Making space to learn: leading collaborative classroom design

Abstract

Design principles for learning spaces for 21st century learning emphasise flexibility and collaboration. Yet it is rare in Australian schools for school leaders to invite students and teachers to collaborate in the design process or to prepare them for the transition into innovative physical learning spaces that are often designed to challenge and change existing learning habits. This article presents a qualitative case study of how one primary school leader led a successful transition for a teacher and her students by inviting them to design their future physical learning space and reconstruct their pedagogic relationships. This article analyses her leadership practices drawing from literature in the learning space, student voice and leadership fields to consider the benefits and challenges experienced by the collaborators when making space to learn.

Keywords: leadership; learning spaces; student voice; 21st century learning; participatory design; action research

Introduction

School Principal, Emma Knox* invited students and teachers to redesign their physical classroom space as an authentic learning experience designed to empower the teacher and students. This article reports on Emma's leadership practices, in particular her interactions with the teacher Kathryn Conti* and how together they enabled students to be involved in a participative design process in an Australian primary school setting. Through analysing the events of the collaborative design process, this article identifies leadership practices that empower students and teachers in their transitioning into newly designed learning spaces.

In this study, the process of *making space to learn* came to mean both the leadership processes involved in designing a *physical* learning space as well as designing opportunities for teachers and students to generate new cooperative patterns of interactions in the *pedagogic relational space*. Space is usually understood as the geographic location for events and objects but space

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can also be understood as something that is socially produced and achieved through human activities that occur in a location (Lefebvre, 1991). Learning spaces in schools encompass the synergy of interactions within both social and physical spaces (Elliot Burns, 2011). However, this view of learning spaces is not widespread in education despite the concept of the learning environment being recognised as 'the third teacher' by post-war Reggio Emilia educators (Strong-Wilson & Ellis, 2007). For most teachers learning space is conceptualised as "in the students' heads" (Wilks 2009, p. 18). Emma recognised that redesigning the physical space would create an opportunity for Kathryn and her students to enter into a new pedagogic space and move towards her vision for 21st century learning.

This article begins with a review of literature about participatory learning space design, student engagement and leadership before the methodology for the study is described, the case study context is outlined and the leader's practices are analysed. The analysis presents a rich description of the design process, as well as highlighting effective leadership practices to inform future collaborative design practices.

Designing learning spaces for 21st century learners

Government funding had provided Emma with an opportunity to redesign a school classroom built in the 19th century, to suit the needs for learners in the 21st century. Learners in the 21st century are often characterised as digital, mobile, independent, social and participatory (Beetham & Sharpe, 2013). In response, learning spaces are being designed to be more flexible, spacious, welcoming and enabling digital and social collaboration (Radcliffe et. al. 2008). In Australia this vision for collaborative and active learning is also reflected in the two educational goals for young people that promote equity and excellence, and learners who are confident, creative, and active and informed citizens (MCEETYA, 2008). Yet despite these visions of participative learning, students and teachers are rarely included as participants in the design of their new learning spaces (Flutter & Ruddock, 2004; Newton & Fisher, 2009).

When participants are not involved in the design process or design thinking, there is little evidence that the pedagogical practices implied by the learning space design emerge (Elliot Burns, 2011. p. 51). Instead of being empowering, new learning spaces can cause teacher stress about how to teach in the new conditions particularly where there has been no consultation in design or preparation for transition (Wilks, 2009). The investment in designing spaces to promote new types of learning can be lost if the process for pedagogical transition process is not

also part of the design thinking. Preparation for transitions to new learning spaces is recognised as a significant opportunity for teachers and students to reimagine new pedagogic practice and consider alternative routines and practices (Bland, Hughes & Willis, 2013). The role of the school leader in facilitating the process of redesign and transition is therefore a significant one. However there has been little empirical research that considers the leadership that facilitates innovative pedagogies in new spaces, or the processes and preparation required to transition to new spaces (Blackmore et. al. 2011). The following article contributes to this emerging research area of interest.

