**	**100**	**44**	**100**	**11**	**100**	**10**	**100**
School Location	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Metropolitan	43	100	45	100	36	81.8	4	36.4	8	80.0
Regional	0	0.0	0	0.0	2	4.6	6	54.5	0	0.0
Unable to determine	0	0.0	0	0.0	6	13.6	1	9.1	2	20.0
TOTAL	**43**	**100**	**45**	**100**	**44**	**100**	**11**	**100**	**10**	**100**

* Until age 12.
** Until age 10.

Data collection and analysis

A range of data were collected including post-it notes, models and illustrations (photographed), and participant worksheets. A post-workshop survey asked participants to rate the workshop on a four-point Likert scale of Excellent, Good, Fair and Poor. Two open-ended questions asked participants about their experiences in innovative learning environments.

1. Thinking about your own experience, what teaching and learning opportunities are supported by innovative learning environments?
2. Thinking about your own experience, how are teachers in your school using or not using these?

Analysis of the qualitative workshop data as well as the open-ended survey questions utilised a traditional qualitative data analysis approach, including coding, identification of themes, triangulation, model building and theory linkage (LeCompte & Preissle, 1993) of responses on post-its, text derived from the worksheets, and illustrations or models provided by participants. It should be noted that existing design thinking approaches required some modification to ensure that categorical data was collected from the sessions to allow for this analysis. Collecting participant responses via coloured post-it notes, photographs of assemblages, and short written responses served this need. Thematic analysis of the data corresponds to each of the research questions developed for each workshop. Although group discussions provide a rich source of data, these were only recorded for the last workshop in Brisbane due to resource and logistic constraints. For the purpose of this report, the qualitative data from the post-workshop survey are not reported here.

Assumption College, Y2 Architecture. Photography: Peter Clarke.

St Columba's College, Sophia Library, Hayball Architecture. Photography: Diana Snape.

Findings

Sydney - ILEs and teacher practice

How do teachers perceive and define ILEs?

The Sydney workshop focused on participants visualizing the physical and experiential elements of the learning space they are in. Working in groups, participants organized these physical and experiential elements on a spectrum of emotions, as well as discussed difficulties or negative aspects of these elements and ways to improve them.

Physical and experiential learning elements

We began with the assumption that a learning environment can be improved by two types of learning elements—the physical and experiential classroom elements. Physical elements would include features such as cushioned chairs and adjustable lighting (Sommer & Olsen, 1980). Experiential learning elements would include learning characteristics, which would result in knowledge transformation because of the experiential change (Kolb, 1984). The hypothesis is that these elements can result in learning that is purposeful, functional and empowering. During the workshop, participants were asked to describe and model these elements using materials provided such as wooden sticks, pipe cleaners, and foam pieces. Figure 1 (overleaf) provides some examples of participants' models.

Participants also discussed and grouped these elements into positive and negative aspects. Flexibility and agility in the physical elements as well as collaborative learning were listed as positive characteristics. Negative characteristics of these elements include mismatch between pedagogy and space, and teachers' resistance to change. Participants seemed to agree that a learning environment that is innovative has flexible spaces (through reconfigurable walls, for instance) with adequate resources (such as ICT, collaborative technologies and flexible furniture) that encourages student-centred learning, provides agility to move between different types of experiential learning (for example to move between independent, collaborative, inquiry learning), and support the use of different learning strategies.

Participants were then asked to describe how they felt about the use of these elements in the

classroom under four emotions: (1) pleased; (2) optimistic; (3) disappointed; and (4) frustrated. Figure 2 provides an example of the group exercise.

Physical elements that participants felt 'pleased' and 'optimistic' about could be grouped into:

1. **Flexible and mobile furniture** such as stools, benches, chairs on wheels, bean bags, café style furniture, and round tables;
2. **Writeable surfaces** such as walls, tables, and display space;
3. **Information Communication Technologies (ICT)** such as wireless technology, interactive whiteboard resources, personalised devices such as iPads, Apple TV, green screen; and
4. **Designated specialist teaching spaces** such as areas for wet activities, movie-making and recording, art and crafts, performances, indoor/outdoor breakout space, and library/ resource centre.

Participants indicated that these elements provided 'flexibility' and 'innovative'

