1 Building a new pedagogy

THIS SECTION AT A GLANCE

- **we consider the way in which design of physical space impacts the learning that happens in the space;**
- **we identify current trends in learning and teaching practice;**
- **we look at the need for a set of guiding principles to inform learning space design.**

Expectations from reading this section

Many of the professionals associated with supporting the design and build of learning spaces do not themselves have a background in teaching and learning practice, nor do they have direct contact with the end users and stakeholders. The result is that we too often build improved versions of what we already have rather than profoundly challenging the assumptions on which learning spaces are designed. Even lecturers may not fully realise the implications of the way in which the built environment constrains the type of activities that may be carried out. The purpose of this section is therefore to give a brief overview of what is generally recognised as current good practice in learning and teaching and to invite those involved in learning space design to start thinking at a very early stage about the type of learning and teaching experiences they would like to create for the future.

In particular we suggest that:

- design decisions should be guided by a set of educational principles and articulating these principles clearly and simply will aid dialogue and understanding between different stakeholders involved in a learning space project;
- we need to design for a diversity of pedagogic approaches bearing in mind a strong prevailing tendency towards a socio-constructivist approach[5] that emphasises participatory and collaborative activities wherever appropriate;
- we need to think about entire campuses as learning spaces and consider the seamless flow of different types of learning activity as well as the overall range of provision.

> *"We need to start, then, by asking not 'what buildings do we want?' but instead 'what sort of education do we want to see in future?'. We need to ask not 'how many classrooms do we need?' but 'what sorts of learning relationships do we want to foster? What competencies do we want learners to develop? What tools and resources are available to us to support learning?'"* (Rudd *et al* 2006[6])

5 *Socio-constructivism — a pedagogic approach that emphasises the impact of communication, collaboration, and negotiation on thinking and learning, Students are actively involved in their own learning which is a process of peer interaction mediated and structured by a tutor.*

6 *Rudd T, Gifford C, Morrison J and Facer K (2006) What if...Re-imagining learning spaces. Futurelab: www2.futurelab.org.uk/resources/publications-reports-articles/opening-education-reports/Opening-Education-Report128*

1.1 Constructing learning

The title of this section is taken from Monahan's (2002) use of the term *built pedagogy* to refer to "*architectural embodiments of educational philosophies*"[7]. In other words, the way in which a space is designed shapes the learning that takes place in that space. The design of many of our lecture theatres and traditional classrooms has changed little over hundreds of years. The layout generally predisposes a transmission model whose built pedagogy says that one person will transfer information to others, who will all absorb it at the same rate, by focusing on the person at the front of the room. Similarly, computer labs that do not provide for multiple viewers of a display screen or libraries that do not permit talking convey a built pedagogy contrary to the ideas of social constructivism. This is in stark contrast to prevailing pedagogies that emphasise learning by doing, active learning[8] and problem based learning[9].

> *"Because we habitually take space arrangements for granted, we often fail to notice the ways in which space constrains or enhances what we intend to accomplish."* (Van Note Chism 2006[11])

> *"The question in the future might not be, should we develop alternative learning spaces, but just how damaging to learning are traditional classrooms and lecture theatres?"* (Martin 2010[12])

The issue extends beyond formal teaching space to other areas where students spend time. Students spend a lot of transitional time in corridors or outside where they may be obliged to sit on the floor or perch on ledges. Such spaces are not equipped to facilitate learning or interaction and reinforce the message that students do not learn until they move into formal learning space with a lecturer present. The separation of support services and places where staff spend time also creates a distinction that puts the student in a role as a recipient of information rather than a member of a learning community with an ethos of research engaged teaching[10].

The focus of current thinking about good practice in education puts the emphasis very firmly on learning rather than teaching and sees the learner as a cocreator of knowledge rather than a consumer of transmitted information; our learning spaces need to reflect this.

Another factor significantly impacting the type of learning and teaching that is possible is the ubiquity and accessibility of digital technology. As technology becomes increasingly mobile and affordable it offers new possibilities to design new types of learning activity that encourage students to create as well as consume learning resources and to collaborate in different ways within the physical space. The convergence of the physical and virtual environments is therefore a significant theme throughout this Toolkit.

> *"What made this task difficult was a lack of immediately relevant information. Developments in pedagogic thinking provided much information around teaching practice but seemingly little, by contrast, about the kind of spaces that would support these educational progressions."* (Martin 2010[13])

Whilst it is true that students often want clearly identifiable places, such as libraries, for learning, the constructivist learning paradigm supported by ubiquitous technology leads to a more holistic, connected view of the university campus. Rather than consisting of discrete locations where learning is constrained in time and space, we start to think of the whole campus as a place where a continuous flow of formal and informal learning can take place.

