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5. RE-IMAGINING THE OPEN CLASSROOM

INTRODUCTION

Throughout the world, schools are commonly seen as places that are failing our youth, failing to equip them with the skills needed to enter the university and the workforce. In response, researchers, policy makers, educators and designers have been searching for the recipe for educational success. The primary ingredient to such success is often reduced to the perceptual capacity of creating *innovative learning environment*s. However, what defines an *innovative learning environment* is not well understood and this is becoming increasingly apparent as architects, politicians, educators, and families plan new school buildings. One currently trending concept is that a *future-focused building* is necessary for educational quality and innovation. This is often *code* for moving away from traditional customs of teaching and encouraging alternative methods of teaching, through physical design. While not specifically defined, it is tacitly understood that such a *future-focused school* would contain certain qualities such as: *openness*, *integrated settings*; *collaborative areas*, and *flexible spaces*. However, these physical parameters, in themselves, are not necessarily grounded in educational, environmental or developmental psychology research or theory. These ambiguous terms can leave the design process vulnerable to interpretation and, potentially, misunderstanding, among practitioners, especially given the interdisciplinary composition of design teams.

When school construction is guided in the aforementioned manner, more often than not, the resulting products are structures that while appearing innovative, radical and ground-breaking, may not support learning processes in the way that planners, educators, and administrators had hoped (Lippman, 2010). Even though the initial goal might have been to move away from traditional models of teaching, the assumptions that there are direct and positive correlations between flexible space and particular learning outcomes, can lead to disappointment. For example, one of the most frequent changes in recent construction projects is the inclusion of cavernous common areas. These might be planned between classrooms or by combining classrooms to create one large space. The commons are typically proportional to the number of classrooms present. For example, two classrooms will have an area the size of one classroom, four classrooms will have a common area size of two classrooms, six classrooms will have a common area the size of three classrooms, and so forth. The intention of these areas is to encourage, extend, and enhance learning activities outside the classrooms yet they often fall far short

of this goal. This may be related to a lack of knowledge regarding the affordances and constraints of these physical settings. Consequently, such spaces often cannot truly be designed to complement the learner, the learning and the things to be learned.

Before assuming the commons or any seemingly innovative spatial design will enhance pedagogy, the classroom and its spatial affordances and constraints, including the arrangement of furniture, technology, and location of various focal points, must be examined from a transactional worldview perspective. A transactional worldview perspective (Altman, 1992) recognizes how the actions that occur as part of the social environment influence the organization of the physical environment, and, in turn, how this activity within the physical environment shapes the actions of the social environment (Lippman, 2010). This suggests that the actions the individuals and their activities must be considered and understood before planning the physical environment; for, if the transactions are understood, then the concept for the spatial design is intentional, grounded in the pedagogy of the place, since it is crafted to enable the learner and enhance learning.

An intentionally designed learning environment situates teaching and learning in time and within a specific place. By understanding the physical assets of a classroom as mediating pedagogy, these spaces can then be designed to support the diverse ways that learning occurs and the needs of the learners whether they meet in a large group, in a smaller cooperative working group, or individually. Rather than recognizing these distinct opportunities, many educational leaders and planners are associating classrooms with archaic elements of teaching and learning. We, however, argue that this view may be based on misconceptions and assumptions about the physical space, and that taking such a position can result in designing spaces that do not adequately enable learning.

Classrooms can be highly collaborative spaces. Rather than seeing this room solely as four walls supporting whole class meetings, we should be encouraged to re-imagine this space as one that facilitates a range of learning opportunities. Such spaces afford the ability for students to transition seamlessly from explicit teaching to project-based learning and from project based learning back to didactic teaching. To achieve this goal, classrooms must be planned with a variety of clearly differentiated learning zones – activity settings (Tharp & Gallimore, 1997). To better understand why this approach might be instituted, the affordances and constraints of the classroom must be examined. Accordingly, the purpose of this chapter is to:

- explore the history of the classroom
- examine the research on open-learning environments;
- re-imagine the classroom as an open learning environment;
- present models from practice from the United States of America, Sweden, and Australia which examine the classroom as an open learning environment; and
- provide recommendations for planning classrooms as open and active learning environments.

The Case for the Classroom: A Historical Perspective

In the 1700s, the one-room school house emerged in the United States of America (Figure 5.1). This open classroom was the place where children were taught religion and to be good citizens (Lippman, 2010; Bissell, 1995). The room was organized with the teacher on a stage at the front of the room with students seated at desks bolted to the floor arranged in rows facing the teacher. Since the students were of different ages, the younger students sat in the front with the older students, seated behind them.

