

JO DANE

15. THE EFFECTIVE TEACHING AND LEARNING SPATIAL FRAMEWORK

An Evaluation Tool

CONTEXT

The Effective Teaching and Learning Spatial Framework was developed within the context of higher education as part of the writer's PhD research. It was underpinned by an evaluation of four new generation learning environments conducted at four Australian universities. The Framework and resultant evaluation tool is considered to have broader cross sector application into Schools, TAFE institutions and corporate learning environments.

The objective of the PhD was to develop an evaluation tool that: could be applied to any formal classroom space to test its alignment with effective teaching and learning practice; could be implemented by teachers to help develop their teaching practice; could be implemented by designers to help design activity-based classrooms; was simple to use (anyone can implement), and could be repeated any time.

INTRODUCTION

Within the last fifteen years a new space typology has emerged on University campuses across the world, vicariously called New Generation Learning Environments or Spaces, and presenting an alternative to traditional classrooms such as lecture theatres, tutorial rooms and seminar spaces. These new classrooms have developed out of academic demand for spaces that enable greater collaboration and interaction between students, underpinned by an understanding of 'good' or 'effective' teaching and learning processes.

METHODOLOGY & METHODS

A literature review of 'student-centred learning' conducted for the PhD revealed a distinct theoretical and practical domain referred to as 'effective teaching and learning'. The term refers to an approach to teaching and learning that is holistically dedicated to enabling students to foster a deep approach to learning. In dissecting the 'effective teaching and learning' literature, key concepts have surfaced and resulted

in profound implications for student learning behaviour and consequently the revelation of key spatial characteristics that will foster desired learning behaviours. Six essential elements of effective teaching and learning have been distilled from the literature, as outlined in [Table 1](#), and are discussed below.

Table 1. Essential elements of effective teaching and learning

<i>Effective teaching and learning</i>	<i>Literature references</i>
1. ...promotes student activity and engagement with content; empowers students with choices and maintains interest through a variety of activities, resources and learning styles.	(Biggs & Tang, 2007; Entwistle, 2009; Hounsell, 1997; Prosser & Trigwell, 1999; Ramsden, 2003, p. 93; Shuell, 1986; Skinner, 2010)
2. ...encourages the teacher to view teaching from the student's perspective and build meaningful relationship with students	(Entwistle, 2009; Laurillard, 2002; Marton & Booth, 1997; Prosser & Trigwell, 1999; Ramsden, 2003; Rogers, 1969)
3. ...is a social process whereby knowledge is socially constructed	(Dewey, 1897; Dewey, 1961; Garrison & Archer, 2000; Laurillard, 2002; Lave & Wenger, 1991; Piaget & Inhelder, 1969; Vygotsky, 1978)
4. ...fosters a deep approach to learning that encourages student independence	(Dewey, 1961; Hounsell, 1997; Marton & Saljo, 1997; Rogers, 1969)
5. ...is contextualized & relevant; teachers have an awareness of student prior learning	(Biggs & Tang, 2007; Entwistle, 2009; Hounsell 1997; Kolb & Kolb, 2005; Laurillard, 2002; Prosser & Trigwell, 1999; Ramsden, 2003; Rogers, 1969; Shuell, 1986; Skinner, 2010)
6. ...involves teachers continually evaluating how students perceive their learning situation, the learning approaches being adopted, as well as providing regular and targeted feedback to students, including formal assessment	(Biggs & Tang, 2007; Chickering & Gamson, 1987; Entwistle, 2009; Hounsell, 1997; Laurillard, 2002; Prosser & Trigwell, 1999; Ramsden, 2003)

EFFECTIVE TEACHING & LEARNING BEHAVIOURS

The effective teaching and learning discourse presents explicit and implicit clues as to the teaching and learning processes that may occur in the classroom. It prompts the question: what does effective teaching and learning in the classroom look like? This section outlines the 'essential elements' to reveal actions and behaviours by teachers and students that contribute to effective teaching and learning. These behaviours are presented as holistic actions rather than fine-grain behaviours. In other words, rather than anticipating the minutia of behavioural possibilities, the schema will rationalise

broad behaviours such as students being able to interact with each other, being able to move around the room and being able to capture digital content.

