

GRAEME OLIVER

8. DEVELOPING NEW LEARNING ENVIRONMENTS

Co-Constructing Innovation in Education Practice

CONTEXT

This chapter proposes a model for the evaluation of the effectiveness of innovative learning environments in supporting the achievement of innovative educational practices. The purpose of such evaluation is to inform improved practice in the future. A review of the literature suggests that the current models of evaluation in this field tend to be situated in the separate domains of architecture or education. The model presented here proposes a framework that enables both architectural and education perspectives to be considered in a developmental process. This supports the practice of co-constructing innovation in education through the most effective implementation of innovative learning environments.

INTRODUCTION

The last decade has witnessed a series of investigations into innovative learning spaces in Australia, largely funded through the Office of Learning and Teaching (OLT) or Australian Research Council (ARC). Lee and Tan highlighted that “evaluations of learning spaces have been limited in depth, rigour and theoretical grounding, and heavily reliant on informal or anecdotal evidence” (2008, p. 3). Within their research, Souter, Riddle, Sellers and Keppell (2011) expressed concern that “although there is abundant, significant and expanding literature on teaching, learning and knowledge generation beliefs and practices, and an equally extensive strong body of work exploring physical and technological environments and systems for learning and teaching, published research intersecting both is uncommon and not well understood” (2011, p. 5). Each of these studies came to a conclusion similar to Cleveland and Fisher (2013) who suggested that “approaches to evaluations that attempt to assess the effectiveness of physical learning environments in supporting pedagogical change are in their infancy and require further development” (p. 24).

This chapter proposes an operational model through which to map the complex connections and relationships between building design and education practice. This is intended to further the development of the field of learning environment evaluation by addressing the issue that Souter et al. described as “a polarised body of work, one hand holding the theoretical and pedagogical and the other handling

the technological and physical” (2011, p. 5). This model has been developed as a means by which to conduct research into effective ways to analyse the connections and relationships between innovation in building design and education practice in a more empirical, rigorous and pragmatic manner.

The development of the model was directed by the key question: What operational models might best support the co-construction of innovative education practices in innovative learning environments?

Embodied within this question are a number of concepts that need to be explored in their own right before being integrated to develop a framework for a holistic analysis:

- What trends typify innovation in learning environment design?
- Is innovation in learning environment design viewed in the same way by architects and educators?
- What is innovation in education practice?
- Is innovation in education practice viewed in the same way by architects and educators?
- How can we evaluate the impact innovative learning environments have on innovations in education?

INNOVATION IN LEARNING ENVIRONMENT DESIGN

A first step is to describe the “technological and physical”; that is, current understandings of innovation in learning environment design. A survey of the literature on contemporary learning environment design reveals a number of issues.

There has been a determined effort by architects over the last two decades to engage more deliberately with the principles of teaching and learning when designing new learning environments. However, while there is growing consistency around the rhetoric relating to innovative learning environment design, there remains great diversity of opinion and practice around how innovation in design should be implemented to support innovation in education practice.

The *Defining Spaces for Effective Learning* project of the Joint Information Systems Committee (JISC, 2006) brought a range of experts together to develop a consolidated analysis of building development issues. The final report highlighted that “educational building is an expensive long-term resource” and recommended the following principles for designing spaces for effective learning. Learning spaces should be:

- Flexible – to accommodate both current and evolving pedagogies
- Future-proofed – to allow 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

The Programme on Educational Building (PEB) project of the OECD produced the *Compendium of Exemplary Educational Facilities* (2006) using the following criteria to determine exemplary practice:

- Flexibility – transformable learning spaces, student centredness, problem-based learning facilities
- Community needs – engagement with multiple stakeholders, catering for life-long learning, sharing facilities with families and others
- Safety and security – meeting design standards, financial accountability.

These two projects represent a body of work that emerged from an architectural background seeking to make more explicit the connection between education principles and the physical learning environment.