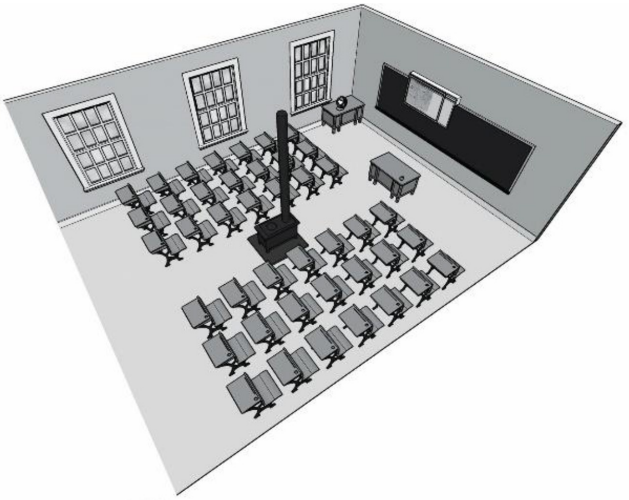

Figure 5.1. One room school (image designed by Curtis J. Gibbs, New York, NY)

With the advent of the industrial revolution, the one room school house grew becoming larger to accommodate the greater number of immigrant and migrant students attending school; however, this left some students nearer to the teacher and others much further away. Originating in Lancaster, Pennsylvania, the Lancasterian School design maintained some elements of the one room schoolhouse – notably that the stage, desks and chairs arranged in rows and bolted to the floor. However, this model introduced small group work areas along the perimeter walls. During a lesson, the teacher might move around the classroom trying to personalise the lecture by making eye contact with students. When the lecture ended, these defined areas became places which allowed the older students to assist the younger students in their studies (Lippman, 2010).

Along with the arrival of the Lancasterian School typology at the beginning of the 19th Century, the Common School Building in the United States and England emerged (Figure 5.2).

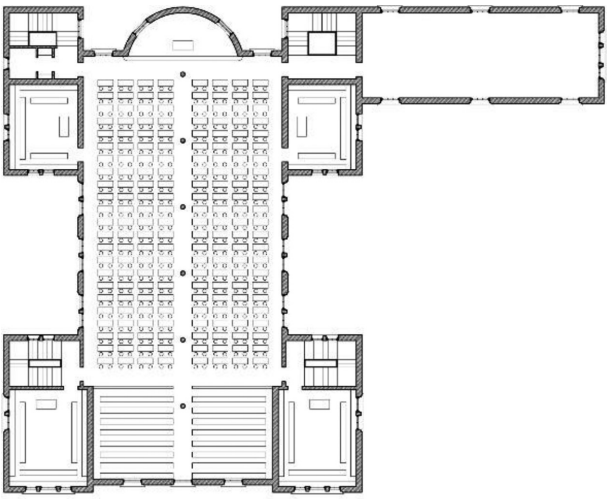

Figure 5.2. Common school building (image designed by Curtis J. Gibbs, New York, NY)

Like the Lancasterian model, the common school extended the size of the one room school house. In addition to enlarging the floor plan, a balcony was introduced. While these design features allowed more students to attend these schools, the physical environment continued to support a teacher-centric learning environment, which fundamentally was no different than the original model. However, the "new' common building school was designed with four seminar-like rooms for approximately twenty students, most likely as a strategy to private areas away from noise where students might focus on specific tasks (Lippman, 2016).

In the in the mid-nineteenth century, schools started to group students by age, ending the "mixed age" learning approach (Lippman, 2010; Bissell, 1995). Organizing schools around graded classrooms connected by vertical and horizontal corridors and verandas was common place. While separate classrooms helped to deal with challenges related to capacity and noise, the spatial arrangement of these spaces reinforced the disconnect students had with one another and their adult caregivers. Literally and figuratively, teachers owned the front of each room. Teachers' desks served as a barrier which prevented students direct access to them. Although no longer bolted to the floor, the desk row arrangements were maintained, defining the mode of learning as an individual effort. This spatial configuration with desks spaced approximately 450 mm apart, reinforced the physical separation among all members of the classroom community. In essence, the building typology that emerged further alienated students from their social environment and their learning experiences (Missellbrook, 2013).

In the 1970s, the open plan school emerged in response to educational innovations initially developed in the 1960s. "A relatively recent innovation on school architecture, the 'open-space school' lacks interior partitions; visual and acoustical separation

between teaching stations and classroom areas is limited or eliminated" (Cohen, 1976, p. 334). These buildings were viewed as prototypes by architects for promoting modern education (Rivlin & Wolfe, 1985). Nonetheless, this model did not yield the anticipated outcomes for teaching and learning. Consequently, many of those schools implementing the "open design" idea have undergone changes returning to the traditional way of divided classroom arrangements (Sanoff, 2002). If innovation in schools means abandoning traditional ways of teaching and learning and introducing alternative approaches to pedagogy, how does this equate with providing architectural deterministic design solutions? Instead of providing a normative solution for building schools (Lippman, 2010), we recommend grounding the design in the pedagogy of the place. Otherwise, we repeat the same mistakes of the past. Most recently with the wave of school construction in the UK and USA at the end of the 20th Century, the open plan school was re-introduced as a means to promote alternative ways of teaching and learning. The outcomes, have been similar to the schools of the 1970s; for, primary schools in a number of cities in the UK, including, Gloucestershire, Derby, Coventry, Leicester, Hertfordshire and Cardiff and Bushey Manor Junior School have abandoned the open plan arrangement (Patton, 2008).