1. Effective Teaching and Learning Promotes Student Activity and Engagement

Students can engage with the learning content in a variety of ways that may involve working individually or in small groups, for example, working from textbooks or work sheets or via educational technologies. Activities to be encouraged and enabled include: creating, producing, brainstorming, researching, analysing, debating, performing, building, and simulating. These activities often require students to move around the room, access technologies and writeable surfaces, work individually but then come together as part of a group, share content with colleagues, or present to the whole cohort. There are spatial consequences for undertaking all these activities. Sometimes these activities will be implemented synchronously, with everyone working to the same activity at the same time. However, it should also be possible for students to choose how they engage with the content to be learned, and there may be multiple student groups working on different activities at the same time.

2. Effective Teaching and Learning Encourages the Teacher to View Teaching from the Student's Perspective

Viewing teaching from the student's perspective will involve being able to interact directly with students either as individuals, in small groups, or as a whole cohort. Therefore it is important that the teacher can move around the room easily and is able to access all students equally and equitably. Sharing the resources in the room is another way of fostering an equitable relationship between teacher and students. If the teacher is the only permitted user of the technologies in the classroom, then the teacher will remain disconnected from the student's perspective. In order to promote shared and equitable access by both teachers and students classroom resources should be positioned around the room.

3. Effective Teaching and Learning is a Social Process Whereby Knowledge is Socially Constructed

Engagement in the learning process often begins with, or is enhanced by, students connecting with each other on a social level. As they get to know each other, social conversations comfortably transform into learning conversations. Social connections often break down cultural, emotional and academic barriers, paving the way for greater engagement around learning content. Social behaviours are impacted by the distance between people, so the classroom should enable students to interact at 'personal', 'social' and even 'intimate' distances, as defined by Hall (1970). Students may need to engage in different ways at varying distances but simultaneously in the classroom.

4. Effective Teaching and Learning Fosters a Deep Approach to Learning that Encourages Student Independence

Empowering students with choice as to how they engage with learning will foster independence. It may be as simple as students being able to choose a learning activity or assessment method, or it may involve allowing students to manipulate the physical environment. Students may choose the speed at which they complete assessment milestones. This may mean that they are working on different tasks at the same time, accessing different resources at the same time, and seeking guidance on different aspects of the curriculum. Therefore the classroom will need to be agile enough to cope with a variety of parallel student activities and interactions that are fostering movement and creating noise throughout the environment.

5. Effective Teaching and Learning is Contextualised and Relevant; Teachers have an Awareness of Prior Learning

Every student brings a unique context and prior learning experience that influences the product of interactions among the cohort. Relevant learning content is of fundamental importance to students and contributes significantly to their motivation to engage. An effective teacher will harness the differences that exist in every cohort by understanding prior learning and what is relevant to all students. Giving students and teachers the opportunity to connect and build this level of understanding may involve a combination of enabling a social learning environment, fostering independence and promoting various individual and collaborative activities. Highly engaged students who are motivated to learn should be able to use the classroom environment in a variety of ways that suit each unique situation, hence the criticality of providing an agile physical classroom environment.

6. Effective Teaching and Learning Involves the Teacher Providing Effective and Timely Feedback

One of the most valuable contributions to student learning is effective and timely feedback. This may happen in many different ways such as digitally, via assessment, or verbally in the classroom. This reinforces the importance of the teacher being able to equitably access and communicate with all students in the classroom. However, when group work is being undertaken the teacher may prefer to evaluate group progress from afar, by being able to see brainstorming notes on a wall, refer to a digital screen, or hear discussions taking place. Rather than hovering around student groups, which may interrupt their thought process, teachers can effectively maintain an awareness of progress from afar. This also diminishes the student's reliance on the teacher and thus fosters independence. As soon as a student or group appears to be having difficulty of falling behind, the teacher can offer assistance. Therefore, being able to connect visually with all students in every corner of the room and to

the content with which they are engaging, is vital in the classroom. Teachers need to be able to scan a group from afar or be able to interact at close distance.

THE EFFECTIVE TEACHING AND LEARNING SPATIAL FRAMEWORK

A critical finding of the research undertaken by the writer was the compelling relationship between effective teaching and learning (as described in the literature), effective teaching and learning behaviour (as inferred in the literature) and critical spatial qualities associated with new generation learning environments. As discovered throughout observations of various classrooms, qualities of space could include tangible objects such as furniture and technologies, but also non-tangible elements such as spaciousness, a variety of furniture and access to classroom resources.

