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INNOVATIVE LEARNING SPACES: CATALYSTS/AGENTS FOR CHANGE, OR 'JUST ANOTHER FAD'?

Sense Publishers

INTRODUCTION

Various announcements about the death of the traditional classroom are proving premature; first because research is not providing conclusive evidence that 'non-traditional' classroom spaces have advantages that warrant such pronouncements; and second, because traditional classrooms are needed in any school that seeks true spatial flexibility. The focus of mature debate on this topic is shifting from advocating radical departures from the norm, towards the provision of a range of spaces that accommodates the huge array of preferred learning and teaching styles that occur in schools. This focus on teacher and student practices within a variety of classroom typographies, means the traditional classroom will retain a valuable role in the education of our students.

This is not to say what we presently call innovative learning environments (ILEs) won't eventually prove to be a significant agent of change. They most probably shall. However, this is likely to be in terms of their capacity to add to teachers' pedagogic repertoire (thus improved affective and effective outcomes for students), and not as a stand alone catalyst for change as some '21st century learning' advocates might predict. This chapter will draw on historical precedents and emerging research in learning environments evaluation to argue what we are witnessing is not a revolution, but simply another chapter in a sustained, multi-faceted and slow-moving reconceptualization of the role of space in education. This slow change accounts for a myriad of variables far more complex that the current futuristic digital native discourse, and relies on sustainable changes in practice based on sound evaluation practices. As such, this broader-focused debate, if undertaken wisely, is likely to see sustained rather than fad-like change concerning the design of our schools.

Three Australasian newspaper articles (Figure 1) illustrate the nub of this conversation. The first, printed in the Sydney Morning Herald in 2011, proudly announces the death of the classroom. The second, published in Melbourne's Age newspaper in mid 2015 pronounces the open classroom experiment a failure as teachers erect walls. The third, from New Zealand's Otago Daily Times in late 2015 challenges that country's Ministry of Education to justify spending funds on research into such spaces' effectiveness.

The articles rather simplistically illustrate that we have been here before, we are seeing a repeat of the distrust generated by innovative spaces four decades ago, and we have little proof of their effectiveness beyond wishful conjecture.

Figure 1. Stevenson, 2011; Cook, 2015; Lewis, 2015.

Sayatana (1998) claims we are doomed to repeat history if we do not learn from it. If so, the lesson we must learn from the issues these articles articulate is that the careful gathering and use of evidence is critical; we must carefully catalogue what was learned in order to underpin future developments. This chapter will address the issue of the failure of various governments' 1970s attempts to modernise learning and teaching through the introduction of open plan schools. It will make the case that perceived failure of that initiative was due to, first, poor evaluation; and second, the poor preparedness of teachers for these spaces. It will argue that the demise of open plan learning in the 1970s and 1980s had little to do with empirical evidence of what happened in those spaces - the philosophy of differentiated learning that drove such developments preceded those initiatives and continues today. The chapter will outline a 2010s need to prove the effectiveness of ILEs to those who would use fear of the new to bar its existence, and to do so inclusive of but well beyond a 'needs of the 21st century learner' rationale.

This constitutes recognition that the evolution of ILEs is not a fad, but part of a long and steady process of improving education, one that has been in progress for hundreds of years. To continue this positive trajectory, for ILEs to be implemented successfully in the 2010s, we need rigorous evidence of their pedagogic performance in order to build strategies that skill teachers on their use.

LESSONS LEARNED FROM PREVIOUS FAILURES

ILEs that existed in the 1970s and 1980s have been ridiculed to the extent that even today 'open plan' designs are, in some circles, deemed incompatible with effective teaching and learning (see, for instance, Pandel, 2015). This has occurred largely through what could be called anecdotal methods – blogs, opinion pieces, reports of other people's opinions, staff room discussions and the like have built a body of dissent around ILEs that is hard to address due to its lack of substantiation. One contrast to this - that is, a critique based on actual evidence - comes from Hattie (2009). His synthesis of over 800 meta analyses of studies provides a hierarchy of most-to-least effective variables, which impact on student learning. Of 138 factors that his synthesis finds impacts student learning outcomes (such as 'micro-teaching', 'classroom discussion', and 'providing feedback'), 'open classroom programs' rate 133rd. It falls so far short of Hattie's $d = 0.4$ benchmark (below which any value-added 'growth' could be argued to not exist) that he concludes unequivocally the evidence to hand shows "open classrooms make little difference to student learning outcomes" (p. 88). What I am calling the 'Hattie Edict' has inadvertently assisted those calling for ILEs to not proceed. I say 'inadvertently' because the Edict is quite correct if read in context, that is, it is limited to reporting that no evidence of effect exists. It does not make claim that this constitutes evidence they do not work. However, it is often the latter that many mistakenly cite from his results.

