A RESEARCH REPORT PREPARED BY THE UNIVERSITY OF MELBOURNE

Learning Environment Design and Use

SUMMARY OF FINDINGS

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Executive Summary

This report – *Summary of Findings* – is intended to support evidence-based decision making by those involved in the design and use of school learning environments. It summarises the findings of a three-year collaborative research initiative involving Catholic Education Melbourne (CEM), Catholic Education Diocese of Parramatta (CEDP) and the Learning Environments Applied Research Network (LEaRN) at the University of Melbourne. The *Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence Based Approach (2015-2017)* project is one of the largest known studies to have evaluated the relationships between the built environment and the pedagogical practices and activities of school teachers and students. The findings have been drawn from the rigorous evaluation of 43 learning environments in 38 schools.

Overall, the TELE project findings highlighted nine principles of designing and using school learning environments to best pedagogical effect. Fundamentally, learning environments in both primary and secondary schools should offer the following:

1. A dynamic social and physical environment;
2. Variety and choice, with respect to both settings and activities;
3. The capacity to differentiate and personalise learning experiences, including across independent, small group, and whole class activities;
4. Ready access to multiple learning settings, commonly differentiated by furniture arrangements and/or glazed separations between spaces of different sizes;
5. Engaging and meaningful teaching and learning experiences, including opportunities for instruction, interaction and reflective retreat;
6. Options to socially organise students in varied ways, within the same class and/or across multiple classes;
7. Good acoustics, especially in more open spaces;
8. Good sightlines, to enable the consistent observation and monitoring of students’ activities;
9. A design that recognises the physical, organisational, temporal and cultural histories of the school/school sector and allows for pedagogical development over time, without alienating teachers from their past practices.

NB. Hybrid-pedagogies may be considered a path to more engaging teaching and learning experiences – particularly in secondary schools.

In keeping with the above principles, it was concluded that the best alignments of learning environments (design) and pedagogies (use) occurred in type D learning environments (see Methodology). As a spatial typology, this cluster of facilities – characterised by adjoining classrooms and common areas that may be transformed into one large space, or progressively closed-down into smaller spaces/classrooms – was overall the most supportive of the desired pedagogical activities of teachers and students.

With a view to improving the design and use of new learning environments, the project’s findings also indicated that successful future designs may represent ‘hybrid’ building typologies – especially related to type D and E learning spaces.
Acknowledgments

We wish to acknowledge the support and foresight of Mr Stephen Elder, OAM, Executive Director, Catholic Education Melbourne for commissioning this research, along with Mr Gregory Whitby AM, KSG, Executive Director, Catholic Education Diocese of Parramatta.

The Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence Based Approach project involved an extensive evaluation program over three years (2015-2017). The successful completion of the project can be attributed to the long-standing partnership of ten years between Catholic Education Melbourne (CEM) and the Learning Environments Applied Research Network (LEaRN) at the University of Melbourne, along with more recent productive collaboration with the Catholic Education Diocese of Parramatta (CEDP).

The central role of the 38 principals, 300 teachers, 3872 students and 11 learning environment experts who participated should be applauded. Without their willing participation the project would not have been possible.

The substantial contributions of all involved, including many individuals from within each participating organisation has been greatly valued. The partnership model that allowed the project to prosper provides an exemplar for others to follow. While academic researchers from the University of Melbourne led the evaluation/research program, much credit for its success goes to the sponsor organisations for taking an active role in the evaluation program. Staff from CEM and CEDP were directly involved in reviewing survey data, conducting walk-throughs, running focus groups, and producing drafts of individual learning environment evaluation reports. Their involvement is expected to aid future decision making about how best to design and use learning environments in Catholic schools, based on the insights gained through personal involvement in the project’s fieldwork program, in addition to the documented findings of the project.
Introduction

The Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence Based Approach project commenced in 2015 as a collaborative research initiative between Catholic Education Melbourne (CEM) and the Learning Environments Applied Research Network (LEaRN) at the University of Melbourne. The Catholic Education Parramatta Diocese (CEDP) joined the project as a formal collaborator in early 2017.

The TELE project represents one of the largest known studies to have evaluated the relationships between the built environment (learning environments/spaces) and the practices, activities and behaviours of school students and teachers (pedagogies). Drawing on the rigorous evaluation of 43 learning environments in 38 schools, this report collates a distilled Summary of Findings from the three-year program of learning environment evaluation.

Objectives

The objective of the project was to develop an evidence base to inform the design and pedagogical use of learning environments in Catholic schools. To achieve this, the pedagogical effectiveness of a diverse range of learning environments in primary and secondary schools were evaluated using LEaRN Evaluation Module 3 – Alignment of Pedagogy and Learning Environments.

All learning environments were sampled from within the two participating dioceses (CEM–37 and CEDP–6). The evaluation tool used was developed in 2011–2012 via an earlier research collaboration between the Catholic Education Office Melbourne (CEOM) and LEaRN (see Cleveland & Soccio, 2013).

Research questions

The project addressed the following research questions:

- How can Catholic school learning environments (primary and secondary) be designed and used to best pedagogical effect?
- How well aligned are contemporary pedagogies with the designs of learning environments in Catholic schools in the Melbourne and Parramatta dioceses? What influence do different building typologies have on this alignment?
- How can the alignment between contemporary pedagogies and the design of school learning environments be improved?

Spatial framework

For the purposes of the project, learning environments were identified as the zones, including adjoining spaces, used by a class, cohort or year level at the same school. Five spatial typologies (Dovey and Fisher, 2014) were used to ‘type’ learning environments with similar spatial characteristics and/or space planning relationships. These five typologies may be differentiated by their relative degree of openness and interconnectedness, from traditional classrooms (type A – enclosed) to permanently open-plan spaces (type E – open). See Methodology for details.

Using a strategic sampling technique, an even distribution of each learning environment type (A/B, C, D, E) was evaluated during the three-year project to help identify which types of spatial layouts (including furniture, fit-out, and cultural practices) were the most supportive of contemporary pedagogies (approaches to teaching and learning), as envisaged by CEM, CEDP and the participating schools.

Participants

The project’s findings represent the opinions of the 3872 students, 300 teachers, and 11 learning environment experts who participated in the project – all of whom shared important insights and perspectives into their lived experiences (Lefebvre, 1991) of the space(s) they inhabited and/or observed in detail. Consequently, the data presented in this report honors the users of the learning environments that were evaluated, revealing rich details about ‘what works’ for those occupying these spaces/facilities.

Each participating school was provided with a comprehensive Learning Environment Evaluation Report. These reports contained detailed evaluative feedback about the learning environment(s) that were sampled at the school, including summaries of the data collected and the local findings. The provision of these reports provided the participating schools with a valuable local output resulting from their involvement in the project.
Document structure

This report distils the findings associated with each of the 68 design and use variables that were assessed through the TELE project. The Final Report (April, 2018) included information about how each of these variables ‘enabled’ and/or ‘constrained’ pedagogical practices. Only the ‘enabling’ factors are presented in this Summary of Findings. These are presented on the subsequent pages, as organised by the following 18 overarching dimensions, or themes:

- Geographical engagement
- Size and scale
- Activity settings
- Furniture
- Opportunities for agile and flexible use
- Provision of resources
- Access to resource storage
- Movement of people and objects
- Provision and use of display space
- Character and aesthetics
- Accessibility
- Security
- Student toilets
- Occupant comfort [acoustics]
- Occupant comfort [thermal and air quality]
- Occupant comfort [lighting]
- Staff professional development
- Teacher support spaces.
Methodology

Background and context

In June 2012, what was then known as the Catholic Education Office Melbourne (CEOM) partnered with the University of Melbourne’s Learning Environments Applied Research Network to conduct a research project to develop and pilot test two learning environment evaluation modules: LEaRN Evaluation Module 2 – Technical Performance Evaluation/Indoor Environment Quality, and LEaRN Evaluation Module 3 – Alignment of Pedagogy and Learning Environment. These evaluation modules were developed to address the shortcomings of existing school post-occupancy evaluation (POE) tools (Cleveland & Fisher, 2014).

