

Putting 'structure within the space': Spatially un/responsive pedagogic practices in open-plan learning environments

Abstract

Non-traditional open-plan schools and classrooms are currently enjoying a resurgence in Australia, with proponents arguing for the necessity of educational spaces that more readily accommodate the needs of 21st century learners. However, these learning environments can pose considerable pedagogic challenges for teachers who must balance the ethos of spaces designed to facilitate autonomous and flexible student learning, while simultaneously managing the complexities of shared space and resources, decreased staff-student ratios, and highly variable student responses to learning in open-plan settings. This paper draws on observational and interview data from an Australian study of three primary schools operating in open-plan spaces. Informed by cultural theories of spatial practice, we argue that the ways in which teachers conceptualise and operationalize notions of 'structure' is pivotal to the responsiveness of pedagogic approaches within open-plan spaces.

Key words: non-traditional educational spaces, open plan schools, pedagogy, space, information technology

Introduction: the form and reform of educational spaces

The changing needs and practices of today's learners has become a familiar topic of educational discussion, raising questions about how schooling might best address the challenges presented by technological and cultural factors in students' lives and learning. In response, some education systems have taken on 21st century mantras of 'mobile', 'flexible' and 'agile' learning, moving away from traditionally configured classroom spaces into contemporary open-plan learning environments. Such spaces can present both opportunities and constraints, as students and educators alike adjust to new conditions in which to learn and work. In this paper, we draw on an ethnographic study conducted in 2011 in three open plan primary schools in the western suburbs of outer-metropolitan Sydney, to consider some of the ways that educators' notions of 'structure' inform everyday classroom practice within contemporary open plan learning environments.

We situate our study in dialogue with earlier models of open-plan schooling, bearing in mind that despite the often futuristic rhetoric about the newness and innovation of such schools, they are neither new nor particularly unique. Non-traditional open learning classrooms emerged in the late 1960s and 1970s as part of programmatic reform movements that saw purposefully-designed schools as a means of facilitating the kinds of autonomous, learner-directed, teacher-facilitated activities often associated with the progressivist tradition (Hutchinson, 2004). During this period in the United States, nearly half of all new schools built had incorporated open-plan designs, in support of the view that flexible, adaptable spaces would provide “the optimum setting for learning” (Hutchinson, 2004: 96). Despite their promotion of peer interaction and teacher collaboration, however, factors such as ‘high levels of noise and distraction, occasional disagreements with colleagues and reduced spontaneity in teaching’ (Hutchinson, 2004: 98) were found to ultimately undermine the ideological and educative goals associated with such reforms.

While open-plan settings eventually fell out of favour (Hutchinson, 2004), they have re-emerged in recent years in countries including Australia, New Zealand as well as the United Kingdom, Germany, Finland and Spain (Makitalo-Siegl et al., 2010). In the Australian context, open-plan learning environments can be described in multiple ways. While some are purpose-built, others operate within existing facilities that have been adapted through the removal of walls between classrooms, the addition of shared spaces for designated activities, or the housing of shared resources such as library resources and computers. Importantly, non-traditional learning environments of this sort are defined not only by their open-plan architectural designs and movable furniture and fittings, but also for the changes they bring about to teaching and learning practices. For teachers, working in such spaces generally implies team teaching, sharing space and resources, and distributing roles and responsibilities. For students, self-directed learning, freedom of movement and peer collaboration are assumed to be facilitated within open plan environments, consistent with the suggestion that “opening up of educational spaces serves as a metaphor for the freedom of individual choice in terms of what, when and how learning happens” (Reh, Rabenstein & Fritzche, 2011: 83). **Such pedagogical practices it is argued**

require a reorientation towards a mode of learning that is student-centred and reflective of the diversity of multimedia and problem centred environments encountered by students and young people as they enter a changing workforce. Pedagogy in open-plan or open-space classrooms connect these newly emerging pedagogical requirements for student-centred learning with an explicit awareness of space as educative (see for example: McGregor, 2004; Mulcahy, 2006; DeGregori, 2011).