> *"The emphasis on learning means that we must also think about the learner. Learning spaces are not mere containers for a few, approved activities; instead, they provide* ***environments for people****."* (Brown and Long 2006[14])

7 *Monahan, T. (2002) "Flexible Space and Built Pedagogy: Emerging IT Embodiments," Inventio, vol. 4, no. 1*
8 *Active learning is a general term for learning activities that engage students in doing more than simply listening and taking notes. Students participate in activities that promote synthesis, analysis and reflection on course content, encouraging students to take ownership of their learning. It can involve students working either individually on tasks to clarify and internalise their understanding of course content or with others on collaborative activities that motivate each other's learning and reflect on different peer perspectives: http://bit.ly/cityuniactivelearn*
9 *Problem based learning – a student centred pedagogy in which students learn about a subject through the experience of solving an open-ended problem and learning as fundamentally social and grounded in conversation.*
10 *See Van Note Chism (2006) for a discussion of these issues. Van Note Chism, N. (2006) Challenging traditional assumptions and rethinking learning spaces in Oblinger, D.G. (ed) Learning Spaces. Washington DC: EDUCAUSE: www.educause.edu/research-and-publications/books/learning-spaces*
11 *Van Note Chism, N. (2006) Challenging traditional assumptions and rethinking learning spaces in Oblinger, D.G. (ed) Learning Spaces. Washington DC: EDUCAUSE: www.educause.edu/research-and-publications/books/learning-spaces*
12 *Martin, P. (ed) 2010) Making space for creativity. University of Brighton: http://about.brighton.ac.uk/creativity/Library/UofB_msfc-ebook_FINAL.pdf*
13 *Martin, P. (ed) 2010) Making space for creativity. University of Brighton: http://about.brighton.ac.uk/creativity/Library/UofB_msfc-ebook_FINAL.pdf*
14 *Brown, M. and Long, P.D. (2006) Trends in learning space design in Oblinger, D.G. (ed) Learning Spaces. Washington DC: EDUCAUSE: www.educause.edu/research-and-publications/books/learning-spaces*

1.2 A principle led approach

Whilst in the following sections we look at recognised design standards for certain aspects of learning spaces (e.g. audio visual equipment) there is no formula that will allow you to design a successful learning space to support your particular institutional mission. You will be bringing together a mixed group of stakeholders (most of whom may be doing this for the first time) in order to design for an unpredictable future. In the case of a major building project, many of the technologies that are currently state of the art will be outdated by the time the build is complete. In this scenario the best starting point is to identify a clear educational purpose and a set of principles that will guide your design decisions and allow for new and updated ideas to be included in the infrastructure.

There are numerous published examples of design principles. Many of them are based on Chickering and Gamson's (1987) seven principles of good practice in undergraduate education as translated into space design[15]:

1. Encourages contacts between students and staff;
2. Develops reciprocity and cooperation among students;
3. Uses active learning techniques;
4. Gives prompt feedback;
5. Emphasises time on task;
6. Communicates high expectations;
7. Respects diverse talents and ways of learning.

Jisc (2006)[16] outlines a very simple set of principles, that space should be:

- **Flexible** – to accommodate both current and evolving pedagogies;
- **Future proofed** – to enable space to be re-allocated and reconfigured;
- **Bold** – to look beyond tried and tested technologies and pedagogies;
- **Creative** – to energise and inspire learners and tutors;
- **Supportive** – to develop the potential of all learners;
- **Enterprising** – to make each space capable of supporting different purposes.

Agreeing the principles that should underpin learning space design in your particular context may be no easy matter. The principles will need to gain widespread support. However, if they are to enhance your learning and teaching practice they will need to be articulated in a way that challenges the *status quo* and demands positive action on the part of those using the space. You will need to think very carefully about how the principles will be put into practice. In the Viewpoints below you will find a number of observations on the meaning and value of terms such as *flexibility*.