The development and pilot testing of LEaRN Evaluation Module 3 (see Cleveland & Soccio, 2013) provided the platform for the TELE Project to be initiated. With a focus on the pedagogical effectiveness of learning environments, LEaRN Evaluation Module 3 was used as the primary data collection tool throughout the project’s three-years. Informed by an extensive review of the literature on the evaluation of physical learning environments (Cleveland & Fisher, 2014), this evaluation instrument was developed to address two main objectives:

1. To evaluate the alignment between desired teaching and learning activities and the design of general purpose learning environments in primary and secondary schools; and
2. To generate data that can inform decisions about the design and use of learning environments.

Typology classification

Learning environments (spaces) representing five different typologies were selected for the study. These were identified as the zones, or adjoining spaces, used by a class, cohort or year level at the same school, and classified in accordance with the five spatial types identified by Dovey and Fisher (2014). The five typologies (see Figure 1) may be differentiated by their relative degree of openness and interconnectedness, from traditional classrooms (Type A) to permanently open-plan spaces (Type E).

Type A – A cluster of traditional classrooms connected by a corridor.

Type B – Identical to type A except that the corridor connecting the traditional classrooms is widened to create a breakout space, identified as ‘street-space’.

Type C – The walls between two or more adjoining classrooms are made flexible, enabling these classrooms to be joined, creating a new space identified as ‘commons’.

Type D – The walls between adjoining classrooms and the street space are flexible, allowing the entire learning environment to become one large space, whilst also retaining the ability to close it down into traditional classrooms.

Type E – The space is open plan. The environment cannot be converted into traditional classrooms without major renovation.

Figure 1: A visual representation of the five learning environment types defined by Dovey and Fisher (2014), adapted by Soccio and Cleveland (2015).
Evaluation methodology & methods

Three phases of fieldwork were involved in evaluating each learning environment using LEaRN Evaluation Module 3. This iterative methodology allowed emerging insights to be pursued and more detailed understandings to be attained. The processes of data collection associated with each phase are outlined below:

**Phase 1 (online surveys, refer to Figure 2)** – involved a school leader, commonly the Principal or Assistant Principal, completing an online survey about the school’s culture, teaching practice and educational philosophy. Subsequently, the teachers and students that used the learning environment being evaluated completed an online survey about their day-to-day experiences using the space for teaching and learning activities.

*Figure 2: Online survey participants in Phase 1*

**Phase 2 (observational walkthrough, refer to Figure 3)** – involved a learning environment expert (LE Expert), commonly a Principal Consultant or Regional Director from the Catholic Education sector or a LEaRN Researcher, completing an observational walkthrough and accompanying online survey about the qualities of the learning environment being evaluated. These ‘walkthrough’ surveys were completed following consultation with the teachers who regularly used the space.

*Figure 3: Learning Environment Expert participant in Phase 2*

**Phase 3 (focus groups, refer to Figure 4)** – involved the teachers and LE Expert who completed the online surveys participating in a one-hour focus group (Bryman, 2004) about the learning environment evaluated. The findings arising from the earlier survey results were used to prompt discussion about the factors that were found to have enabled and/or constrained teachers and students from using the learning environment in accordance with each school’s educational philosophy and desired pedagogy. This process enabled assumptions about the learning environments being evaluated to be “exposed, described and explained in ways that brought fresh insights” (Walsh & Downe 2005, p. 205).

*Figure 4: Focus group participants in Phase 3*

Data analysis and the production of findings

In total, 3872 students, 300 teachers, and 11 LE Experts participated in the project – all of whom shared important insights and perspectives into their lived experiences (Lefebvre, 1991) of the space(s) they inhabited and/or observed in detail.

Following the development of an online interface and database for LEaRN Evaluation Module 3, data collection for the period 2015-2017 was paired with a process of annual meta-synthesis (Walsh & Downe 2005) of the findings arising from the participating schools in each year. The purpose of this meta-synthesis was to develop ‘big picture’ lessons learned about the design and use variables that contributed to the effectiveness of the learning environments that were evaluated.

The TELE project aimed to understand and explain phenomena associated with the lived experience of different types of learning environments. To achieve this a mixed-methods approach involving meta-synthesis of both quantitative (survey results) and qualitative (survey comments and focus group discussion) data was used.
Design and Use Guidance

Based on the findings of the TELE project
Geographical Engagement

Affinity
Belonging
Ownership
Mastery

Do users demonstrate affinity for, and mastery and ownership of, the learning environment?

Students’ geographical engagement (Cleveland, 2016) may be influenced by their affinity, mastery and sense of ownership of the learning environment. Positive geographical engagement may be expressed in the way students organise themselves and their environment to support social learning activities, and may influence their ability to engage in learning with some autonomy. Conditions for teaching and learning may be optimised when teachers and students are relaxed, self-directed and accountable for their teaching and learning.
Affinity for the Learning Environment

Factors found to enhance affinity for the learning environment

Design

“What I really love about this space is my colleagues. I love that I can see them. I feel surrounded. I feel connected. I feel supported”

- Spaces that are designed for communities of teachers and students, supporting strong social connections and cohesion;
- Stimulating environments that feature a variety of learning settings, able to accommodate diverse learning activities;
- Spacious and uncluttered spaces;
- Good links to the outdoors – visually and physically, allowing observation and movement between indoor and outdoor settings;
- Domestic-style interiors that do not look institutional;
- The availability of quiet withdrawal/reflective spaces;
- Natural light.

Use

- A welcoming and communal culture amongst teachers and students;
- Maintenance of orderly and tidy environments, including the intentional placement of furniture and resources to maintain a sense of order and purpose;
- Effective support from school leaders related managing students with behavioural issues.

Sense of Belonging and Ownership

Factors found to enhance a sense of belonging and ownership

Design

“The environment makes me feel a lot more comfortable. I feel like I’m at home, instead of in an institution”

- Learning environments that feel comfortable and homely.

Use

“Teachers and students can use many different spaces in the environment, which contributes to their ownership of the space”

- A school culture where teachers and students are empowered to make active choices about where to work and freedom to modify spaces to suit their teaching and learning activities;
- A culture of mutual-respect that fosters good relationships: teacher-teacher, teacher-student and student-student;
- The collaborative use of display space (2D and 3D) by teachers and students to create a sense of ownership and belonging, and celebrate students’ work and achievements;
- Adopting organisational structures that help students (particularly those in secondary schools) establishing a sense of belonging to a place/social group, despite being timetabled to classes in multiple spaces across a campus;
- Supporting teachers to embrace moments of spontaneity in their classes, including mediating concerns about noise disrupting others.
Mastery of the Learning Environment

Factors found to enhance mastery of the learning environment

Design
- Learning environments designed with a variety of learning settings that enable multiple activities to be offered concurrently – and the option for students to move between settings when required;
- Learning environments that feature well-integrated furniture and technology, with both working in unison to optimise teaching and learning opportunities.

Use
“We are continually experimenting with using the space differently”
- School leaders’ encouragement of teachers to test pedagogical ideas and experiment with different spatial arrangements and/or patterns of use (routines);
- Establishing shared expectations amongst teachers and students about the nature of collaborative practice;
- Establishing a common educational vision and supporting successful ideas so they may be ‘scaled up’ and shared across the school;
- Allowing sufficient planning time for teachers to collaborate, reflect on their practice and develop effective strategies for using shared spaces and resources.
Size and Scale

Student supervision
Crowding
Flexibility
Operable space

Does the overall size and scale of the learning environment support a variety of learning modalities?

The size and scale of the learning environment may influence the way students and teachers are socially organised, as well as influence opportunities for a variety of teaching and learning modalities to be adopted.
Monitoring

Factors found to enhance monitoring of student activity

Design
“The glass doors and paneling allow visibility of students who are working in the ‘gallery’ outside of the classroom”

• Adequate size of learning environments to allow teachers and students to move readily within the spaces;
• Unobstructed sightlines through the learning environment, allowing teachers to oversee students’ activities;
• The space is not so large that students are too spread out for teachers to monitor and support them;
• Software that allows teachers to monitor students’ online activities;
• Large aperture doors that open between classrooms and/or onto break-out spaces/common areas to allow movement between spaces/settings.