Despite studies from earlier decades that identified consistent – and largely unresolved – problems associated with teaching in these sorts of spaces (Hutchinson, 2004), research conducted more recently laments that more emphasis has been given to the need for improved learning spaces rather than to their actual use in everyday practice. According to McGregor:

The role of the physical environment as a context for teachers' work has... received little attention, despite surveys of workplace conditions suggesting its importance. Studies rarely go beyond suggesting the need for more decent space in order to improve motivation and enhance teachers' ability to work effectively' (McGregor, 2003, p. 358).

This observation is supported by Australian research conducted nearly a decade later (Blackmore, 2011; Campbell, et al, in press), with a major review of the international literature published in 2011 (Blackmore, 2011) showing that the focus of current research “has been in the design phase, not the implementation and transition phase, with little research on the sustainability/re-evaluation phase” (Blackmore, 2011: 3).

This is consistent with the observations of teachers and principals in our study regarding the need for greater availability of research-based information and professional development about teaching and working in non-traditional spaces. This paper, therefore, is written in response to the challenges and opportunities presented by the resurgence of non-traditional open plan learning environments, and the need for educational research literature that focuses on the ways that ‘people that use the space – practitioners and learners’ (Blackmore, 2011, p.iii).

Drawing on interview and observational data, we consider here how notions of 'structure' feature in teachers' pedagogic approaches in open-plan settings. We draw here on Michel de Certeau's theoretical insights regarding space and everyday practice, focusing on everyday classroom interactions and pedagogies that shape teaching and learning as a spatial practice. This paper is one of a suite of papers concerned with the use of open-plan learning environments by principals, teachers and students. The perspectives of principals and students is taken up in greater detail elsewhere (Authors 2013, 2014). Here we focus on teachers as a significant group whose everyday spatial practices merit in-depth consideration, with particular consideration of how teachers' use of such spaces and the material resources within them is shaped by their existing understandings of pedagogy as a structured activity. Importantly, it is not our intention to present a case 'for' or 'against' open-plan learning environments, neither are we gesturing toward pedagogic strategies or models for use in such spaces. Rather, we want to highlight the complexities such spaces present for both learners and educators, and to argue that the ways in which teachers working in such spaces conceptualise and operationalize notions of 'structure' can be pivotal to whether pedagogic practices are responsive to the demands that open plan environments necessarily present.

Notes about the study

The study discussed in this paper was conducted in three Catholic primary schools in Sydney, Australia. The study was conducted during 2011, and investigated how teaching and learning are impacted upon by the introduction of open-plan, non-traditional learning spaces. The introduction of these spaces involves a major diocesan reform prioritising a model of schooling in which space, resources, activities and teacher expertise are shared within predominantly open-plan design schools and classrooms. The introduction of open plan learning environments is not unique to the Catholic school sector however, and the approaches taken in our study sites are consistent with those in other schooling sectors where similar initiatives have been introduced (see, for example, Blackmore et al, 2011). Each of the schools in our study had provided input into design features they considered particularly necessary

or appropriate to their school. The school principals and teaching teams were endeavouring to negotiate and refine the use of the open plan spaces in an ongoing way, with a view to addressing the reform agenda whilst maintaining responsiveness to local needs. In some of our study sites, for example, the teaching and learning spaces were 'purpose built', and others were the result of modification of existing buildings. The study aimed to gain insights into how these pedagogical spaces are used at different phases of implementation, and within different types of school contexts.

Sites were nominated by the relevant Catholic Education Office, and were broadly reflective of the diversity of such spaces in schools across the diocese. Following approval from the university Human Research Ethics Committee¹, the research team met with principals for preliminary discussion and an overview tour of the schools. Written consent was obtained from principals and school staff, and parental consent was obtained on behalf of students whose classes were to be observed.