The spatial elements mentioned above have been synthesised below into six essential spatial qualities that are considered critical to the design of new generation learning environments in order to enable effective teaching and learning to occur. They are:

1. Spaciousness
2. Mobility of furniture
3. A variety of furniture settings
4. Accessible educational technologies for students
5. Active surfaces, and
6. Student access to all classroom features.

These qualities do not ignore indoor environmental qualities (IEQ) that are known to affect the experience of learning, such as natural light, thermal comfort and fresh air (Lackney, 1999; Nair & Fielding, 2005; Tanner & Lackney, 2006). The six essential spatial qualities listed above are a unique contribution from this study to existing learning space discourse and are considered complimentary to accepted IEQ conditions.

1. Spaciousness

Spaciousness is a spatial quality often associated with having ample room to move, although it has greater implications for bestowing a sense of freedom for the occupants of space. While Tuan (1977) declared that “a setting is spacious if it allows one to move freely”, he also asserted that “spaciousness is closely associated with the sense of being free. Freedom implies space; it means having the power and enough room in which to act” (p. 52). Space is objective and tangible – it has a volume that is measurable. The elements within a space and the number of occupants within will contribute to its sense of ‘spaciousness’. A 60m² space with a 3 metre high ceiling and minimal furniture will feel spacious to a single occupant, however the same space with sixty occupants will most likely feel crowded. Depending on the number of occupants, the ceiling height and other elements within the space

(e.g. furniture), the point at which the room begins or ceases to feel spacious is subjective and difficult to define.

In the context of new generation learning environments, having ample space to move around is fundamental, not only for enabling the teacher to move easily around the room to engage with students, but to enable students to move freely around the room, engaging with other students and participating in a variety of learning activities. However, as per Tuan's interpretation (1977), spaciousness in a classroom environment should engender a sense of freedom in students to initiate activities, access resources, or engage with others, relevant to their learning objectives. An 'effective' teacher provides some structure and guidance, but liberates students to take ownership of their learning experience. An 'effective' learner should be empowered to access resources and people within and beyond the classroom. Effective teaching requires the teacher to access all students equally and directly engage with them in order to better understand their perspective. Spaciousness generates possibilities for students to engage with each other either through planned activity or through spontaneous, serendipitous opportunity.

Spaciousness therefore enables freedom, creativity, spontaneity and serendipity within the learning situation. Students and teachers can move unencumbered around the room to benefit interaction and communication. It enables floor space to be used in creative ways, from students sitting (or lying) on the floor or developing a performance, to spreading material out, or to facilitating the use of instruments. Spaciousness is a valuable educational commodity that has been identified as a critical spatial feature of new generation learning environments.

2. Mobility of Furniture

Mobility is the ability for a piece of furniture to be easily moved without undue effort. This includes chairs and tables on castors, or lightweight furniture that can be easily relocated or reconfigured. Historically furniture in most learning settings has been either fixed or heavily constructed to avoid mobility. Typical educational settings have been established to focus on the teacher, inhibiting reconfiguration of furniture that may place greater emphasis on student activity and initiatives. Immobile furniture signal to students that they are to remain fixed and focused on the teacher, thus reducing any sense of learning initiative.

Mobile furniture provokes the development of student learning initiatives beyond the norms of classroom inertia associated with lectures and tutorials. Developing student independence, as a recognised objective of effective teaching and learning, is partly orchestrated by empowering students to take ownership of their environment. If a student is compelled to manipulate the physical environment in order to enable specific learning activities, then that student is demonstrating initiative. Effective teaching will encourage such initiative within the physical limitations of the classroom.

Power and hardwired data supply to computers and other equipment naturally prevents mobility of some furniture, particularly tables. This is one of the most difficult spatial elements to contend with in the design of new generation learning environments, as it can become a significant constraint for where and how learning activities are enacted.

The mobility of chairs, coupled with spaciousness, enables students to develop initiative by manipulating the physical environment to support the learning activities that are relevant and immediate to their needs.

3. Variety of Furniture Settings

A variety of furniture settings enables different activities to simultaneously take place. In the context of effective teaching and learning this establishes choices for students, further developing their learning initiative. Teachers may assign learning objectives and guidelines but enable students, with consultation, to plan and implement multiple activities to achieve those objectives. Enabling a variety of activities presupposes that students can work at their own pace, influenced by their prior learning experience and perspective of their learning situation. Therefore, providing a variety of furniture settings that enables concurrent learning activities will support many of the characteristics of effective teaching and learning.