There are also voices that advocate propositions for innovative learning environment design with an orientation to more active connection with digital learning in the design process. EDUCAUSE is one organisation that is representative of this approach. EDUCAUSE declares its mission is to “advance ... education through the use of information technology” (Lomas & Oblinger, 2006, p. 2). The organisation’s research and position papers advocate for innovative learning environments to encompass the following features:

- Digital – acknowledging that “technology” is a way of life for modern students
- Mobile – enabling the interconnection of multiple devices
- Independent – acknowledging the self-reliance of today’s students
- Social – enabling students to work and collaborate in virtual social groups
- Participatory – recognising that students may participate with global connections.

Brown (2006) emphasised the need to consider virtual space as a part of the learning environment. Similar themes were articulated through the *Futurelab* project, ‘*What if...? Re-Imagining learning spaces*’. This report proposed that new schools should be more than more comfortable warehouses and that new design should “enable learning in a range of sites and in a range of different configurations of people and resources ... enable flexible use of a range of different approaches to learning ... and reflect an understanding of how people learn” (2006, p. 12).

The Partnership for 21st Century Skills organisation in its white paper, *21st Century Learning Environments* (Partnership for 21st Century Skills, 2012), pictured these learning environments as support systems that organize the condition in which humans learn best. “Learning environments are structures tools and communities that inspire students and educators to attain the knowledge and skills the 21st century demands of all of us” (2012, p. 3).

The report *Innovative Learning Environments (ILE)* from the Centre for Educational Research and Innovation (CERI) of OECD (2013) used a case study approach (125 examples from 20 countries) to develop a model of “learning environment” and to provide examples of innovation in learning environments. This model was composed of four elements: learners, educators, content and resources

(2013, p. 11). The ILE report described a learning environment as “an organic, holistic concept that embraces the learning taking place as well as the setting; an eco-system of learning that includes the activity and outcomes of learning” (p. 22). Forty different features of learning environment design were identified in the ILE report (see [Figure 1](#) below).

Flexible	Evolving pedagogies	Future-proofed	Re-allocated
Reconfigured	Bold	Creative	Supportive
Enterprising	Supporting different purposes	Student centred	Problem-based learning
Community needs	Multiple stakeholders	Life-long learning	Safety and security
Design standards	Financial accountability	Digital	Mobile
Interconnection	Virtual groups	Collaborate	Participatory
Global connections	Access to teachers	Breakout spaces	Cooperative learning
Access to ICT	Multimedia support	Quiet spaces	Multipurpose rooms
Student-teacher conferencing	Community in the school	Professional practice	Different approaches to learning
Educators	Resources	Learners	Content

Figure 1. A summary of terms used from an architectural perspective to describe features of innovative learning environments

INNOVATION IN EDUCATION PRACTICE

The *Innovative Learning Environments* report (OECD, 2013) opened with the statement, “Innovation is a key element of today’s societies and economies, and that includes how we learn” (p. 11). Blackmore, Bateman, O’Mara and Loughlin (2012) noted that the “notion of innovation is itself problematic in education” (p. 10). They highlighted that innovation occurred in schools in environments that had to simultaneously provide services and maintain the smooth running of everyday practices. With the need for schools to operate as systems that provided stability, predictability and continuity, it is difficult for them to make fundamental transformations of structural and operational mechanisms. Given this context, the CERI report presented a conservative definition of innovation in its project cases. They defined educational innovation as “an intentional departure from the traditional approach of the large body of general or vocational education in its own context – i.e. it is deliberately innovative” (p. 25).

Defining innovation in this manner as contextual and self-referenced is applicable to individual educational organisations or settings, but does not help build a structural model of educational innovation that is transferable. A concept with transferability is needed to build a model that can be applied repeatedly across a range of situations, i.e. can develop the research qualities of validity and rigour. The Innovation Unit in the United Kingdom is addressing this issue. Hannon, Patton and Temperley (2011) highlight the need to differentiate between an innovation agenda and an improvement agenda in making educational change. They advance the argument that merely focusing on improving the current model of schooling will never by itself generate innovation that leads to different educational provisions and educational outcomes. They argue that innovation requires deliberate engagement with changing at least one element of the current educational provision.