The study took a qualitative approach, utilizing ethnographic methods such as observational field notes and interviews with teachers and principals. The study took the form of a collaborative ethnography, in which "two or more ethnographers coordinate their fieldwork efforts to gather data from a single setting" (May & Pattillo-McCoy, 2000: 66). Our 4-person research team observed teaching and learning activities across a range of age groups and 'key learning areas' (KLAs) of Australia's formal curriculum. We interviewed teachers and principals about their experiences of working in non-traditional spaces, and their perceptions of students' learning and interpersonal experiences in the spaces. Classroom observations and informal interviews with staff during observations were digitally recorded using LiveScribe Echo digital notetaking pens. This ensured accuracy in the research process, and enabled the team to share time-coded notes, diagrams and informal interviews as additional data sources. Observations focused on the organization and utilization of space, learning and teaching practices, and qualitative indicators of student learning, such as student engagement, learner autonomy and peer learning

¹ University HREC approval number N2010_24

efficiency. Our observations of classroom activities considered how factors such as generalized instruction delivered to larger groups, the prevalence of independent and group work activity, potential distractions such as noise and movement of others in the space, and the composition of groups across subjects and key learning areas, might shape students learning, their ability to complete of tasks and work effectively in groups, and their own perceptions of their learning.

These observational data were augmented by audio-recorded semi-structured interviews with teaching staff and principals. Formal interviews with participating teachers and principals were recorded using both LiveScribe pens and iPad AudioNote. Teachers were interviewed individually or in groups, according to preference, about their experiences of teaching, collaboration and professional learning in relation to the open-plan learning spaces. Principals were interviewed individually about leadership strategies for supporting teacher professional learning, induction for new staff, change management strategies and considerations for pre-service teacher education. Interviews were transcribed using a professional transcription service, and transcripts anonymised using pseudonyms for individuals and schools.

Spatial practices: un/structuring teaching and learning in open-plan spaces

For many educators, careful planning, coordination, organization and regulation are important factors in determining the quality of learning and teaching. Indeed, as recently noted in the European research literature, “...it is a common perception that well-structured learning environments are prerequisites for learning in schools.” (Stornes, Bru & Idsoe, 2008: 318). This corresponds, in no small part, to psychological and socio-cultural theories of learning that have predominantly informed the field of education (Kahn, Qualter and Young, 2012: 859), and that seek to establish links between learning and internal cognitive structures and/or social structures. In this paper, we use the term ‘structure’ to refer to the ways that teachers’ in our study understand of pedagogy as an activity that ideally is, or ought to be, ordered, organized and conducted in particular ways. We acknowledge that there are multiple theoretical debates concerned with social structures, or ‘structurally shaped circumstances’ (Archer, p.130) and their relationship to individuals and their capacity

to act agentively. Our theoretical vantage point is somewhat different, in that the structures and structuring practices to which we refer are understood as culturally produced practices, rather than pre-existing structural conditions. Indeed, many normative structuring practices in schools and classrooms – the organization of time, curricular content, material resources, lesson plans, assessment tasks, seating arrangements, and peer groupings, to name but a few – are part and parcel of everyday teaching and learning activities designed to produce order so that learning can occur.

Yet as Deborah Britzman observes, education's emphasis on order, and with it conformity, has its foundation in scientific discourses grounded in the Western Enlightenment in which:

...the problem of learning was considered a technical problem of management. Knowledge, broken down into discrete and measurable units, was arranged hierarchically, in order to convert learning to observable outcomes. Borrowing from the methodology of the natural sciences and the discourse of scientific management in industry, a technical mode of rationality came to determine the dominant approach taken in understanding and organizing teaching and learning (2003: 47)

For Britzman and other critical theorists (see, for example, Apple, 1988, 1995; Biesta, 2006, 2011; Popkewitz, 1987, 1998;), attempts to rationalize education as a scientifically valid enterprise through multiple forms of assessment, measurement, standardization, and to govern, compartmentalise and regulate knowledge through the biopolitical discipline of its human subjects, have come to furnish education's normative logics and structures of intelligibility. Discourses of structure, so much a part of the 'common sense' of contemporary teaching and classroom management, are therefore imbricated in a profoundly ideological tradition oriented toward achieving an orderly and compliant population for the purposes of social governance.