Use
“There is tremendous support amongst our group of teachers”

• A culture of collaborative practice amongst teachers;
• Establishing a culture of trust and developing responsible student behaviours;
• Making students aware that their activity is being monitored by teachers as they move around the learning environment;
• Monitoring students’ progress on learning activities, including consistently checking/assessing the products of their work;
• Encouraging students to report ‘wrong’ behaviour to their teacher(s), particularly the misuse of digital devices;
• Keeping windows clear and unobstructed by displays of student work or learning resources;
• Positive teacher attitudes towards developing students’ independence and interdependence.

Sufficient Space

Factors found to enhance a sense of sufficient space

Design
“There are lots of different spaces, so my feeling is you have enough space because there are many spaces to choose from”

• Learning environments that feature a variety of learning settings;
• Furniture that is well-matched to the scale of the space (i.e. not over-furnishing);
• Adequate floor area.

Use
“The use of space is negotiated between teachers as-well-as students across different year levels. Good relationships enable this”

• Equitable access to all spaces within the learning environment – such as across a day or week;
• Teachers coordinating/planning which spaces will be used for specific activities (such as the use of break-out spaces/common areas by different classes);
• A culture that promotes good relationships between all members of the learning community (i.e. teachers and students).

Flexibility and the Use of Operable Space

Factors found to enhance the flexibility and use of operable space

Design
Operable doors (or walls) that are lightweight, easy to use, and do not require an independent locking mechanism;
• Good acoustics that allow adjoining spaces to be effectively used when connected (opened) as-well-as separated (closed);
• Furniture that allows reconfiguring of the space without blocking access to operable doors or requiring the furniture to be moved.
Use

“For a maths class, the doors are often closed. For inquiry sessions, they are often open. There is no default position, it changes so regularly”

- A culture that encourages teacher collaboration;
- The nature of learning activities determines the logical opening and closing of adjoining spaces, rather than blanket set of rules or expectations;
- Timetabling of activities in adjoining spaces that are complementary;
- A culture of tolerance to some level of noise from adjacent groups.

A well-utilised space featuring a variety of purposeful (yet adaptable) learning settings.
Activity Settings

Learning activities

Encounters

Does the learning environment provide suitable settings to support the desired learning activities?

The variety of activity settings available to teachers and students may influence the types of pedagogical encounters [teaching and learning activities in different sized groups] they have access to and the quality of their teaching and learning experiences.
Variety of Learning Activity Settings

Factors found to enhance a variety of learning activities

Design

“The learning street has a huge variety of uses. We have all four classes in there at times, and then small groups with teachers working at different times. The small space also is like an office. It’s used as a meeting space and a small group learning space”

- Differentiated spaces that are available to support a variety of activities (e.g. accessible wet areas in primary schools that may be used for art, cooking, science or general learning activities that may generate mess);
- Break-out spaces and learning commons in immediate proximity to classrooms, with good visual connections;
- Outdoor learning settings with adequate protection from ‘the elements’, so poor weather conditions do not prevent their use (wind, heat, rain);
- Interior design elements, that include:
  - Lockers integrated into the learning environment that are of a suitable height to be used as work surfaces for standing activities, as-well-as to display three-dimensional objects (e.g. learning resources or students’ work)
  - Well-distributed display technologies (e.g. digital screens) that afford access to teachers working with groups of students and/or smaller groups of students working independently
  - Raised platforms/stage areas that may be used for performances, large group meetings, or a variety of floor-based activities that require students and materials to be spread out.

Use

“If one grade is doing debating, for example, and the grade next door is trying to read quietly, then it becomes problematic as the noise travels and can’t be contained”

- Synchronised activity across groups/classes using shared spaces;
- Teachers planning together for a variety of learning activities across the day;
- Teachers’ acceptance that productive noise may be generated by learning activities, especially when students are highly-engaged in collaborative tasks.
Specific Activity Settings

Factors found to enhance the use of specific activity settings

Design
- Spaces that are purposefully designed and/or furnished to differentiate activities across different learning settings;
- A mix of loose and fixed furniture items provide environmental cues about how the learning setting could/should be used;
- The floor area occupied by different learning settings aligns with the group sizes and types of learning activities that are anticipated;
- A variety of soft and hard surfaces helps delineate different learning settings;
- Agile and reconfigurable furniture allows new layouts to be readily created in support of students wishing to work individually, in pairs or in small groups;
- Good visibility between adjoining spaces that enables teachers to monitor students’ activities and feel comfortable with students working in adjoining settings;
- Good acoustic performance/separation of learning settings, allowing collaborative activities without unacceptable noise levels.

Use
“One room is dedicated to craft and messy activities, allowing students doing similar things to work in closer proximity”
- Teachers working collaboratively and sharing access to the variety of activity settings that are available across the learning environment.
Furniture to Support Learning Activities

Variety
Mobility

Does the furniture support the desired learning activities?

The design and selection of furniture may influence students’ and teachers’ engagement in teaching and learning activities. Furniture items may mediate the number of students and teachers involved, their distribution, and their opportunities to participate in certain activities. For example, tables of a certain size and shape might be well-suited to small group meetings, while other larger tables might be better suited to boardroom-style meetings or painting murals. Similarly, soft seating might afford a comfortable place to read, while a stool might offer a temporary place to sit amidst a more active learning setting.
Use of Furniture for Learning Activities

Factors found to enhance the use of furniture for learning activities

Design
“The tables allow for a range of spatial configurations and a range of different activities”

- Furniture items that are purposeful – not necessarily mobile (i.e. appropriate for the learning setting and types of activities to be undertaken);
- Regular shaped tables that are large enough to accommodate the learning materials that students require (e.g. laptops and/or books);
- Tables that may be reconfigured in a variety of ways (may be of varying heights);
- Varied furniture items, including items such as ‘solo stations’, ottomans, couches, tiered seating, and cushions/beanbags;
- Furniture that is appropriately sized for students;
- Furniture designs that allow for teachers to sit with students;
- Chairs designed to fit under the desks and are not too bulky;
- Furniture on wheels;
- Stackable chairs.

Use
“When group work starts I don’t want to utilise the breakout areas … I want the groups close together, in one space, so I can see that they are on track … It is when they get into the real project work (when the ideas are known) that I want the groups to find the space and furniture that suits them in getting the work done”

- Providing teachers and students with opportunities to be involved in furniture selection, including the opportunity to test prototypes;
- Allowing students choice of where to work;
- Purposeful use of furniture settings to align with activities.
Opportunity for Agile and Flexible Use

Connections

Sightlines

Does the learning space provide opportunities for agile and flexible use?

Opportunities to use learning environments with agility and flexibility may have an impact on students’ activities and their learning modalities. Such dynamism may be underpinned by teachers’ pedagogies and their ability to supervise students effectively, as well as by students’ sense of ownership of their learning environment.
Connections to Outdoor Learning Environments

Factors found to enhance the connection to outdoor learning environments

Design
“There is excellent access to a large covered outdoor learning deck”
• Direct connections and clear sightlines between indoor and outdoor spaces;
• Access to technology or other learning resources outside;
• Appropriate outdoor landscaping and/or furniture;
• Adequate weather protection in outdoor learning environments.

Use
“I like the flexibility students have to work out in the garden area. It is something that the students have ownership over and it allows them to be creative and to seek out an area that suits their needs for that session”
• Teachers allowing students some autonomy regarding where they work;
• Providing a clear focus for outdoor activities;
• Multiple teachers sharing responsibility for supervision across indoor and outdoor areas;
• Clear expectations set by teachers about appropriate student behaviour and maintaining standards through privileged access during lessons.

Sightlines to Adjoining Areas

Factors found to enhance good sight-lines to adjoining areas

Design
“The open area allows easy access within the learning environment and good sightlines”
• Glazed walls, especially between general learning areas and break-out spaces/common areas;
• Half-height partitions and furniture;
• Open design of learning environments (in type D and E learning environments).

Use
“The level of visual connection is dependent on the retractable walls being opened up or closed down”
• A culture of collaboration that encourages teachers to maintain or create an open environment physically, socially and culturally;
• Student work and learning resources displayed on dedicated display boards so that glass walls or windows are kept clear;
• Positioning of furniture so that good sightlines are retained.