Having a variety of settings is in distinct contrast to furniture settings within traditional classrooms, lecture theatres and tutorial rooms. Lecture theatres traditionally contained one type of fixed seat facing the teacher, with a tablet for writing on. Tutorial rooms typically have modular furniture, which whilst potentially mobile, is conventionally set out in rows all facing the teacher. Even when student activities are implemented, the experience would generally involve all students undertaking the same activity.

A variety of furniture will support a variety of activities, but a variety of activities can also be supported by settings that are purposefully designed with an understanding of the spectrum of possible activities. Enabling a variety of activities is a critical characteristic of new generation learning environments.

4. Accessible Educational Technologies for Students

The new generation learning environments evaluated in the writer's research all enabled internet access to students with computers provided at a ratio of one computer per three students, or lower. This access negated the computer laboratory effect of one person per computer that may tempt students to be distracted by social media and other personal interests. A lower ratio of computers promotes collegiality and cooperation among students, increasing the likelihood that computers in the classroom will be utilised in a manner that is relevant and symptomatic of effective teaching and learning.

In contrast to standard classrooms on campus, where educational technologies are the domain of the teacher, new generation learning environments are distinguished by the emphasis placed on enabling student access to the educational technologies within the classroom. Furthermore, students increasingly carry internet-enabled devices to class such as laptops, smartphones and iPads, increasing the necessity for classroom access reliable and fast Wi-Fi systems. Students can use their devices to enhance the learning experience and promote collaboration by capturing content, accessing web-based resources or sharing material with peers.

Universities' investment in sophisticated intranet services has created hybrid learning environments where students can access unimaginable quantities of information wherever they have access to the internet. As internet-enabled computer resources are a key characteristic of new generation learning environments, students can access a world of knowledge relevant to the context of their learning encounter.

The presence of computers in new generation learning environments begins to normalise the experience of accessing internet resources at any time. In this sense, effective teaching and learning is enhanced through the choices and possibilities presented to teachers and students by accessing internet-based resources in real time, reacting to spontaneous demand and relational to relevant learning activities.

5. Active Surfaces

New generation learning environments are about promoting effective teaching and learning, where according to Shuell, "what the student does is actually more important in determining what is learned than what the teacher does" (1986, p. 429). A key aspect of this is being able to express oneself and to share and communicate cognitive activity with others in the room.

Students build confidence in their learning when they can see or hear what other students are doing. Whether a student is working individually or in a small group, it is reassuring for students to know that they are on the right track. Inspiration and motivation can occur when students can see other students productively engaging, and crucially, see the product of that engagement. A classroom environment can facilitate this with 'active surfaces', that is, walls and floors that can be used for different learning activities. Examples of active walls include whiteboards, pin-boards, blank walls for projection and wall-mounted LCD or plasma screens. An active floor may consist of unoccupied floor space, either permanently vacant or created by moving furniture out of the way, where an array of alternative activities may take place.

Students' monitoring other students in the room, and teachers easily monitoring what students are doing, have an underestimated benefit of learning in the classroom. Monitoring is enabled through 'active wall' features where students can develop ideas, plan assignment tasks and demonstrate understanding that is displayed for the teacher and other students to see. Active surfaces are a spatial feature that should

be considered in new generation learning environments, to facilitate experiential learning, knowledge sharing and monitoring among students and teachers.

6. Students Access to All Features

Effective teaching and learning fosters a deep approach to learning through the development of student initiative and independence in the learning process. This implies a more democratic relationship between teacher and student, as distinct from the authoritarian relationship that prevails in many teacher-centred situations. Teachers can nurture a democratic relationship simply by availing use of all aspects of the classroom environment to students, free of rules and encumbrances that convey the teacher's command. New generation learning environments are designed as student-centred spaces, enabling student access to all features of the room or precinct.

It is important to stress that while many teachers in the writer's PhD study said their students were advised they were free to move around the classroom as they wished, it was only activities instigated by the teacher that compelled any movement by students.

