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Aspirations for new learning spaces: Making the 'complex' possible

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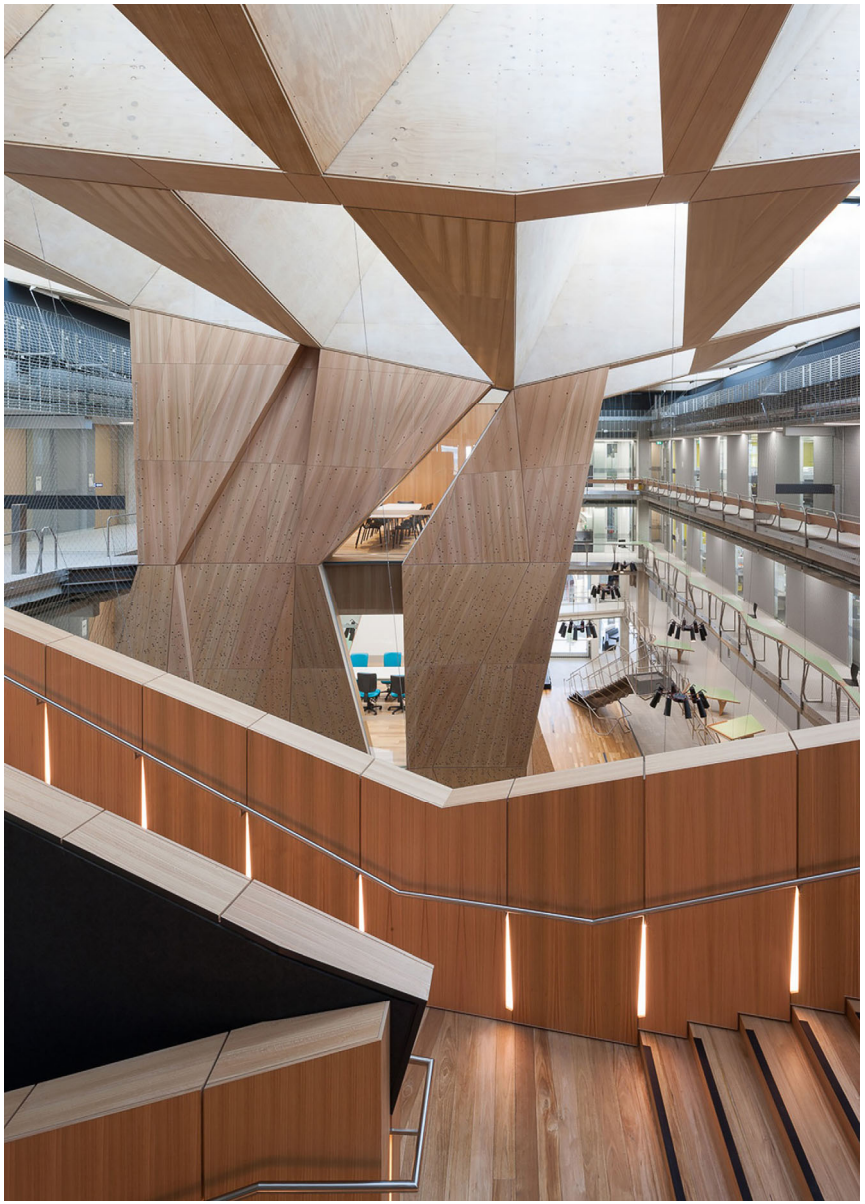
Associate Director LEaRN
Faculty of Architecture, Building and Planning