Low furniture height ensures good sightlines across open learning environments
Provision of Resources

Computers
Reading materials
Physical materials

Is the learning environment adequately resourced?

The availability of learning resources and materials may impact the variety of activities that students can engage in and the learning modalities available to them.
Access to Computers

Factors found to enhance access to computers to support learning activities

Design

“The role of desktop computers is to support students in their learning by way of creating/publishing documents, research, creating movies, slideshows and presentations”

- Reliable wi-fi access that gives teachers confidence using technology with their students;
- Bring-your-own-device (BYOD) programs that give schools control over operating systems, so they can provide technical support, software updates and maintenance;
- Provision of distributed desktop computers for instances when larger screens are needed and/or more processing capacity is required for programs that don’t run well on students’ laptops;
- Well-located power points for students to charge their laptops safely;
- Ensuring that the devices being used are well-matched to learning tasks (e.g. laptops are better than iPads for work requiring a lot of keyboard input).

Use

“The laptops enable the type of movement that we encourage in our classrooms”

- Access to laptops that allow students to work in a variety of learning settings, including with others;
- Expectations that students will take their devices home to charge the battery, reducing the need for bulky device storage and re-charge stations/trolleys;
- Providing students with adequate technical support to ensure they have the required software and digital curriculum resources.

Use of Display Technologies

Factors found to enhance the use of display technologies for learning activities

Design

- The provision of multiple digital screens in the learning environment, including in break-out/ common areas;
- Digital screens in learning spaces that allow teachers and students to connect wirelessly from any device – reliably (e.g. not just from Apple devices to Apple TV);
- Well-positioned display screens, with consideration given to acceptable viewing angles and distances, and the flexible positioning of furniture in relation to the screen(s).

Use

- Quick responses to issues from technical support staff;
- Ready access to online resources and student work via platforms such as Google Docs and Google Classroom;
- Equipping teachers and students to use technologies to their full capacity;
- Keeping equipment well-maintained.

Digital screen located for student and teacher use in a shared learning area.
Hands-on Learning Resources for Learning Activities

Factors found to enhance the use of resources for learning activities

Design

“Each learning hub has a dedicated cupboard for storage of hands-on materials”

- Easy access to hands-on resources;
- Storage walls and cupboards that help maintain learning environments looking orderly and neat;
- Ready access to an adjacent library or resource centre from the learning environment;
- Provision of secure storage.

Use

“There have been plenty of times where I have been explaining a concept and I’ve thought how good it would be to find an artefact to engage in another way of thinking about the problem”

- Teachers have a clear purpose for hands-on resources;
- The resources on display are regularly ‘refreshed’ to keep students engaged;
- A culture of respect towards caring for shared resources.

A library providing ready access to reading materials from the learning environment.
Storage of Belongings and Shared Resources

Student storage

Shared storage

Secure storage

Is there adequate provision for the storage of students’ belongings and class resources?

The ability to store belongings and learning resources, and to access them as required from the learning environment, may influence the variety of learning activities that can be offered to students.
Storage of Student Belongings

Factors found to enhance storage of student belongings

Design
• Lockers situated in wide corridors or open learning commons, to allow access without undue congestion or disruption to circulation (secondary schools);
• Bag hooks located in a dedicated zone that can be kept tidy near the learning environment (primary schools);
• Ensuring lockers (secondary) and storage tubs (primary) are large enough for the required belongings;
• Provision of dedicated space for drink bottles (primary schools);
• Chairs with built-in bag/book storage, enabling convenient access, movement and freeing up desk surfaces;
• Providing dedicated storage for art-works and other works-in-progress.

Use
• Making pencils, pens and other materials available to students so they don’t require as much personal storage space (primary);
• Maintenance of lockers to keep them in good working order (especially the locks).

Storage of Shared Resources

Factors found to enhance storage of shared resources

Design
• Readily accessible storage within shared spaces/learning commons;
• Storage provision within reach of students i.e. not above eye level;
• Limiting the depth of shelving so materials don’t get lost behind other resources;
• Providing mobile trolleys for hands-on resources and storing/charging shared technology.

Use
• Teachers planning what resources are required and collecting these from a central location;
• Teachers sharing responsibility for learning resources with colleagues and keeping storage areas tidy;
• Consulting teachers annually about storage requirements to keep pace with program updates and ensure adequate provision;
• Aligning resource provision with timetables to ensure resources are accessible and adequate for the class/ cohort;
• Equitable allocation of storage areas amongst teachers.

Secure Storage for Teachers

Factors found to enhance secure storage for teachers’ use

Design
• Lockable cupboards within the learning environment where teachers can store their personal belongings;
• Lockable cupboards integrated into teacher’s (mobile) workstations.

Use
• A culture of respect within the school that reduces the need for secure storage;
• Storing important documents or medications in the central administration office, rather than in the learning environment.
Movement of People and Objects

Teacher movement
Student movement

Does the movement of people and objects align with the desired pedagogies and learning activities?

The degree to which students can move within the learning environment, including making choices about where they learn and with whom, may affect their ability to take ownership of their learning as well as their capacity to develop the agency required to become self-directed learners.
Movement of Teachers in the Learning Environment

**Factors found to enhance the ability of teachers to move around the learning environment**

**Design**
- Learning settings (defined by furniture arrangements) that afford teachers ready access to students, including the option to sit with individuals or small groups of students to engage in discussion and provide feedback;
- Access to learning commons or break-out spaces that enable students to work in a variety of settings beyond the classroom and teachers to join them as required (these may be shared by multiple classes and/or year levels);
- Uncluttered environments with good sightlines;
- Moveable whiteboards that allow teachers to provide instruction from multiple locations in the learning environment;
- Wireless connectivity between teachers’ devices (e.g. laptops or tablets) and display technologies, such as LCD screens or data projectors.

**Use**

“In some instances when I have been team-teaching I look over at my colleague and we realise that we are redundant. The students are engaged and supporting one another. So, in these cases, we then need to move around the room looking for ways to challenge students to move to the next level. Our movement becomes about enabling and promoting even greater levels of engagement”

- Collaborative (team)-teaching practices that permit the coordinated supervision of students across multiple settings/spaces;
- Well-understood routines and expectations that students will complete work independently, or in groups, with support from teachers as required;
- Encouraging teachers not to rely on traditional pedagogies (instruction from the front of the class).

Movement of Students in the Learning Environment

**Factors found to enhance the students’ ability to move around the learning environment**

**Design**

“Excellent lines-of-sight enable movement of students anywhere in the space and they still remain visible”

- Good sight-lines;
- A variety of purposeful learning settings (furniture arrangements) that offer students choice regarding which settings might best support their activities.

**Use**

“Students are allowed to choose where they sit, but are instructed to be mindful of how it affects what they are doing”

- Clearly articulated and well-recognised routines that govern acceptable patterns of student movement and access to technology;
- Teachers engaging students in on-going discussions about how to effectively participate in self-directed learning;
- Students with behavioural issues entering into contracts with teachers to limit disruption to other students’ learning activities.
Provision and Use of Display Space

2D displays
3D displays
Display areas

Is there adequate display space, which is used effectively to communicate with all members of the learning environment?

The provision and use of display space may influence opportunities to share learning resources, celebrate students’ work, and create a shared sense of ownership of the learning environment for teachers and students.
Provision of Two-Dimensional Display Space

**Factors found to enhance the provision of two-dimensional display space**

**Design**
- Well-integrated display surfaces that take advantage of vertical (wall) surfaces to offer easy to use display opportunities and/or writable surfaces;
- Acoustic wall panels/materials that double as display space, allowing learning resources to be attached with velcro and/or other easy fixing devices;
- Storage cupboards that are covered in pinable surfaces.

**Use**
“There are great pin-boards outside the classroom that I can use for displaying student work. I tend to use the inside walls for displaying learning resources”

- Display spaces that are accessible to the whole learning community, or school, to celebrate student achievement;
- Digital technologies [e.g. large screens] that are available for sharing learning resources, student work and school notices.