Hattie was limited to data being presented by four meta analyses, which were in turn were conducted by academics limited by the number of studies available to them, and the methodological quality of those studies. Described in greater detail elsewhere (Imms, 2016), a summary of an 'unpacking' of these indicates four issues that temper the degree to which the Hattie Edict can be used in 2010s learning environments discourse.

– The quality of the data used in the original studies was questionable. It has been claimed they failed to define key concepts, they frequently used inadequate sample sizes, and they did not include longitudinal studies that would have measured the sustained impact of these spaces as opposed to early-use effect (Gray, 1978). The measurement instruments used in the studies often favoured traditional classrooms (Doob, 1974). There was considerable inconsistency in the design of the studies, with '…not all studies [can be] considered [methodologically] equal' (Marshall, 1981, p. 82).

– The age of the data was an issue. The four meta analyses used in Hattie's synthesis were conducted between 1980 and 1982, and comprised of studies conducted only in the 1970s. It is reasonable to question if a finding of 'no effect' in the 1970s can be used to plausibly claim a similar trend exists in the 2010s.

– There were inconsistent stipulative definitions. There is evidence the meta analyses inadvertently compared apples to oranges. For example, the studies were seen to regularly treat as synonymous 'open learning programs' and 'open classrooms' but many 'open programs' were frequently taught in traditional classrooms, and 'open programs' actually ranged widely in practice (McPartland & Epstein, 1978).

- A final point is that Hattie's Edict relies on quantitative studies reporting effect sizes. This is indeed required practice for meta analyses, thus the case for any synthesis. Omission of qualitative studies means a range of findings of impact are omitted within the Edict. For example the USAs Educational Research Services (1974) cites studies favourable to 'open plan' classrooms which are not included in the Edict. All quality research acknowledges such limitations, as does Hattie (2009), but those who use the Edict without accounting for these misrepresent the findings.

This brief critique highlights one reason why ILEs failed in the 1970s; poor evaluation. There was no conclusive proof of their effectiveness, thus they were vulnerable to social and political pressure for their closure (Socol, 2014). Interestingly, Hattie is a Chief Investigator on a 2016-2019 Australian Research Council Linkage project on this topic (www.iletc.com.au). This may be because, while there was no empirical evidence in the 1970s that these spaces had any effect on student learning, that proof is not conclusive. It is our challenge in the 2010s to find more informative evidence, for better or worse..
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THE FOCUS ON RIGOROUS EVIDENCE

If the first fault from the 1970s was a lack of credible evidence, how should 2010s evidence be gathered, and what should it look like? In terms of the former, the 2014-2016 *Evaluation of 21 st Century Learning Environments* (E21LE) ARC Linkage project (www.e21le.com) is building an evaluation matrix suitable for teachers and designers to implement robust evaluation strategies of learning environments (Imms, 2015).

As we have learned, evaluation of learning spaces is a complex task and no one evaluation approach is suitable. It must embrace a myriad of effective and affective domain foci. It must be applied (in terms of being useable by educators). It must be both formative and summative, qualitative and quantitative, as needs demand. It must be both retrospective, assessing what has occurred; and predictive, generating theory on what should be done, based on evidence. It must be 'disseminate-able' – capable of being passed on to other educators with the aim of using successes to drive evidence-based strategies in other schools.