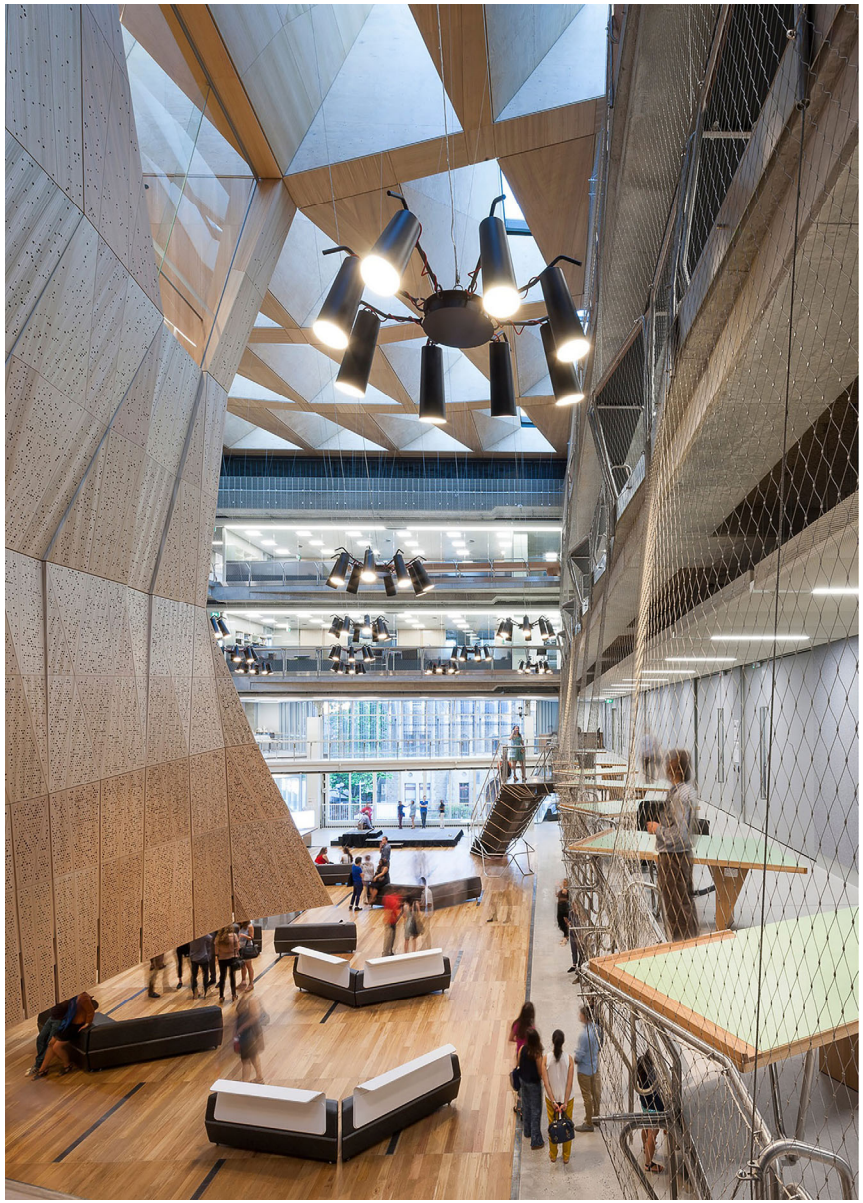
University of Melbourne
Melbourne School of Design