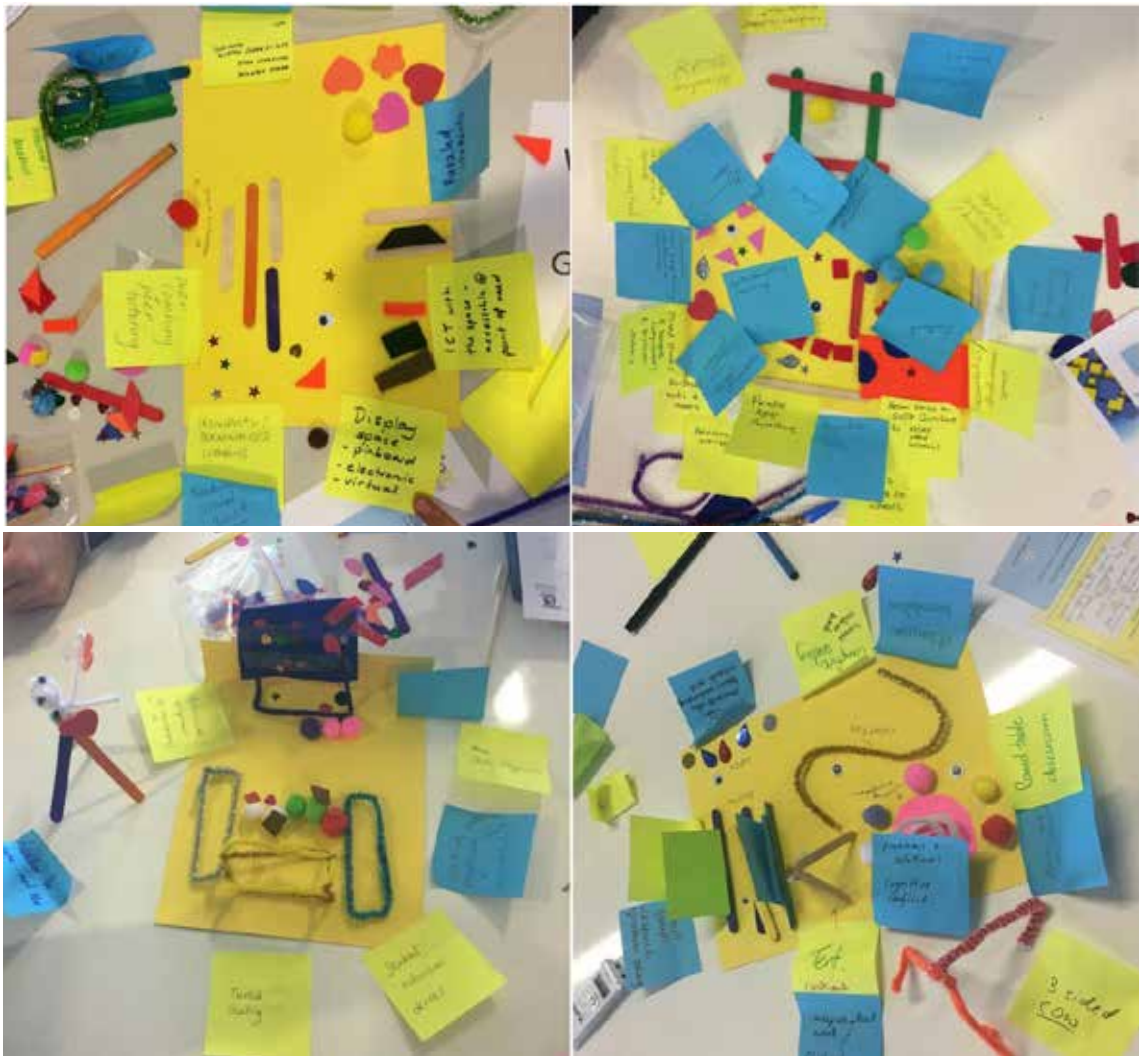

Figure 1: Examples of learning space models.

pedagogical practices and promote an environment that is more 'student-centred'. With elements that worked well in the learning space, participants felt 'pleased' and 'optimistic' that these encouraged experiential learning of collaboration or small group learning, quiet reflective independent time, and feedback.

Physical elements that participants felt 'disappointed' and 'frustrated' could also be grouped into furniture and ICT. These frustrations and disappointments seemed to stem from too much 'diversity' in furniture or furniture that does not work such as tables being too heavy to move or ICT that fails. Some participants also felt 'disappointed' and 'frustrated' that these learning spaces resulted in a loss of control or flexibility, difficulties getting the right fit of teachers for collaboration, and students creating cliques or falling through the cracks.

Figure 2: Example of group exercise.

Challenges and solutions

Once the model creation had probed the teachers to explain their current understanding of ILEs, priming them to emotionally and pragmatically reflect on their experiences, they were ready to move pass the surface level observations of teaching in an ILE. The playful and expansive group conversation up until this point sought to frame this final activity where individuals were asked to identify some of the challenges they face using these spaces. Once a list was generated, the group discussed and pinpointed the top challenges and generated possible solutions. These can be categorised into school, teacher, student, parent/community and physical barriers. Most of the challenges centred on teacher and physical barriers. Table 3 lists the top challenges and solutions. In particular, teacher barriers include:

- Lack of knowledge about ILEs and non-traditional learning
- Ongoing professional learning that supports collaboration
- Staff resistance, teacher practice and mindset
- Compromised teacher identity, traditional mindset and resistance
- Pedagogical and environment change, no personal space (desk)
- Management of devices and equipment
- Pedagogical shift (change agent)
- Fear of failure, willingness to change, limits in knowledge and confidence
- Changing teaching practice
- Student learning accountabilities due to nature of large open environment.

Some of the solutions identified by participants to mitigate these teacher challenges include communication and transparency of the school's strategic direction and ethos, professional development and learning, involvement and exposure to successful ILEs and best practices, and individualised support and training in the use of ILEs. In particular, participants' observed a lack of professional development and learning in this area.

Summary

If we start with the assumption that a learning environment can be categorized by the physical and experiential classroom elements, findings from this workshop suggest that a learning environment that is innovative can be defined as one with adaptable spaces and ubiquitous resources and technologies, which can evolve and change to support transitions between different types of student-centred learning. Participants conceded that while innovative learning spaces bring with it the potential for improved student learning, they were also frustrated with the challenges of using these learning spaces. These challenges can be categorised into school, teacher, student, parent/community and physical barriers. Participants identified resistance to changing teacher practices through untransformed teacher mindsets as a barrier to effective use of innovative learning spaces.

Table 3: Challenges and solutions teachers face using innovative spaces.

Challenges	Solutions
Institutional barriers	
Change management, mindsets, risk and reluctance	• Clear vision for learning that drives change, develop critical mass with willing teachers, transparency, leadership led change, visit successful ILEs, iteration
Lack of consensus to put money in due to unproven research	• Evaluation/data about learning in ILE, research, and student feedback
Funding, budget, resources, cost of infrastructure	• Prioritising grants • Sourcing more money through fundraising, grants, business sponsors • Push for more goverment funding (e.g. Gonski), targeted strategic planning • P&C • Use cheaper supplier
Teacher barriers	
Lack of knowledge about ILEs and non-traditional learning	Use prototypes and pilots, bring in toys, get feedback
Ongoing professional learning that supports collaboration	Learning focused classroom
Staff resistance, teacher practice and mindset	Transparency, professional development, involvement, exposure to successful ILEs, individualised support and training, professional learning, shared practice
Compromised teacher identity, traditional mindset/ resistance, pedagogical and environment change, no personal space (desk)	Pairings, agreements, protocols, courses, collaboration enforced, strategic direction, correct pairings, teacher professional learning
Management of devices and equipment	Professional learning in the use and management of technology
Pedagogical shift (change agent)	Time management framework (to collaborate, plan, find relief, create dialogue) and support, cultural shift
Fear of failure, willingness to change, limits in knowledge and confidence	Abandon standardised testing (such as NAPLAN), targeted professional learning, professional development, visit successful ILEs
Changing teaching practice	Targeted structured professional learning, training, curriculum consensus
Student learning accountabilities due to nature of large open environment	Relationships between teacher and student (knowing the names, culture)
Student barriers	
Student distraction/disengagement	
Parent/Community barriers	
Parents-educating them about change	Look at other schools with ILEs
Physical barriers	
Lack of physical space for quiet/individuals/groups and traditional furniture	Creative use of existing space to allow flexibility then transition to ILEs
Timetabling blocks of classes to create teams to use the spaces	Put secondary teachers in grade teams to reduce crossovers
Traditional space (furniture and layout)	Adaptability, flexibility
Time	Timetabling
Acoustics	Physical (glass partitions) and pedagogical (hands up/small groups) change
Too much furniture, sharing classrooms with fixed furniture	
Other - time, pragmatism, perception of favouritism, slow progress (may lose momentum)	

Auckland - Teachers mind frame and belief systems

Do teacher mind frames reflect actual practice?