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Provision of Three-Dimensional Display Space

**Factors found to enhance the provision of three-dimensional display space**

**Design**
- The provision/design of dedicated spaces for 3D display, ensuring that learning environments are not cluttered with objects that may be broken or cause harm;
- The integration of display spaces on top of cupboards for 3-D objects such as sculptures or models made by students;
- The provision of narrow shelves on classroom walls that may be used to display small scale 3D student work.

**Use**
- Recognition that ‘object-based learning’ may enhance students’ educational experiences [i.e. the value of 3D learning resources is not limited to specialist subjects such as Art and Science].

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Dedicated cabinets for the display of three-dimensional student work and learning resources (not yet in use)
Use of Display Areas

Factors found to enhance the use of display areas

Use

“Many of the children in my class commented on the way they use posters and displays as a strategy to help their learning in their self-reflection reports at the end of last term”

• Teacher understandings of the value of effective displays for making learning visible, sharing of ideas, and benchmarking expected (or aspirational) levels of student achievement;

• School leaders’ expectations that display spaces will be used to good effect;

• The regular ‘turn-over’ of displays;

• The display of learning resources in the areas where students are working, making such resources accessible and able to be readily referenced;

• The display of students’ work in recognition of particular achievements, rather than displaying every student’s work for every project;

• The well-curated use of digital displays.

The purposeful curation of learning resources and examples of students’ work
Character and Aesthetics (Affective domain)

Colour
Materials
Furniture
Views
Symbolism

Do users like the character and aesthetics of the learning environment?

The character and aesthetics of the learning environment may influence how people (students and teachers) ‘feel’ about the spaces they occupy. The variables assessed here (design, colours, materials, furniture, views and symbolism) may each contribute to occupants’ affective responses to the spaces they occupy.
Colour and Materials

Factors found to enhance the aesthetics of the learning environment

Design
“It’s colourful and new which allows learning to be more fun and motivating”

- Colours, patterns and textures that help define different spaces/settings and give them an identity;
- Light, playful colours that make the space feel welcoming;
- Neutral background tones that allow for ‘bursts of colour’ to come from displays of student work and allow teachers to change the identity of the space to suit the teaching and learning focus;
- Colours that are considerate of students with sensory issues, who can feel ‘overloaded’ by too many colours and/or busy patterns;
- Materials that are contemporary but not ‘over-designed’;
- Furniture of varied heights, shapes and colours (including tables and soft furnishings);
- Hard-wearing surfaces which are easily maintained and kept clean;
- Hard (washable) surfaces used in learning environments for art and science;
- Soft surfaces, including floor coverings, that provide a ‘nice’ tactile experience.

Views to the Outside

Factors found to enhance views to the outside

Design
“The large windows and glass doors make the outdoors part of our learning space. It adds to the calming effect to have the greenery and natural light”

- Views that highlight elements of the natural environment, such as gardens and tree tops;
- Ensuring materials/design elements don’t obstruct views, such as frosted glass, poorly positioned hand rails, and windows that are positioned too high to take advantage of the view;
- Optimising elevated positions to offer good views.

Use
“The students view the school as environmentally friendly and sustainable … [they] are quite environmentally aware and are able to identify with those aspects”

- A school culture that fosters awareness of the natural environment;
- Views that are accessible (i.e. unobstructed by student work and/or learning resources displayed on windows or closed blinds).
Symbolism

Factors found to enhance the symbolism of the learning environment

Design

“The school vision of nurturing creativity and curiosity, with an emphasis on social skills, ties in with the environment being flexible and well-suited to collaboration”

- Contemporary layouts and furniture choices that align with the school’s educational vision and the types of teaching and learning activities that are promoted in teacher professional development;
- Inspiring names of spaces, such as names derived from historical, religious or cultural figures, that symbolise key educational values;
- High quality facilities that promote a sense of pride in students.

Use

“Children experience a sense of ownership of the learning environment as they developed the vision statement regarding the use and care of the learning environment. Accordingly, students are aware of the boundaries and expectations, empowering them to grow in their independence”

- The ability of staff to articulate the school’s educational vision;
- Collaborative testing of new ideas associated with the vision;
- Effective school leaders who clearly and regularly articulate to the teachers what the school’s educational vision is through professional development and the school’s strategic plan.
Accessibility

Disability access

Way-finding

Is the learning environment easily accessible?

The ability of students and teachers to access the learning environment may be compromised in several ways. Movement may be restricted by level changes, the lack of lifts or other devices to aid transition between floors, large distances between learning areas, narrow doorways, as-well-as clutter that may restrict passage within the learning space. Poor way-finding cues may also limit effective movement around a campus.
Access

Factors found to enhance disability access to learning environments

Design
“It doesn’t look like a disabled person’s ramp”
- Accessibility ramps that are conveniently located and used daily by students for general movement, not just by disabled students (i.e. Universal Design);
- Ramps that are wide-enough to enable a person with limited mobility to move with a group (i.e. peers);
- Learning environments located on the ground floor, or located on a single level above ground that is well-serviced by a lift;
- Lifts that are logically located, well-signed and easily accessible;
- Wide doorways and corridors;
- Magnetic strips that hold doors open;
- Automatic doors;
- External doors that open outwards.

Use
- The availability of teachers to provide assistance;
- The availability of alternative spaces (such as the library) into which classes may be relocated if a student is temporarily disabled;
- Procedures that facilitate access to lifts without relying on a single staff member (e.g. to unlock the lift);
- Ensuring students, staff and visitors are aware of access/lift locations.

Wayfinding

Factors found to enhance way-finding

Design
“As our school grows clear signage will be required to ensure way-finding”
- Intuitive campus design;
- Effective signage;
- Learning environments designed with a unique architectural character, distinguishing them from other buildings/learning environments on the site.

Use
- Clarity and user-friendliness of visitor induction programs;
- Additional signage and navigation support during temporary building works.

Clearly defined internal circulation routes may aid way-finding
Security

Experienced safety

Perceived safety

Do students and teachers feel safe inside the learning environment?

Teachers’ and students’ perceptions of safety may influence their ability to carry out their desired activities.
Safety

Factors found to enhance a sense of safety

**Design**

“The learning environment is open for staff to view others at all times”

- Good sightlines so teachers and students are visible;
- Spaces that are designed to be age/size-appropriate (e.g. furniture and fittings are of an appropriate height for users);
- Staff rooms that are distributed throughout the school/buildings/learning environments;
- Exit/entry-ways that are readily visible and accessible from inside the learning environment;
- Well-distributed lockers that do not create bottlenecks during peak student movement;
- Consistent lighting (limiting dark areas);
- Doorways that open in a consistent direction.

**Use**

“We share our space with other staff. I feel very safe”

“The school is very vigilant about online safety”

“Our students are encouraged to engage with all teachers all the way through from kinder. We are a team of teachers”

- The presence of multiple adults within the learning environment (e.g. team-teaching);
- The familiarity of teachers and students with school safety procedures;
- A welcoming and inclusive school culture that encourages students and parents to approach school staff to discuss safety concerns;
- Teachers who embed the school’s values (e.g. ‘respect’) into daily lessons;
- Ensuring the occupation of spaces does not lead to overcrowding;
- Teachers who give students choice about where they can work within the learning environment and with whom;
- Teachers who regularly engage with students as they move around the learning spaces/campus;
- The monitoring of students’ online access and activities.
Student Toilets

Access

Safety

Can students access the toilet area safely?

The accessibility of toilets from the learning environment, as-well-as perceptions of safety when using toilets, may significantly influence students’ propensity to use toilets when required and the quality of these experiences. In turn, concern about their toileting experiences may influence their ability to engage effectively in learning activities and with school more generally.
Access to Toilets

Factors found to enhance the accessibility of toilets

Design
• Toilets located with direct access from the learning environment – plus external access (either direct or indirect depending on building design);
• Short travel distances to toilets from the learning environment;
• Toilets located on the same level as the learning environment;
• Adequate number of cubicles for the number of students using them to avoid queues and overcrowding.

Use
• Adequate monitoring of toilet areas by teachers;
• Procedures for providing internal and external access to toilets at different times of the day (to ensure security);
• Well-maintained toilets in good working condition (including locking mechanisms);
• Maintaining good levels of hygiene.

