INNOVATIVE LEARNING ENVIRONMENTS / OVERVIEW

What is an ILE?

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What do we mean by innovative, modern and flexible learning environments?

New and transformative environments in education, whose design is based on our current understandings about how learning occurs and what supports are needed, are variously referred to in the current discourse as Innovative Learning Environments (ILE), Modern Learning Environments (MLE), or Flexible Learning Environments (FLE). These terms are used quite interchangeably, although different researchers, practitioners and policy-makers may apply differently nuanced interpretations to the terms.

The 'learning environment' in the terms ILE, MLE and FLE refers to the organic whole of the way that learning is organised for a group of learners in a given context and at a given time, that is, all the aspects of a school environment that influence learning. It indicates pedagogical and psychosocial components as well as the particular spatial design, and refers to physical context as well as its materials and tools, social roles, pedagogies, learning goals and activities.

ILEs are not to be confused with the open-plan environments in vogue in the 1970s and 1980s. This is because open plan classroom designs are not necessarily adaptable to meet students' learning needs, and in fact may constrain potential for learning and teaching. The spatial configuration, and in particular its openness and flexible nature, is often believed to enable the changes in pedagogy and practice that make for an ILE: there is an argument that new, flexible and learner-centred spaces coupled with new technologies can facilitate a paradigm shift from teacher-led, traditional pedagogies to the personalisation of student-centred and inclusive approaches in which all students are involved in educational activities in a way that meets their individual needs, although the body of research literature is clear that a change in spatial design will not achieve this paradigm shift in and of itself.

Key physical features of ILEs, MLEs and FLEs include:

- *Sufficiently sized space* to include a range of different learning activities and diverse groups, and that allows and encourages adaptation and reconfiguration of the space.

- *A central open space* that is shared by several classes, enabling collaboration and learning between classes.

- *Break-out spaces* which offer a range of different activities, such as group work, reading, creative work, reading, reflection and presenting, so that a variety of activities can happen simultaneously.

- *Mobile and flexible elements* such as sliding partitions, mobile screens or whiteboards on wheels, diverse possibilities for table arrangements of different sizes and in different orientations, so that parts of the room can be separated off for particular learning activities. Minimal fixed partitions, furniture, fittings or other equipment.

- *High levels of visual transparency* created through fewer walls and a greater use of glass.

- *Integration of technology* (often wired and wireless) and access to a range of resources.

Organisational features of ILEs, MLEs and FLEs afforded by the physical features include:

- *Flexibility in groupings*, for example, combining two classes into one for team-teaching, or splitting a class into smaller groups and spreading them out across the space.

- *Cooperation and collaboration* with other teachers.

- *Student choice* of where to work or how to configure the learning space in a way which is most suited to them.

How effective are ILE - what does the research say?

Although it is theorised that ILEs can contribute to raising achievement because they can more readily support the needs of learners, there is little information on the nature or strength of the relationship between the quality of school facilities and educational outcomes. However, ILEs have been implicated in a range of outcomes including an increase in the range of active, student-centred, personalised and collaborative learning experiences and increased engagement. Assessing the impact of ILE designs is hindered by the multi-faceted nature of learning environments and the variety of teaching and learning programmes implemented within them. With many interacting and intervening variables it is difficult for research to isolate the impact of particular individual features. There are also cultural and geographical differences within schools that interact with pedagogical and layout choices and affect their impact, making sensitivity to context an important factor in the success of particular initiatives within ILEs.

By contrast, there are well-established links reported between features such as inadequate and poor heating, lighting, ventilation or acoustics and poor outcomes for students. Structural features of buildings are found to be more important to achievement than cosmetic or design features. High noise levels have been found to negatively affect attention, concentration and memory, and within open-plan ILEs, intrusive noise from other teachers and class groups has been found to affect students in terms of noise annoyance and ability to hear the teacher. Crowding and density are also associated with poor engagement and achievement. Below-adequate provision of any of these features adversely affects not only students but teachers too, which may diminish teacher effectiveness. However, while it appears that raising these factors to adequate levels can make a significant difference to learning outcomes, there is little evidence that it is helpful to improve these features beyond adequate levels.