The workshop focused on teachers' mind frames and belief systems. Participants worked in small groups to explore how teachers' beliefs about learning shape their teaching. These small group discussions illustrate challenges other teachers face, what they are doing to overcome them, and provided an opportunity to discuss what teachers need to support their teaching practices. This workshop helped participants and the ILETC research team to better understand how learning environments overlaps this phenomenon.

We began with the assumption that powerful impacts in the use of ILEs relate to how teachers think (Hattie, 2012). Hattie (2012) describes a teacher's mind frame as the mediating variable that directs how teachers and school leaders think and act when engaged in all aspects of teaching. As such, it provides a framework for understanding the impact of a teacher's pedagogy on student learning. He presents eight mind frames, or ways of thinking, that underpin those actions and decisions of teachers and leaders that are likely to have significant impacts on student learning. The mind frames are drawn from the findings of his synthesis of over 800 meta-analyses (Hattie, 2009) and encapsulate the "belief that we are evaluators, change agents,

Figure 3: Teacher personas.

adaptive learning experts, seekers of feedback about our impact, engaged in dialogue and challenge, and developers of trust with all, and that we see opportunity in error" (Hattie, 2012, p. 159). The eight mind frames are, teachers:

1. Believe that their fundamental task is to evaluate the effect of their teaching on students' learning and achievement.
2. Believe that the success of students is based on what teachers do (or don't do).
3. Want to coach and model different ways of learning, rather than teaching.
4. See assessment as feedback about their impact.
5. Engage in dialogue, not monologue.
6. Enjoy a challenge and never retreat to just 'doing their best'.
7. Believe that it is their role to develop positive relationships in learning spaces and staffrooms.
8. Inform parents about the nature of learning.

We were keen to learn whether participants current mind frames reflected their teaching practices. Adapting the persona tool used in human-centred design to profile a potential user, participants worked in pairs to flesh out biographical detail for an incomplete sketch of a teacher (see Figure 3). The activity sought to explore how brief quotes from teachers can illuminate his or her teaching philosophy, and potentially underlying beliefs on how learning happens. Following the group discussion, teachers were now primed to individually reflect on their own teaching beliefs. Using and adapting Hattie's mind frames literature (2012), the teachers self-reported how they situated themselves against a set of teaching belief statements. Following the activity, teachers individually reflect on how their teaching practice played out day-to-day. The goal being that the teacher could then assess if there were gaps in what they believed was good teaching practices and how they actually taught in practice. In addition, participants reflected on the type of learning spaces that contributed the most and least to their teaching practices.

Teacher biographies

After reading brief quotes from a fictitious teacher as if spoken "At a job interview" and "The first day of school", participants filled out further details such as age, teaching experience and biography. Developing the teacher persona enabled them to reflect about their own experiences. Following this activity, teachers developed their own personal biography of their experiences. Participants' experiences range from beginning teachers up to experienced teachers (above 20 years of experience). Table 4 (overleaf) provides example statements from three beginning, medium term and experienced teachers.

Teacher belief and practice statements

Participants were asked to rate themselves against belief statements and practice statements about teaching that capture what he/she would typically feel in the learning space. Each statement represented

a possible belief or practice continuum within each mind frame articulated by Hattie (2012). There were no right or wrong statements—the aim was to get teachers perceptions of their beliefs and practices about teaching. The number of participants who rated against a four-point scale on each mind frame belief and practice statements are provided in Table 6 (overleaf). It should be noted that statements were developed by project team members based on collective understanding of Hattie's (2012) mind frames.

In the main, participants' beliefs seemed to be aligned with their practices. One participant felt that there was no difference between what he/she believes in and what he/she practices because:

> *My new principal encourages me to do things differently. We are moving forward and that excites me. Permission to play.*

Another participant commented:

> *Not many differences as the management team were working towards a school culture that matched my beliefs and the way I taught.*

Marked differences could be seen in participants' responses to the belief and practice statements for mind frame 2, "*Teachers/leaders believe that success and failure in student learning is about what they, as teachers or leaders, did or did not do… We are change agents!".* One participant explained the difference as:

> *Yes, I believe all students can be challenged but when I teach I tend to think about how I can make it more engaging and fun. Putting it more on my way than the kids.*

The primary cause for this difference, according to the same participant is that:

> *My mindset—being in a single cell classroom—tending to go back to teacher teaching the kids.*

Table 4: Example biography from three teachers.

Participant	Biography	The first day of school I say	At a job interview I say
Beginning teacher, P2	Two years experience. Not afraid to make mistakes and learn through them. Sport and the Arts orientated. Good people's person.	"Curiosity, perseverance and stepping outside of your comfort zone is what drives your learning".	"I believe the relationship you build with your student is what helps drive them to be the student they can. Collaboration is the key to success".
Medium term teacher, P2	Teacher in their 40s, been teaching 12 years. Has had career experiences outside teaching and is passionate about 21st century technologies	"We are in this learning environment together. I'm here to help you and discover and grow and make progress. Learning can be challenging and if you have a positive mindset you can overcome anything and learn".	"I believe in growth, mindset, challenging students enough to push through barriers, inquiry based approaches, to follow passions".
Experienced teacher, P5	Teacher of 25 years (secondary and primary). I have 3 children and coach sport. Masters and currently on doctorate. Head of teaching and learning at school	"This is exciting: a chance to try new things; new students, how can I differentiate for my students. Who are you? Let's get to know each other- how do you learn best? I want to hear what you think so we can learn together".	"Learning comes from multiple opportunities and styles; from knowing your students, inspiring them (as learners and culturally), values and vision, key competencies, learning objectives".

Impact of learning space on student learning and teaching

Participants were asked to rate three elements in terms of how these would affect student learning on a four-point Likert scale of "Really positive impact" to "Really negative impact". Table 5 provides a summary of responses. The majority of participants perceived that innovative elements of technology, furniture and flexible spaces have a positive impact on student learning.

Participants also described the ways the learning space affects their teaching practices. Participants agreed that a flexible space can meet a variety of student learning needs, and enable different teaching approaches (in some cases regardless of the space), as well as the use of technology, as ways that a learning space can support their teaching. Participants' comments seem to suggest that spaces become innovative when teachers make use of the possibilities that the space affords. Examples of comments by participants include:

> *A flexible space that can support collaborative activities of students and at the same time students can learn by their own way.*
>
> *Ability to choose activities to suit [students'] learning needs and choices.*
>
> *A learning space is what you perceive it to be. An ILE can be in a form of any space.*

Two elements of the learning space that least support teaching were inflexible furniture and spaces that were too small. For instance, teachers noted that furniture was often too big, there was too much, or that it was superfluous. They also noted that the ability to have a quiet space or breakout space is important for students' independent learning.