The following set of design principles has been loosely adapted for this Toolkit from the work of Lomas and Oblinger[17]. We propose that learning spaces should:

Create a sense of community and encourage participation

Learning is above all a social process. The physical environment of a university should create a sense of being part of a learning community. It should support people learning together through providing physical spaces for collaboration and the possibility of connecting digitally to a wider community, for example through video or desktop conferencing and webinars. The possibility to observe others at work helps create a sense of connectedness, and the existence of

15 *Chickering, A. W. and Gamson, Z. F. (1987) Seven Principles for Good Practice in Undergraduate Education. American Association for Higher Education: www.lonestar.edu/multimedia/SevenPrinciples.pdf*

16 *Jisc (2006) Designing spaces for effective learning: a guide to 21st century learning space design: http://www.webarchive.org.uk/wayback/archive/20140616001949/http://www.jisc.ac.uk/media/documents/publications/learningspaces.pdf*

17 *Lomas, C. and Oblinger, D.G. Student Practices and Their Impact on Learning Spaces in Oblinger, D.G. (ed) Learning Spaces. Washington DC: EDUCAUSE: www.educause.edu/research-and-publications/books/learning-spaces*

social space fosters peer to peer and staff student interactions where much of the real learning is consolidated. We need to create an environment where students construct and cocreate knowledge as well as consume it.

Integrate and connect learning

A well designed campus allows seamless integration between different types of learning activity: between formal and informal learning and between group and individual learning. The way in which different discipline areas are colocated can encourage interdisciplinary collaboration and students in different years or subjects working in the same space can offer peer mentoring and new avenues for research. Integration of services into the areas where students spend most time can provide better support for the learning experience. Integration of physical and virtual learning resources and activities needs to be considered as part of overall space design. The way in which the physical space integrates the university into its wider context is also important — this can involve the relationship with local landmarks, the ways in which the local community might access the campus and the relationships with business and enterprise such as start-up hubs.

Meet a range of different learning needs

Well designed learning environments offer facilities that are appropriate for the needs of the institution's learners and spaces that can be adapted to meet a variety of different learning requirements. Furniture which is easily configurable, controllable lighting and portable technologies all have a part to play and *low tech* user-friendly tools have their place alongside digital technologies. Physical space should not constrain the types of learning activity that can be supported and we need to keep future needs in mind, but we cannot demand that all space should be *flexible* because of the difficulty in defining what we might want to achieve by this (see the Viewpoints below and Section 4, Effective learning by design).

Andy Weekes/ © University of Brighton

Photo 1: These booths give a private feel for small group work in a large open reception area at the University of Brighton.

Offer a comfortable working environment

Discomfort is a great distraction to learning. Heat and cold, noise and levels of natural and artificial lighting should all be carefully regulated. Seating should take into account different body sizes, accessibility requirements and the long periods of time students sit without moving. Adequate surfaces for writing and supporting computers, books, and other materials are also required: the small, sloping surfaces on most standard tablet arm chairs are inadequate for these purposes. Current trends in integrating learning and social space bring their own set of issues, not least the transmission of noise and odours from hot food from social spaces into more formal study areas, so zoning and differentiation needs to be carefully thought through. Beyond these functional requirements we also need to think about how to create an appropriate ambience for each space so that students want to spend time there. University planners look to create a *sticky campus* by creating the right environment to retain students through the day. This might mean looking at factors such as extending coffee shop hours on campus and providing adequate space to store personal possessions like bags and coats.

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Photo 2: Group and individual study spaces, Queen Margaret University.

Offer support

Locating support desks and resilient help systems where students (and staff) are, rather than just where the unit's home base is found, encourages use, as does enabling online support. Both staff and students may need support in maximising the potential of innovative types of learning space. Whilst we stress the importance of ensuring that learning spaces are easy and intuitive to use, the Learning Landscapes project[18] found that, without support, there is a tendency to revert to traditional practices even in the most innovative pedagogic environments. Support should also include assistance to teaching staff to upgrade and digitise teaching resources to suit new environments.

Make effective use of technology

For students whose world is digital, connected, immediate, social and participatory, access to a wireless network is essential. The students' world is not just the physical one in which they find themselves; it is also the virtual one in which they chat with friends, meet people, share digital content, and explore new ideas. Since learning can occur any place and at any time, there are few, if any, locations where wireless is not valuable.

As students consume information in multiple formats and interact with information by modifying it or sharing it, this activity places additional demands on the network. During peak periods, student use may saturate the wireless network. Having institutional devices with wired connections available as well is part of the answer but the wireless network needs to be designed to cater for continuing growth in demand.

Most students own a variety of technologies such as laptops, smartphones, MP3 players, tablets and more. As technology becomes more ubiquitous and affordable, institutions will find opportunities to deliver information and services in multiple formats and to multiple devices. Convenience is a priority for students, so ensuring that any space can be a learning space by delivering information to personal, handheld devices is important. Approaches to service delivery must however include consideration for those who may not personally own such devices.