TO HAVE OR NOT TO HAVE THE CLASSROOM

In reaction to the failed open plan school, the schools of the late 1980s and early 1990s reverted to designs typically seen in the 1950s and 1960s. Usually, these were buildings where classrooms were linked by horizontal and vertical pathways (Figure 5.3).

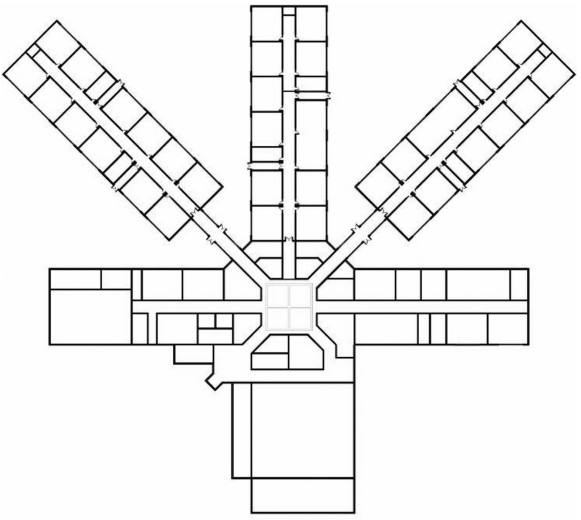

Figure 5.3. Standard finger plan (image designed by Curtis J. Gibbs, New York, NY)

However, with the emergence of 21st century learning ideologies at the end of the 20th century and guided by an architectural deterministic approach (Lippman, 2010), school districts and municipalities were encouraged nationally and internationally to identify experts to guide them in the creation of innovative, personalised, and constructivist learning environments (Pearlman, 2014) that were expected to depart significantly from current school designs. The view was that designs would significantly and positively shape the intended actions of teachers and learners. For many educational planners, the work of these experts has become the primary guide for how modern learning environments are planned (Nair & Fielding, 2005; Fisher, 2005). As Pearlman states,

> Innovators [of learner environments] no longer speak of classrooms. Students now work in learning studios, learning plazas, and home bases. They shift as needed into many varied extended learning areas and collaboration zones/ incubators that include project-planning rooms, workrooms, and other breakout [spaces]. (2014, p. 126)

Although this statement implies that exciting new learning environments are being crafted, it is not clear how this approach is a true alternative model that can improve the planning of school buildings. In fact, these new "innovative" learning areas have not advanced our understanding of space nor how its organization enables and enhances learning better than in traditional classroom spaces. Despite the paucity of research, there has been an increasing trend to reject the classroom. Today's, designers seem reluctant to even use the term "classroom" when discussing plans and designs for new or innovative schools.

Consequently, the term "classroom" has become synonymous with outdated views of teaching and learning. These negative associations may be related to long held beliefs that "classrooms" have been historically planned to reinforce a teacher-centric learning environment. While the thinking around teaching and learning has been evolving over the last fifty years, the area of 60 square meters (750 square feet) for the classroom, generally, has remained consistent over the last one hundred years. In these settings, desks are, generally, arranged in rows facing the front of the room. Given this, it is understandable that there is a desire to shift the narrative to include more attention-grabbing terms, even if the new spaces created are not drastically different than current classroom designs. So, is there any harm changing the semantics to discussions on ideal and innovative learning environments? The potential for detrimental effects, can occur when there is an assumption that a "learning studio" will spontaneously transform the teaching and learning within its walls.

Even though classrooms may be planned in ways that support collaborative learning and diversity in learning styles (Lippman, 1995, 2013a, 2013b; PEHKA, 2012), this discussion along with the activity of crafting these spaces to enhance pedagogy, generally, occurs when teachers work in existing school buildings. Since classrooms remain an important reference point when discussing schools, changing the nomenclature and rejecting the classroom in favour of alternate terms can be

confusing. This stems in large part from the near 200-year history of using the term "classroom" to refer to learning spaces. Given that the newer terms are not in general use and are often vague, it may be more prudent to accept the conceptual construct of the classroom as a physical feature of the school environment in which teachers can manage, structure, and encourage the planned activities (Huse, 1995). By accepting and using the term "classroom", the focus can be turned to truly understanding these places and resolving how to craft them to be congruent with the current needs of the users and trends in teaching and learning.

Given this, we argue that true innovation may mean accepting that classrooms are relevant and necessary for teaching and learning (Benande, 2016), and that these spaces can continually evolve and adapt to new needs. To move forward with advancing the spatial design of the school building, the affordances and constraints of classrooms must be examined in order to best provide spaces that enable learners and enhance learning. Regardless of what they are called, once inhabited, these spaces are treated, viewed and understood by the learning community as classrooms.

DEFINING THE SPATIAL ENVIRONMENT OF THE CLASSROOM

Before either discounting the classroom, or accepting it as an essential element in the school building, it is important to examine the ways in which the spatial organization of the classroom supports a traditional way of teaching and learning. Drawing on the research, this section will examine the affordances and constraints of a traditional classroom design approach. The teachers' work area will be examined followed by the learners' work area. The intention of this section is to go beyond the generalizations of the active teacher and passive learner, but rather to ground the concepts of vulnerability, ownership, and engagement in context.