Summary

We started with the assumption that teachers who exhibit teacher mind frames as conceptualised by Hattie (2012) are "more likely to have major impacts on student learning" (p. 182). In the main, participants' mind frames seemed to reflect their practices. The only marked differences could be seen in the way teachers view what they could do to affect student learning and what they actually did in practice. This is aligned to previous research that the promotion of teacher agency does not just rely on the beliefs that individual teachers bring to their practice, but also requires collective development and consideration (Biesta, Priestley, & Robinson, 2015). Key elements that supports teachers' practices are flexibility of space to meet varying learning needs, the ability to use different teaching approaches regardless of the space, as well as the use of technology within the space.

Table 5: Elements of the learning space and its impact on student learning.

Elements	Really positive impact		Slightly positive		Slightly negative		Really negative impact	
	n	%	n	%	n	%	n	%
Technology-infused classrooms	22	68.8%	7	21.9%	3	9.4%	-	-
Diverse range of furniture	9	28.1%	19	59.4%	4	12.5%	-	-
Reconfigurable learning spaces	15	46.9%	16	50.0%	-	-	1	3.1%

Teacher mind frame	Belief statement	**Which statement most represents an exemplary teacher?**	Belief statement
1	I know what is optimal and I do this to the best of my abilities.		I seek feedback to assess how I might improve my teaching
2	I facilitate student learning to the best of my abilities		I believe all students can be challenged
3	I seek new methods of teaching and assessing student's learning		I look for chances to demonstrate different ways of learning
4	Teachers and students are peers in the feedback equation		Assessment is about student outcomes of student learning
5	Evaluating student's learning requires two way communication		I assess how and what students are learning
6	I break down the challenges into manageable bits for my students		I engage students in the challenge of learning
7	I embrace mistakes and encourage learning from failure		I try to prevent misconceptions and misunderstandings
8	I inform parents about their child's grades and performance		I encourage parents to engage in how their students are learning

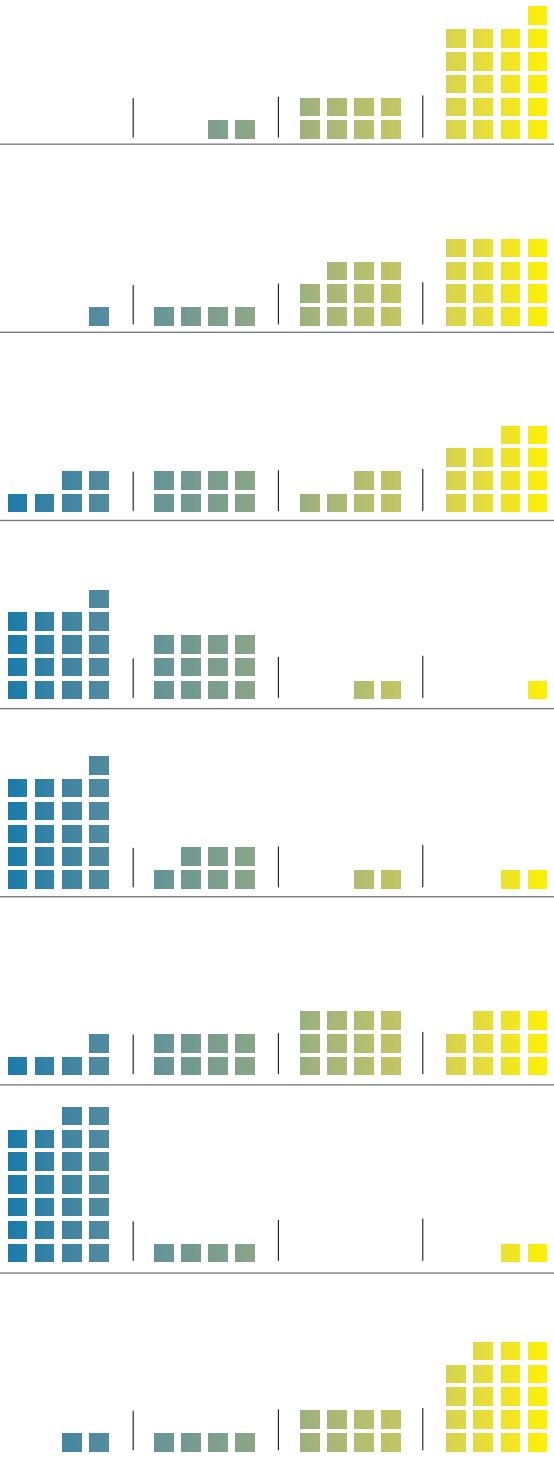

Table 6: Participants' belief and practice statements.

Practice statement	**Which statement is most like what you find yourself saying in class?**	Practice statement
I've learned that this is the best way to teach this material		I'll modify this lesson based upon the feedback I get
I try to make lessons engaging and learning fun		It's amazing how these students rise to a challenge
This a fun way to gauge how well you learned the material		Let's try a few different ways of approaching this problem
There were low scores so I'll try a different approach		You guys didn't quite get this topic- we'll go over it more
Let's discuss in groups and work through this assignment together		Make sure you read and understand the feedback I've left
Go through and do the ones you know how to do		This is a bit challenging, give it a go then we'll discuss it as a group
Learning from mistakes is as important as getting it right		If you aren't sure about something, refer to the textbook
Make sure your parents see your school-work portfolio		Do this with your parents, it shows what we are doing in class

☐ Each square depicts teachers agreement towards each statement.

Christchurch - Student deep learning and ILEs

What are teachers' understanding of deep learning?

The workshop in Christchurch focused on Deep Learning and ILEs. Participants worked in small groups to describe the concept of what student deep learning is and model the learning scenarios this takes place in. The workshop inspired an increased awareness of the conept of deep learning, and how learning spaces currently support or could better support deep learning.