These ordering and organizing traditions, we suggest, are significant features of educational cultures. The structuring logics that take form in the everyday rhythms and routines of teaching are not merely machine-like instrumentalities, rather they

are experienced and embodied by the subjects of teaching and learning. The organizing rationalities and spatialised enactments of teaching practice, in other words, are normative practices that produce, and potentially transform, teaching cultures. Such practices, for Michel de Certeau, “create strong networks of information; in them circulate elements of knowledge and know-how, information about economics, geography, or technology. These are the real networks of communication and pedagogy” (Certeau, 1997: 114).

This raises questions for what Popkewitz refers to as the "spatial politics of education" (1998: 129), not merely in terms of struggles over access and participation across geographical (urban, rural, etc) spaces but also in the spatial distribution and operation of structuring activities – understood here as an aspect of cultural practice – within the smaller scale settings of schools and classrooms. The latter is of particular interest here, as we consider how everyday material, relational and conceptual structuring of spatial practices. In this respect our thinking is informed by an understanding of education’s discursive logics and structures of intelligibility as outlined above, and which we also consider in dialogue with Michel de Certeau’s argument that ‘spatial practices concern everyday tactics’ (de Certeau, 1984: 115) – in other words the everyday activities, resistances and uses that organize and transform space into ‘practiced place’ (de Certeau, 1984: 117).

Thus our reading of the ways that teachers in our study operate within and conceptualize pedagogic spaces becomes an important means by which the space is actualized for its users. For de Certeau, “Space occurs as the effect produced by the operations that orient it, situate it, temporalize it, and make it function in a polyvalent unity of conflictual programs or contractual proximities” (de Certeau, 1984: 117). This is not to suggest that spatial practices are pre-determined by, in this instance, instrumentalist rationalities of Enlightenment thought, but rather it is to consider how these logics that inform contemporary education are played out in spatial practices that constitute both users and spaces in multiple ways. De Certeau’s metaphor of walking through the city illustrates how walkers use, and in so doing, create the city as a ‘practiced place’:

...if it is true that a spatial order organizes an ensemble of possibilities...then the walker actualizes some of these possibilities. In that way he makes them exist as well as emerge. But he also moves them about and he invents others, since the crossing, drifting away, or improvisation of walking privilege, transform or abandon spatial elements (1984: 98)

This line of thinking is particularly helpful for understanding how spatial practices are shaped by histories, rationalities and materialities, yet are simultaneously subject to reworking and reinvention through their everyday use. For studies concerned with the spatial design of educational spaces, this emphasis on both logics of practice as well as everyday uses of space holds important keys to understanding the responsiveness or otherwise of pedagogies in open-plan spaces. Whether schooling occurs in a space that is deliberately and purposefully created, or is ad hoc and improvisational, it is shaped by the everyday spatial politics and practices that both precede and occur within it. As discussed in the latter sections of this paper, teachers' discursive constitution of the notion of material and pedagogical 'structure' plays a crucial role in the practice of space in open-plan settings.

Structuring materiality: spatial practices and politics of objects and resources

Despite what Jill Blackmore identifies as a dominant theme in the research literature regarding the importance of pedagogically and physically flexible spaces, she also notes that there is less empirical evidence demonstrating *how* the physical settings of classrooms impact on learning (Blackmore, 2011). O'Toole and Were (2008) concur, pointing out that:

...the physical layout, or spatial arrangement, and the material objects within that environment, and the integration of these two corporeal constructs, that sense of 'place' that forms the context in which research is conducted, is largely unacknowledged as a source of qualitative research data (2008: 616).