What should this evidence focus upon? Through a suite of three annual international Research Higher Degree symposia, the Learning Environments Applied Research Network (LEaRN) at the University of Melbourne has constructed a framework of issues that require addressing. Doctoral students are often skilled practitioners wishing to extend their experience and impact through research; as such they are often unencumbered by the restrictions and parameters imposed on larger research projects. They are, it is argued, operating at the edge of what should be done and act as an indicator of the directions more formalized research projects will travel. The following evaluation issues have emerged from these events (with citations from Imms, Cleveland & Fisher, 2016):

– Issues of *leadership:* how can principals drive a change culture in schools? (Osbourne, pp. 35-44.)
– Issues concerning the *role of the architect* – how should architects assist in teachers' inhabitation of space? (Clarke, pp.65-74.)
– Issues concerning *definitions of key terms* – how do we define 'innovative spaces and teaching' when evaluating learning spaces? (Oliver, pp. 107 – 116.)
– Issues of *equity and inclusion* – how do we evaluate the effectiveness of learning spaces for those with disabilities? (Rose-Munro, pp.131-144.)
– Issues of *collaborative practices* - how does space assist good teacher collaboration? (Bradbeer pp. 75-90.)
– Issues concerning the *curation of learning* - what can museums teach schools about manipulating space for learning? (Villafranca, 2016.)
– Issues concerning *blended and virtual learning* - how does ICT help teachers use space well? (Yang, 2015.)
– Issues of *building performance* – how do we make evaluation of indoor environmental quality accessible and useable by teachers? (Soccio, pp. 195-210.)
– Issues surrounding the *evaluative role* of the educational space planner (ESP) – in what ways does the ESP engage in iterative process-based evaluation as part of good design processes? (Sala-Oviedo, pp.145-161.)
– Issues of *learning outcome measurement* – how do we isolate the variable of space when assessing student learning outcomes? (Byers, pp. 117-130.)
– Issues concerning the non-traditional learning space – how do we account for the affective when assessing the worth of a learning environment? (Healy, pp. 235-250.)
– Issues of *pedagogy*, how do we teach teachers to teach well in innovative spaces? (Knock, upcoming.)
– Issues of *core criteria measurement* - how do we measure variables such as affordances of space, deep learning and space, and teachers' spatial mind-frames? (Murphy, upcoming.)
– Issues of *design affordances* – how do we get teachers to utilise the design features provided by architects? (Young, upcoming.)

These are important points. Sherman (1990) argues developing a body of evidence such as this is fundamental to the long term well-being of education. She laments education's history of fads and bandwagons and how these hinder sustainable development. Education is rife with examples of ideas that create popular discourses and become the focus of attempts to re-invent our profession. We are likely to jump on these bandwagons, she says, due to their popularity and temporary traction with those who decide policy. However, they often disappear once enthusiasm is diminished – the latter occurring due to a lack of substance, and that substance can be interpreted as being no evidence to indicate the viability of the initiatives. The parallels to the 1970s open learning and open classroom phenomenon are obvious. Undertaking quality research to develop evidence about good practice and impact is the key to ensuring 2010s ILE developments constitute *sustained* change in how we

teach and how students learn. Those lessons are as poignant now as they were in the 1970s; creating cultures of sustainable change

TEACHER PREPAREDNESS AS ONE COMPONENT OF SUSTAINED CHANGE

If lack of good evidence was one shortcoming of the 1970s open schools program, the second was poor teacher preparedness. The common statement is that teachers were not trained in how to use these significantly different schools, and when suddenly placed in such spaces reverted to known practices that did not take advantage of their uniqueness. Apparently teachers' default pedagogies - while no doubt of high quality - often worked in conflict with large collaborative environments.

A mistake often made from this discussion is the assumption whole-scale pedagogic changes are required if ILEs are to be successful. Yes, there is a significant change between the physical learning spaces of traditional versus ILEs. But the practices within are not necessarily equally polarized. Some claim that factory-approach teaching is the standard in traditional classrooms, and ILEs demand the opposite - teaching that reflects the 'creativity, communication, collaboration and critical thinking' needs of the 21st century learner. ILEs allow this type of learning to happen, they say; traditional classrooms are a hindrance, a barrier to be dismantled. There is possibly merit to this argument, but its either/or logic seems to flow too easily. With the current paucity of evidence about this assumption of causality, are we again treading the dangerous pathway of fads and bandwagons?

In fact, it could be argued that teachers have been helping education move towards this 'four C' goal for many, many years. If this is true ILEs are a welcome development that can speed up or re-focus such pedagogic improvements; they would be an agent of change, as compared to being the magical catalyst that some espouse.