What is deep learning

We began with the assumption that ILEs accommodate the learning approaches of the 21st century student. Instead of going in with pre-conceived ideas of what this means, participants were asked individually, and as a group, to describe what deep learning is. Individually, participants visualized deep learning through illustrations. Examples of these illustrations are provided in Figure 4. As groups, participants defined a number of key concepts of deep learning, which can be categorised as follows:

- Creativity – Thinking "outside of the box/space", creativity-making, testing, reflecting, curious and seeking;
- Collaborative – Working together, asking questions, listening, influencing and contributing to the work of others;
- Critical thinking – Higher-order thinking and questioning, being challenged, big idea-making connections whilst utilising prior knowledge;
- Character – self-directed agency, change and impact; and
- Citizenship – Learning as part of an ecosystem, community links and involvement.

These concepts could be mapped against the Deep Learning Competency Framework (Department of Education and Early Childhood Development (DEECD), 2015) of six deep learning competencies. Interestingly, communication, one of the six deep learning competencies identified by the framework, was not explicitly acknowledged as a characteristic of deep learning by participants.

Additionally, participants included 'teacher as learner and learner as teacher' as a key concept for student deep learning. The concept of learner as teacher is about challenging students in ways in which they have never been challenged before, and in doing so, improving their own learning experience. In other words, it is about the manner in which the teacher is actively engaged in interrogating his/her own practice with a view towards improvement. This is affected by what teachers believe they can and should do to influence student learning.

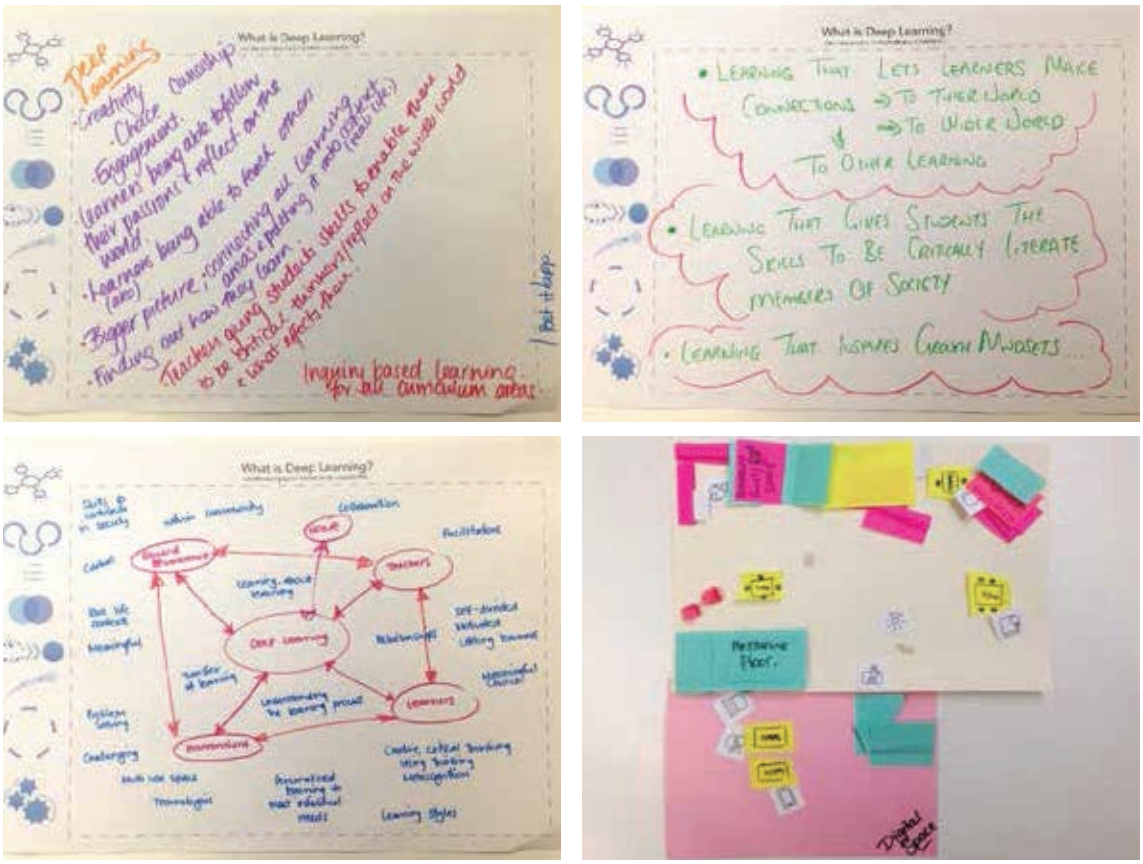

Figure 4: Examples of deep learning illustrations.

Models of deep learning

Participants were asked to model a deep learning scenario using craft material and Playmobil and Duplo figures. They were then asked to discuss as a group the elements in their model scenario, which contribute and support deep learning. Figure 5 provides examples of models of deep learning. One group described their deep learning scenario as:

> *Our learning ecosystem shows students learning in a variety of spaces and in different ways. Learning is personalised. Students have choices with how they learn. Learning can be differentiated. Students have the opportunity to tap into interests. Students can be challenged though 'hard fun' - fostering creativity. Problem posing - before finding solutions.*

Participants identified several elements of the physical environment that would contribute to enhancing student deep learning. These include:

- A range of space including mezzanine floor, reading nooks, indoor and outdoor space, breakout space, quiet space, digital space, presentation space and 'campfire' space;
- Moveable furniture and fit outs such as walls, partitions, tables, create-a-space elements, cushions, furnishings, lighting, bi-fold windows, sliding doors,
- Access to a variety of tools including Information Technology (IT) devices, paper/pencil, books and music;
- Materials for hands-on activities.

According to participants, these elements of the physical environment would encourage deep learning through opportunities for

increased 'agency and choice', 'collaboration' and 'engagement' (in the classroom, with the community and globally). These elements would also support deep learning by offering a range of experiential learning experiences such as 'personalised learning', 'problem solving', 'authentic learning', 'reflection' and 'discussion'. Learning from the experience of others, participants also discussed how their model is similar or different from their current learning space. One participant who felt that their learning space was enabling deep learning, indicated:

> *We have communal as well as more separate spaces. Students have agency in terms of moving furniture around, who they collaborate with, working independently. Technology devices are used freely to aid learning. Students have input in what they learn. Students share information, make connections, are teachers as well as students.*

On the other hand, another participant related:

> *Currently working in an ILE where aspects of deep learning occur at times. More [professional development] needs for staff and ongoing for learners (students and teachers) to make the most of the space and use it effectively for the best learning to occur all the time. Need to continue to develop and make changes. Challenges come from transitioning from single cell to ILE and I don't think we are there yet. Why are we doing what we are doing and is it making a difference? Massive journey! I'm only just beginning!*

Summary

If we begin with the assumption that ILEs can and should accommodate the learning approaches of the 21st century student, findings from this workshop seem to suggest that deep learning for the contemporary student should encapsulate characteristics of creativity, critical thinking, character, collaboration, citizenship, and teacher as learner. Participants identified several elements of the physical environment that would contribute to enhancing student deep learning including a variety of spaces, moveable furniture and fit outs, access to a range of tools, and materials for hands-on activites. These elements of the physical environment offer a range of experiential learning experiences such as personalised and authentic learning, problem solving, reflection and discussion, and encourage deep learning through opportunities for increased student agency, collaboration and engagement.