In our study, the structuring, ordering and placement of material objects and the orderly distribution of physical bodies presented as an ongoing concern for educators. In early conversations with teachers and principals, considerable emphasis was given to the ways that furniture, fittings and resources figured in endeavours to make effective use of the space at hand. In each participating school,

the research team was given a guided tour of classrooms, facilities and school grounds. Principals discussed the importance of making funds available in an ongoing way, so that teachers could experiment with classroom configurations of furnishings such as tables, chairs, desks, bean bags, sofas and bookshelves, introducing new elements and discarding or rearranging existing elements in response to emergent requirements. Similarly, teachers typically observed that the physical arrangement of objects and resources within the open-plan space was an important consideration when planning activities and coordinating the movement of groups of children throughout the day. This focus on the material placement of objects, resources and bodies is consistent with Blackmore's observation that:

Much of the literature on furniture design and classroom settings focuses on ideal patterns and designs characterised by flexibility and mobility of structures, the grouping of desks, computer pods and display boards in order to facilitate multimodal pedagogies that accommodate individual learner's needs, and personalisation of space. (Blackmore, 2011: 8)

Across the three schools we visited, material elements were deliberately used in a variety of ways consistent with goals of supporting individual student learning within the context of spaces and resources that were shared across groups and between peers. Some examples include:

Use of coloured groupings of tables, with one colour signifying that students using the materials or computers on those tables could work together with peers, while another differently coloured group of tables signified that students using materials and computers there were expected to be working alone on individual assignments and projects.

The placement of iPads and laptops in a central location for use throughout the day in both teacher and student-directed learning activities.

The placement of sofas, chairs, beanbags and colourful rugs in designated reading spaces where children could sit comfortably whilst reading or working on projects.

The positioning of low bookshelves and seating to form discreet spaces for designated learning and free play activities, which could be repositioned in different configurations as needed.

While such examples could of course be found in traditionally designed classrooms,

in open spaces accommodating anywhere from 60 to in excess of 200 students, visual and spatial cues about how particular resources or areas should be used became valuable tools for communicating about expectations and activities without excessive repetition. Similarly, material objects established a particular ‘mood’ or ‘feel’ for smaller areas within larger spaces. For example, textiles such as soft rugs on floors and comfortable upholstered seating created inviting, more intimate spaces demarcated for quiet activities such as reading. The importance of materials and their use for such purposes in these schools underscores Sutherland and Sutherland’s contention that “it is not only the design of the built environment of the classroom that is important, but also the design of the tools that are used in that are used within the classroom” (2010, p. 59).

Teachers in our study commented on the importance of having adequate material resources such as up-to-date technology, if pedagogies were to be effective in these complex spaces. In practical terms, sharing resources between larger numbers of students generally means that without adequate supplies, technology, and staffing, learning activities can be overly prescribed and potentially curtailed by timetables, and by who is using, or planning to use, what equipment when. For example:

We group the kids ...so then there’s only small class groups, so you only need it for one and then we repeat, repeat the lesson next, and it just makes it easier. So because of lack of resources, that’s what we have to do, we just have to timetable it and put our groups in...So one teacher does it, and then we just repeat it according to the level, but that’s the way we get around using the resources. You need, because you’re all doing it at the one time, it’s very difficult to have enough resources, and everything really, the resources are a big crow in our side. We just structure our lessons so we use the resources that we’ve got. (Teacher interview 1.3)

Here the notion of structure appears as a central organizing feature of learning activities. This teaching team’s *practice of space* (Certeau, 1984) relies on extant beliefs about the need for order, consistency and repetition, even in the context of spaces designed for flexibility, adaptability, exploratory and agile learning.

This is not to minimize the importance of sufficient resources for use by teachers and

students. Indeed, our findings support the contention of teachers in all three sites that these spaces require 'more, not less' resources. What we do want to suggest, though, is that existing conceptual frameworks predicated on beliefs about teaching and learning as necessarily structured activities can give rise to unnecessarily inflexible spatial practices that may not make the best use of either the space or materials available. In the above example, teachers see the imposition of additional structuring of both lessons and the daily timetable as the most appropriate pedagogic response to what they perceive as a lack of order implied by the limited supply of preferred resources.

