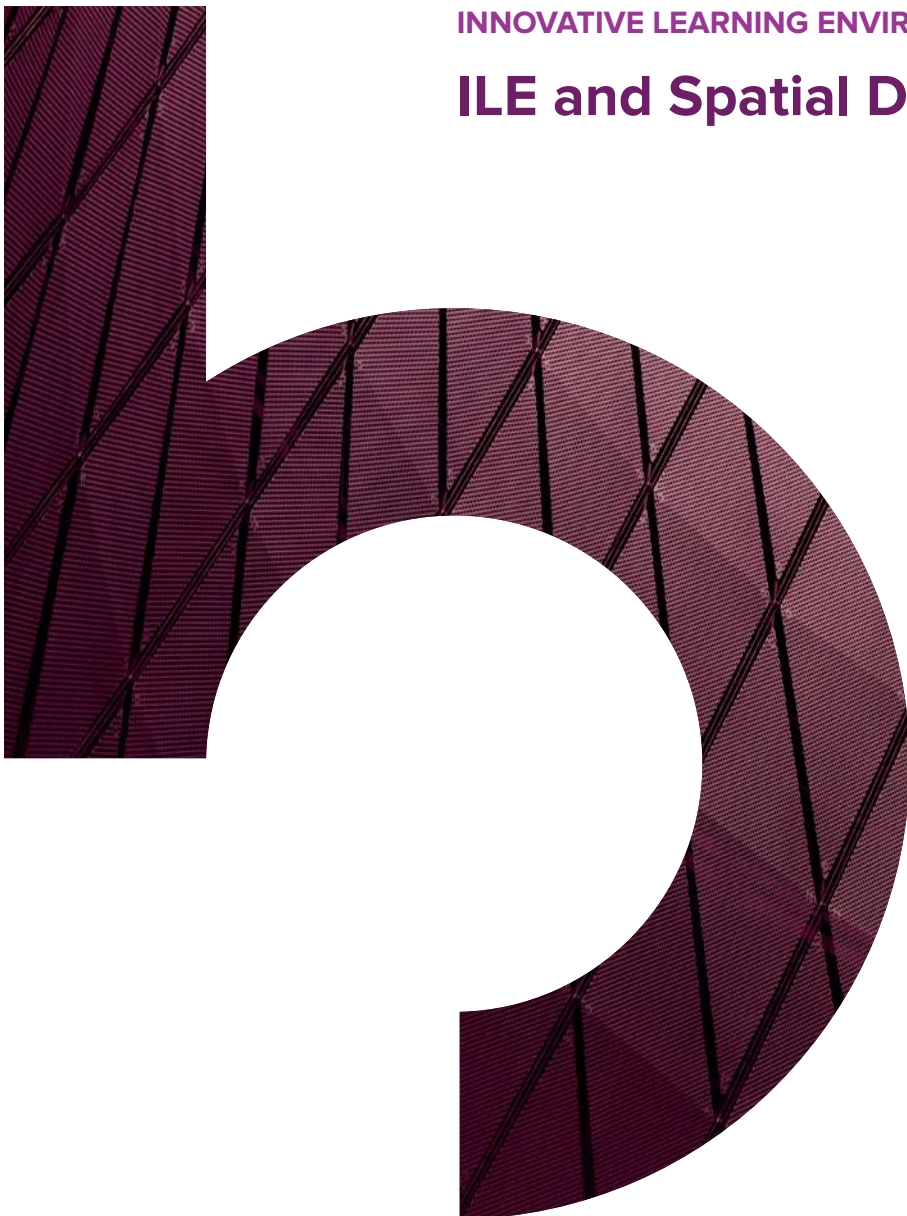




INNOVATIVE LEARNING ENVIRONMENTS / OVERVIEW

ILE and Spatial Design



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In their flexibility of use and potential for diverse spaces for learning, Innovative Learning Environments (ILE) are intended to support teachers to move to more discursive teaching styles with a focus on student choice, curricular integration and rich tasks, and personalised, individual learning in which students are increasingly able to engage in self-regulation.

While ILEs may have many affordances for new, more effective pedagogies, their success depends on teachers being able to identify and exploit this potential. Evidence shows that effective transition from a traditional teaching environment to ILE is often limited by poor spatial or environmental competency. Environmental competency is the ability to perceive and act upon the range of opportunities offered by the learning environment to achieve particular outcomes and goals. It is not about determining which pedagogies will be effective in the space available, but about recognising opportunities to reconfigure spaces to support the achievement of specific learning goals.