Figure 5: Examples of deep learning models.

Phoenix College (Stage 1), Y2 Architecture.
Photography: Zac Couyant.

Canberra – Journey Maps

How do teachers perceive their transitions into ILEs?

The workshop in Canberra focused on better understanding the journey teachers go on when they transition into an ILE. Participants were involved in a 'journey-map' activity, which encouraged peer discussion around their formative early experiences (see Figure 6), followed by individual reflections and perspectives on what they did, felt and thought when they transitioned into the new learning spaces. With an emphasis on the social learning that comes from sharing concrete experiences, the workshop helped participants be explicit about their journey and learn from the experiences of their peers. Because of the nature and focus of the workshop, we sought participants who had prior experience transitioning from a traditional space to one more innovative.

Transition to a more innovative learning environment

In search of some best practice narratives, we started with the assumption that the project team could learn from better capturing the experiences and emotions a teacher goes through during the process or period of changing from a learning space considered to be traditional, to one that is more innovative. The decision to assess the journey through a psycho-emotional lens gave the participants encouragement to be very open about the anxiety and excitement they might have felt at different points. This information

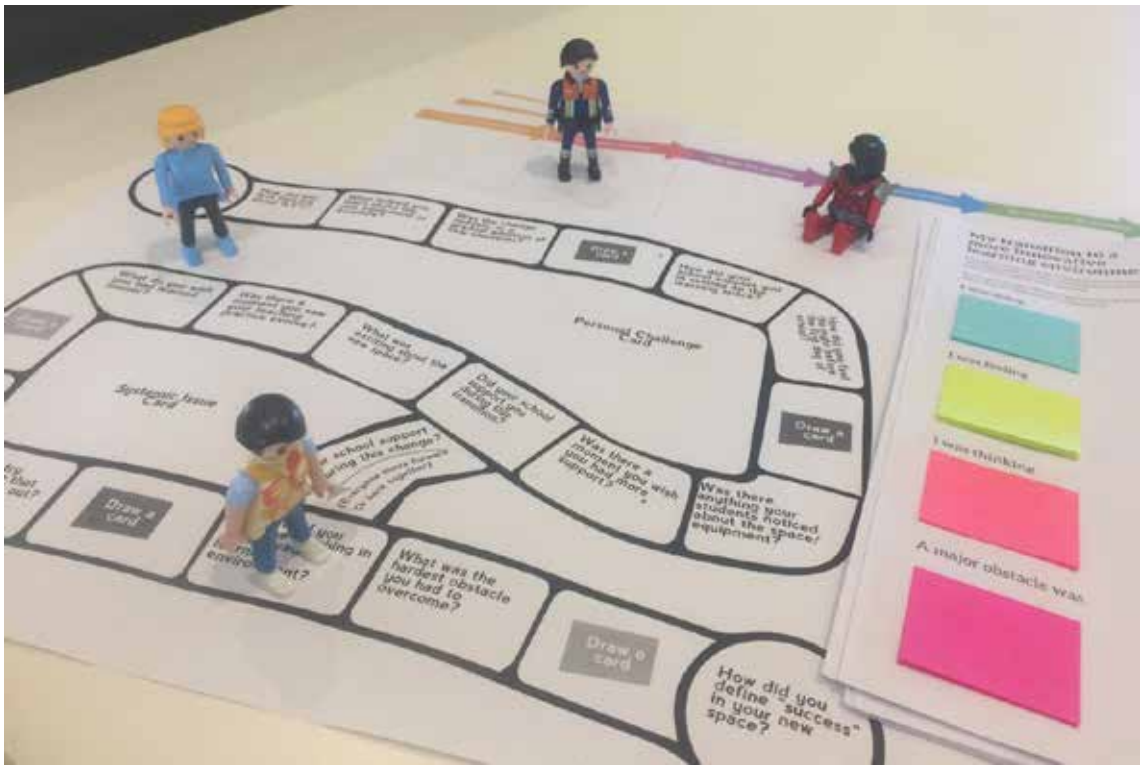

Figure 6: The journey map.

in turn gave the project team data on how to maximise the teachers' intrinsic motivation to change and scaffold their transition to new learning contexts.

Participants were asked to describe their journey by writing about what they were doing, thinking and feeling during five stages of the transition process into an innovative learning space: (1) when I first heard about, (2) to prepare for using, (3) the first day of using, (4) as I gained familiarity, and (5) by the end of the semester (see figure 7). Following the group discussion and personal reflection, participants were asked to write a letter to a teacher about to transition into an ILE, from the perspective of a teacher that has already transitioned.

When I first heard...

Participants were mostly excited when they first heard about their move into a learning environment. Only one participant felt challenged about setting up a learning space that teachers could use effectively. A number of participants considered seating plans and the furniture that would support the needs of both students and teachers. A few participants considered more holistic school-level factors such as the school culture required to drive change, leading contemporary practices to influence school improvements, and the need to balance between being strategic and innovative. Participants identified two obstacles at this early stage of the process—the cost of implementation and the lack of training and development for teachers. Although the sample was small (n = 11), only one participant felt that the potential of the new space did not outweigh the effort required for transitioning into ILEs.

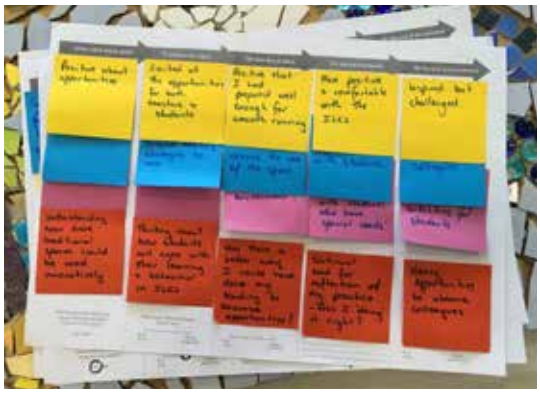

Figure 7: The transition process.

To prepare for using...