The Teacher's Work Area

Generally, in a classroom that supports traditional ways of teaching and learning, the teacher is the least exposed person in the room, since the typical spatial arrangement positions the teacher at the front of the room and his/her desk at the corner. The student desks serve as an additional physical barrier preventing the teacher's movement to the students and vice versa. When the teacher is seated at the desk, s/he is enclosed on three sides with a wall behind, a wall to one side and the desk at the front. This arrangement affords the teacher with a view of the entire space and the activities of the learners (Figure 5.4). As a consequence of the long-standing view of how teaching occurs, the electrical equipment, smart boards and other teaching tools, reinforce a static setting where teachers are fixed to a single location. Within this scenario, teachers, who already have ownership of the space, are also provided with an area of safety, whereas learners are confined to an area defined by their desks and are completely exposed on all sides as they work through their tasks-at-hand.

Figure 5.4. View from teacher's desk in a classroom that supports traditional ways of teaching and learning

The Learners Work Areas

In these types of settings, teachers stand in one area for the entire class period supplying information to learners. In this scenario, the teacher performs, and learners are expected to passively sit, but actively absorb information. Not only does this arrangement reinforce a hierarchical structure of how learning occurs, most importantly, this spatial design approach promotes traditional ways of teaching, which potentially disconnect learners from their teachers, alienate the learner from others, as well as disengage learners from acquiring knowledge. This disconnection impairs students' ability to develop dependable relationships with their caregivers, sense-of-belonging, an identity of themselves, and social awareness (Brizzard, 2016). Disconnecting the learner negates transactions that transform them. Observing the activities of others, means the learner is not fully engaged in resolving the task-at-hand. When the learner is not fully engaged in activities and not directly engaged with others, their development is inhibited; requiring more time for them to recognize and understand how to develop strategies for working through situations. Furthermore, knowing how to deal with situations allows them to develop identities of themselves (Lippman, 2010; Wenger, 1998). However, when learners are unable to work through these situations, this not only hinders their development, but also means they are unable to witness the development of their colleagues emerging identities (Brizzard, 2016).

Additionally, such an arrangement has been associated with negative impacts of auditory and visual access of students with teachers. The evidence on the effects on noise on learning is not entirely conclusive. In fact, noise concerns may be less

about sound and more about the specific and situated activities that occur in the learning environment. The types of activities taking place may be more important than the (design of the) space (Brunetti, 1971), so, there is a difference between teachers attempting to address a class of pupils who are quiet and attentive against the intrusive noise arising from activities outside of the classroom. However, when students are fully engaged in prescribed learning activities, a high level of noise does not necessarily result in distraction (Bennett et al., 1980).

The research on furniture arrangements in classrooms, which support traditional ways of teaching and learning, indicates that the configuration of seating has an impact on the learning process as a cause for the decline of student performance in terms attention span, concentration, comprehension and retaining of information. If the room has seats arranged in rows, students occupying the front rows are more attentive, engaged and generally answer questions than those in the back of the room (Wannarka & Ruhl, 2008; Hawkins, 1997; McCorskey & McVetta, 1978; Sommer, 1969). When the U-Shape/semi-circular arrangement is employed, while it organizes students so that they can see one another, this configuration also confines each learner to sit at a desk where s/he is peripherally engaged with his/her classmates. Not only does this configuration reinforce the teachers' role as the giver of information, but also extends the teachers work area. With this configuration, the teacher still occupies the space at the front of the room which includes the concave area created by the U-Shape in front of the students' tables/desks. Hence, the teaching area is expanded in the form of a T-Shape.

PRACTICE THEORY

Gaining a deeper appreciation for how the spatial design of traditional classrooms influences learning provides essential information for re-imaging the classroom. However, before re-planning these spaces, the transactions that occur in them must be explored. While the literature review by Blackmore, Bateman, O'Mara, and Loughlin (2011) on design and the physical attributes of buildings, i.e. air quality, temperature, and noise on student learning connect the empirical evidence with the effects of these attributes to the built environment (Higgins, Hall, Wall, Woolner, & McCaughey, 2005), their review clearly indicates that there is little empirical evidence addressing the connections between physical learning spaces, teacher pedagogical practice, and student learning experiences and outcomes. To this end, this review is similar with what Upitis (2009), Higgins et al. (2005) revealed.

Both Montessori and Reggio Emelia proposed the notions of structured environment as vital to the child's learning. Reggio Emilia goes as far as to call the environment the third teacher, whereas Montessori refers to it as the prepared environment. Regardless, both of these notions highlight the importance of shaping the space to encourage, enable, and enhance learning, an innovative/future-focused learning environment may be created. Instead of thinking that designing an innovative building will foster the ways in which teaching and learning occur, the design must

begin with crafting spaces that support the diverse ways that people acquire knowledge and master skills (Lippman, 2010). To this end, the spatial design must be fashioned around the understanding and research on personal space, territory, safety, comfort, self-awareness, social awareness, and spatial awareness (Brizzard, 2016). With this knowledge, these places, then may be successful for engaging learners.