Emma's long term leadership vision was to support the teachers' transition towards more flexible and student centered pedagogical practices and to find "a sense of ownership, connectedness, and understanding of how they learn." The State Schools of Tomorrow project (Queensland Government, 2007) that prioritised consultation and improved school learning environments represented an opportunity for both teachers and students to be part of a participative design process, a vision that is supported in the learning space literature. Teachers and students provide valuable insider information about the variety of uses of the existing spaces, and through sharing opinions, can create a dialogue about learning and shared understandings of the potential for future uses (Frost & Holden 2008; Prosser, 2007; Woolner, et al, 2010). Students also generate ideas that adults would not have thought of (Rudduck & Flutter, 2004; Greene, 1995). Involving students as participants and agents in designing their everyday learning spaces can also promote democratic engagement with the social and political forces that shape their lives (Foley, 2011). When students are involved in designing learning spaces, consistent preferences for comfort, colour, connectedness to nature, adventure, play, and technology emerge (Bland & Sharma-Brymer, 2012; Bland, Hughes & Willis, 2013). Despite these worthy goals student participation can lack sustainability and create disappointment when well intentioned practices lack clarity about the purposes and possibility of participation (Foley, 2011). In this case study, the school leader's purpose behind a participatory approach was to enhance learner engagement.

Creating space for student engagement

Learner engagement was defined as cognitive focus on academic tasks, high degree of positive emotion, and high participation made possible through pedagogic practices that invite self-awareness of how to learn (Munns & Woodward, 2006). Engagement is directly linked to

student improvement in learning (Skinner & Pitzer, 2012) and needs to be understood as situated within social and ecological influences (Lawson and Lawson, 2013). Student engagement is "the conceptual glue that connects student agency...to the organizational structures and cultures of school" (p. 433). In their extensive review, Lawson and Lawson note that place based studies of engagement are needed, with attention to organisational structures and the actions and positions of students in engagement activities. Involvement of the students in the design of their learning space provides such a context. For Emma, it was an opportunity for the students to create a legacy for other learners, as well as a smart investment, as "if you are going to have this level of investment financially, there should be a commensurate level of commitment emotionally and intellectually."

Effective school leadership is needed to support full student participation in being part of school change, requiring the leader to create socially supportive spaces for the development of new teacher and student identities (Fielding 2006). Students can sometimes contribute "obnoxious, incomprehensible, recalcitrant voices" (Bland & Atweh, 2007 p. 344) or may take time to adjust to having opportunity for greater responsibility and explorations of the tensions that are often taken for granted in their daily schooling lives (Rudduck & Flutter, 2004). Bland (2009) notes that inviting students and teachers to be full participants as critical co-researchers has significant implications for school leaders and traditional relationships of power in schools. Emma noted that leading participatory design "takes a lot of emotional and intellectual capacity and a bit of confidence in managing change processes and being willing to let go. It takes more time and more energy and lots more organising." She noted "I used to be very good at doing things to people. I have got better at doing things with people." Collaborative leadership practices can be challenging for school leaders to enact, particularly within the current educational leadership policy climate in Australian schools.

Leadership of collaborative design

Leadership that seeks to empower others to reimagine new ways of learning and teaching draws from traditions of transformational leadership where teachers are motivated to explore new teaching practices often in collaboration with peers (Leithwood and Jantzi, 2005). It also draws on the theories of distributed leadership where power and expertise is shared among teacher leaders (Lumby, 2013). Yet both of these leadership traditions have been criticised in recent years. Transformational leadership has been criticised as focusing too much on enhancing the

working conditions for teachers rather than student learning (Robinson, 2010) while distributed leadership can conceal a growing workload expectation for teachers (Lumby, 2013).