These learning environments are also important sites for considering the spatial politics of distributing materials and bodies according to particular educational rationalities. Our observations of the ways that some objects and resources were positioned or rendered inaccessible within a space have clear pedagogical implications. For example:

In one school teachers lamented that resources for subject areas such as music and visual arts had either been relegated to locked storage cupboards in another building, or removed entirely from the school. This meant that lessons using such resources were effectively restricted if not precluded altogether. Such lessons and activities seldom if ever occurred outside designated time with a specialist teacher, who now had to transport many of the materials needed from home because they were no longer accommodated at the school.

In one shared space accommodating over 100 students, technological resources such as iPads, laptops or computers were placed in an area of the room most readily accessible to the students for whom the most senior member of the teaching team had primary responsibility. Access by students from other groups had to take place at a time when it would cause least disruption to this group, such that activities involving technology took place within limited timeframes that were often further reduced by the length of time it took for computers to turn on and be ready for use.

Teachers in one space had strategically positioned book cases and other items of furniture to block the view of colleagues who were disliked or mistrusted, and to shield themselves from unwanted scrutiny. This further reduced the cohesion and effectiveness of the teaching team, and imposed constraints on the time and accessibility of other members of the teaching team to students across the cohort.

These examples illustrate how “Objects within or at a place have meanings based on culture, function and power” (O’Toole and Were, 2008: 619). Objects such as teaching resources, computers and iPads functioned as a means of marking out entitlements and exclusions that were tacit features of everyday cultures of the schools and/or the teaching teams observed. Curriculum areas such as music and visual art, and indeed the teachers of those subjects, were tacitly ascribed subordinate positions within a hierarchy of subject areas through the restricted access to space and resources. Similarly, objects and materials designed and intended for use in one way, could be withdrawn or appropriated for different purposes, in what de Certeau might describe as ‘tactics’, ‘ruses’ or ‘ways of operating’ (1984: xviii-xix) through which everyday practices instantiate acts of resistance to the operations of power within which teachers found themselves. In these examples, pedagogical responsiveness was curtailed, as material objects came into use as a means of creating or reinforcing hierarchies among teachers, subject areas, learners and groups.

Importantly, these kinds of spatial politics have a powerful effect on the cultures of teaching, leadership and classroom practice when they occur (Campbell, et al: in press). Teachers eager to experiment with the possibilities afforded by open-plan spaces, encountered frustrations when negotiating with other staff around access to technology or other resources, or seeking support from colleagues who had effectively used furniture and fittings to render themselves inaccessible in the team teaching environment. Such situations occasionally led to conflict, and were remarked on by several participants as presenting some of the more difficult challenges of working in the open-plan spaces. For example:

Those teachers that aren’t pulling their weight are pulled up on it straight away because it stands out like you wouldn’t believe. (Teacher Interview 2.3)

Especially if you're working with somebody that you don’t necessarily get along with or you have a personality clash with. That’s huge because that will drag you down and your functioning ability within that classroom is going to be not a great as if you have a high functioning

team.... Then the relationship with the team closes down and what you end up having is three sort of distinct spaces within the one. You end up having, it's almost like three classrooms but not walls, do you know what I mean? (Teacher Interview 5.2)

Similarly, some participants reported struggling in teams in which new teachers, in particular, felt that a colleague had made use of material resources to delineate private entitlements or demarcate their authority in unequal relations of power. Such conflicts in turn presented challenges for principals in everyday matters such as staff development and planning the composition of teaching teams from year to year. As one principal observed of a team that was having difficulty working together in the space they shared:

Over where [stage grouping] are it's very different with that feeling, and I don't know how you get around it. We've tried a little bit with furniture and they've tried a little bit different with, this term but maybe they're not the ideal people to be around there. (Principal Interview 1.1)