This paper focuses on the role that innovative learning environments can play as the lead element for engaging in a deliberate process of innovation in education practice. If the innovation is occurring in only one area (innovative learning environment on its own or innovation in education practices on their own) then there will only be moderate achievement in innovation outcomes. This relationship is represented in the figure below.

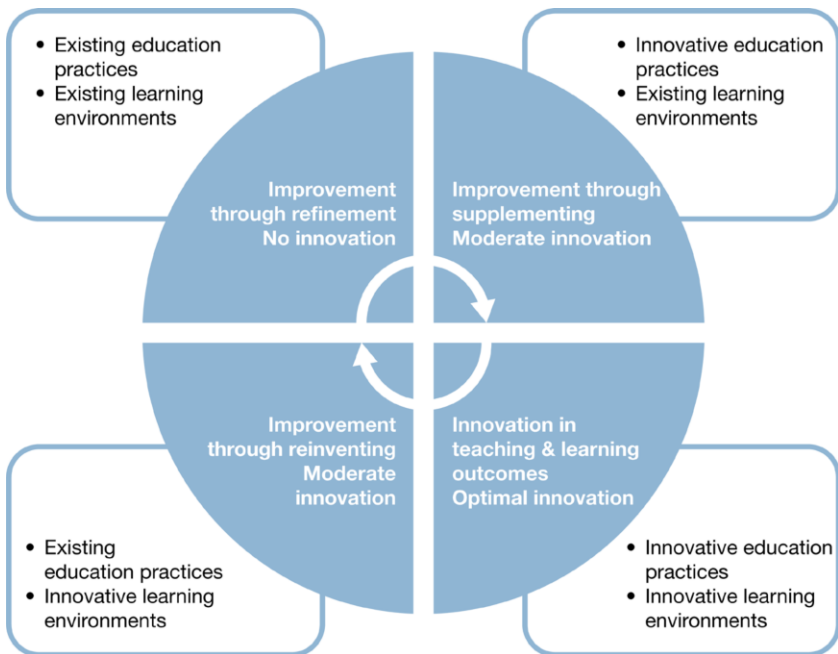


Figure 2. A framework for analysing the relationship between innovative learning environments, innovative educational practices and innovative outcomes in education (adapted from Hannon, Patton and Temperley, 2011)

While the framework suggests that innovation in learning outcomes occurs when there is engagement with innovation in both learning environment design and education practice, it does not mean to imply that innovation only occurs through a “leap of faith” into the bottom right quadrant. The nature of innovation is more nuanced than that. Steven Johnson in his book *Where Good Ideas Come From: the Natural History of Innovation* (2010) makes a case for rejecting the “eureka” moment portrayal of innovation and suggests that innovation is more likely to be “slow hunch” development through connections of ideas to generate new products or new practices. Building on this concept it is appropriate to consider innovation in education as an ongoing journey, rather than the achievement of a particular outcome. The arrows in the centre of the framework suggest this sort of dynamic. What the framework does is help map the journey of innovation. A school or learning institution could be working across all four quadrants of the framework at any point in time. At one particular moment the innovation could have a focus on the physical learning environment such as the establishment of a new outdoor learning area. At another time the innovation could have a focus on innovative pedagogies such as the implementation of problem based learning methodologies. Action on either of these innovations could be expected to lead to improved learning outcomes. The purposeful combination of action could provide the opportunity for truly innovative outcomes in teaching and learning in the manner defined by Hannon, Patton and Temperley (2011).