Perception of Safety in Toilet Areas

Factors found to enhance the perceptions of safety in toilets

Design
• Toilets located near the learning environment, allowing good sightlines for passive supervision by teachers;
• Cubicle doors and partition walls that are full height (floor to ceiling);
• Cubicles that are self-contained with their own toilet, hand-basin and mirror;
• Toilet areas that are well lit;
• Effective door locking mechanisms that allow students to feel secure when using the toilet (i.e. not likely to be disturbed), including clear indicator on the inside to show when the door is locked;
• Positioning of toilets away from isolated areas or campus boundaries or gates.

Use
• Protocols that encourage/ensure students go to the toilet in pairs (particularly in primary school);
• Toilets kept clean and in good working order;
• Provision of separate toilets for younger and older students.
Occupant Comfort (acoustics)

Distractions
Hearing
Noise levels

Does the learning environment provide a comfortable setting for teaching and learning (acoustics)?

The acoustic performance of the learning environment may significantly influence the ability of students and teachers to engage in learning activities, particularly those requiring speaking and listening. Background noise (volume and reverberation) may also have an impact on students’ and teachers’ acoustic comfort.
Distraction in the Learning Environment

Factors found to enhance ‘comfortable’ levels of distraction

Design

“I could pop my head into the other room and let the teacher know I’d be closing the door for a while and then I could open it back up again when the noisy activity was finished”

- Readily-operable doors that provide the option to close down a space to reduce distraction from noise or movement;
- The availability of ‘alternative spaces’ for either noisy or quiet activities;
- Effective acoustic separation between learning spaces, such as between classrooms and break-out/common spaces;
- Good acoustics in open environments.

Use

- Establishing shared expectations about noise levels for teachers and students;
- Team-teaching, with classes doing complementary activities;
- The coordination of activities to reduce the impact of large numbers of students moving during class-time;
- A culture that accepts distraction as a part of curiosity.

Ability to Hear Teachers’ Instructions

Factors found to enhance students’ ability to hear teachers’ instructions

Design

- The provision of acoustically controlled spaces within larger learning environments – such as small and medium-sized meeting rooms – that may be used for noisy or quiet activities, including targeted teaching sessions;
- Avoiding the provision of very large spaces in which teachers’ voices ‘get lost’.

Use

- Effective methods of delivery, such as short instructional activities that are focused and engaging (delivered before allowing students to move off to participate in small group or individual activities);
- Gathering students in close proximity for instructional activities (rather than speaking to students that are dispersed across large areas);
- The regular programming of small/medium group instructional activities, as opposed to whole class or cohort instructional sessions.
Noise Levels

Factors found to enhance acoustic comfort

Design

- Good quality acoustic treatment within the learning environment to reduce reverberation;

- Design that recognises the need to compensate for internal and external noise (e.g. HVAC systems, fans, car traffic).

Use

“We use noise level charts so we can set the level according to the activity”

- Establishing shared expectations about reasonable noise levels, including modification in relation to certain forms of activity;

- Aligning teaching and learning activities across the classes or groups sharing a given learning environment;

- Encouraging positive teacher attitudes (mindset) to ‘productive noise’;

- Using learning environments for the number of students they were designed for (not overcrowding).
Occupant Comfort (thermal and air quality)

Thermal Quality
Air Quality
Air Flow

Does the learning environment provide a comfortable setting for teaching and learning (thermal comfort)?

The ability of students and teachers to engage in learning and teaching activities may be dramatically influenced by the temperature and air quality in the learning environment. Poor thermal conditions (high or low temperatures) and/or poor air quality (e.g. high CO2 levels) may negatively impact their wellbeing and their ability to participate productively.
Thermal Comfort in the Learning Environment

Factors found to enhance thermal comfort

Design

“The large doors provide for lots of breeze coming through the entire learning space, making a comfortable environment to work in. The high ceilings also contribute to air quality and air flow”

• Well-insulated buildings that retain heat in winter and reduce heat gain in summer;
• Passive cooling design, including operable windows and doors, avoiding west-facing windows, as-well-as high louvres for purging hot air at night;
• Heating and cooling systems that are well-distributed so they reach all learning spaces;
• Well-zoned thermostat control;
• Efficient and effective heating, ventilation, and air conditioning (HVAC) systems.

Use

“We turn the cooling on before lunch on a hot day to cool the students down when they come in”

• Turning on heating or cooling in advance (as required);
• The effective operation of night purging louvres in summer;
• Quick response from maintenance / administration teams to fix issues relating to heating / cooling systems.

Air Quality and Air Flow

Factors found to enhance quality and air flow

Design

• Buildings designed to allow passive cross-ventilation;
• Operable windows (sufficiently large for air flow) that allow user control;
• Effectively designed and positioned ceiling fans;
• High louvres, or vents, for purging hot air in summer and improving air circulation generally;
• Fly screens on operable windows;
• Consideration given to the location of operable windows to ensure external noise doesn’t make them unusable.

Efficient heating, ventilation, and air conditioning (HVAC) systems can maintain thermal comfort.

Operable windows, ceiling fans and high ceilings can help maintain air flow and good air quality.
Occupant Comfort (lighting)

Light Quality

Reflection/glare

Does the learning environment provide a comfortable setting for teaching and learning (lighting)?

Quality of lighting may have an impact on the ability of students and teachers to engage in learning and teaching activities without the distraction of too little or too much light, or issues of sunlight reflecting off screens. Natural light has been shown to promote wellbeing and productivity in the learning environment.
Light Quality

Factors found to enhance light quality

**Design**
- A mix of natural daylight and artificial light (as required);
- Zoned lighting that enables natural and artificial light to be modified to suit different activity settings and activities;
- Internal glazing that allows natural light to penetrate deeper into buildings, such as into learning common or meeting rooms;
- South facing windows – and effective shading devices on windows facing other orientations – that allow natural light to enter learning spaces without causing problems associated with glare.

**Use**
- Effective use of blinds to reduce glare when needed, but allowing natural light in as the default setting.

Control of Sunlight Reflection and Glare

Factors found to enhance the control of sunlight reflection and glare

**Design**
“The projectors have a very high luminosity so there is no reflection and the room doesn’t have to be dark to see the projected image”
- Protection from direct sunlight, particularly on the northern side of buildings, via external shading devices and/or extended eaves;
- Orientation of buildings to avoid direct exposure to western or northern sunlight;
- Blinds or curtains to control natural light when necessary;
- Spatial arrangements that provide students with the option to relocate to alternative settings to avoid glare;
- LCD screens and/or projectors with high levels of luminosity;
- Matt finishes on screens used for display;
- Display screens that may be repositioned and/or reoriented to avoid unwanted reflection.

**Use**
“I often book a particular room in the library for watching films or documentaries so that students can clearly see the screen”
- Availability of rooms that can be darkened for viewing films or other digital content.
Teacher Support Spaces

Location
Connection
Collaboration

Are teaching support spaces well located and designed?

The location and connection of teacher support spaces [staff workspace] in relation to learning environments may impact the ability of teachers to effectively collaborate in the planning and resourcing of student learning. The layout of such spaces may also encourage, or discourage, collaboration between teachers. Visual connections between teacher support spaces and learning environments may also be desirable. Such arrangements can enable teachers to monitor students’ activities, as well as model collaborative practices to students and other members of staff.
Location and Design of Teacher Support Spaces

Factors found to enhance teachers’ use of support spaces

Design
“Our teacher space is directly adjacent to classrooms and is all glass”

- Teacher support spaces are centrally located, easily accessible and encourage teachers to feel part of an inclusive social environment;
- Good visual connections between teacher support spaces and learning environments;
- Teacher support spaces that offer adequate storage, either within the support space and/or within the adjacent learning environment;
- Good acoustic separation between teacher support spaces and the learning environment for times when privacy is required.

Use
“Teachers at this school never sit at their desk. They do a lot more planning at standing desks and share spaces”

- Flexible use of learning spaces for teacher planning;
- The strategic timetabling of specialist classes to free up learning environments for planning by teams of teachers – mostly in primary schools.