ILEs certainly reflect the needs of the '21 century learner', but these collaborative, student-centred, immediate knowledge goals have in fact existed for quite some time. In the 1960s, the Plowden Report (1967) argued the very same ideals, reflected in comments such as the following (Bayon School, 1975) that resonate with 2010s arguments for such spaces;

• Students are experiencing an explosion in information… Its better to teach them to access and process information, than to get them to commit a small percentage to memory.
• Teachers must be freely accessible to all, not stay at the front of the room…
• Students learn well, even better, from each other.
• Spaces must allow students to use peers as fellow learners and teachers, and facilitate teachers as resources to help that learning.
• Classrooms with flexible furniture and moveable walls are needed to allow freedom of movement, access to resources…
• Students need individualised learning plans, individualised assessment strategies… spaces that provide the capacity to match a student's knowledge needs to a team of teachers, not just one.

• Spaces must reflect that no two students are the same, learn the same.

Such thinking emanating from the Plowden Report and other sources at that time was heavily influenced by the 1930s Vgotskian theories of constructivism. These in turn were a development from 1920s Deweyan ideals of the student as a self-motivated learner, with education being a democratic flexible arrangement. Dewey's ideas were a development on the 1820s Pestalozzian critique of over-formalized learning and the need for learning to be an active and authentic experience. Pestalozzi, in turn, can be argued to have built his thinking on the 1760s work of Rousseau and his concept, presented in Emile, that learning happed through interaction with community and society and should be aimed at developing active, thinking individuals.

Our excitement about differentiated learning is not a sudden epiphany, as some arguing the merits of the 21st century learner may be prone to suggest; rather it is one outcome from more than 250 years of sustained thinking and action. While important at present, the future is not only about '21st century learning', rather the way this concept is one iteration of 250 years of educational development. It does not constitute the predominant driver for ILEs, and to use this rationale for ILEs existence condemns them to being considered another fad. From (before!) the days of Rousseau to now, we have had technological, social, and economic upheavals that education has had to meet; '21st century learners' and ILEs are simply another chapter.

CENTURIES OF INNOVATION

To illustrate this concept, Figure 2 is a representation of these developments. A better scholar of educational history than I would plot an accurate and informative illustration, but this estimate will suffice for my argument. It is indicative only – there is no worthwhile measure of 'change' (the 'y' axis), nor is it needed in this case.
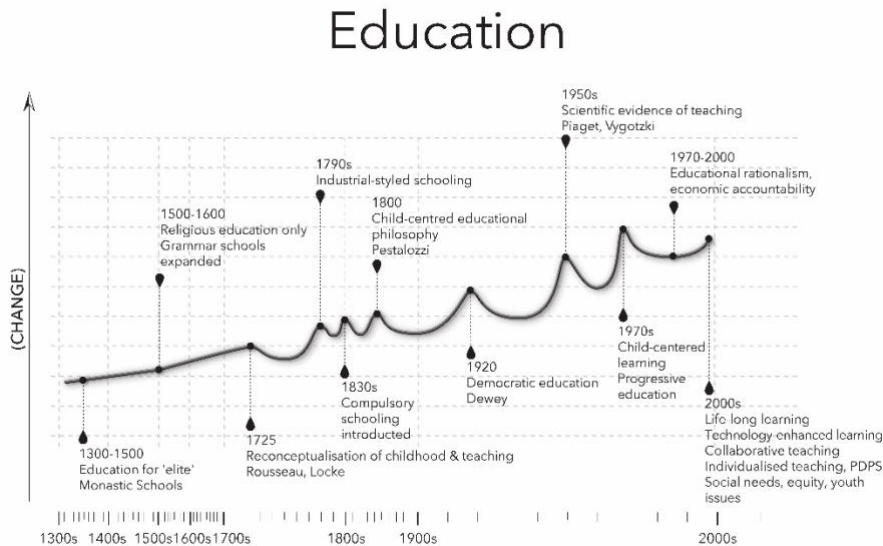
Figure 2. Conceptual model of the development of education over time (indicative only).