The relationships both within and between the quadrants are rich and complex. Cleveland (2013) identified 114 factors that influence innovation in schools, and through surveys with academics, educators and educational planners found that they reported a high proportion of these factors to be of high to very high importance

<i>Development Phase</i>	<i>Impact on Pedagogy</i>
Design	Consultation in design Clarifying educational / pedagogical principles Preparation for pedagogical change
Implementation & Transition	Orientation to space Rethinking pedagogical approaches Professional learning Utilising space
Consolidation	Changes in pedagogy Adaptive use of space Changing relationships and space Changing organisation and operation for space
Sustainability and Re-evaluation	Evaluation for innovation

Figure 3. Framework for investigating innovative pedagogical practices and innovative learning environments (adapted from Blackmore et al., 2011)

throughout the innovation process (p. 110) thus highlighting the extent of complexity to be addressed.

Oblinger (2006) stressed that “learning spaces mediate the relationships and social practices of teaching and learning, and are only one factor among many in the complex relationships of teaching that inform learning outcomes” (p. 5). Blackmore et al. (2011) provided a conceptual framework for their literature review to help organise this complexity developed from the perspective of impact on pedagogy.

This focus on the relationship between pedagogic practice and innovative learning spaces aims to set up an investigation that can focus on two key issues that are regularly identified in the literature on innovative learning spaces: the

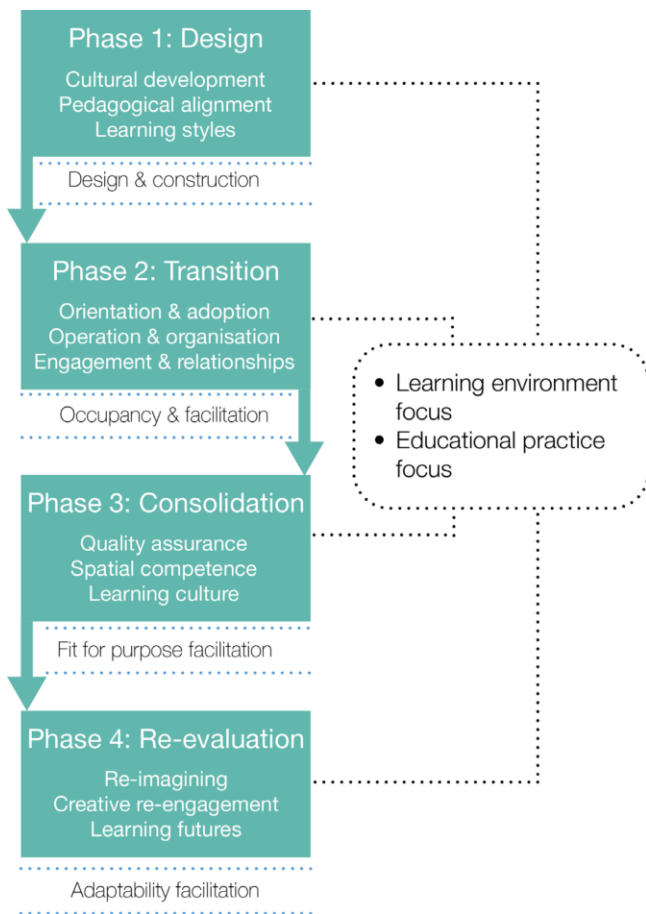


Figure 4. A model representing the co-construction of innovation in innovative learning environments and innovative education practices over time

many factors and complex relationships that operate in the nexus between learning space and learning outcomes, and the limited research of a longitudinal nature in the field.

This writer has adapted the Blackmore et al. (2012) framework to include the perspective of architects as well as educators in the process of co-constructing innovation in the learning environment and education practice.

Figure 4 is significant in that it presents a timeline for considering the process of innovation, although no specific dates are suggested for the phases of the timeline at this stage. It also presents a framework for considering the participation of both educators and architects in the process of innovation. These are broad markers in a field that is characterised by high complexity.

Research in the field to date tends to be dominated by philosophical positions without direct connections to empirical evidence, there is little recognition of the context of schools (Blackmore et al., 2011), and there is little evidence that long-term changes in practice are occurring (Lee, 2011). This is made more complex by the fact that the field works across disciplines and professional areas (education and architecture), and that the body of work across these fields is not well connected and not well understood (Souter, 2011). The model presented above develops a framework to address of these issues in a systematic manner.