The leadership paradigm that has greatest emphasis in educational policy in Australia currently is that of instructional leadership, which "by definition is strongly focused on the quality of instruction" (Bendikson, Robinson, & Hattie, 2012 p. 7). This is in response to the increasing emphasis within Australian education on performance measurement, benchmarks and standards and accountability (Klenowski 2009; Luke 2011). Instructional leadership is a paradigm adopted by many Queensland school leaders who are under pressure to show improved school performance scores supported by research claims that the effect of instructional leadership on student outcomes can be up to three to four times as great as that of transformational leadership (Robinson, 2010). Yet others such as Sun and Leithwood (2012) argue that instructional leadership is a subset of transformational leadership. Policy documents that regulate the practice of Queensland school principals do not clearly define what is meant by instructional leadership often adding the phrase on top of lists of characteristics previously associated with transformational leadership (Farwell, 2013). These discourses that emphasise accountability in "high performance" models of school leadership have been critiqued as being "essentially totalitarian" (Fielding 2006. p. 300) or returning to "great man" and trait theories of leadership (Timperley, 2011). However Timperley (2011) notes that while there is debate about the labels of theories, there is a strong consensus in the research about the types of leadership practices that enhance students' learning outcomes.

Leaders in schools where students perform beyond expectations have capabilities in building relational trust, solving complex problems, integrating theoretical and classroom knowledge, and creating the expectation that student and teacher learning is inextricably linked. Effective leaders of learning have a deep knowledge of teaching and learning, create relationships of mutual respect that empower others and focus on improving teaching to be more effective for students (Robinson, 2010, Timperley, 2011). Leadership that empowers others was evident in this case study and also underpins the methodology.

Methodology

While this paper focuses on the leader's role in leading the collaborative design of the learning space, a case study approach is used to represent the situated leadership activities and interactions with others to represent some of the messiness of leading change in action (Simons

2009). Through the inductive analysis of this case study, it becomes possible to infer important leadership practices involved in remaking school learning spaces to enable collaborative learning.

Data was gathered over a two-year period, during three visits by the researcher at the beginning, middle and end of the design project. The researcher observed classroom interactions, photographed visual artefacts and conducted separate interviews with Emma, Kathryn and groups of students. In between each visit, the data was analysed by the researcher using an open coding approach that enable the development of abstract ideas or themes (Charmaz 2006). Summaries of these emerging themes were emailed to Kathryn and Emma for comment, and further inquiry. Short video clips were created to show to students in the next research trip to prompt recall and interpretation of adult conclusions. In this way the participants were involved in analysing their own data as their commentary informed what was salient and powerful in shaping their learning over time. Learner engagement was problematised and explored in depth conversations where Emma challenged and supported Kathryn to re-examine some of her long held teaching assumptions and practices. During the research inquiry it became clear how that the school leader was a highly significant factor in creating the necessary successful conditions for positive change and support for the teacher to investigate and change her own practice over time. .

Context

The case study school is located in a small regional town in southern Queensland. The school had an enrollment of approximately 350 students aged 5 - 12 years in 2010 - 2011, the years of the research study. It was originally built in 1874 as a collection of wooden, raised single storied buildings with high ceilings and open verandah, built around a quadrangle. Emma had been at the school in a leadership position for 14 years, and had an additional 12 years of previous experience as a teacher and curriculum leader in various rural secondary schools. The school used the timetabling practice of 'looping' that involved a teacher completing a loop of two curriculum years with a class of children to enable the teacher to build positive parent and student relationships, and to plan developmental learning. Kathryn was timetabled to teach her class for year 4 and 5, a time span that enabled this project involving in-depth design and transformation of the classroom with her students to be possible.

Students in the class represented a wide diversity of sociocultural backgrounds. Some children came from the surrounding agricultural community and others were children of itinerant workers, or from families attracted to the lower cost of living in a rural town. The children were aged between 8 and 10 years old, and also reflected a diversity of learning abilities and needs. With their teacher, they participated in a series of curriculum experiences embedded within their Study of Society and Technology curriculum units to help them develop their understanding of learning and design, leading to small teams of students each giving a "pitch" for a design to be presented to the school principal by the end of 2010. The selected design was then to be used to refurbish the classroom over the long summer school holidays and occupied by the students for year 5 in 2011.

Leadership practices

While the teacher and students developed important leadership roles, the following analysis focuses on the practices of the school Principal, Emma. Quite distinct phases in Emma's leadership of the collaborative process emerged and are described in figure 1 and the following descriptive case study.