THE EFFECTIVE TEACHING AND LEARNING SPATIAL FRAMEWORK

The Effective Teaching and Learning Spatial Framework (below) integrates the essential elements of effective teaching and learning with their relational behaviours and spatial qualities as seen in [Table 2](#). The convergence of these three tracts begins to form a response to the question: What does effective teaching and learning look like? The physical environment plays a critical role in deliberately enabling the identified teaching and learning behaviours with specific spatial characteristics presenting fundamental opportunities for teachers and students to engage with each other in a variety of meaningful ways.

A deliberately non-deterministic spatial framework has been developed to ensure pedagogical flexibility and design agility. Teachers will have the freedom to implement a vastly increased range of learning activities compared to the opportunities inherent in typical lecture theatres and tutorial rooms. Architects and designers will have the freedom to apply the spatial qualities in ways only limited by their imagination. They can be applied in a generic sense, for use by a wide range of disciplines or tailored to specific contexts such as science laboratories.

THE EFFECTIVE TEACHING AND LEARNING EVALUATION TOOL

The evaluation of new generation learning environments has emerged as an important bi-product of new classroom typologies as universities seek to demonstrate better student outcomes and to validate significant investment in new generation learning

Table 2. The effective teaching and learning spatial framework

<i>Effective teaching and learning:</i>	<i>Teaching and learning behavior:</i>	<i>Spatial qualities:</i>
1. ...encourages the teacher to view teaching from the student's perspective and build meaningful relationships with students	<ul style="list-style-type: none"> • the teacher moves around the room to access all students equally and equitably; • the teacher and students accesses the same educational technologies; • the teacher is able to engage with students individually, in small groups or as a whole cohort • students feel valued and respected 	<p><i>SPACIOUSNESS</i> to enable easy movement around the room</p> <p><i>ACCESSIBLE EDUCATIONAL TECHNOLOGY</i> for students as well as the teacher</p> <p><i>MOBILE FURNITURE</i> to enable quick and easy reconfiguration of the classroom</p>
2. ...is a social process whereby knowledge is socially constructed	<ul style="list-style-type: none"> • students engage with each other and with the teacher; • students collaborate, interact and communicate with each other in many different ways 	<p><i>VARIETY OF FURNITURE SETTINGS</i> to encourage different types of activities</p> <p><i>ACTIVE SURFACES</i> for sharing ideas and experiences</p>
3. ...fosters a deep approach to learning that encourages student independence	<ul style="list-style-type: none"> • students can focus on learning activities during class; • students consolidate meaning through discussion with teachers and peers • students manipulate the environment to suit their needs; • students move around the room to access appropriate resources; • students may move around the room to communicate with other students 	<p><i>VARIETY OF FURNITURE SETTINGS</i> to suit the varying needs of each class and each student</p> <p><i>MOBILE FURNITURE</i> to enable quick and easy reconfiguration by students</p> <p><i>STUDENT ACCESS TO ALL FEATURES</i> in the room/ precinct: no barriers</p>
4. ...promotes student activity and engagement with content; empowers students with choices and maintains interest through a variety of activities, resources and learning styles	<ul style="list-style-type: none"> • multiple students/groups access relevant technologies and resources simultaneously; • different students undertake different activities simultaneously • students share/record/save ideas and <i>new</i> knowledge for future reference. 	<p><i>ACCESSIBLE EDUCATIONAL TECHNOLOGY</i>, internet-enabled and in multiple numbers</p> <p><i>VARIETY OF FURNITURE SETTINGS</i> to enable different activities</p> <p><i>ACTIVE SURFACES</i> for capturing and sharing ideas</p>

Table 2. (Continued)

<i>Effective teaching and learning:</i>	<i>Teaching and learning behavior:</i>	<i>Spatial qualities:</i>
5. ...is contextualised & relevant; teachers have an awareness of student prior learning	<ul style="list-style-type: none"> • students undertake activities relational to their prior learning experience; • different students work at different paces; • different students undertake different activities simultaneously • students access resources relevant to their needs 	<p><i>VARIETY OF FURNITURE SETTINGS</i> to enable different activities</p> <p><i>ACCESSIBLE EDUCATIONAL TECHNOLOGY</i> for students as well as the teacher</p>
6. ...involves teachers continually evaluating how students perceive their learning situation, the learning approaches being adopted, as well as providing regular and targeted feedback to students, including formal assessment	<ul style="list-style-type: none"> • the teacher moves easily and equitably around the room, observing and talking to students, individually and in small groups; • the teacher scans the room to evaluate progress and identify students who need help 	<p><i>SPACIOUSNESS</i> to enable easy movement around the room and to access all students</p> <p><i>ACTIVE SURFACES</i> for viewing student progress and ideas</p>

environments (Lee & Tan, 2011; Pearhouse et al., 2009; Radcliffe, Wilson, Powell, & Tibbetts, 2009). However, the majority of evaluation processes are overly complex, requiring specialists to implement them and often do not address fundamental issues relating to pedagogical objectives. Consequently very little meaningful evaluation ever occurs.