Participants were split about how they felt while they were preparing for the transition process. Some felt excited while others were nervous. This nervousness stemmed from the stakeholders (such as teachers, students and parents) being unprepared for the transition, the pressure to see the space utilized as a contemporary pedagogic tool, as well as ensuring that more 'traditional' spaces are used more innovatively. Not all participants felt supported by their school throughout this process. While they conceded there were a lot of physical resources, there was insufficient time, training, professional development and 'headspace' allocated to discuss how to use the new learning spaces, develop relationships with other teachers, parents and students, and manage risk.

The first day of using...

Participants were also split about how confident they were feeling on the first day in the new learning space. While some felt quite confident, others felt unsure about how the new learning space and the furniture configurations might work. A number of participants felt that the lesson '*could have been done in any classroom really*' or that the set-up and teaching were '*still pretty conventional*'. Students seemed to be central at this stage of the transitioning process—questions were focused around how students were using the space, how they were coping in the new space, and finding the best use of space and fit for the students. A key consideration is the configuration of the space and furniture used. Some participants were amazed at the '*new ways of using furniture that I had not thought of*' and that '*the students used the space differently to how I anticipated*'. Interestingly one participant commented that '*students [were] making forts and vehicles out of furniture. We continued to teach expectations and kept all furniture in the space*', alluding to the lack of flexibility and creativity for students to 'experiment' in the new space.

As I gained familiarity...

As teachers became more accustomed to the learning space, they felt more confident and more prepared to '*let go of control*'. They were also more creative in the use of the space and were more prepared to challenge students within that space. There were a few participants who felt that the students were disengaged with the teaching and learning in the space or taking too long to adapt. Some of the challenges during this stage of the transition process was '*letting go of control*', '*understanding the kids and their learning needs*', and '*being on display*'. However, a major challenge for participants was '*setting up the space*' either through making some '*personal space*' for students, '*setting up guidelines and structures*' for the use of space, encouraging mobility of students, and using space more effectively to maximise teaching and learning opportunities.

By the end of the semester...

Having spent approximately six months in the new learning space, participants felt positive about the new space using words such as confident, energised, pleased, trusted, inspired, and challenged to describe how they were feeling. Only one participant felt frustrated, and this was attributed to not having enough resources to support innovation. Most participants felt quite comfortable working in the space by this stage. A lot of the reflections by participants were centred around improvements— '*how can we use the space even better*', '*how can we get practice to match the space*', as well as the '*continual need for reflection of my practice*' and '*expanding, tweaking plans, revisiting student expectations*'. A number of participants sought evidence that whatever they were doing had an actual impact on student learning and outcomes.

Words of wisdom to a fellow teacher

The participants were asked to write a letter to a teacher about to move into an innovative learning environment, from the perspective of a teacher that has already transitioned. The aim was to provide helpful advice and insider knowledge that they themselves would have wanted to receive before their own transition.

Participants had numerous tips and advice for new ILE users. Most prominent was the idea of reversing the traditional, didactic school dynamic by handing choice back to the students. The concept of student centeredness emerged as a key theme, with participants advising future ILE users to '*put students at the centre of your planning*', '*let them help you set it up!*' and '*allow the children to take the lead, they may make use of the space in ways you never thought of*'. The overarching message in teachers' letters suggested that participants' retrospectively would have benefited from someone telling them to 'let go' of control and place trust in the students.

Participants empathized with teachers' potential fears and resistance of transitioning into an innovative learning space. Comments centred on encouraging teachers to not be afraid, to try unfamiliar and different ways of teaching, to change practices, take risks and reflect on what works. One participant commented, '*be ready and willing to stop, change and try again if things don't work as you had hoped*' implying changes in practices do not necessarily translate after one iteration in the new environment. Another comment along the same theme was '*don't stress—it will come over time*'.

Another theme that emerged from the letters was the idea of flexibility. There was an acknowledgement of how reconfiguring the space with different furniture arrangements and wall divisions allows the space to become more personalised to the different learning needs and learning styles of students '*from whole class to small group to individual*' as '*some kids really like to have their own space*'. One participant commented '*the freedom of the room just opens up so many opportunities that you won't want to go back!*'

Collaboration, both between teachers in terms of team teaching and sharing ideas, as well as learning and collaborating with students, was also a recurrent theme. Most prominent was the idea of utilising relationships with other teachers to '*share ideas/concerns/ thoughts*' on '*how to best use the space*', for support, or as a feedback mechanism where teachers could '*go and watch them teach*' and '*ask them to watch you*'. The concept of collaboration also extended to community engagement and education about ILEs, letting expectations be known early and looking at good practices for inspiration and feedback. One particular comment captured the overall theme of the letters:

> *Let go of your traditional knowledge of what schooling should look like. We are preparing students for the future. Don't predict the future, learn the future.*

Summary

We started with the assumption that teachers go through multitude of experiences and emotions during the transition into ILEs. A consistent theme that seemed to emerge at every stage of the transition process is concerns around configuring the new space and the use of furniture in that space. A key consideration also is how students transition into the new spaces—how students were using the space, how they were coping in the new space, finding the best use of space and fit for the students, and most importantly whether the new practices occurring in the new space had an actual impact on student learning and outcomes. Finally, two important considerations are the mindsets and professional development (or lack of) for teachers. Teachers were mostly excited by the possibilities at the beginning of the transition process to more reflective on how they can continue to improve their practices as their journey progressed. The lack of professional development and/or best practices could be key to being able to drive the enthusiasm rather than have it drowned out by their lack of support.

Stonefields School, Jasmax Architecture.
Photography: Alex De Freitas.

Brisbane – Teacher change

What support is required to enable teachers to undertake change in their practices?

This workshop focused on examining what types of supports are required to enable teachers to undertake change in their practices. Activities involved participants visualizing metaphors to help them describe the conditions in which changes in practice take place, as well as using these metaphors to describe the ideal system that would support a teacher adapting to an ILE.

We started with the assumption that a system of support could be developed to assist teachers in using space as a pedagogical tool. Providing support for teachers may enhance their capacity for change which involves learning and improvement (Richards, Gallo, & Renandya, 2001), and encourages them to become agents of change (Fullan, 1993) in promoting more active student learning. Great teaching practice, in this context, can be defined as those effective practices that use space as a tool to improve student learning.