This conceptual model is being presented here simply to illustrate five points. First, education has been in a constant state of improvement, from its early days in the 700AD monastery schools through to today's impressive ILEs. Through the development of the grammar schools, the industry style schools of the 1800s, to developments such as Montessori, Reggio Emilia, and compulsory schooling, we have witnessed a slow, gradual implementation of new approaches to educating children.

The second point is that this growth can be argued to be positive – the red line is on a steady, upward progression. Each improvement in the provision of education programs, driven by emerging theories and sustained experimentation, has resulted in the quality of education in 2010s being unarguably superior to the 700s.

The third point is that the line does not rise evenly. It has bump and dips, each representing the positive impact of a new idea followed by a regression towards the mean. New initiatives gain traction, then inevitably seem to fall from favour and retreat. An example is the rise of Montessori in the USA in the 1920s then its quite significant 'demise' due to public critique, and its strong re-emergence in that country's schooling landscape 40 years later (Whitescarver & Cossinetino, 2008).

The fourth point is that the 'retreat' of initiatives is never as extensive as their rise. Each leaves in its wake residue of good practice that improves education in some way.

The fifth point is that the 'slope' of bumps and rises in education are relatively gradual. New ideas take some time to become implemented, and when they lose traction the drop is gradual.

For discussion purposes, we can also apply the same illustrative exercise to the design of education facilities over time (Figure 3). To repeat, this is indicative only and a true historian would provide a more informative model. But again, Figure X exists to simply illustrate a three points.

First, the spaces in which learning happens is something that has been intentionally engaged with for hundreds of years. Monastery schools utilised cloisters and chapels off cathedrals. Then separate learning institutions were developed, often being large open plan rooms. The industrial era saw great thought being put into how spaces could support peer learning, with break out spaces, large lecture spaces and sub-groups being formed within open learning spaces. Design affordances were well considered, such as air flow, acoustics, and the display of teaching materials. The cumulative impact of these initiatives over time – each as innovative in their day as ILEs are today - is the steadily improving quality and effectiveness of spatial design demonstrated in Figure 3s gentle, continuous, upward line.
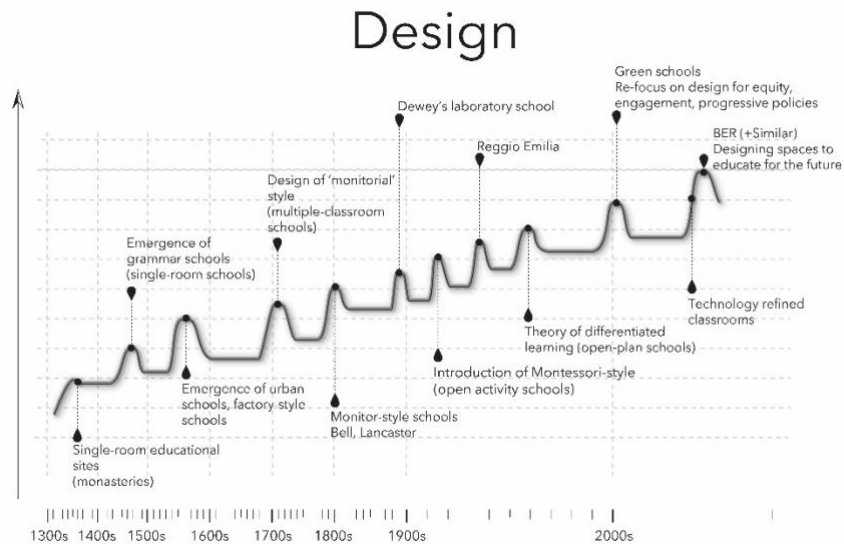
Figure 3. Conceptual model of the development of education facility design over time (indicative only).

Second, and like education, the design of these spaces experienced bumps and dips as ideas grew and then fell from favour. Church-based facilities did not suit the advent of grammar schooling where more children were admitted to education and needed to study not only Latin and theology, but also mathematics, science and other languages. Grammar schooling in turn evolved into the industry model, then separate classrooms, the disciplinary model of schooling, and so on up to the present day.