The Effective Teaching and Learning Spatial Framework (ETLSF) presented an opportunity to develop an evaluation tool that was simple to apply, addresses key pedagogical objectives, behaviour and spatial qualities. Furthermore, the evaluation outcomes present a clear indication of the efficacy of a learning space for implementing effective teaching and learning. The ETLSF was dissected to establish 25 statements separated into the following four categories: Furniture, Engagement, Technology and Pedagogy.

With a particular learning space in focus, participants were asked to respond to statements according to a standard Likert Scale that differentiated the level of agreement with each statement, where 1 = significantly disagree and 5 = significantly

agree. The higher the rate of agreement with the survey statements, the better suited the physical environment was for implementing effective teaching and learning. A low rate of agreement with the survey statements indicated that the physical environment was not well suited to implementing effective teaching and learning.

Each response attracted a numerical value, with a maximum total of 125 points, aggregated to a percentage number that formed an efficacy rating of the learning space, or how effective a learning space was for enabling effective teaching and learning. For example, a total response of 100 points equalled 80%, resulting in an 80% efficacy rating for enabling effective teaching and learning. A learning space was considered well suited to enabling effective teaching and learning if the evaluation response achieved an efficacy rating of over 80%.

A degree of subjectivity was required by each respondent when deciding whether they 'agreed' versus 'significantly agreed', or 'disagreed' versus 'significantly disagreed'. However the writer was confident that this would not cause substantial differentiation between evaluation responses. As long as participants' responded to each statement with true and honest intentions, the results would likely provide a compelling sense of how well suited the environment was for applying effective teaching and learning practice.

Several statements were framed in terms of how 'possible' it was to enact certain activities within the learning space. In this context what is possible is a critical concept relating to the potential of learning space rather than relying upon observations of what actually occurs. The presence of a new generation learning environments may enable effective teaching and learning, but does not guarantee that effective teaching and learning will occur. There have been many observations of predominantly didactic teaching practices occurring in new generation learning environments, despite the intentions of the environment being to foster activity and collaboration. The learning environment may enable a specific educational approach, but if the teacher chooses not to adopt that approach, the possibility of practicing effective teaching and learning has nonetheless diminished.

The primary purpose of the Effective Teaching and Learning Evaluation Tool (also known as RateMyClassroom) is to confirm the presence of spatial characteristics and possible learning activities that are associated with effective teaching and learning. It may also be used as a checklist for designing new generation learning environments and a further purpose of prompting teachers to reflect upon their teaching practice by implementing behaviours embedded within the evaluation statements. The goal for designers should be to design learning spaces to achieve an efficacy rating equal to or greater than 80%.

FINDINGS/RESULTS

RateMyClassroom was tested by the writer on three new generation learning environments: (1) the Learning Lab at the University of Melbourne; (2) Room 241 in