Practice Theory provides a framework for understanding the relationship between the social and physical environments as it recognizes, first and foremost that the learner and the learning environment are both active. Furthermore, this perspective examines the transformations of people in relationship to the individuals' activities within their socio-historical, cultural, and physical dynamics. Practice Theory builds upon a transactional perspective and Vygtosky's (1978) theoretical perspective on the Zone of Proximal Development. A transactional perspective incorporates notions that: "People and psychological processes are situated in and inseparable from their physical and social contexts…. Time, continuity, and change are intrinsic aspects of psychological phenomena" (Altman, 1992, pp. 268–269). Vygotsky's (1978) zone of proximal development involves the following: (1) the distance between problem solving activities by someone working alone and a person's problem-solving activity when assisted by collaboration with another or others; and (2) the disjunction between the individuals' everyday transactions in their primary environments (home and community) and their experiences within secondary environments (school and workplace). Secondary environments have their own socio-historical context, which may be distinct from the understandings of individuals' everyday experiences, developed within their primary contexts (Cole, 1995).

Situated Learning Theory

Situated Learning Theory is fundamentally practice theory as it relates to learners and learning. This perspective stresses the relevance of where, when, and how opportunities take place for learners (Brown, Collins, & Duguid, 1989; Greeno, Collins, & Resnick, 1996; Putnam & Borko, 20000). Furthermore, this perspective acknowledges that learning is embedded within an activity system, i.e. an art room, technology laboratories, science laboratories, and language laboratories, etc. These activity systems provide authentic experiences because they are planned to engage learners/apprentices through the practices that occur routinely within defined settings (Brown & Conroy, 1999). According to Putnam and Borko (2000), situated learning theory acknowledges that:

- cognition is situated in social and physical contexts. Situated learning relies on authentic activities to encourage cognitive development.
- cognitive development occurs as a result of the shared negotiations and shared cognitions with others in the physical environment/activity systems.
- cognitive development is a social process. Social cognition involves transactions with others in the social environment. These transactions are a factor in how cognition develops and what kinds of skills are acquired.

- To evaluate the situated nature of learning where acquiring knowledge and mastering skills involves authentic practices, the activity system is understood as the unit of analysis. This analysis occurs at three levels, which recognizes that the:
- Activities are conscious actions, and comprise chains of actions.
- Actions consist of chains of operations.
- Operations, which are actions at first, require conscious effort. With practice and internalization, activities turn into actions and eventually into operations, gradually becoming more automatic. At times, this trend can be reversed, and previous automatic operations may need more conscious effort. The relation between activities, actions and operations is thus dynamic (Russel, 2002; Jonassen & Rohrer-Murphy, 1999).

Within the situated learning perspective, learning involves transactions that transforms the learner. Ironically, this perspective recognizes that the transformations that take place are not arbitrary, but occur within purposefully designed settings. For this reason, the physical environment must also be thoughtfully, responsibly and appropriately crafted.

Activity Settings

In order to nurture learners' transactions and negotiations the physical environment must be purposefully designed (Putnam & Bork, 2000). Understanding these concepts provides the foundation for creating defined learning zones in classrooms. While there is little research that examines how the physical environment enables the learner and enhance the learning, Tharp and Gallimore (1997) offer insight to this with the concept of the activity setting. Activity settings are differentiated and defined learning zones in the physical environment. These learning zones:

- provide access to a variety of peers with varying levels of skill with a given activity;
- influence the types of [engagements], verbal and otherwise, that occur in the daily routine;
- affording learners spaces to actively explore the allowable range of activities permitted in the space;
- provide opportunities for students to create, reflect on, and redesign their activities and respond to their self-generated changes;
- afford appropriate levels of adult direction and monitoring in order to allow for developmentally appropriate latitude in what learners do and how they do it; and
- reduce the potential for environmental "chaos" including crowding and noise via minimizing the impact of negative environmental features, while offering the developmental benefits of ideal built spaces.

Hence, a purposefully designed classroom is not only understood as integrated/connected, but includes activity settings (Tharp & Gallimore, 1997). Furthermore,

activity settings may be described as the physical embodiment of zones of proximal development (Vygotsky, 1987), and might be conceptualized as spaces that support learning within classrooms. In addition to Tharp and Gallimore's concept of activity settings, Wachs (1976) described areas in early learning centres, in which a child may escape from too intense stimulation as a "stimulus shelter." Moore (1979/1996) described these spaces as areas for retreat and refuge or prospect and refuge (Hildebrand, 1991). According to Moore (1979/1996), the presence of "stimulus shelters" is a strong predictor of later cognitive development. Moore (1986) also recognized that more engaged behaviour or task-focused behaviour (in contrast to random, withdrawn or transitional behaviours) occurs in spaces that have well-defined activity settings than in spatial designs with poorly defined settings. Additionally, learners' investigations are directly related to the degree of spatial definition of activity settings, that is, a spatial design with a variety of defined activity settings leads to greater degree of exploratory behaviour (Moore, 1986).

SPATIAL DESIGN: CASE STUDIES

In this section, select schools from the United States, Australia, and Sweden are presented to highlight that modern and open learning environments are not only feasible in newly designed structures, but most importantly may be crafted within existing classrooms. The models highlighted in this chapter, include schools that were redesigned in part or whole with the aim to re-imagining the concept of the modern learning environment. Webster Groves School District in St. Louis, Missouri, Elementary and Middle schools in the Huddinge School District, Sweden, Public Schools in NSW, Sydney, Australia, and Yule Brook College in Perth, Australia.