Regardless of the technology students use in learning spaces, they will need power (this includes sockets as well as USBs and wireless charging): all devices have a limited battery life, and space planners must take this requirement into account.

Be inclusive and sustainable

Learning spaces need to support the needs of a diverse learner population. Designing for maximum inclusivity in the first place can avoid costly alterations later. These requirements, if not fully understood by the project manager for example, can easily be value engineered[19]. As well as considering the needs of disabled students and staff, you will also need to think about student perceptions of the campus as a safe environment and the extent to which you provide a welcoming and comfortable environment for international students. Sustainability is high on the agenda for many universities and good design can help minimise environmental impact as well as ensuring that facilities have an acceptable lifespan without the need for extensive maintenance.

> *"Students should be at the heart of every project and although students are ephemeral by the very nature of study cycles, the student body is the constant."* Caroline Pepper

> *"Flexibility often just means lazy thinking. The term is used by academics who haven't thought through the realities of different types of learning activities. Flexibility can introduce a lot of issues: it boils down to trying to be Jack of all trades and being master of none."* James Rutherford

Involve, inspire and motivate students

Students will most likely spend more time in campus learning spaces than anyone else and they have a valuable perspective on what works and what does not. Finding meaningful ways to involve students in planning and evaluating space design is an effective way to ensure that the space catalyses learning. As well as simply supporting their learning we should aim for a vision that the space is inspiring and motivating for students. Seeking to delight students should be one of our core aims.

> *"All learning spaces need to reflect the particular institutional context. Often people go to visit spaces and copy them exactly then find it doesn't work for them as it doesn't reflect their university."* Toni Kelly

18 *Neary et al (2010) Learning landscapes in higher education. University of Lincoln: http://learninglandscapes.blogs.lincoln.ac.uk/files/2010/04/FinalReport.pdf*

19 *Value engineering: https://en.wikipedia.org/wiki/Value_engineering*

VIEWPOINT

James Rutherford, Learning Spaces Development Manager, University of Birmingham, has undertaken research into learning space design with a particular emphasis on collaborative learning and there is more information about this research on his blog[20].

James believes that underpinning educational principles can help link a learning space strategy into the learning and teaching strategy in a meaningful way. *"Principles are more effective than strategy. Strategy can be a bit fluffy in some people's minds: it's something that you have to say and it doesn't really mean anything. Principles are more tangible and more effective for people who you want to engage with this".* James is clear that strategy needs to make sense in terms of what is happening on the ground: at Birmingham there is increasing emphasis on enquiry based learning and independent learning and James feels this Toolkit can be useful in helping to flesh out what that looks like in practice.

VIEWPOINT

Bruce Rodger, Head of Infrastructure, University of Strathclyde, tells us that when it comes to designing for particular types of learning activity the notion of flexibility is a personal bugbear for him. *"When people say they want flexibility and you ask them exactly how it should flex they don't know. Flexibility always involves compromise and sometimes you break what it was meant to do in the first place".*

An example of this is a flexible space that was designed with a movable partition in the centre so that it could be used as one large room or two small rooms. In practice its normal use is as two small rooms and it is very rarely used as a large room. The existence of the partition however means that noise transmission is a problem, the audio visual (AV) control system is overly complicated and there are two walls that cannot be used for hanging anything.

Another example is a large auditorium that can also be transformed into three smaller theatres. This was felt to be particularly suitable for use by the conference trade. However, changing from one configuration to another takes two people almost an hour, a limitation that was not obvious when the designs were being presented.

The guidance that Bruce would give to others is that you need to decide what you need each room to do and do that really well and then see what else can be accommodated. He feels that ***adaptability*** is a much more pragmatic approach than flexibility. It is quite practical to design a room to be adaptable between two or three defined states. A fully flexible approach requires a lot of support available at certain changeover times. For Bruce, an often repeated phrase rings true: *"Flexibility is the F word in learning space design".*

VIEWPOINT

Sally Jorjani, Head of Academic and Business Liaison, Edinburgh Napier University, has found that the creation of some new social learning spaces has improved staff student interaction. Sally told us that at her university most academic staff are based in two to three person offices so they find it difficult to talk to students in their office as they worry about disturbing their colleagues. Whilst evaluating the new spaces Sally heard from one lecturer, who is delighted with the new facilities, that interaction has greatly improved, whilst a student has commented "I really like the high 'sofas' as they provide groups with another option to do a project".