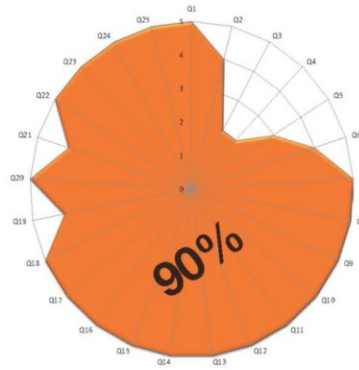
THE EFFECTIVE TEACHING AND LEARNING SPATIAL FRAMEWORK

On a scale of 1-5, to what degree do you agree with the following statements (1 =completely disagree and 5 = completely agree)						
#		1	2	3	4	5
FURNITURE						
1	The classroom is spacious. That is, the teacher can move around the room <i>easily</i> and access all students <i>equally</i> .					
2	Students can move around the room to communicate with other students.					
3	The furniture is mobile and can be easily moved.					
4	There are different types of furniture settings in the classroom (that would enable different types of activities).					
5	It is possible to reconfigure the room for different activities.					
6	It is possible for students to shift furniture around to suit their learning activity.					
ENGAGEMENT						
7	It is possible for the teacher to engage with students individually.					
8	It is possible for the teacher to engage with small groups of students.					
9	It is possible for the teacher to engage with the whole cohort.					
10	It is possible for students to engage easily with each other, for example through discussion.					
11	It is possible for students to conduct collaborative activities.					
12	It is possible for students to communicate with each other in different ways.					
13	It is possible for students to undertake focused tasks during class.					
TECHNOLOGY & RESOURCES						
14	There are educational technologies in the room that are accessible by students (such as digital screens or data projectors).					
15	It is possible for students to access a variety of resources in the classroom, e.g. whiteboard, digital screen, document camera, internet, computer/tablet, etc.					
16	Students have choices as to the types of resources they have access to.					
17	It is possible for multiple groups of students to access multiple technologies at the same time.					
18	It is possible for students to write and share content on writeable walls or digital surfaces (active walls).					
19	It is possible for students to share/record/save content discovered or created in class, for future reference.					
PEDAGOGICAL AGILITY						
20	It is possible for individual students to undertake different activities simultaneously.					
21	It is possible for students to utilise vacant floor space for learning activities (active floor).					
22	It is possible for groups of students to undertake different group activities in the same space at the same time. For example, one group can create content on a digital screen while another group builds a model.					
23	Students have the freedom to instigate their own activities that are relevant to them.					
24	It is possible for students to work at their own pace during class.					
25	It is possible for the teacher to observe and monitor students at a distance (so as not to interrupt them), to evaluate their progress on class activity.					
EFFICIENCY RATING		0%				

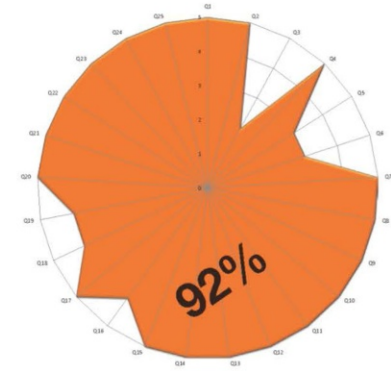
Figure 1. Effective teaching and learning evaluation tool, RateMyClassroom



The Learning Lab, University of Melbourne
Photo source: Jo Dane



Rm 241, Collaborative Teaching & Learning Centre,
University of Queensland, Photo source: Jo Dane



Rm 352, Collaborative Teaching & Learning Centre,
University of Queensland, Photo source: Jo Dane

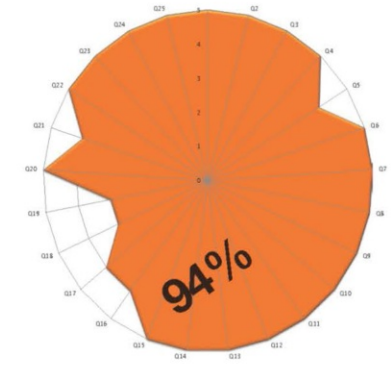


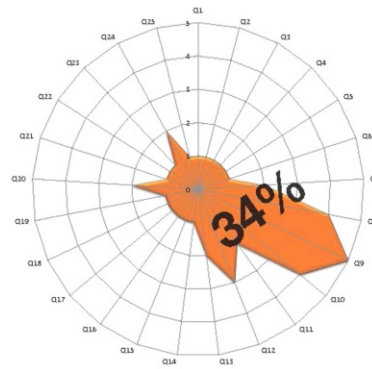
Figure 2. Examples of new generation learning environments

the Collaborative Teaching and Learning Centre at the University of Queensland; and (3) Room 352 in the Collaborative Teaching and Learning Centre at the University of Queensland. The evaluation did not require an observation of a teaching episode in order to isolate the potential of the classroom from the teaching and learning practice that actually occurs.