Reflection on change

Participants began by selecting images that they associate with the idea of change, and sharing why they selected that image (see Figure 8). They were then introduced to the idea of changes in practice

Figure 8: Visual images associated with change.

taking place within a bigger system; illustrated by a brief video of a Rube Goldberg machine and the physical perspective shifting activity (Artandeducation, 2012). Participants reflected on a time in their teaching experience where they have experienced a change in practice. These ranged from using technology, co-teaching, to moving into a more student-centred approach to teaching. Although the sample was small (n = 10), it is noteworthy that only two participants indicated that the change in practice was a result of their perspective or their desire to see change and improved practice. All other participants noted that changes in practices were a result of external factors such as the drive for change from senior management, undertaking professional development or extended learning, as well as a push from students, parents and community.

System to support change

In small groups, they arranged and labelled printed cards representing pieces of the "Magical Mystery Change Contraption" (see Figure 9) to illustrate the human and non-human actors in their systems of change. The final activity incorporated key insights and realisations from their reflections to visualise the ideal contraption that would support teachers undertaking changes in their practices.

Figure 9: Magical mystery change contraption.

Participants' discussion about the elements in a system to support change can be grouped into inputs, outputs and enablers. In simple terms, these could be defined as:

- Inputs - what we need to do it (such as information, materials and people);
- Enabler – Where we do it, and what and who we do it with (such as human resources, tools, equipment, systems, facilities and assets); and
- Outputs – what we produce or deliver.

Inputs

An input is something that flows through a process or activity, which change or undergo a transformation. Such transformation in some way add value to the process or activity. In the context of this workshop, a teacher's practice could be considered as the process or activity. Participants discussed factors that might trigger a change in practice, which includes a challenge posed by the environment (a new building or facilities), an observation about teaching or learning, or an inspiration. One group described it as *'something you've seen or heard, we get excited about it and then decide to take it forward*'.

Participants felt the need to validate the change in practice. This could be done through observations at their own or other schools, through reflections, as well as through data. These would require research, gathering tools, and communication—either to seek permission or build dialogue around the issue. Participants also discussed the motivation for the change, whether it was external (principal, community and other stakeholders) or internal (for self-improvement). Some believed that the change in practice needed to be aligned with the vision and values of the school. Both need to be considered concurrently so that there is a clear view of what the end goal is and what they are trying to achieve.

Enablers

Enablers are things or people that make it possible for someone else to achieve something. Participants noted the solitary nature of the initial process and named a few enablers for change to take place in practice. These include both intrinsic and extrinsic rewards or benefits: the time, space, and the right conditions for success to take place; money; and freedom of headspace to be able to evaluate whether the initiative is worthwhile to take it forward. Participants also discussed about '*bringing others on the journey*' and how it could '*apply in the context of your school or system*' because of the greater benefits for the broader learning community. There is a potential pressure that may occur on the individual teacher because of additional energy expended on systemic change in practice.

Some participants also discussed the barriers to change. There might be oppositions from other teachers about changing practices, about managing expectations, and about making sure change is heading in the right direction. It is about '*keeping the gears well-oiled and motivated*'.

Outputs

The outputs are the desired result as a consequence of the transformation. While participants did not discuss explicitly the outputs as a consequence of a change in practice, the main assumption in this workshop was that changes in practice would enable improved student learning. Participants noted the 'trial and error' of modifying the concept or idea or initiative, finance and the internal and external pressures that may occur in order for improved student learning. As adjustments occur, expectations need to be continually managed so that '*we can continue to deliver what it is we're trying to deliver*'. Good communication is key at this stage. When others can 'see' success and get on board, more reflections can take place through documentation and observation. Effective engagement occurs when the cycle of improvements becomes systemic in nature. As another group commented, '*monitoring as it goes through, tightening loose bolts we need to tighten as we go through, and then the cycle starts again*'.

Summary

We started with the assumption that a system of support could be developed to change teacher practices in the use of space as a pedagogic tool in order to improve student learning. Findings of the workshop centred around the inputs, enablers and outputs required for this change to take place. Within the 'system', inputs could be considered as a challenge posed by the environment (a new building or facilities), an observation about teaching or learning, or an inspiration, which could transform teacher practices. Enablers could be summarised as the human resources, tools, equipment, resources, facilities and assets that allow change to take place. While participants did not discuss explicitly the outputs as a consequence of a change in practice, participants discussed the cyclical nature of improvements to ensure that its direction-setting and resourcing processes, core activities of learning and its enabling systems and infrastructure are continuously monitored and improved.

Marshland School, Architects: Stephenson&Turner/Hayball. Photography: Paul McCredie.

Conclusion

This technical report presents findings of five teacher workshops held in Auckland, Brisbane, Canberra, Christchurch and Sydney in 2016-17. Developed using a design thinking approach, its intent was to establish existing teacher perspectives and insights on concepts central to this project. On its own, the workshops were not intended to provide a holistic view of current practices related to the use of innovative learning environments. The qualitative findings, combined with quantitative data from the Space, Design and Use Survey (see Imms, Mahat, Byers and Murphy, 2017) and scholarly literature (forthcoming), provide a rich understanding and a strong knowledge base surrounding the use of innovative learning environments in Australia and New Zealand.

The findings should be treated with care. Data was based on teachers' perceptions—staff at the coalface who work with students on a daily basis in different learning environments and contexts. Participation was voluntary, consequently included teachers with pre-dispositions either for, or against ILEs. In addition, while design thinking is an approach that has been used for decades, the efforts to quantify some of the data or obtain themes from 'stories' are quite novel and unique. While there is some agreement that without a more systematic and organized structure, design thinking can be a 'random shot in the dark', there exists some tensions between the innovative nature of design thinking and the notion of a codified, repeatable and reusable practice.

The data from the workshops indicated that teachers associated ILEs with the notion of student-centred learning—ways of teaching that shift the focus of instruction from the teacher to the student. A learning environment that is innovative helps students to be active, responsible participants in their own learning and with their own pace of learning, placing the teacher as a facilitator of learning for individuals rather than for the class as a whole. This was a consistent theme in almost all of the workshops. One of the key barriers identified was teacher mindsets—on issues around loss of control, on changing 'old' practices, and on taking risks. This finding, in particular, has substantiated the focus of the ILETC project on teacher mind frames.

Across schools in Australia and New Zealand, the move from traditional classrooms to ILEs is inevitable. Efforts to obtain teachers' perspectives, such as those documented in this report, provide valuable insights into the use of ILEs as a pedagogic tool to direct meaningful and sustainable improvements in student learning. Triangulating this data with other sources of information, this study would be able to provide specific, robust recommendations to inform subsequent in-depth case studies and develop evidence-based strategies to enable teachers to unlock the potential of ILEs.

St Columba's College, Sophia Library, Hayball Architectre. Photography: Dianna Snape.

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Our partners