CONCLUSION

This paper presents a proposal for investigating the question, ‘What operational models might best support the co-construction of innovative education practices in innovative learning environments?’ Literature reviews in recent years have identified significant gaps in the research that makes explicit connections between the implementation of innovative learning environments in schools and deliberate attempts to change pedagogic practices in these learning environments. This paper proposes using the temporal framework of Design/Transition/Consolidation/Re-evaluation as an organising tool and combines the perspectives of architects and educators in a process for monitoring and evaluating the impact that innovative learning environments have on innovations in education.

REFERENCES

- Blackmore, J., Bateman, D., O’Mara, J., & Loughlin, J. (2011). *The connections between learning spaces and learning outcomes: People and learning places*. Retrieved from <http://www.learningspaces.edu.au/docs/learningspaces-literature-review.pdf>
- Brown, M. (2006). Learning spaces. *EDUCAUSE Review Online*. Retrieved from <http://www.educause.edu/research-and-publications/books/educating-net-generation/learning-spaces>
- Blackmore, J., Bateman, D., Cloonan, A., Dixon, M., Loughlin, J., O’Mara, J., & Senior, K. (2012). *Innovative learning environments research study*. Retrieved from <http://www.learningspaces.edu.au/docs/learningspaces-final-report.pdf>
- Cleveland, B., & Fisher, K. (2013). The evaluation of physical learning environments: A critical review of the literature. *Learning Environments Research*, 17(1), 1–28.

- Hannon, V., Patton, A., & Temperley, J. (2011). *Developing an innovation ecosystem for education*. San Jose, CA: Cisco Innovation Unit. Retrieved from http://www.cisco.com/web/strategy/docs/education/ecosystem_for_edu.pdf
- JISC. (2006). *Designing spaces for effective learning: A guide to 21st century learning space design*. Retrieved from http://webarchive.nationalarchives.gov.uk/20140702233839/http://www.jisc.ac.uk/publications/programmerelated/2006/pub_spaces.aspx
- Johnson, S. (2010). *Where good ideas come from: The natural history of innovation*. New York, NY: Penguin.
- Lee, N., & Tan, S. (2008). *A comprehensive learning space evaluation model – Final ALTC report*. Retrieved from <http://www.swinburne.edu.au/spl/learningspacesproject/>
- Lomas, C., & Oblinger, D. (2006). Student practices and their impact on learning spaces. In D. Oblinger (Ed.), *Learning spaces* (pp. 5.1–5.11). Washington, DC: EDUCAUSE. Retrieved from <https://net.educause.edu/ir/library/pdf/PUB7102b.pdf>
- Oblinger, D. (2006). *Learning spaces*. Boulder, CO: EDUCAUSE.
- OECD. (2006). *PEB Compendium of exemplary educational facilities* (3rd ed.). Paris: OECD. Retrieved from http://www.oecd-ilibrary.org/education/peb-compendium-of-exemplary-educational-facilities_9789264014923-en
- OECD. (2013). *Innovative learning environments*. Paris: OECD Publishing.
- Partnership for 21st Century Skills. (2012). *21st century learning environments*. Retrieved from <http://www.p21.org/about-us/p21-framework/354>
- Rudd, T., Gifford, C., Morrison, J., & Facer, K. (2006). *What if...? Re-imagining learning spaces*. Retrieved from http://archive.futurelab.org.uk/resources/documents/opening_education/Learning_Spaces_report.pdf
- Souter, K., Riddle, M., Sellers, W., & Keppell, M. (2011). *Spaces for knowledge generation – Final report*. Sydney, Australia: Australian Learning and Teaching Council. Retrieved from <http://www.skgproject.com/>

Graeme Oliver
Melbourne Graduate School of Education
The University of Melbourne