Each of the three new generation learning environments scored 90% or above resulting in the conclusion that all of the evaluated classrooms were highly aligned with the principles of effective teaching and learning (refer [Figure 2](#)). It was therefore assumed that each classroom would enable teachers to implement a wide variety of active, collaborative and technology-rich activities that collectively exemplified effective teaching and learning. Each tested new generation learning



Typical Lecture Theatre
Photo source: Jo Dane



Typical Tutorial Room
Photo source: Jo Dane

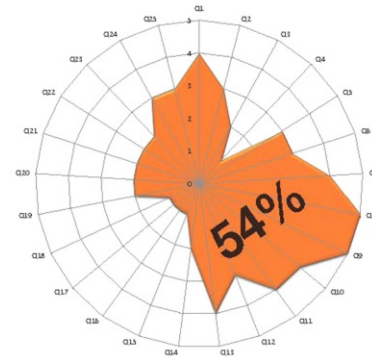


Figure 3. Examples of traditional learning spaces

environment presented spatial qualities that promoted movement of teachers and students around the room, a multiplicity of technologies, equitable access by students to technologies and other room features, and the ability for a variety of different activities to take place asynchronously. This presented the opportunity for teachers to facilitate an extensive array of activities that would increase the likelihood of students engaging deeply with the content, and to develop deep understanding of learning concepts.

The results emanating from evaluations of traditional learning spaces such as lecture theatres and tutorial rooms were particularly interesting. These classroom typologies have dominated educational buildings for decades, built on the premise of an efficient method of teaching to large numbers of students. As Bligh and others have asserted, lectures are not an effective format for student learning (Bligh, 1972; Penner, 1984; Ramsden, 2003). With such condemnation directed towards the lecture/tutorial model, the writer was curious to evaluate traditional learning spaces through the same lens as the new generation learning environments.

RateMyClassroom revealed numerous and considerable limitations of the traditional classroom typologies. Mobility by students was drastically constrained, activities were limited to the teacher-centred technologies in the room, and the potential to implement collaborative learning or asynchronous activities were made difficult, if not impossible, by the typical furniture settings. A tutorial room, which assumed some degree of furniture mobility (although rarely changed) yielded an efficacy rating of 54%; whereas a lecture theatre, with fixed seats all facing the lectern and presentation screen, achieved an efficacy rating of only 34% (refer [Figure 3](#)).

CONCLUSIONS

The evaluation results indicated that new generation learning environments could demonstrably support a diverse range of pedagogical possibilities, significantly more so than traditional learning spaces. The low ratings of lecture theatres and tutorial rooms called into question the value of the student learning experience in what has until now epitomised the higher education learning experience. If a university's objective is to improve the quality of teaching and learning, then a clear example of how this may be fostered on campus would be to promote effective teaching and learning practices within new generation learning spaces, and decrease the reliance upon lectures and tutorials. While the writer recognises the difficulties inherent in reducing lectures within a university environment because they efficiently provide access to course content for large numbers of students, developments in online instructional content are now presenting universities with alternatives in distributing mass content.

The Effective Teaching and Learning Spatial Framework and RateMyClassroom evaluation tool articulate effective teaching and learning practice, desirable learning behaviours, and identify spatial characteristics that enable optimum teaching practice

and student engagement. A multiplicity of purposes emerged through the statements embedded in the evaluation tool. It promises to have an impact beyond the simple evaluation of a single learning space, relating specifically to teachers, designers of future new generation learning environments and other university stakeholders.

For teachers it will:

- Prompt reflection on their teaching and learning practices;
- Prompt consideration of how both they and their students engage with the physical environment to support and foster effective teaching and learning.

For designers it will:

- Prompt them to ensure that appropriate spatial characteristics are incorporated into the formal classroom design, to enable effective teaching and learning;
- Raise awareness of the effective teaching and learning behaviours to be sought and enabled in an active classroom.

For other university stakeholders it may:

- Enable facility managers to evaluate new classrooms to investigate whether they are being used in ways that foster effective teaching and learning and support financial reporting cycles;
- Enable researchers to align with related research that measures student engagement, such as Scott-Webber, Strickland, & Kapitula (2013) and Freeman et al. (2014).

The RateMyClassroom evaluation tool provides a simple, easy-to-use instrument for evaluating and designing all learning spaces, but in particular new generation learning environments, to confirm the suitability of the environment for implementing effective teaching and learning. By adopting this tool, universities can establish benchmarks for design by specifying that new generation learning environments should achieve, as a minimum, an 80% efficacy rating. The quality of teaching and learning will improve as the presence of new generation learning environments increases across university campuses, enabling teachers to facilitate effective teaching and learning and enhance the student learning experience.

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