INSERT FIGURE 1 HERE

1. Creating cultural readiness

Emma had established a cultural readiness for a collaborative approach towards change in her years prior to this project. She had involved students in redesigning a school playground, and then involved two Year 6 & 7 teachers in choosing colour schemes and furniture for their classrooms. The teachers reported the learning spaces simultaneously made it easier to facilitate small group work and more difficult to do sustained teacher directed talk from the front of the room as it was a physical strain on their voices and levels of energy. This prompted Emma to consider ways in which she could better prepare teachers to shift to a student-centered pedagogy, and so reduce or at least prepare teachers for the discomfort of pedagogical change, which led to this project.

The vibrant rooms that were the result of these early collaborations in learning space design created school community conversations about the pedagogical advantages and challenges of teaching in newly designed spaces that occurred daily in the staff room between

teachers, with parents and with visitors attracted by the innovation. Emma noted "in most schools the Deputy Principal just rings up and orders furniture. Teachers and students don't know what they are getting or why they are getting it, which means they won't value it and won't know how to use it." Involving others in the design was building on the culture of collaboration in learning design, but also creating readiness for the teacher and students to engage in further transitions towards learner-centered pedagogy.

2. Creating a practical vision

Emma communicated the vision for pedagogic change in personal and practical ways early in the process. Emma released Kathryn from her teaching responsibilities for a day, driving together for several hours to tour Bizfurn, a furniture manufacturing company, with whom she had collaborated with previously. Kathryn was able to see and touch furniture and talk with an industry expert who had collaborated with many schools. Kathryn took away a scaled map of how the classroom might look in the space with her preferred furnishings. In the car ride to and from the factory that day, Emma was able to answer Kathryn's initial questions, and talk through any early concerns. Emma reflected "I work with them [teachers I am leading through change] in the first instance so they can see what it looks like, then let them do it more independently, so initially I was with Kathryn a lot, then a little bit, and I will let her finish it off by herself." The experience of making the vision of a new learning space tangible early in the process enabled Kathryn to imagine new possibilities and feel supported in what both an exciting and a scary responsibility as "I don't really know how this will look and I don't want to make the wrong decision as this is my first time designing, but I know Emma will help me so it will look great in the end." Initially Kathryn's concerns were about making design choices. Over time this shifted towards how students were learning.

3. Supporting the translation of the vision to a strategic curriculum plan.

Over the following weeks, Emma organised for Kathryn to visit and evaluate the existing innovative learning spaces in the school to find out what was working for learning and what wasn't. Kathryn then researched and developed a pedagogical model that incorporated her vision for the type of learning she could see occurring within an innovative learning space, "I used the Learning by Design framework [Kalantzis, Cope & Victorian Schools Innovation Commission. (2005)] and we used sticky notes and bits sheet of paper to plan a balance of activities". When it became clear how time-consuming it was to translate the vision into a written curriculum plan,

Emma released Kathryn from some of her teaching time to type it up "and put it into the format I wanted". This practical support reassured Kathryn in what felt to be a significant change. Leaving the plan open for student input was a new experience for Kathryn as she usually planned each week meticulously and "I have had to let go of that. It was a necessary thing to happen, but it does worry me". Emma worked regularly alongside Kathryn in the classroom as their plans for including the students in the participatory design were enacted.

4. Collaborating with students as designers.

The Technology unit called "Designs for Learning" structured the students' collaboration as part of their regular classroom learning and assessment program. The unit of work was planned for one hour a week over 10 weeks, however the students' enthusiasm, and the resulting overlaps with mathematical and literacy learning, meant that the learning experiences extended over 20 weeks. Students used digital cameras, concept mapping software and collaborative charts to capture, share and reflect on their learning. The unit was designed around Emma's vision "for students to know that 'we can make things happen... this is our school, our space, our learning'." Emma led by co-teaching with Kathryn to model how to collaborate with students, as well as by judiciously sharing her leadership decision-making power with students by focusing on opportunities or spaces to enhance student cognitive, emotional and behavioural engagement.