John Wardle Architects and NADAAA

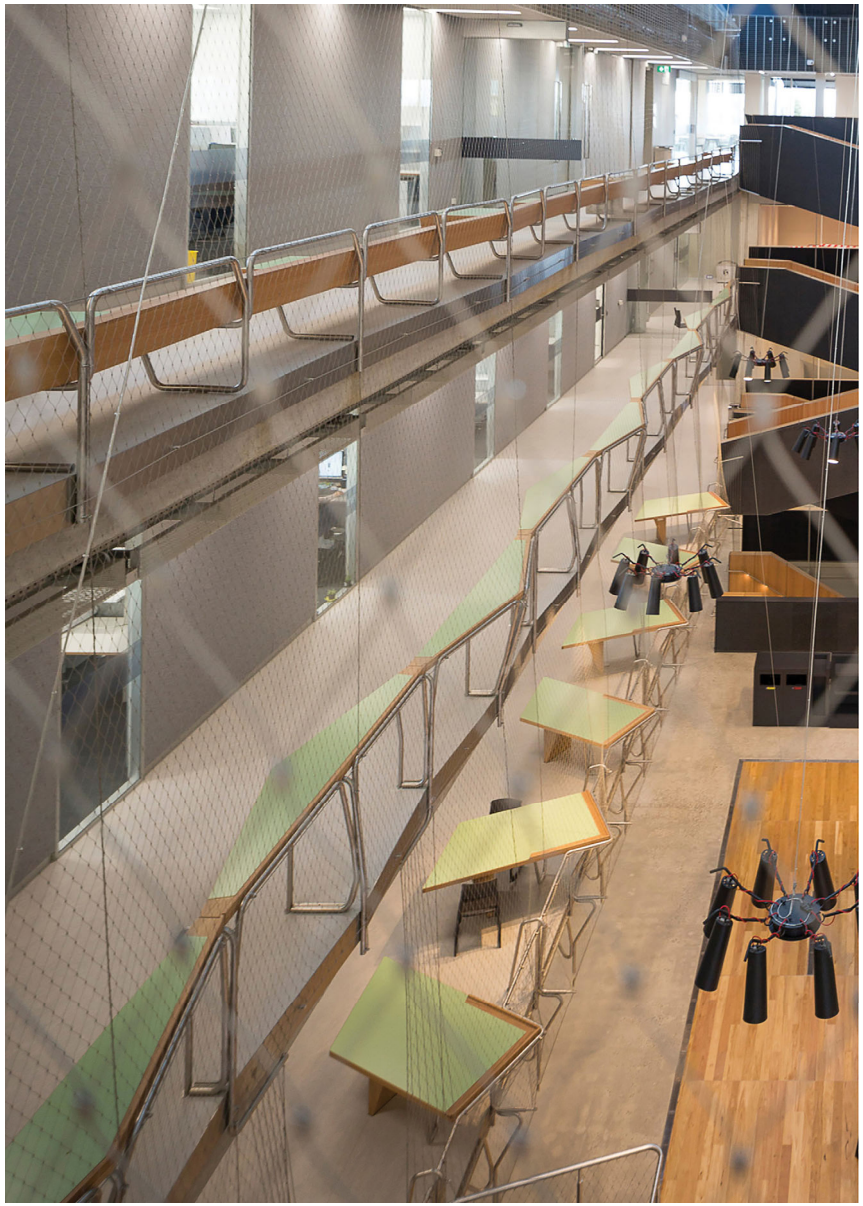
Source: Peter Bennetts

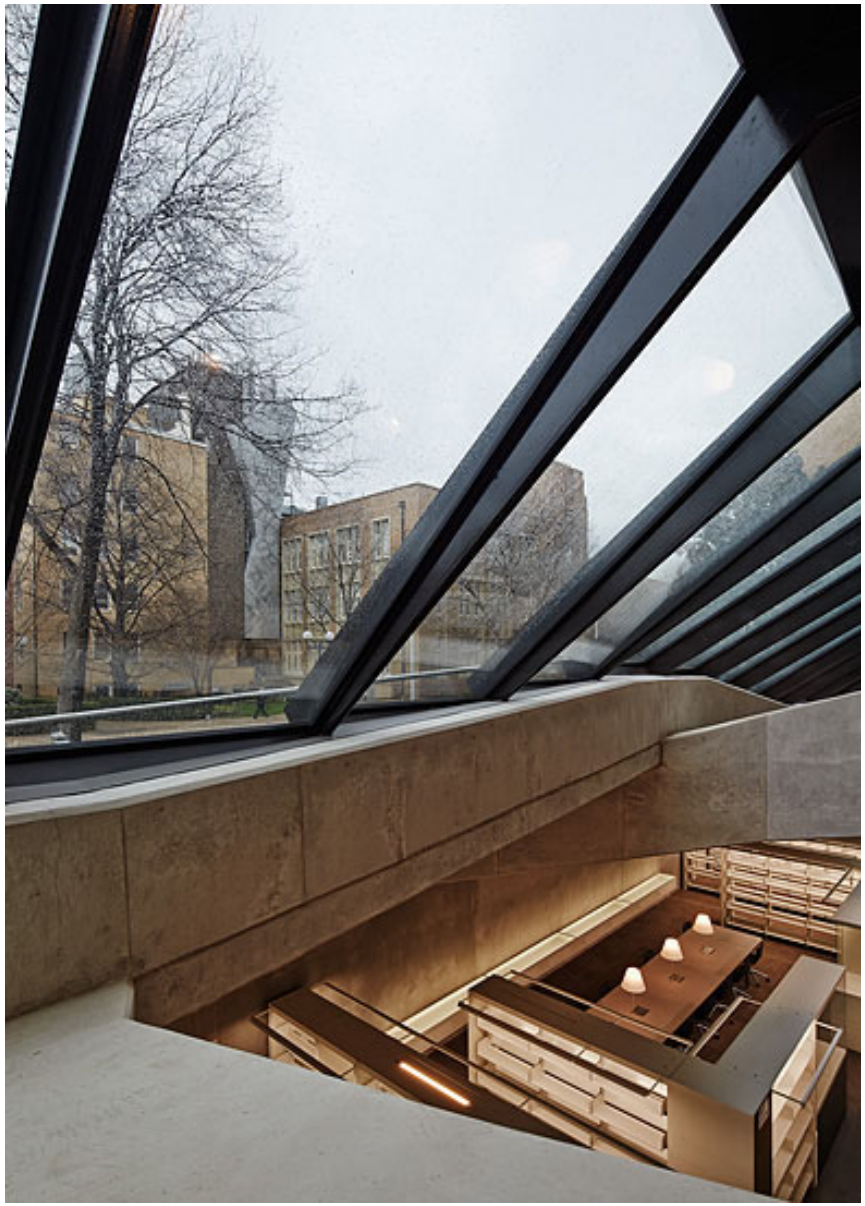


Source: John Horner



Left: John Horner | **Right:** Peter Bennetts





Left: John Horner | **Right:** Peter Bennetts

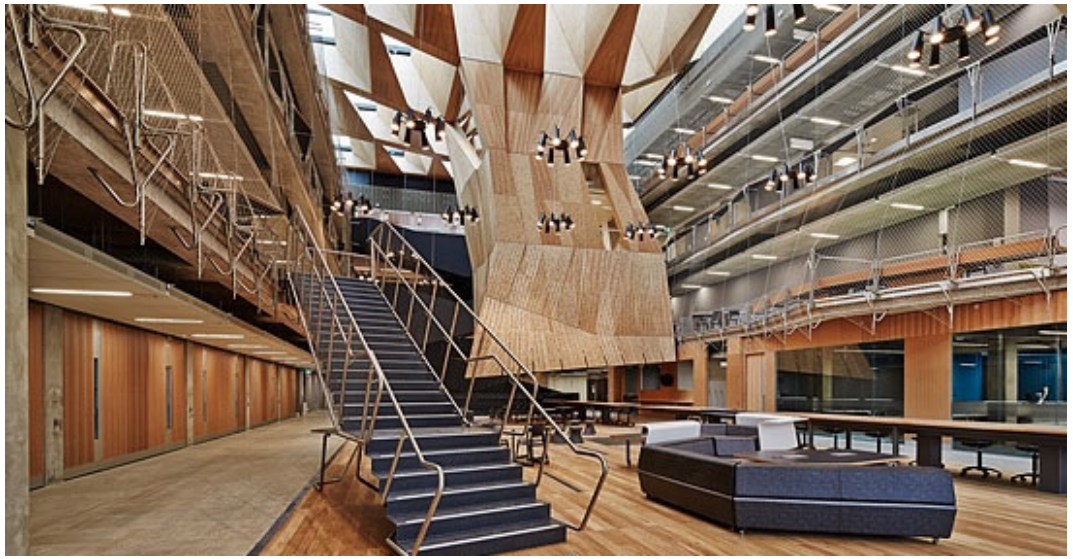
Library and exhibition spaces

Top: Library space with natural light from the ground level glass curtain façade.

Bottom: Dulux Gallery, lower ground floor.

Top: John Horner | **Bottom:** Peter Bennetts

Atrium that opens and closes for teaching and exhibitions



Top: The atrium with studio spaces closed.