20 *http://learningenvironmentdesign.net/*

VIEWPOINT

Eleanor Magennis, Head of Space Planning, University of Glasgow, is a qualified architect who works within the Estates and Buildings Department at the university. Eleanor feels fortunate that her first learning space project (in a previous role at the University of Strathclyde) was a teaching cluster driven by the desire to implement an active learning approach. She worked with a fantastic academic champion and had students involved from the beginning which gave her very good insight into teaching and learning practice. This experience has shaped Eleanor's views about how universities need to work with architects to ensure that they understand the educational context. She sees a key role for this Toolkit as supporting architects to see how learn*ing is changing and also to understan*d the impact of technology on how students learn. Without this kind of support Eleanor says projects will simply *"deliver what has always been done".*

Eleanor suggests that a good way to approach any learning space project is to start with graduate outcomes and ask what skills do you want students to gain; how does teaching support this and how does the space support this? This forces you to think about the pedagogic approach and define the kind of space that can support the required activities. It is a good way to engage academics and show you are asking the right questions and talking their language. Eleanor recommends that *"Having a good academic champion is crucial. They drive the project through. They are focused on the pedagogy and they take account of the student voice and bring that in".*

Resources

- FLEXspace (the Flexible Learning Environments eXchange) is an open access repository populated with examples of learning space images and related information from institutions worldwide[21].
- City University has produced a short video for tutors detailing a range of new learning spaces and the types of activity to which they are suited (particularly active and collaborative learning)[22] and a series of blog posts on activities that can be done in flexible and non-flexible spaces[23].
- The Australian Learning and Teaching Council has an excellent website, Retrofitting University Learning Spaces, that looks at principles underpinning effective learning spaces and tips for putting the principles into practice[24].
- James Cook University in Australia has produced a website called Learning Spaces Snapshots that has a collection of short videos showing how different pedagogic approaches are put into practice in different types of learning space[25].
- McGill University, Canada: Principles for designing teaching and learning spaces[26].
- The Pedagogy, Space, Technology (PST) Framework developed by the University of Queensland provides a design and evaluation framework to help learning space project teams reflect on what they are doing and why[27].

21 *http://flexspace.org/*
22 *www.youtube.com/watch?v=sAVtiuHCfCM*
23 *http://bit.ly/cityuniactivelearn*
24 *http://learnline.cdu.edu.au/retrofittingunispaces/*
25 *https://sites.google.com/site/jculearningspaces/home*
26 *Finkelstein, A.,Ferris, J.,Winer, L. and Weston, C. (2014). Principles for designing teaching and learning spaces. Montreal: Teaching and Learning Services, McGill University: www.mcgill.ca/tls/files/tls/principles_for_the_design_of_teaching_and_learning_spaces_2014_f.pdf*
27 *University of Queensland (2009) Learning Spaces in Higher Education: Positive Outcomes by Design. Proceedings of the Next Generation Learning Spaces 2008 Colloquium: www.uq.edu.au/nextgenerationlearningspace/proceedings*

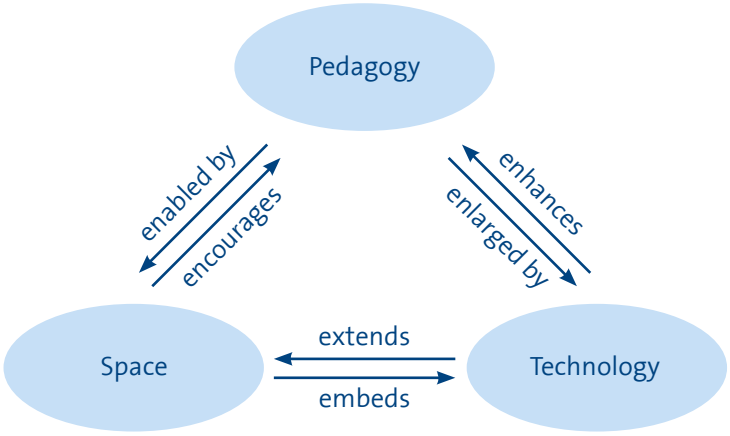

Figure 1: A Pedagogy-Space Technology (PST) Framework for Designing and Evaluating Learning Places (D. Radcliffe), University of Queensland. Creative Commons License (Attribution-Noncommercial-ShareAlike 2.5)[28].

28 *University of Queensland (2009) Learning Spaces in Higher Education: Positive Outcomes by Design. Proceedings of the Next Generation Learning Spaces 2008 Colloquium: www.uq.edu.au/nextgenerationlearningspace/Chapter1.pdf*