a) Creating space for cognitive engagement through students becoming experts

Emma visited the classroom to tell them she expected them to develop expertise in designing spaces, as she needed them to help design a new classroom. Students were well aware of the vibrant year 6 and 7 classrooms that had been recently been re-designed, and so took seriously the challenge of being designers. Through the curriculum plan, they developed expertise by:

Learning about the theory of design & 21st century pedagogy
Students learned about designing by first creating a dream bedroom and building a scale model in a shoebox. They then appraised their design, and invited parents to an exhibition of their work. Students researched about 21st century learning, reading magazine articles and frameworks on the internet. From these articles, they worked with their teacher to identify what implications these principles would have for learning spaces. Emma created digital libraries of resources for Kathryn and co-taught in the school computer labs for the some key lessons. Emma modelled how to use the digital resources and through ongoing conversations with the students positioned them as the designers…"which do you think we should choose…why?" Emma's modelling the

technology and questioning was significant for Kathryn who found it initially daunting, but "we meet at lunch, decide the plan, and what we have done, and I follow the plan until she comes back, which is positive for me." Students researched the psychological impact of colour on emotion with Emma and Kathryn, and developed appraisal criteria for positive learning spaces.

Applying literacy and numeracy skills

Students created floor plans using Google Sketch- up and discussed how to resolve the dilemmas that emerged when the scaled models showed that not all of their about desired furnishings might fit. When reading challenging design or pedagogy texts, students used dictionaries to decode important words, and created wall charts with definitions to share with others. Kathryn reflected that the students "did some professional readings that were quite difficult for this age group, but they highlighted and used dictionaries...They all felt so important, but they had the key words like collaboration and inclusivity and they came back and taught the other kids. They are wanting to have a go...It is like they are owning the learning". The students also used the design discourse and also learning theory in their peer discussions.

b) Creating spaces for emotional engagement by belonging within a class and community

Emma positioned the students as active and responsible agents of community change, indicating that they would do the research and make recommendations. She emphasised that the classroom space was an investment in their own learning as well as the learning of those students who were growing up in the school, and so it was an important responsibility and a reason for the space to be designed flexibly. Emma gave the students opportunity to transform how they felt about their own and others' participation in learning and school.

Understanding learning styles

The students completed an online quiz identifying their preferences for learning modalities and discussed the results as a class. Students began to talk about their own preferences for learning, but also consider the preferences of others as they worked together. From these styles, students began to collect drawings and images from texts about design ideas for classroom spaces that would help variety of learners feel good while they learned. In explaining their draft designs to the researcher, students made links to learning style preferences such as; "I concentrate best sitting down", or "I learn by talking" or "I learn best sometimes by myself or with a friend", or "we need to think of those classes who will use it after us."

Interviewing others

The students worked in groups to write interview questions and then go and interview younger and older students about what they liked and disliked about their learning spaces. The students also toured other classrooms in the school and recorded their own ideas about likes and dislikes. Students in their small groups prioritised these ideas, before sharing and discussing them with the whole class. There was a clear development in student understanding of one another's needs, and this empathy flowed through in their design choices.

Being Creative

Students were encouraged to imagine what their dream classroom would look like, feel like and sound like. These ideas were captured in a wordle and drawings they then explained features to peers. The class then synthesised the results with previous research, to develop a class vision for learning. Kathryn noted that she started to do a lot of social problem solving after lunch, and used "circle time". This was valued and recognised by the students, so in their designs they made sure there was room to "sit on the floor to discuss like bullying and that and we wanted to have more comfortable, but more scary, so we thought of a mat with really hairy stuff on it." Students had other creative ideas like a chocolate volcano for when they needed a sugar fix.

Handling physical resources

Emma invited the students into the staff common room where various carpet and furnishing manufacturers had left their sample books on display. The students worked in teams, excitedly feeling textures, putting sticky note flags on preferred items, and justifying choices to one another before making decisions about their preferences. The invitation into a space that was usually reserved for adults was a tangible sign that the students' opinions were valued.