Third, in architecture it could be argued that new initiatives occurred quickly, but also faded back to the mean more quickly than education, thus its bumps and dips are steeper. An example can be seen in the 21st century. In comparison to education where change is slow, architecture has demonstrated through Australia's Building the Education Revolution a capacity to quickly grasp emerging needs and transpose these to the drawing board, then to the actual build. While teachers grapple with, for instance, the introduction of ICT into classrooms, designers have conceptualised how such advancements can be addressed, then have designed and built them and handed them over for use, while educators continue to be stumped by effective use of ICT (Byers, Hartnell-Young & Imms, 2016). Creating cultures of change in teaching practices is at best a slow and challenging process; the difficulty is amplified significantly when space is added as a variable (Deed & Lesko, 2015).

When these two conceptual mappings are conflated (Figure 4) we view a landscape of gradual change over time; a tidal-like uptake then regression, seen in

both educational and design initiatives. Also visible is disparity in how design and education have aligned. The dips and bumps do not always coincide, and illustrate that at all times either educational thinking has outstripped the design of physical learning spaces, or vise versa.
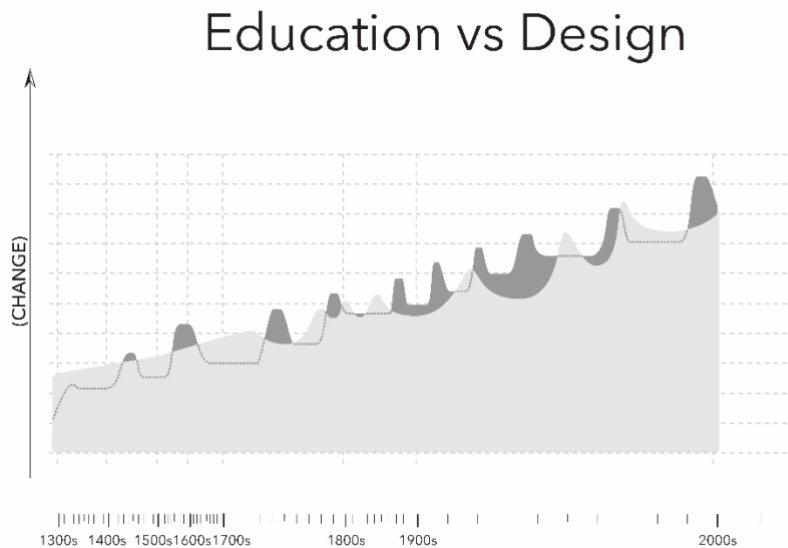

Figure 4. Conceptual model of education+facility design, over time (indicative only).

Such disparity is to be expected, but results in a 2010s situation where the design of our teaching environments have, arguably, surpassed education's capacity to utilise them. At 2017, the two lines are again apart, and it is our job to address this gap in spatial practice.

What is also clear from a broad, more temporal view of our current situation, is that history teaches us ILEs are not a catalyst for change, rather an agent. Handing over keys does not guarantee teacher change or improvement in learning outcomes for students, but it does provide teachers another device to help them teach even better. Space won't necessarily improve teaching by itself, but it can be *used to improve* teaching. What is required is work that focuses on helping teachers make the most of these environments.

This is not new work for educators, who have been adjusting to change for some time. But sustained change occurs in a manner not unlike education's action research cycle. Evidence gained from one implementation of a strategy is used as a platform to refine the next implementation. Continued over time, this builds a robust body of knowledge and practice that effects improvements in what we teach and how

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students learn. Interestingly, when overlaid with the design+education illustrative example (Figure 6), we can view our arrival at ILEs in the 2010s as not a sudden epiphany driven by an (arguable) 21st century learner 'fad'; rather it is an outcome borne from continual refinement of our craft. The former is unsustainable, a fad. The latter is the type of foundation that ensures continued, upward growth.

CONCLUSION

This is the nexus of our current dilemma. We must advance ILEs as a sustainable development in educational development without over inflating their importance to the degree they are exposed to a sharp needle, then suffer oblivion for another forty years or more. If we prove through good teacher training, sound collaborative professional development, and rigorous research how they improve the well-being and learning outcomes of our students, we will ensure a sustainable innovation in education has occurred.

This action should have been undertaken in the 1970s; however, we can learn from that mistake. The solution is to frame ILEs as being a sustainable development – to view our initiatives as part of long term development, and to build evidence that turns a fad into an evidence base for ongoing growth.

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