Design for better learning

The way our kids learn is changing, and building design is racing to keep up.

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THERE IS A TEACHING REVOLUTION going on in New Zealand schools. Old-fashioned didactic teaching methods are being supplemented by self-directed learning, group activities and mixed teaching styles aimed at a diverse range of learners.

Most traditional cellular classrooms were not designed with this kind of teaching and learning in mind, so the Ministry of Education is helping schools consider how property upgrades might better support their vision for education.

Pegasus School in Canterbury.

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Transforming our classrooms

Innovative learning environments is the phrase that is often used to describe this new approach. Innovative learning environments are more learner focused than traditional classrooms. They encourage collaboration and inquiry and support teachers to teach in the style that best suits their students' needs.

'It's important to think of the learning environment as the full ecosystem - the students, teachers, facilities, teaching resources, activities, community interactions and so on,' says Jerome Sheppard, Head of the Ministry's Education Infrastructure Service. 'Property is only one part of the learning environment. We help schools to create flexible learning spaces to support the kind of learning environment each school is seeking to create.'

More open flexible spaces

A flexible learning space can be designed in a variety of sizes, styles and configurations, but its main purpose is supporting different ways of learning and activity use. Many feature partitions to break up a larger space into smaller working areas, while others are designed to combine into sizeable communal areas accommodating several classes and teachers at a time.

As well as the ability to adapt and transform to support day-to-day teaching and learning requirements, these spaces are ➤

also well suited to cater for the long-term evolution of educational best practice.

'It's about providing flexibility so you can teach and learn in many ways,' says Craig Cliff, Senior Policy Manager, Education Infrastructure Service, Ministry of Education.

Supporting these different activities in the same space requires a well thought out and purposeful building design.

Elements of a learning space

'Although the spaces are more open, they're not strictly open plan. We often see well designed spaces with 60–80 learners and three teachers operating together with no permanent acoustic separation between them. But there will also be smaller spaces within that broader space where individuals or groups can retreat. These breakout spaces can be acoustically sealed with glazing or sliding glass doors or created using well placed furniture,' he says.

The Ministry recommends each learning space have up to 40 m² of associated breakout space, although for large shared breakout spaces, the average amount of breakout space per teaching space should be lower.

Large breakout spaces for group activities such as performances and presentations are recommended, but they must be connected to and accessible from the learning spaces.

Teachers and learners should also be able to see from one space to the other, and teachers able to passively supervise the large breakout area from the main learning space.

Workspaces are also where teachers plan, meet, interview, store personal items and socialise. The Ministry recommends that designers place these areas close to the learning spaces rather than group them in one or two locations.

'In more open learning spaces, the design should also include physical cues to the users about where to go if learners want to be noisy or find a quiet area to focus,' says Craig.

Designing quality learning spaces

Learning spaces must also meet physical performance standards. Guidance is in the Ministry's *Designing quality learning spaces* series, with topics covering acoustics, air quality, heating and ventilation, and lighting.

Acoustic performance

The acoustic performance of learning spaces has a direct impact on the usability of the space and the learning outcomes. For example, excessive background noise and reverberation can make it hard to hear and understand speech. To achieve good acoustics and maintain flexibility of the learning spaces, the Ministry recommends that designers:

- use highly acoustically absorptive materials on floors, ceilings and walls wherever possible
- provide 3–4 m² per learner to allow better acoustic separation
- provide a range of adaptable learning spaces, including those that can be acoustically separated when required.

Thermal performance

Similarly, students and teachers need to be comfortable to reach their full potential. The Ministry is currently updating its thermal performance and indoor air quality requirements and guidance. This will be released early in 2017.

To control excessive indoor temperature on hot days, it recommends that designers:

- control solar gain with thermal insulation, shaded windows and glazing to provide adequate natural lighting without excessive heat gain
- orient new buildings to avoid direct sunlight during the hottest part of the day, where possible
- passively cool spaces by increasing ventilation and air movement and using thermal mass to reduce temperature fluctuations.

To avoid unacceptably low temperatures on cold days, designers should:

- add heat using energy-efficient and flexible heating systems when necessary
- mitigate heat loss with thermal insulation, manage ventilation and use appropriate window areas
- maximise solar gain.

Lighting

Research shows that learners and teachers perform better with natural lighting. The Ministry says that natural daylight should be the main source of lighting in learning spaces, supplemented by artificial light when natural light fades or in overcast weather.

Balancing priorities

The original *Designing quality learning spaces* publications provided best-practice advice and recommendations, but the Ministry is now taking this one step further.

'With the update to our acoustic guidance in September 2016, for the first time, we've introduced minimum mandatory performance requirements for new school buildings,' says Craig.

'This document makes it clear to designers what aspects of the learning space are absolutely non-negotiable and what areas they should discuss with the end users. It's about identifying what's important, in this case, with acoustics and how it fits as part of the wider system.'

The flexibility of a learning space, acoustics, heating and ventilation, and lighting are interrelated, and a change to one often impacts the others. For example, an effective but noisy ventilation system introduces fresh air but also increases ambient noise levels.

'Designers have to make decisions about what aspects of the learning space to prioritise. Our guidance indicates that, when forced to make trade-offs, first consider the flexibility of the space as that's the best indicator of its usability, followed by acoustics, then ventilation and air quality, lighting and finally energy use,' says Craig.

'Ultimately, however, it's up to the school and the users of the space to reflect on what is important to them.'