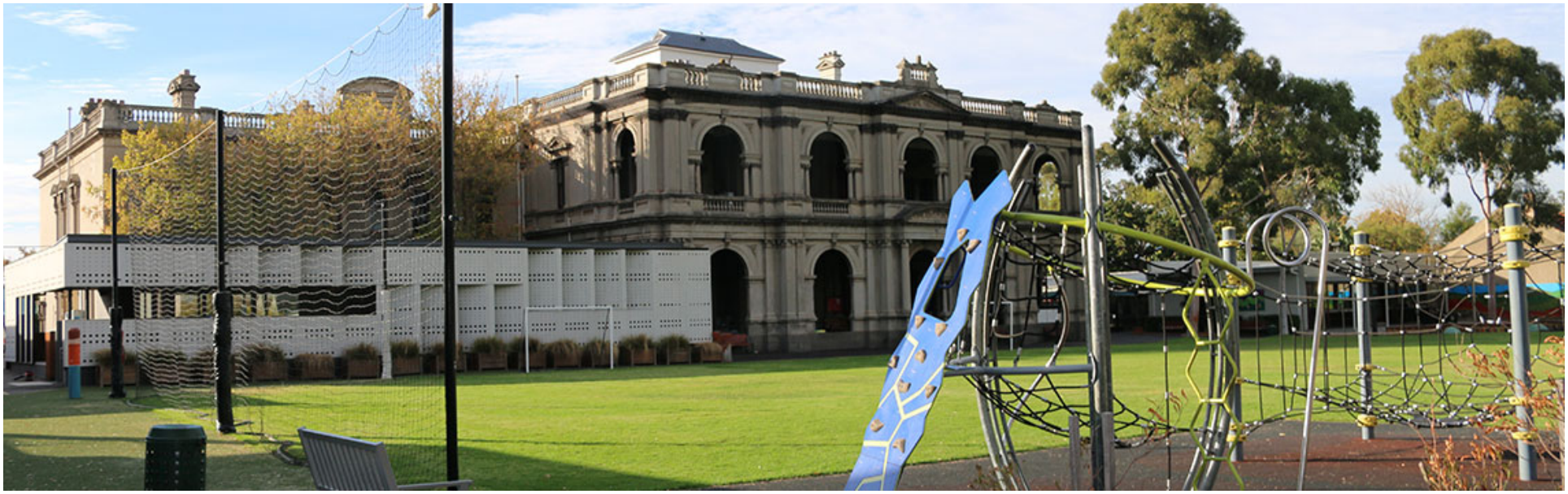
Bottom: The walls of the studios open for exhibition & display.