International examples are presented here to offer a deeper understanding (Yin, 2014) of the characteristics, attributes, and affordances of open-plan classrooms that enable learning and support learner engagement. These examples of classroom redesign offer insight for planning open-plan classrooms which enhance formal classroom-based learning programs (Patton, 2015). The re-design process began with the focus on generating a good understanding of the cases and case contexts, the following methods were used: (1) observations (2) focus groups; and (3) semi-structured interviews (Goodrick, 2014).

Crafting the Open Classroom

To illustrate how classroom arrangements may enable the learner and enhance optimal learning experiences, the following classroom re-design models from practice are provided The classrooms represented in this section, were reimagined using an Evidence Based Design Approach, a systematic design process as part of educational and architecture planning practice, rather than, the normative mindset that has traditionally informed school design; for, the normative mindset is often not based in research but on general trends, best practices, or the newest fad of the time.

The new design layouts were modelled based on the literature on situated learning theory, observations in how the classrooms were used and interviews with teachers and students. The designs for these settings were based upon the premise that learning is neither passive nor does it occur individually, but rather is socially constructed (McMahon, 1997). Learning happens as individuals are engaged in social activities. Situated learning theory recognizes that learning is embedded in social and physical contexts. Hence, the built environment must be crafted to actuate learning and engage learners (Brown & Conroy, 1999). Additionally, situated learning theory acknowledges that the learners' transactions are not arbitrary, but occur within purposefully designed settings. Furthermore, this perspective situates learning in context and acknowledges the reciprocal relationship that occurs between behaviour and experiences, the transformations of the learner results from their transactions with their social and physical learning environments (Lippman, 2010). With this understanding, a concerted effort was made to craft the rooms to support specific actions and operations for the learners.

Time was spent observing each classroom and talking with teachers about their needs and goals. Generally, teachers were frustrated with their spaces. They wanted more space or a new classroom and better access to students. Teachers reported that they felt that the spaces and the furniture limited them from being able to create a 21st century, or innovative learning environment. Based on the observations and interviews and using the existing furniture classrooms were re-imagined. The intentions were to design places that were responsive to the daily actions, operation and motivations of the social environment. Where possible, the teachers' desks were eliminated to create more usable space. Using the existing furniture multiple

Figure 5.5. St. Lawrence primary school using existing furniture, classroom organized to create activity settings where students have a choice of where they prefer to work (photograph by Places Created for Learning)

Figure 5.6. Primary school, Huddinge, Sweden (photograph by Places Created for Learning). This classroom was crafted to create activity settings or rooms-within rooms

Figure 5.7. Skapaskolan, Huddinge, Sweden (photograph by Places Created for Learning). This is a portable classroom where the furniture was arranged so that teachers had areas to support large group meetings, cooperative working groups, and independent work

learning zones, activity settings, were created to support the variety of transactions necessary for the development of the whole learner. When possible, tables and chairs for groups of four learners were placed along the perimeter walls (Figures 5.5, 5.6 and 5.7). By doing this, the centre of the room was available for all, becoming a place where the class might gather and have easy access to resources housed in moveable storage units. Additionally, this space allowed teachers to be always, and in all ways, available to students – visually and physically. This arrangement was intended to reflect a class where ownership was shared between the teacher and the students.

Findings

Webster groves school district St Louis, Missouri, USA. In this school teachers wanted to re-make their classroom into places that supported alternative ways of teaching. The design team was given the opportunity to support, encourage and transform four (4) classrooms. The initial design may be described as disjointed. While a variety of furniture, tables and chairs, ottomans, and couches, were introduced into the rooms, they were not arranged in relationship to how learning was intended to occur. The design team reconfigured the rooms with to an area where the whole class could meet as well as created several differentiated learning zones, activity settings, to support cooperative group work and independent learning areas.

The efficacy of the design changes at Webster Groves was assessed from comments from teachers a few months after the rooms were re-organized. The school community members specifically noted:

- We loved the changes to our room and opening up the space – the children have a lot of opportunities for moving within the classroom space.
  it allows the teachers to see everything taking place – no blind spots.
  The environment is filled with opportunities for individual, small and large group needs as needed throughout the day.
- The students immediately responded positively to the space. Having the "conference table" where we can come together as a class (instead of meeting in the floor) has really changed the dynamic of our whole-class discussions.
  We had presentations last week, and found that turning the whole-group table in front of the Smart Board really allowed us to both present and participate in a more authentic way.
  Several of my colleagues have expressed interest… As a result, the fourth-grade team has made a conscious effort to rethink their use of space, focusing on the concepts of prospect and retreat, activating corners and walls, and finding flow within their rooms.
- Most importantly, the main idea Webster Groves School District is promoting to their educational staff is that to create a 21st Century Learning Environment,

teachers must re-think and change instructional practices, and then re-arrange the space to support these instructional changes.