Some studies have explored correlations between the affordances of the physical environment for particular pedagogical opportunities and student performance. The move to flexible learning spaces can have a significant impact on teachers' pedagogical approaches and mindsets, but there are no research studies that identify causality in the relationships between aspects of the physical environment and students' achievement.

As the result of moving some classes to ILE, one school in Australia reported a significant decrease in the proportion of time spent in direct instruction, and an increase in active pedagogical activities such as interactive instruction, facilitation and providing feedback.[1] In these ILE, direct instruction was shorter and much more focused in its intent. Students spent more time on higher-order tasks such as creating, appraising and refining products, which involved a greater proportion of hands-on and practical activities, and the time spent off task or disengaged was reduced. The same study also indicated that there is a correlation between traditional environments, teacher-centric pedagogies and lower levels of positive teacher mindset, and student engagement in deep learning activities. However, where student-centred pedagogies are developed in traditional classrooms, the levels of teacher mindset and deep learning are also high. This suggests that it is not the classroom design but the change in pedagogy that is important for better outcomes.

The impact of an innovative physical space on learning depends on teachers' ability to include the affordances of the space as an integral part of planning and delivering a teaching and learning programme. Teachers need to develop and implement effective teaching and learning for a flexible learning space, and continue to refine those practices. It is the pedagogies associated with student inquiry that lead not only to higher performance and longer-lasting outcomes, but to skills such as collaborative problem-solving and critical thinking which are identified as crucial for student learning in today's context.

The impact of the learning environment may be quite substantial and lead to positive shifts in students' perception of learning and in their enjoyment of and engagement in learning within ILE, alongside a greater ability for students to articulate their preferences for learning in an ILE. This is thought to be the result of greater flexibility and choice and the personalisation of learning for these students. Students in secondary schools with ILE in New Zealand have more ownership of their learning, more equal relationships with teachers, and a greater tendency to engage in blended learning (which supports traditional learning with digital media). Again, it is important to note that statistically significant improvements in student outcomes relate to environments in which teachers exploit both digital technologies and spatial designs in order to enable responsive pedagogies.

Other studies have suggested that gains in learning within flexible and open spaces are partly to be credited to students' intrinsic drive to learn, and argue that, when students are not intrinsically motivated, flexible learning spaces become noisy and unstable, and students are easily distracted for sustained periods. As students have been found to feel more valued and are happier in a modern, quality space, it is possible that some of the effects of installing a new environment will be related to morale. Simply upgrading learning spaces can lead to greater motivation as a result of students and teachers feeling valued, as opposed to the actual change in environment itself. Thus, these results might be short term, based on the novelty factor, and so each new cohort of students needs the opportunity to personalise the space in order for it to continue to motivate engagement. This suggests that consultation and change will be ongoing and, as students move on, it will be necessary to engage new groups of students in improving the environment in order to maintain motivation and morale. Change in student attitudes and achievement as a result of an ILE will vary dependent upon levels of student choice and autonomy in consultation processes, the increased sense of self-worth and motivation for teachers and students as a result of their ideas being valued and invested in, and how suitable innovations are for their particular contexts.

Factors reported to be related to positive outcomes for students' engagement and achievement
Appropriate lighting levels and sources (higher levels of daylight)
Appropriate temperature maintained
Easy access to different learning spaces
Students' ability to choose their own work space within the environment i.e. the choice to work at standing tables has been found to lead to increases in on-task behaviour and working memory
Alignment of pedagogy to the physical space
Large areas for diverse activities and a variety of spaces overall
Flexibility for teachers to change spaces
Good quality outdoor spaces (especially for primary students) and opportunities to learn outdoors
Outside views (not necessarily commanding views but the provision for students to rest their eyes on views of at least 50 feet)
Clearly defined pathways, wide corridors and freedom of movement (a lack of expansive pathways implies higher density)
Accessibility of technology
Technology that is embedded within a teachers' pedagogy
Creating opportunities for students to identify and work on their own interests and strengths within projects that are meaningful to them
Factors reported to have a negative effect on students' engagement and achievement
High noise levels
Inadequate ventilation, heating or light
Open storage (reported to be distracting to students)

References

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