Collaboration in Teacher Support Spaces

Factors found to enhance collaboration in teacher support spaces

Design
- A variety of different sized settings that can accommodate teachers meeting in small and large groups;
- Furniture that is designed for collaborative activities, such as boardroom tables or booths.

Use
“Collaboration is a core part of our day-to-day work and by collaborating with one another, we are role modelling to our students how collaboration can be done. Through collaboration more can be achieved than is possible for just the individual”

- A school culture that values and promotes collaboration;
- The regular and adequate time-release of groups of teachers to allow for meaningful collaboration.

A ‘boardroom-style’ furniture arrangement supportive of teacher collaboration.

A setting within the learning environment used frequently by teachers for collaborative planning
Staff Professional
Development

Teacher support
Opportunities

Is teacher professional development well supported by the school?

Professional development may influence the pedagogical approaches employed by teachers, depending on the extent and nature of such learning opportunities, and provide the main means of aiding teachers’ use of the physical environment as a pedagogic tool. The development of new cultures of practice, based on collaboration, openness and innovation, may be achieved through well-structured change management processes that include ongoing formal and informal learning opportunities for teachers.
School Support for Teacher Professional Development

Factors found to enhance school support for teacher professional development

Use

“We have a strong and effective leadership team who are modelling learning and collaboration. We want our teachers to be ‘leaders of learning’, not managers of schools”

- A clear educational vision and strong leadership to realise the vision;
- Encouraging teachers to think about the purpose of the spaces they are in and to align activities with learning settings;
- Professional development that is evidence-based and readily actionable by teachers;
- Adequate time release for teachers to engage in professional development.

Provision of Professional Development Opportunities for Teachers

Factors found to enhance the provision of professional development opportunities for teachers

Use

“Support for teacher development is provided through professional learning at staff meetings, regular professional learning days, through Google Docs, webinars, guest speakers, informal meetings and curriculum development meetings. Staff with expertise in particular areas are encouraged to share their skills and strategies”

- Professional development programs that are designed to create systemic change, rather than address seemingly unrelated issues;
- A range of related professional development topics is covered by the school;
- Whole-school planning days that are held each term to build teachers’ skills in collegial learning groups;
- Visits to other schools to develop understandings about how space and practice may be aligned in ‘alternative ways’;
- A culture that supports ongoing peer-to-peer feedback and dialogue.
Conclusions

The findings of the Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence Based Approach project included a wealth of information about many specific issues. These were distilled from the evaluative insights derived from 43 learning environments across 38 schools. These findings relate to the 18 learning environment dimensions, or themes, that were agreed as the focus of the evaluation program. But what was learned about the alignment of pedagogies and learning environments, overall?

The following synopsis brings together the ‘global findings’ of the project, through addressing the three key research questions. This commentary offers consolidated insights into what has been learned and outlines the general conclusions that may be drawn from the project.

**How can Catholic school learning environments (primary and secondary) be designed and used to best pedagogical effect?**

As the TELE project progressed, it became clear that the pedagogies being promoted by the central education offices of the Melbourne and Parramatta dioceses where generally well-recognised by the participating schools and were commonly observed in the practices of teachers. These pedagogies were frequently characterised by well-coordinated collaborative teaching approaches – particularly in the primary schools – and commonly emphasised a range of differentiated and personalised learning experiences for students; including independent, small group, and whole class activities. Attention to developing student agency, capacities for self-directed learning, and ‘whole person’ attributes was common.

By contrast, extended periods of teacher-led instruction and learning activities that required little cooperation, communication or complex thought tended to be less favoured. As the schools selected for participation in the project were chosen on the basis that they were performing well pedagogically, it was encouraging to witness that was indeed the case.

It was also clear that the differing historic structures (physical, organisational, temporal, cultural) that have governed teaching and learning practices in primary and secondary schools over past decades were still exerting a strong influence on the pedagogies that were prevalent. Teacher collaboration (associated with planning and face-to-face teaching), project-based learning, and cross-curricular activities were common-place in the participating primary schools, but less frequently observed in the secondary schools. Nonetheless, some secondary schools were observed to have broken from historical norms and adopted more ‘primary school-like’ practices, especially in the middle years (Years 7-9).

Fundamental to the adoption of more contemporary pedagogies was the production of a dynamic social and physical environment. Neither good practice, nor good spaces in isolation resulted in the production of highly effective learning environments. Rather, ‘effectiveness’ was observed to arise from the combined effect of good practices and well-designed spaces. A key feature of such alignment was the variety and choice these environments offered students and teachers with respect to their social and physical experiences – and therefore their options for learning and teaching.

In several focus groups, the frustration of teachers was evident as they discussed the limitations placed on them and their students by learning spaces that offered little choice in how to socially organise students – either within the same class and/or across multiple classes. Comments related to their school leaders promoting ‘innovative pedagogies’, but their spaces being traditional and difficult to arrange for varied activities. By contrast, teachers in well-designed spaces that offered access to multiple learning settings – commonly differentiated by furniture arrangements and/or glazed separations between spaces of different sizes – talked about the options they had to offer students a variety of engaging and meaningful teaching and learning experiences, including opportunities for instruction, interaction and reflective retreat.
The TELE project highlighted that capacity to offer variety and choice – of both setting and activity – was central to the effective design and use of learning environments. The physical and social production of multiple learning settings, contrasted by the ‘sameness’ of many traditionally fitted classrooms, was talked about by teachers with enthusiasm. However, they did highlight several caveats; principally that good acoustics were paramount, especially in more open learning environments, and that good sight-lines were equally essential, to enable the consistent observation and monitoring of student activities.

Overall, the findings of the project highlighted nine principles of designing and using learning environments to best pedagogical effect. Fundamentally, learning environments should offer the following:

1. A dynamic social and physical environment;
2. Variety and choice, with respect to both settings and activities;
3. The capacity to differentiate and personalise learning experiences, including across independent, small group, and whole class activities;
4. Ready access to multiple learning settings, commonly differentiated by furniture arrangements and/or glazed separations between spaces of different sizes;
5. Engaging and meaningful teaching and learning experiences, including opportunities for instruction, interaction and reflective retreat;
6. Options to socially organise students in varied ways, within the same class and/or across multiple classes;
7. Good acoustics, especially in more open spaces;
8. Good sightlines, to enable the consistent observation and monitoring of student activities;
9. A design that recognise the physical, organisational, temporal and cultural histories of the school/school sector and allows for pedagogical development over time, without alienating teachers from their past practices.

NB. Hybrid-pedagogies may be considered a path to more engaging teaching and learning experiences – particularly in secondary schools.

How well aligned are contemporary pedagogies with the designs of learning environments in Catholic schools in the Melbourne and Parramatta dioceses? What influence do different building typologies have on this alignment?

The responses of students, teachers and learning environment experts (including quantitative data not included in this Summary of Findings) to the variables that were assessed across the 18 learning environment dimensions (themes) clearly indicated their overall preference for type D and E learning environments. However, based on a deeper reading of the issues associated with what’s working – and what’s not – it was logical to conclude that the best alignments of pedagogies and learning environments occurred in type D learning environments. As a spatial typology, this cluster of facilities was overall the most supportive of the desired pedagogical activities of teachers and students. Indeed, this group of facilities responded best to the nine principles of designing and using learning environments, as listed above. Collectively, the type D learning environments:

1. Offered opportunities for dynamism;
2. Provided for ‘variety and choice’;
3. Situated independent, small group, and whole class activities;
4. Supported different forms of instruction, interaction and reflective retreat;
5. Allowed for the creation of multiple learning settings;
6. Enabled students to be socially organised in a variety of ways;
7. Performed well acoustically, in-part due to the ability to enclose specific spaces as required;
8. Offered good sight-lines, when glazing was used to delineate different settings/spaces; and
9. Allowed for pedagogical development over time, through support for ‘hybrid pedagogies’. 
But what about the type E learning environments? While the type E learning environments were generally well-liked by students, teachers and learning environment experts, the commentary about these spaces revealed some shortcomings - primarily related to acoustic performance. Concerns were raised about poor noise attenuation generally, as well as about the limited options to separate spaces to reduce distraction from noise and/or movement. Teachers identified the lack of ‘alternative spaces’ for either noisy or quiet activities as detracting from the ‘pedagogical possibilities’ of the spaces, and complained of having to limit the occurrence of noisy activities for fear of disrupting others. It should be noted, however, that such limitations were not always present. Some type E learning environments included acoustically controlled spaces – such as small and medium-sized glazed meeting rooms – which helped overcome some of these shortcomings, thus enabling both noisy or quiet activities to occur, including targeted teaching sessions and other ‘aside activities’.