Huddinge school district in Sweden. The goal of the Huddinge school projects was to assist the school community with re-thinking how teaching and learning occurs best. While classrooms had similar furniture, desks with chairs, tables and chairs, and sometimes a couch, to name a few, the classrooms all varied in shape and size. Regardless, teachers wanted places where they could still teach explicitly and have areas where students could work cooperatively.

By reconfiguring the spaces, each space became purposeful – differentiated and defined to support didactic teaching, collaborative learning, or independent work. Generally, each space has been organized by grouping 2–3 tables along walls (activity settings), which form a central area in the classroom that is shared between the teacher and learners. Hence, the outcomes have been to transform classrooms that were arranged to support more traditional ways of teaching to environments that encourage alternative ways of teaching by creating a variety of activity settings or as they teachers stated, "rooms-within-rooms."

The effectiveness of the re-arrangements was determined in part with informal teacher and student interviews which were conducted in April 2016, and October 2016. Students' comments highlighted the importance of being able to see others from anywhere in the room, the "open" feeling of the classroom and the greater array of work space choices.

Teachers were particularly impressed with the new design as well, noting:

I never thought I would ever have a new classroom.

I just want to say how pleased and happy we all are, both pupils and teacher….

No one has complained, they seem to work more calm now; the placement of tables [was] excellent. You sat children with each other that I never would have done.

Suddenly they just went along. Even two of my really bad girls that should not be in the same classroom because they always fight have become good friends now. They will now play after school, even sleep over the weekend.

Terrigal and Wamberal Public Schools. NSW, Sydney, Australia. For Terrigal and Wamberal Public Schools, the journey for crafting alternative learning environments was tied to developing a better understanding for how staff and students will transition to their new future-focused building additions. Staff were very much interested in working through the possible issues prior to moving into the additions. The success with the spatial design changes were evaluated as part of a focus group where teachers who had invited us to re-think their spaces offered their thoughts on their new arrangements. This focus group was conducted in May 2017. Overall, teachers stated the following benefits of the new design/changes:

- Improved transitions and movement.
- Loved big open spaces where students have access to resources
- Could not believe how much space the portable classrooms afforded.
- By not assigning seats students were given choice with whom and where they worked. This seems to have reduced stress in the classroom.
- Tables allow shared ownership of the room rather than individual ownership of a desk.
- To achieve a flexible collaborative environment was not just achieved by re-arranging furniture, but required building a culture around how the spaces is to be used.

These comments suggest that by having choice reduced stress for students and made the rooms calmer. Based on research on stress and how it influences learning, these new open arrangements with activity settings, direct access to resources, and choice of where to work, afforded learning and encouraged students to learn how to work together.

Yule Brook College, Perth Australia. The new design plans for Yule Brook College, a Big Picture Education School, were based on interviews with two teachers and the principal who provided insight for understanding the process of change for the high school. For this school, we re-imagined the classroom with high benches and stools. In this college, the teachers have ownership of their classrooms. The comments were focused on the following advantages of the new design:

- The students move more quickly between transitions – explicit teaching to cooperative and/or independent work.
- The classroom felt less cluttered, because students put their bags away rather than leaving them on the floor.
- Teachers are spending more time at benches teaching and working rather than at their desks. As a result, they are considering replacing their desks with storage units.

Based on these comments, the spaces were open which allowed for faster transitions between tasks, teachers felt that they were more visually and physically connected to their students.

From the schools examined, we can extrapolate that these new settings supported learners and educators. Furthermore, the positive outcomes are not directly a result of the re-arrangements of the spaces, but rather are a result of concerted efforts on the part of the school community to design the environments in a way to best serve the needs of its users. Each school worked through a process to create alternative learning environments. Lastly, the spatial design of these classrooms is only one key aspect/building block along this journey to crafting innovative learning environments.

CONCLUSION

Many education and design professionals have been unduly tainted by the traditional definition of classroom space. In this chapter, we invite readers to re-imagine the

classroom and consider how it can be a pivotal component of an innovative learning environment. The classroom has a deep and lasting historical significance and has been changing in response to the needs of the times. By harnessing the affordances of these spaces, we can work to refine classrooms in specific ways, to serve a wide variety of needs.

The selection of school models from around the world, illustrate how traditional classrooms can be re-imagined to support learning. While limited to 35 classrooms, the case findings suggest that classrooms originally designed to support traditional ways of teaching and learning can be redesigned as open-planned spaces that better support movement, coping with stress and social interactions These physical adjustments can aid in creating a culture that understands the actions, operations, and motivations that occur, spaces can be re-imagined creating dynamic spaces for children's' learning and the development of their self-awareness, social awareness and spatial awareness. Based on the reports provided from school stakeholders, it appears that the physical changes made to the classroom helped to positively alter students' learning behaviours, social interactions and teacher's actions within the space. By purposefully transforming the physical environment, learning zones were created that afford learners the opportunities for engagement and learning mastery, and avoided elements that work against learning.