Participants in each school also noted that furnishings, learning materials and equipment required a degree of 'trial and error' to ensure that the resources were optimal to the learning and organizational needs of students and teachers in such settings. For some, however, questions remained about whether the use of space was consistent with the intention of its design:

We've experimented with moving furniture around a little bit. So, we've tried different things... But in saying that...it's still a work in progress, I don't think we are using the space the way it is intended all the time, we still require further professional development, but it's just time to plan and think about how – okay, how are we using this space well enough. [Teacher Interview 5.3]

For this teacher – and indeed for his workmates who also participated in the study – there was considerable willingness to try new approaches and experiment with the material resources available to them. Interestingly, though, the willingness to innovate does not appear to be predicated on views borne out of the experience of everyday use. Rather, endeavours to experiment with the space are situated between structural concepts of architectural planning and intentionality, on one hand, and planning and professional programs on the other.

Structuring learning: ordering pedagogic minds/bodies in space and time

In this final section of the paper, we consider how notions of structure inform teachers' views of pedagogy and learning. In particular, we are interested in ways that spatial practices are shaped by teachers' notions of structure as a pedagogic ideal. Our observations and interviews consistently identified tensions between perceived needs for flexibility and experimentation in these spaces, and traditional discourses that see structure and order as both conducive to learning *and* as a demonstration of professional competence. As Richard Johnson points out in relation to traditionally designed schools, the disciplined order of classrooms and corridors is part of the:

...traditional judgment...that students who sit still and quietly at their desks and work, usually at their writing and reading, are good students. It follows, then, that good teachers are teachers who are able to get all their students to sit still and quietly at their desks and work, usually at their reading and writing. (Johnson, 2009: 30)

Indeed, while teachers in our study were remarkably consistent in the view that traditional pedagogies, classroom management strategies and expectations of students were unlikely to prove effective in open-plan learning environments, they nonetheless expressed a range of anxieties about how lesson failures, noise, or other aspects of their work would be viewed by others. As one teacher put it:

I just feel like with the agile learning spaces ... I always feel like I'm being judged. And that's just a personal thing for me. But anyone that walks through my space, I feel like saying, "Please don't watch me. I'm nervous and I just —" do you know? (Teacher interview 2.1)

Such anxieties were generally experienced less acutely over time, with some teachers commenting that once accustomed to the open-plan environment, they found that having their work and that of their colleagues made visible was of great benefit:

[In a traditional learning space] I've got no one to be able to model off. I think it's important professionally and, like, for professional development to be able to watch other teachers and learn off them. And that's what I've been able to do within the agile learning space and

within my team. I've just gotten so much out of it. (Teacher Interview 5.2)

One strategy commonly adopted – including in teams that described themselves as highly cohesive and working well together – involved intense reliance on routines, timetabling and a highly organized distribution of duties such as lesson planning and delivery, classroom management and reporting. For a number of teaching teams, structuring the day became an important means of maintaining orderly progression through extensively planned and often highly choreographed activities. The emphasis on routine often related to teachers' beliefs about students, in particular what was perceived as students' desire or need for structure. For example:

I think they [students] get overwhelmed by the space if you don't **put structure within the space** ... If you want to work in [open-plan learning spaces] you can't just assume they know how to work in groups, they know how to do this, they know how to research, they know how to problem solve because they don't ... you'd have to have huge group work [and] social skills kind of program, because that's one of the platforms that they need (Teacher interview 1.2)

So what can we do, I go back to the conversation, well what are we doing here in the learning space to support the child? And it is that notion that all children are needing learning support, all needing support in their learning at different times – some will need more, some will need less, so ready for that independent task. I suppose the difficulties still lie in the fact that **these children need structure and routine and intensive intervention**. And sort of trying to work that into this [open-plan learning] space is the challenge that lies before us now [Special needs teacher, Interview 4.3]