The shortcomings identified in connection with the type E learning environments also related to them offering ‘less margin for error’ with respect to the ability of teachers to employ contemporary pedagogies, including highly developed collaborative teaching practices. As noted in Dovey and Fisher’s (2014) journal article from which the learning environment typologies were sourced, type E spaces “embody the burning of bridges: the architecture of a new order, or is it chaos?” (p. 19). They commented that “... As openness increases, so does the demand for retreat spaces, new forms of closure and new regimes of control” (p. 19). While ‘chaos’ was not observed in any of the type E learning spaces, this can be attributed to the development of sophisticated collegial teaching practices – or ‘new regimes of control’ – that schools had developed, often under the influential leadership of principals devoted to ensuring that their new learning environments ‘worked’.

The extent to which the success of new learning environments should rely heavily on the leadership capabilities of principals (and other school leaders) to ensure their success is an interesting question. Certainly, a focus on ‘instructional leadership’ should not be diminished. Nevertheless, this project raised questions about the extent to which new forms of social structure are needed to replace the physical structures that have supported order in schools over past decades. In other words, to what extent should (and can) the sustainability of productive pedagogies in schools rely on highly sophisticated collaborative teaching practices?

This question should probably be considered separately for primary and secondary schools. For primary schools, it appears far more likely that collaborative teaching practices can be effectively developed and maintained, due to the regularity with which teachers can work together, including sharing manageable-sized cohorts of students (generally observed to be up to 100). Given such forms of social organisation, well-developed type E learning environments that offer ‘retreat spaces’ and ‘new forms of closure’, as suggested by Dovey and Fisher (2014), may well be appropriate as a model for learning communities of up to 100 students. The same probably cannot be recommended for the later years in secondary schools.

Given the focus on subject-specific teaching in secondary schools, and the propensity for teachers to teach across multiple classes and year levels, the capacity of teachers to develop well-coordinated collaborative teaching practices with colleagues is much diminished. That is not to say they cannot team-teach, or work closely with peers, they can, but expectations regarding the sophistication of such collaborations should be tempered. With this in mind, the convertibility of type D learning environments, that retain the option to revert to traditional instructional spaces, may offer opportunities for pedagogical diversity, whilst not limiting pedagogical development and change over time.

How can the alignment between contemporary pedagogies and the design of school learning environments be improved?

It is important to note that the learning environment typologies being discussed in this report are not singular plans or arrangements, as some have assumed based on the representational diagrams (see Figure 1). Rather, the typologies are clusters of facilities that share common “forms or patterns of interconnectivity and interpenetration with adjacent spaces” (Dovey & Fisher, 2014, p. 8). The variety of buildings that were evaluated by typology can be seen in Appendix A. These plans demonstrate the diversity of space planning arrangements that may be categorised within each typology.
With a view to improving the design and use of new learning environments, it seems likely that successful designs may represent ‘hybrid-typologies’ – especially related to typologies D and E. Dovey and Fisher’s typologies were categorised based on an analysis of award winning buildings that had already been built. Advances on these award-winning buildings may not necessarily fit neatly into the current typologies. It also appears probable that designs for primary and secondary school learning environments should diverge – at least to some extent, in keeping with the social organisation/timetable structures that tend to govern schools in each sector.

To better align pedagogies and learning environments, it is suggested that architects, school leaders and teachers need to work more closely to understand the performative requirements and/or affordances required of learning spaces. Methods of articulating what learning settings are required, how these relate to each other, which should be defined by spaces (enclosures) and which can be defined by furniture or interior elements within larger spaces, and how they combine to offer a suite of productive learning opportunities is required. The communication of such information to architects also needs to be better addressed. Diagrammatic, as-well-as text-based, descriptions of learning settings and arrangements would aid better communication and the development of common understandings. A stronger emphasis on performative briefing, that captures insightful descriptions of what teachers and students ‘wish to be able to do’, is needed before significant improvements to learning space designs can be more uniformly achieved.

In-situ prototyping of proposed learning environment layouts within existing school spaces, where possible, would also help teachers and school leaders test pedagogy/space relationships before committing to building designs and/or the selection of furniture. Prototyping, as a regular occurrence, would also aid pedagogical development, including the development of patterns or models of collaborative practice, that can be shared with others – both within and between schools.

Afterword – Opportunities for acting on the project’s findings

The voices of students were largely absent from this Summary of Findings report, because students didn’t participate in focus groups and where therefore not able to be quoted. However, students were given the opportunity to provide written feedback in the surveys they completed. The lessons learned from this program of learning environment evaluation are perhaps best summarised by students’ comments – demonstrating their desires for dynamism and agency, and their wish to participate in a tapestry of engaging learning activities. A snapshot of the things students valued is provided below:

I really enjoy this space. I really like how you can spread out into different spaces, whether you are working individually, with partners, or in a group, there is always enough furniture and space in this building (secondary student).

We have different areas to learn. We have a small space that allows us to have a few people in there, which makes it quiet (primary student).

I like that we have the freedom of a large classroom. We have some activities outside and some inside. We have many learning resources such as websites, art and craft resources, sport equipment etc. All students have lots of room to interact and have group meetings and discussions (primary student).

I like it because we have three places we can go without asking and our classroom is full of space to move around and really be ourselves (primary student).

In some spaces we can work with two classes. This allows more communication. With more communication, we learn more (primary student).

It is anticipated that the findings presented in this report (both high-level and detailed) can inform school facility planning and design in the Melbourne and Parramatta dioceses, as-well-as more broadly. The evidence collated largely confirms current approaches to new school design; nevertheless, we hope the content of this report, and the project overall, will inform significant improvements to the designs of individual facilities, including the designs of new buildings and refurbishment projects in primary and secondary schools – helping to inform all stakeholders involved in learning environment design and use about what’s working!
References


Appendix A – Learning Environments Evaluated by Typology (sample only)
Type A Learning Environments

SECONDARY SCHOOL | 2015

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2017

PRIMARY SCHOOL | 2017

PRIMARY SCHOOL | 2015
Type B Learning Environments

SECONDARY SCHOOL | 2015

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2017

PRIMARY SCHOOL | 2016

LEGEND

- Solid wall
- Operable wall
- General learning area “classroom”
- Breakout meeting rooms (enclosed)
- Storage (sometimes ‘resources’ or ‘other’)
- Breakout space/commons/street-space
- Teaching support office/coordinator office (staff only)
- Toilets (students)
Type C Learning Environments

SECONDARY SCHOOL | 2015

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2017

PRIMARY SCHOOL | 2015
Type C Learning Environments (continued)

LEGEND

- Solid wall
- Operable wall
- General learning area “classroom”
- Breakout meeting rooms (enclosed)
- Storage (sometimes ‘resources’ or ‘other’)
- Breakout space/commons/street-space
- Teaching support office/coordinator office (staff only)
- Toilets (students)
Type D Learning Environments

SECONDARY SCHOOL | 2015

SECONDARY SCHOOL | 2015

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2017

SECONDARY SCHOOL | 2017

PRIMARY SCHOOL | 2015
Type D Learning Environments (continued)
Type E Learning Environments

SECONDARY SCHOOL | 2016

SECONDARY SCHOOL | 2017

PRIMARY SCHOOL | 2015

PRIMARY SCHOOL | 2016

PRIMARY SCHOOL | 2016

PRIMARY SCHOOL | 2016
Type E Learning Environments (continued)

LEGEND
- Solid wall
- Operable wall
- General learning area “classroom”
- Breakout meeting rooms (enclosed)
- Storage (sometimes ‘resources’ or ‘other’)
- Breakout space/commons/street-space
- Teaching support office/coordinator office (staff only)
- Toilets (students)
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