Creating a dream classroom proposal

These learning experiences culminated in the students preparing proposals and plans outlining their recommendations. The students presented these proposals to Emma and the other school leaders to make the final decision. The students expected that while they would vote for their favourite proposals, the final decision needed to be made by Emma as she had knowledge of the budget and other construction knowledge.

c) Creating spaces for behavioural engagement by supporting transitions towards collaborative learning

There was a range of learners in the class group, with quite a few students with additional learning needs. Kathryn's excitement at being involved in the learning space re-design was

tempered by her worry about how she would keep her students on task and behaving well. At the start of her first year with the class, Kathryn struggled to find ways keep her 'lower achievers' involved in productive learning in particular, "I worry if we're doing group work, the lower achievers aren't engaged". Emma supported Kathryn in the initial stages by making frequent classroom visits to talk with the students about their design work, sometimes co-teaching the lesson, or working with a small group. Emma modelled how to establish behavioural expectations while also moving away from a teacher-centered delivery. Emma also used her power as a leader to move some of the higher achieving students of the grade level in the class over time, to include students with some existing skills in peer collaboration and independent learning into the classroom mix.

Kathryn began a reflective practice of mapping student engagement in a visual diagram (Willis, 2011), identifying those who were centrally engaged and those who were more peripherally engaged, and reflecting on what she might to help those on the periphery. She began to question whether those students who were quieter were engaged or not, and experiment with new ways of structuring group work, and ways to hand over responsibility to the learners. Emma and Kathryn were able to problematise what they each recognised as signs of behavioural engagement and question assumptions. By mid year, there were significant changes in Kathryn's pedagogic practices, and student patterns of behaviour, moving from a teacher-centered delivery, towards a supportive learner centered, collaborative classroom. Students saw themselves as people who could make good decisions and take responsibility for their own learning and who helped others learn. By the end of Year 5, learning with peers and collaborating in teams was seen as the normal way to learn, with both boys and girls commenting "We have hardly ever been by ourselves", "We do lots of group work", and "We help each other out".

5. Sustaining change through reflecting, reframing and responding

As a collaborative leader, Emma worked to understand the perspectives of her teachers, and through inquiring conversations reposition or reframe troubling situations so teachers or students were able to feel greater control. During the time of this case study, there was increasing government policy control over the work of teachers, with a centralized National curriculum introduced, new reporting requirements, increased scrutiny of learner achievement data, and external teaching audits being conducted for the first time. Emma reflected "I realised the world was very much closing in for teachers…[so] once I realised that that locus of control was the

source of stress, we talked about it. A lot of it I think they attributed to me rather than to the system because I hadn't taken time to paint them into the big picture." From this reflection, Emma reframed the audit to be a learning opportunity by involving teachers in making meaning from the audit and working in teams to get staff and student input, and set targets. She preferred to lead through participative processes, however she reported that this was not her natural disposition.

Emma recognised that while she was a big picture person who could paint a vision, and she enjoyed being in control and moving quickly, she had learned to "attend to the detail of things, and what that's going to look like and what it means for other people." In the redesign of the learning space, Emma regularly had conversations with Kathryn and the students to find out how they were making meaning from the process. She then attended to details revealed in the conversations, whether that was using her positional power to negotiate greater access to a computer room, helping resolve a conflict when another staff member became jealous of the attention Kathryn was receiving from Emma, or creating opportunities for the students to communicate their findings to other students on the school assembly. Emma moved around the school throughout the school day having conversations with teachers and students about what they were learning and sharing her own most recent thoughts from her professional learning. There was an expectation that everyone was keen to learn. The collaborative design process therefore also enabled Emma to further enhance her leadership practices.

6. Ongoing brokering of construction processes

Emma was actively involved in liaising with the various people in the Department of Education and local contractors responsible for various parts of the reconstruction. Emma described these negotiations as "an endless battle", in which she "put my heels in and got what I want." She noted that she had to pay attention to the details otherwise the integrity of the vision could easily have been lost. So she spent a great deal of time advocating and engaging with stockists, painters and contractors. Emma's language included a discourse of emotional struggle and determination, with comments like "I've managed to claw back a bit more towards the furniture budget than they were allowing me", "It probably would have been quicker except I've been argumentative around wanting them to be accountable around the money" and "its driving me insane." She estimated that leading this design process with the children, working with the teachers in

conversations about planning, pedagogy and learning data, and managing the budget and building took up "at least half – more probably" of her time as Principal.