...that stage is where a lot of the foundation skills are given, and if they miss that it causes problems you know, in further years, and I've seen that when I've taught the older kids where they've missed those there's gaps and it's you know, really hard for them later on; so, **they really do need very structured** – this is my opinion anyway...You know, for some of them – some of them cope really well, but those ones that **need that real structure** it's hard for them. [Teacher interview 5.1]

In these examples, teachers understand student individual and group learning needs as needs for structure. Their explanations of problems pertain to what they perceive as an absence of structure within the open-plan space, hence proposed solutions involve the introduction of order into their spatial practices. Such ameliorations come in the form of direct instruction, tailored programs for structuring student

conduct, maintenance of order and routines, and ensuring the sequential order of foundational skills. However, what we also observed was that teaching teams reliant on an over-emphasis on structure and order at times experienced considerable difficulties in achieving the learning goals they had set out. Approaches such as maintaining rigid timetables in order to ensure that content is covered and the teaching schedule maintained, for example, led to instances where extending a lesson due to student needs was simply not possible:

...you don't have the freedom, I suppose that you do in a traditional classroom to go – particularly when you're intermingled in your groups. Alright, I'm going to spend 10-15 more minutes on maths because...I think that extra 10 or 15 minutes will be really beneficial, but if the others are ready to move on, or to rotate back, then for you to take another 10 or 15 minutes isn't just your 10 or 15 minutes that you can make up tomorrow, you're taking 10 or 15 minutes off everybody else, so that kind of is a bit hard as well, I suppose. [Teacher interview 3.1]

While adherence to strict timetabling and divisions of labour in some teaching teams was deemed necessary for managing noise, minimizing disruptions and covering content efficiently, such structuring practices themselves potentially posed a disruption to student learning. We found that where teachers had moved away from strictly defined, highly structured notions of teaching and learning, toward an understanding of pedagogy in terms of “the agency that joins teaching and learning” (Britzman, 2003: 54), there was greater willingness for experimentation, professional risk taking, and co-learning between teachers and students. As one highly experienced educator in a school with well-established success over time working in open-plan environments explained:

And our philosophy has always been that we are all learners. Not just the children – we are learners ourselves. So with the space there we can see that we're learning from each other. We bounce off each other. We know all the children within our school. And the children feel quite at ease approaching any staff member with any learning question or any other question. [Assistant Principal, Interview 4.2]

Our observations in this particular school supported this view of what we would argue are spatially responsive pedagogic approaches in which the open-plan school became a space that facilitated experimentation and innovation, and for learning

together *with* students about how to make the space work for them in achieving the learning goals they had mutually set out to accomplish. In a school environment where teachers are, as this assistant principal put it, “willing to learn or who are willing to be challenged by this sort of learning” [Assistant Principal, Interview, 4.2], open space that can be used flexibly becomes a resource rather than a constraint.

Conclusion: structure, teaching culture and spatially responsive pedagogies

In this paper, we have argued that the ways in which teachers working in open-plan settings conceptualise and operationalize notions of ‘structure’ can be pivotal to the spatial un/responsiveness of pedagogic practices. Our findings show how notions of structure shape the placement and use of material objects and resources, as well as how culture and power shape these material spatial practices. Our study also demonstrates how teachers’ conceptualisations of learning needs in terms of the need for structure contributes to the ways in which they order everyday pedagogic activities. Our findings suggest that spatially responsive pedagogies tend to occur where there is less emphasis on structuring timetables, routines, sound, movement, and other variables, and place more emphasis on teachers and students learning together about how best to make use of space as a learning resource. Importantly, our argument is neither a call for chaos and anarchy in the classroom, nor a suggestion that there is no place for order and routine in teaching. Rather, it is an observation that spatially responsive pedagogies are underpinned by commitment to collective learning with, about and within a particular environment. **Our study suggests a need for nuanced understandings about the ways in which teachers conceptualise and operationalize notions of ‘structure’, which, we have argued, is pivotal to the responsiveness of teachers’ pedagogic approaches within open-plan spaces.**

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