Source: Peter Bennetts

Learning Environments Applied Research Network

LEaRN

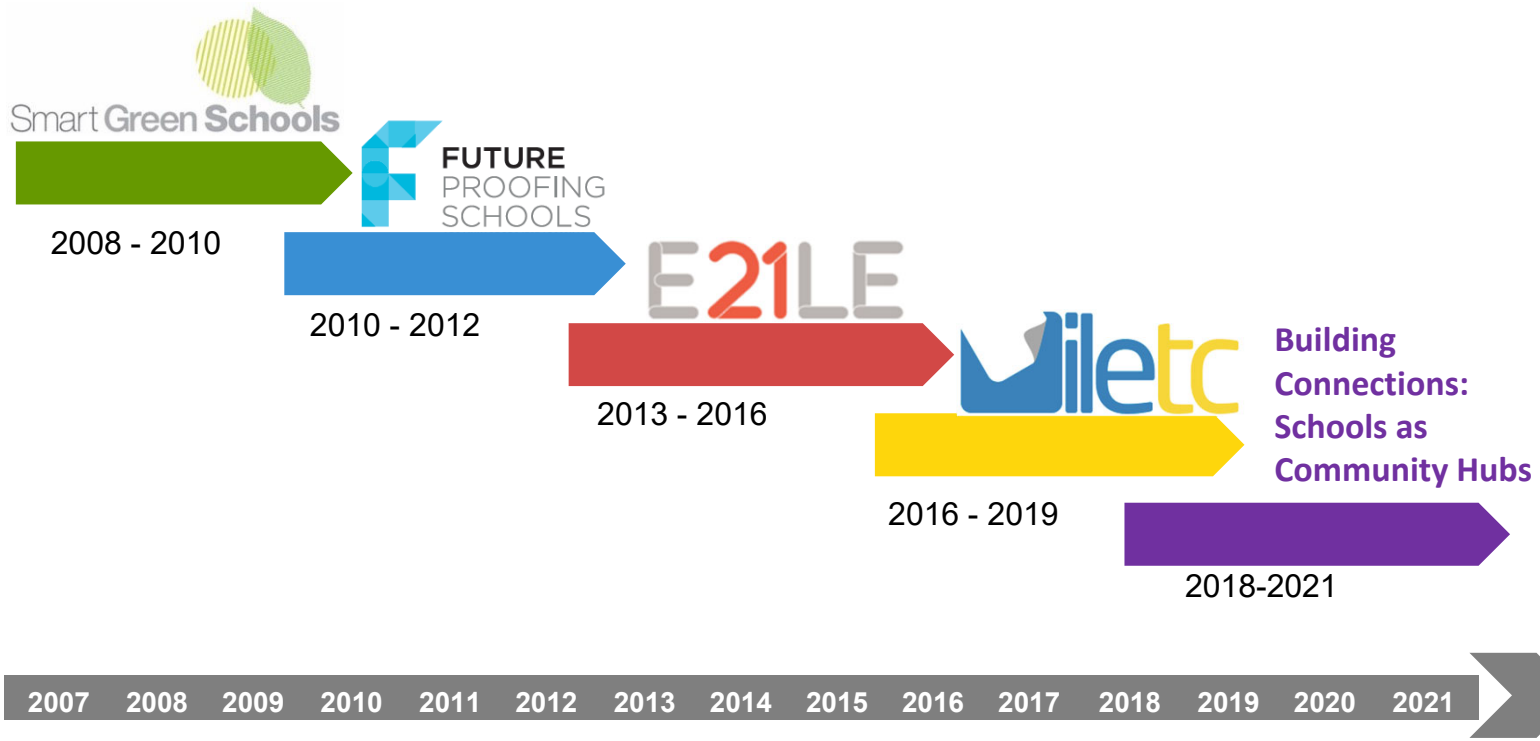
Past experiences



Past experiences

Researching/ working with schools 2008-today

Continuous Australian Research Council Linkage Projects 2007-2021



Government, Catholic, Consultancy and other funding

Plans to Pedagogy (P2P)
A research and consultancy project funded for three years from 2018 to 2020 led by The University of Melbourne.

Translational Briefing: Footscray Learning Precinct Case Study
Commissioned research project for the Department of Education and Training, State of Victoria to prepare a Translational Brief for the Footscray Learning Precinct in 2017.

Innovative Learning Environments and Teacher Change (ILETC)
An Australian Research Council (ARC) Linkage Project funded for four years from 2016 to 2019 led by The University of Melbourne.

Review of Standard Entitlement Frameworks for Schools & School Site Size and Outdoor Space Requirements (including Special Schools & Special Developmental Schools)
Commissioned research project for the Department of Education and Training, State of

Towards Effective Learning Environments in Catholic Schools (TELE)
A collaborative research initiative between Catholic Education Melbourne (CEM) and LEaRN at the University of Melbourne for three years from 2015 to 2017.

Anglican Church Grammar School New Generation Learning Spaces (NGLS) Project
A collaborative research initiative between Anglican Church Grammar School (Churchie) and LEaRN at the University of Melbourne for seven years from 2010 to 2017.

Evaluating 21st Century Learning Environments (E21LE)
An Australian Research Council (ARC) Linkage Project funded for four years from 2013 to 2016 led by The University of Melbourne.

Hospital Corridors: the value of informal learning spaces
A partner-informed project funded by LEaRN for one year from 2013 to 2014 led by the University of Melbourne.

Future Proofing Schools
An Australian Research Council (ARC) Linkage Project funded for three years from 2010 to 2012 led by the University of Melbourne.

Post Occupancy Evaluation of Learning Environments
A partner-informed project funded by LEaRN from 2011 to 2012 before evolving into a commissioned project funded by the Catholic Education Office Melbourne from 2012 to 2013.

Smart Green Schools
An Australian Research Council (ARC) Linkage Project funded for three years from 2008 to 2011 led by the University of Melbourne.

Homestead Regeneration Project (SSEI Module 3 – Woodleigh School)
LEaRN commissioned project to apply the SSEI Evaluation Model (developed by researchers in the faculty of Architecture, Building and Planning) at two 'homesteads' at the Woodleigh School in 2013.

The Influence of Hospital Education Spaces on the Pedagogical Activities of Medical Students and Educators
LEaRN Commissioned Project funded by the University of Melbourne (Learning and Teaching Initiatives Grant) for one year from 2011 to 2012.