Teachers may lack the training to understand and effectively use physical space and environmental affordances to their pedagogical advantage, and traditional, teacher-directed pedagogies often persist within ILE. Among the many options available in open spaces is the choice to continue routine practice, so adaptive choices between conventional and hybrid practice need to be made on a continual and ongoing basis, although these choices are not mutually exclusive. A lack of environmental competency can also result in teachers underutilising the potential of their spatial environment and passively resigning themselves to working in inappropriate environments, rather than proactively changing them to better suit their goals and activities.

Do I need an open-plan classroom to create an ILE? Contrasting views on the importance of physical space

It is difficult for any study to confidently attribute the effects of ILE on learning and teaching to the physical space (or any other feature), or indeed to make any claims for the relative importance of the physical space in accruing benefit to students and teachers. It is impossible to differentiate the impact of the physical space from the accompanying organisational changes such as changes in pedagogy, or improved attitudes of the teachers and students using the space. Despite this, opinions on the relative importance of the physical space in an ILE abound in the literature. There are two camps of thought:

Yes

Space is seen as performative. That is, the physical space brings certain effects (identities, emotions, learning) into play. The social environment or set of attitudes within a group are seen as an environmental effect. Research to support this shows that chronic behaviour problems or their development can be improved or prevented with simple classroom modifications, such as changing the layout. Although improved outcomes for students depend on a combination of factors, including culture, pedagogies, and school organisation as well as the physical setting, these features need to be aligned. It is argued that if the physical setting is poorly matched to teaching practices, then an intended ILE will falter.

The suggestion is that ILE will not succeed in an inappropriate spatial design.

No

Physical spaces are important in terms of student and teacher behaviour, but they are not all-important. Some argue that any classroom could be used as an ILE based on student-centred practices and personalisation. Teaching practices can be independent of their environment, and perhaps even contrary to it. Even in a teacher-focused space (such as rows of desks facing the teacher), teachers can use questions and other engagement practices to elicit students' contributions, and can allow students to engage in self-paced, independent work. Equally, a teacher in an open-plan space intended to work as an ILE can set up formal rows in front of a whiteboard and give a lecture-style presentation. Spatial design does not determine educational practice because other elements, such as staff culture and organisational practices regarding curriculum, grouping and assessment, are significant influences. For example, digital technologies can transform the potential of any kind of space by opening up the classroom and connecting students to other people and resources. Students also have an influence on what kind of learning culture is developed in a learning environment. The impact of the physical setting is also mediated by how teachers decide to use the space. There is some evidence that open-plan classroom designs do impact how teachers teach, but traditional practices have been found to persist in flexible spaces. Some researchers argue that the essential element for transforming practice in an ILE is the school's educational philosophy, not the physical layout. Some teachers report that changes other than the physical layout have had the biggest impact on their teaching. Changes to the allocation of time, such as making lesson periods longer (90 or 100 minutes), were identified as most significant in changing their teaching practice and encouraging personalisation, because these periods were too long for teacher-focused presentations and necessitated more group and self-directed work.

The suggestion is that schools and classrooms can offer an inclusive environment for all students, their cultural backgrounds and preferences for learning, regardless of the physical facilities of the building.

How to develop environmental competency

This might involve a personal reorientation of attitudes, beliefs and behaviours. First, it is important to develop pedagogical repertoires as well as considering the affordances of the environment for those pedagogies. Teachers may develop hybrid pedagogies which encompass routine knowledge and practice alongside new possible practices as part of the process of experimenting with and developing pedagogies. Environmental competency requires awareness of the physical environment but also knowledge about the relationship between environment and learning behaviours, and the ability to change environments through personalisation and creativity. Teachers' personal discoveries about the impact of space will help to build confidence in manipulating environments for greater pedagogical effect.

It is important to experiment with the physical environment, to conduct inquiries, to engage in professional conversations exploring the potential and influence of particular spaces, and to reflect on how the physical space can be a pedagogical tool. This will enable a continual negotiation of the potential of open-plan spaces. It might also be possible to build relationships with design professionals to support this work. Spaces can be organised to offer teacher-centred spaces, student-centred spaces and informal spaces, with activities moving between them according to the planned objectives and goals. Different learning spaces within the same environment will support students' opportunities to choose whether to work individually in a quiet area or to collaborate with others, whereas rows of desks are usually configured by and focused on the teacher, and inflexible. Pedagogical changes associated with ILE may also benefit from the revised organisation of time, such as implementing longer periods of instructional time.

Developing a polycentric space (with multiple focal points to allow the 'front of the room' to be anywhere) is possible with portable technologies and movable furniture, such as screens on walls or on wheels, multiple data projector inputs, and having a large number of 'writable' walls. This aids in the creation of multiple points for instruction and a variety of spatial configurations for different groupings and activities. Making it possible to have different teaching locations across the room has been found to increase discursive teaching practices in ILE. Spatial organisation can also affect relations between teachers and students. For example, a centralised teacher's desk as a focal point for the classroom works a bit like a podium to place teachers at a higher level than their students. This can also be the case when the teacher stands while the students sit. Teachers can consider where to position themselves, whether in the centre of students (a social positioning) or beside students at a workspace (promoting personal relations).