Given that students are continually learning how to communicate, share and negotiate with others, these classrooms were planned to support these important aspects of their social-emotional development. Building on the research on activity settings, the focus was on the creation of differentiated learning zones where children were encouraged to work independently and cooperatively. In all the classrooms, teachers were able to arrange their rooms to support the different learning zones, but more importantly, the learners were encouraged to move between activity settings and were empowered to move furniture in the rooms. Thus, actively constructing the space to suit their needs and developing connectedness and a sense of themselves as active agents in the learning community. While desks, tables, chairs, and cabinets were used by teachers to define specific areas in the rooms, at the same time, the moveable furniture, empowered the learners to arrange and re-arrange their work areas to engage or disengage with others and/or create safe and secure places to learn.

By creating activity settings, distinct and specific learning zones in the built environment, located along walls and in corners, teachers provide opportunities for learners to develop their sense of self, of others and place. Furthermore, they are afforded the opportunity to identify settings in the classroom where they can belong. In situations where children do not feel comfortable, they can, in essence, shape their physical space to afford a sense of security or move to another space in the room. Given the arrangement of the activity settings in the classroom, an open plan classroom is created. Within these settings, teachers, who are already viewed as dependable care givers, have greater flexibility to move around the rooms which reinforced the already existing personal attachments they have with

the children. Furthermore, this open plan arrangement affords teachers the ability to provide visual surveillance over these learning zones. When conflicts take place, teachers can quickly and easily attend to them. Hence, conflict and anxiety levels with students may often be mitigated because teachers are always and in all ways available to them.

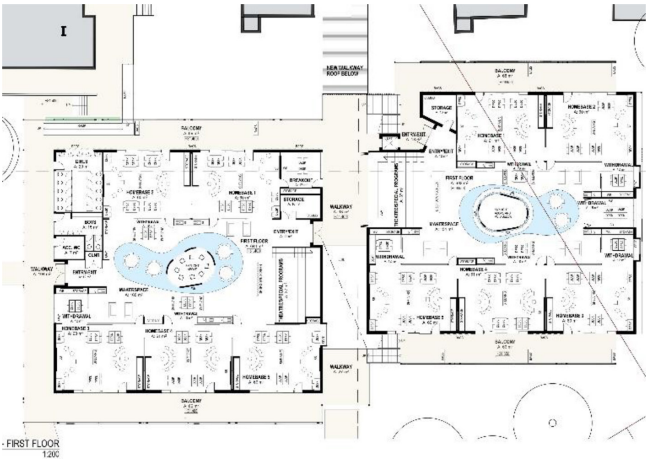

Figure 5.8. Wamberal Public School plan (designed by EJE architecture, Newcastle, Australia & Places Created for Learning, Perth, Australia). Wamberal Public School has been designed to support 15 classrooms

Figure 5.9. Epping Public School (designed by GHD Woodhead, Sydney, Australia & Places Created for Learning, Perth, Australia). Epping Public School has been planned with 22 classrooms spaces

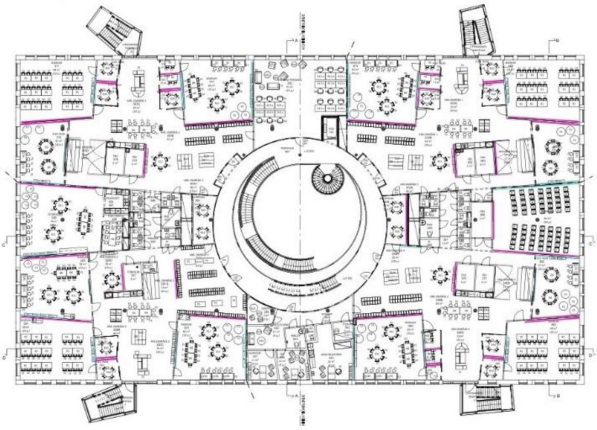

Figure 5.10. Glomstaskolan (designed by Origo Arkitektgruppe, Sweden). Glomstaskolan has been planned with approximately 46 classrooms spaces

Furthermore, the design briefs for crafting innovative learning environments provided to designers in Sweden and New South Wales, Sydney, included the concept of classroom spaces, i.e. Glomstaskolan in Sweden, and Wamberal Public School along with Epping Public School designed for the Department of Education in NSW (Figure 5.8, 5.9, & 5.10). For Epping and Wamberal public Schools, the design includes classrooms with cavity sliding doors between rooms and aluminium framed glass sliding doors to the larger gathering spaces. This approach allows teachers to have choice of opening these doors to connect to the other spaces or not. While the schools in Sydney have been planned around the classrooms and the spaces, outside and adjacent to them, support the activities that are initiated in them, at Glomastaskolan, the approach, supported by the culture of the place, is to have the open space between used as a gathering space and organize the classrooms as the other spaces to support pedagogy. Hence, rather than comparing the spaces that support traditional ways of teaching with alternative ways of teaching, researchers might wish to focus on the ways that current spaces can support alternative pedagogies and how they enhance learning. By understanding why these spaces are being used, what these places afford teachers and students, how these spaces are used, when are these spaces used, and who uses them, researchers and designers can best craft learning environments to be congruent with the transactions that are intended to occur in the learning environment. Through understanding the transactions that occur in the classroom, the framework will be in place for designing innovative learning environments that transforms the learner so that they are able to transition successfully to the university and/or the workforce.

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