Discussion

By the end of 2010 a design was resolved. The students had voted for a jungle theme with carpet and paint in greens and blues and featuring desks that could 'pop apart' for collaboration or individual work, a giant crocodile soft toy called "Snapper", soft seating options, water-cooler and a 'learning goal' tree. However, significant building delays occurred, partly due to catastrophic flooding in Queensland and partly due to staffing changes within the state government design and building department. During 2011, the students watched progress from behind construction fences as the renovation that was meant to be a quick process, took 11 months. The Year 5 students were unable to move in their new room until the final few weeks of their school year. The two-year collaboration was therefore not successful in achieving the original goal of enabling a class of year 4 students to design the new learning space for their year 5 learning. Yet in other ways, it was highly successful. Even without the affordances of the selected collaborative furnishings, new colours and special features, the students and teacher experienced significant pedagogical shifts.

Within the cramped temporary Year 5 classroom space, Kathryn and her students had created fluent, flexible and collaborative patterns of working together that were very different from the teacher-centered pedagogic patterns that they started from. As a result of their design collaboration, there was a much greater distribution of the teacher's power and responsibility to the students, and also a shift in the language students and Kathryn used to talk about learning from one of control and compliance to collaboration and shared decision-making. Student engagement was enhanced cognitively, emotionally and behaviorally not only during the process of design, but evident in their ownership of their learning vision and understanding of how learning is mediated by social and physical environments. Several students reported how they made contributions to the re-design of their family's home or workplace. So while the building of the physical classroom learning space was delayed, it was clear that the leadership process of creating supportive social pedagogic-relational spaces was a successful one.

Empowering leadership is essential in making social spaces for pedagogic reform

Emma's supportive leadership process enabled a teacher and her students to prepare for the transition by reconstructing their pedagogic relationships in readiness for the intended learning practices within the new physical space. The steps identified in figure 1 summarise the leadership process. This process reflected best practice principles of leading change by emphasising the importance of vision driving the action, empowering others and anchoring the change in the culture (Kotter, 1995; Appelbaum. et. al. 2012). What may be obscured by this summary is the messy, contingent and emotional work of supporting teachers and students as they changed both their physical and social learning preferences.

Emma supported Kathryn and the students with the emotional as well as the intellectual work of changing their established pedagogic patterns. Pedagogy is ambiguous, interactive and emergent because student actions as well as teacher intentions shape the interactions (Murphy 2008). By including the learning space design work within the curriculum, students became meaning makers in an active and dynamic process "through which the meaning-makers remake themselves" (Cazden et. al., 1996 pp. 73-4). Both the students and the teacher had to be willing to construct new ways of relating and this involved identity work and change. Hargreaves (2004, p. 287) notes that "there is no human change without emotion" however the emotional responses to self-initiated change are mostly positive, particularly since satisfaction and pride comes from surmounting obstacles, doubts and difficulties. Hargreaves contends an inclusive leader minimizes the pain of change by helping them deal with experience of loss, by engaging teachers in making meaning within their work contexts and by situating the change within systemic and political perspectives to avoid disillusionment (p. 305). Emma created an intentionally balanced space for Kathryn to feel in control of her professional learning while being emotionally and intellectually supported, saying "it has been helpful having two people in the room. Also equally it has been valuable for Kathryn to just to consolidate without having any new input from me"**.** The leader's role in creating social spaces for students to engage in dialogue, or dialogic inquiry, was also significant.