Spatial or environmental strategies can also aid in behaviour management. Problems that lead to behaviour issues can include overcrowding, a lack of space or adaptability of space for particular class activities, as well as visual and auditory distractions. Teachers need to engage in a process of diagnosing problems, trialing solutions and inquiring into their effectiveness. They can begin by observing the kinds of disruptive behaviours occurring in the classroom, when and where they occur, and under what circumstances, considering whether there are distractions in students' working spaces, and trialing some modifications to the environment. Observing the results of these modifications, obtaining feedback and planning further modifications or improvements will help teachers develop their environmental competency.

What does the research say about the features of physical spaces?

Students' easy access to different learning spaces is linked to better outcomes, and varied spaces and floor plans can facilitate an ever-increasing range of teaching and learning methods and technologies, making a learning environment inclusive and accessible to all who use a space. Different spaces might include:

- An open and multi-purpose space – this serves as a social space, central briefing area, and open access learning area
- Space for group learning, or the facility to break large spaces into smaller units to facilitate group work
- Space for individual learning
- Flexible furniture and fittings – which should be easy to handle and move (and durable to withstand this use) so that teachers and students might reconfigure spaces to suit their needs
- Specialised spaces – for activities such as performing arts and sports
- Outdoor spaces – that are well-designed and defined, as these are linked to better student outcomes, particular for younger primary students

Alongside (or in the absence of) the development of an open-plan space, furniture can afford uses that support innovative pedagogies. Examples include mobile screens on wheels with capacity for use as both whiteboards and pinboards which can divide spaces as well as facilitate collaboration and brainstorming. Tables and walls might have whiteboard surfaces too, for recording and communicating work, and be able to be connected into different configurations to suit different sized groups and different activities. Flexible partitions and walls can be successful, allowing teachers and students to close off spaces for some learning activities.

The body of research on the physical environment for learning also indicates that poor surroundings have a negative effect on students' and teachers' attitudes. Features such as indoor air quality, daylight, acoustics and access to food and drink affect students' and teachers' physiology, and can also provoke an emotional response, therefore having an effect on students' and teachers' psychology as well. Inadequate levels of lighting and poor air quality, temperature regulation and acoustics have negative effects on well-being, mood, concentration, attendance and ultimately, on achievement. Quality facilities can improve comfort and well-being, and result in both health, well-being and productivity increases for teachers and students, and these may help to promote students' higher achievement. The structural aspects of facilities that are important for student outcomes include natural light sources, good air quality and acoustics, controllable lighting and heating, windows with outside views, and effective use of colour.

Large, open spaces shared between several classes can have significant implications for noise levels. Chronic noise exposure reduces cognitive functioning, and reading problems can be noise-related, although different students respond to noisy environments in different ways. Students who are particularly vulnerable to the effects of noise on speech perception include second-language English speakers, hearing or sensory-impaired students, and children with autistic spectrum disorders. Perceptions of higher noise disturbance in open plan classrooms resulting in higher levels of distraction are consistently reported in the research, and noise level in open plan classrooms does increase with pupil density, but it decreases once density reaches that of an enclosed classroom.

How to include space and environment in planning

Developing the flexible practice enabled by flexible spaces is crucial, and requires attention to space and environmental features during planning. This means planning for ways in which the walls, furniture, technologies and other resources like teacher aides can contribute to the effectiveness of learning. For example, break-out spaces allow for targeted instruction, small group work or quiet spaces for students who need or prefer to work alone. Similarly, different configurations of space, furniture and equipment can give students meaningful cues as to how to use areas and resources: for example, arranging tables and chairs into clusters indicates collaborative learning.

In any style of classroom, one of the most basic opportunities for environmental change is in the arrangement of chairs, and the impact of this has been quite well researched. Seating arrangements should be dependent on the learning goals and activity. It is important to ensure students can see the teacher and any visual aids from every point in a seating configuration, and that the distance is not too far to compromise visibility and audibility.

So where to start?

The place to start is always with the goals and intentions for learning, and to consider how the learning space, whatever its configuration, can best serve those goals. There is no single perfect learning environment that works for all situations or that never needs to be changed. Teachers cannot wait for obstacles and barriers to be removed, and they cannot avoid failure, but they can plan for barriers as best they can and use failures as learning opportunities. The important thing is to experiment, to make a change, and to observe and evaluate its effect.

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