From principles to practical application: Developing and sustaining innovative educational practices in innovative learning environments
A partner-informed project funded for one year from 2012 to 2013 by LEaRN to understand how schools and universities might better align

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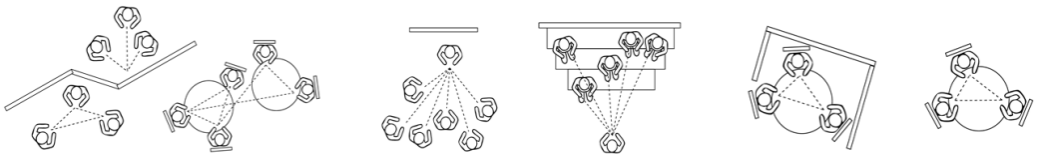
If you were designing 100 new schools, **what types of learning spaces would you build**?



The industrial model: What next?

In a post-industrial world, how can we understand school 'learning environments' – and develop new learning spaces to meet the educational objectives and practices to which we aspire?

Law Architects: Woodleigh School

The industrial model: What next?

How might concepts associated with ‘complexity’, ‘emergence’ and ‘self-organisation’ aid our interpretations of 'learning environments' that are concurrently physical, social and cultural?

Law Architects: Woodleigh School


The problem!

Innovative learning environments as ‘complex adaptive systems’

This keynote will explore …

Influences of new socio-spatial contexts for learning on the participation of students and teachers in pedagogical activities – employing theoretical frameworks derived from the literature on …

‘Complexity theory’

&

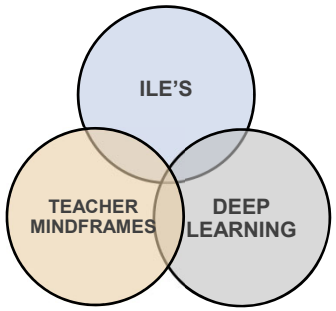
‘Complex adaptive systems theory’

Middle Years Research and Development Project (MYRAD) 2002

- Strengthening teacher-student relationships
- Involving students in decision-making about content, process and assessment
- Presenting authentic tasks that require complex thought and allowing time for exploration
- Inclusion of processes involving co-operation, communication, negotiation and social competencies generally
- Providing for individual differences in interest, achievement and learning styles.

DEET. (2002). *Middle years research and development project: Executive summary*. Victoria, Australia: Department of Education, Employment and Training.

Deep learning 2010's



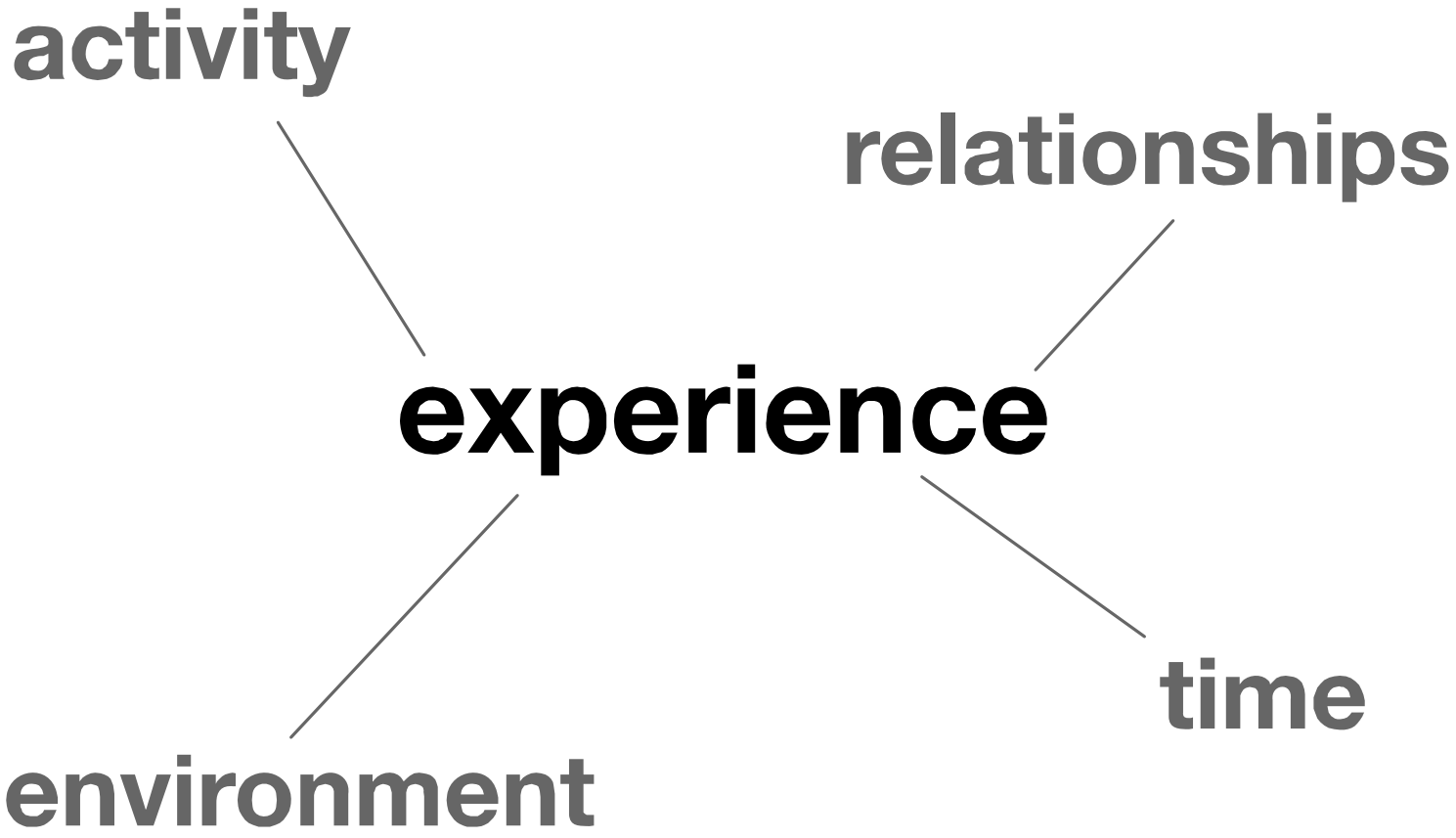
"… prepare all learners to be life-long creative, connected and collaborative problem solvers and to be healthy, happy individuals who contribute to the common good in today's globally interdependent world"