Creation of socially supportive dialogic spaces enables the development of new teacher and student interactions that are "not just radical collaboration, but radical collegiality" (Fielding 2006, p. 300). Dialogic inquiry is a "pedagogical approach in which teachers and learners actively comment and build on each other's ideas and reasoning collaboratively" (Hennessy,

Mercer & Warwick, 2011. p. 1910). Emma and Kathryn needed to make the spaces within these new patterns of interaction socially safe for students to "speak back regarding what they consider to be important and valuable about their learning" (Smyth 2006. p. 282). Fielding (2006, p. 300) identifies four ways that school leaders enable social spaces for student voice to be valued, and these were evident in Emma's leadership approach. Firstly she framed the work within a values paradigm and her personal backing legitimated and affirmed the importance of the students' contributions. Secondly the timeframe was flexible and enabled "dialogue, collective reflection and the restless necessity of a permanent provisionality". Thirdly, she and Kathryn were willing to learn from and with students, challenging traditional identities of teachers and students. Finally, Emma created occasions for the students to lead dialogue with their peers and staff including the research partnership that enabled the students to be experts informing a university researcher about their learning and designing work. Emma created the opportunities and expectations for new learning relationships to emerge.

Challenges of leading participatory learning space design

As a leader, Emma faced a number of challenges in leading this collaborative learning space design project. It took courage and confidence for Emma to follow through with her vision, as it involved pushing back against an emerging policy culture that was expecting leaders to only invest their energies into data driven and test based strategies for improving student learning. In managing this tension, Emma conducted a detailed ongoing analysis on the learning data of the students involved. She noted that the students in the new learning spaces and involved in designing learning spaces were performing significantly above expectations, and sustained these gains over time. The leadership practices clearly identified in the literature as being associated with leadership that enables students to achieve improved learning outcomes (Robinson, 2010, Timperley, 2011) were evident in Emma's leadership. Emma built relational trust, solved complex problems, integrated theoretical and classroom knowledge, and created the expectation that student and teacher learning are inextricably linked. This case study provides evidence that collaborative learning space design can have a positive impact on improved learning outcomes, and that considerations of learning space design and participation are not 'side issues' in leadership for learning improvement.

To create social spaces for the students and teachers to learn about 21st century learning, Emma needed to have highly developed interpersonal skills and a self awareness of her own leadership strengths and weaknesses. She also needed to be reflexive, emotionally astute, and enable others to express their excitement and frustration and fear (Blackmore 2011). Her commitment to supporting the re-design process was more than a moral one, as it involved a substantial part of her time, and the ability to harness other emerging and sometimes competing priorities such as other building programs, audits, whole school literacy development and staff changes into the momentum. Emma also advocated and promoted the work of her teachers to departmental supervisors, and at conferences. This enabled Emma to validate the work to others within the landscape of competing priorities. Her goal of a re-designed learning space was nested within a long-term vision for developing staff and student capacity to be 21st century learners.

Conclusions

This case study is not only the story of the design of an innovative physical space. It also relates the construction of the social spaces that enabled the pedagogical shifts needed within a new learning space to occur. Collaborative re-design of learning spaces can be a lever for significant pedagogical change. Leading the design of learning spaces in this school depended on a strong vision for learning, a cultural readiness for collaboration, a willingness to support students and the teacher in a structured learning process, empower others and actively manage the building processes. It is clear that designing a learning space meant both making a *physical* learning space through a process of collaborative design, but also negotiating new cooperative patterns of interactions, meanings and future actions in the *social and pedagogic-relational spaces* of the school in preparation for new learning spaces. This research has implications for both school designers and leaders within school systems seeking productive ways to support teachers and students in developing new pedagogic practices both in Australia and beyond. Efforts to enhance student learning need to include both students and teachers in the design conversation, as they are the ones who need to opportunity to learn new ways of working together, yet participatory design is not enough. The ongoing work of informed and strategic leaders is essential in supporting students and teachers in these learning conversations that have the potential to transform schools.

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Figure 1

Leading the collaborative design process:

1. Creating cultural readiness
2. Creating a practical vision
3. Supporting the translation of the vision to a strategic curriculum plan
4. Collaborating with the teacher and students as designers by creating opportunities for
   a. Cognitive engagement
   b. Emotional engagement
   c. Behavioural engagement
5. Sustaining change through reflecting, reframing and responding
6. Ongoing brokering of construction processes

Figure 1 Phases in leading the collaborative design process.