Fullan & Langworthy (2013, p.2)

- Character education
- Citizenship
- Communication
- Critical thinking and problem solving
- Collaboration
- Creativity and imagination

Fullan, M., & Langworthy, M. (2013). *Towards a new end: New pedagogies for deep learning*. Seattle, Washington, USA.

INNOVATIVE LEARNING ENVIRONMENTS AND TEACHER CHANGE

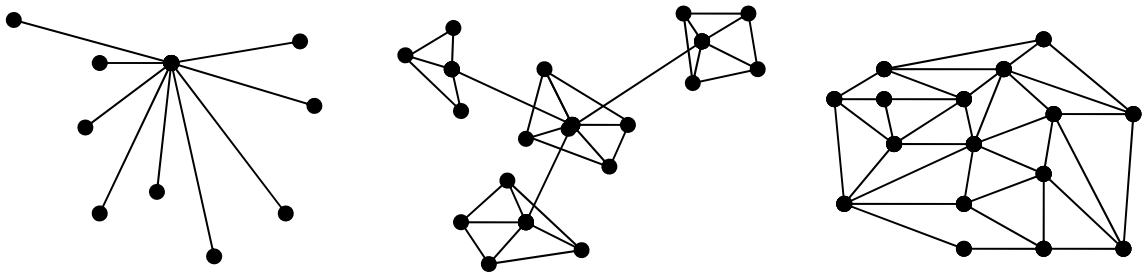

activity
relationships
experience
environment
time

Built pedagogy

The design of school spaces is intrinsically tied to educational philosophies

(Monahan, 2002)

Discipline ⟷ Autonomy



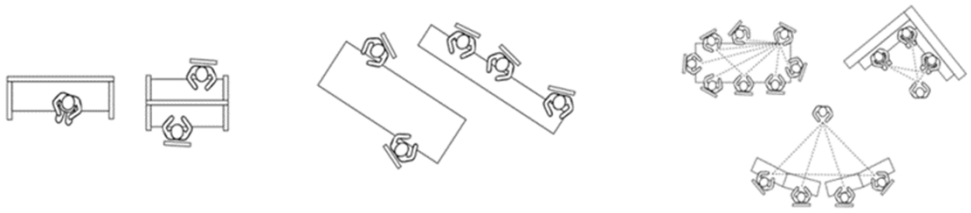
Traditional classroom

Decentralised learning space

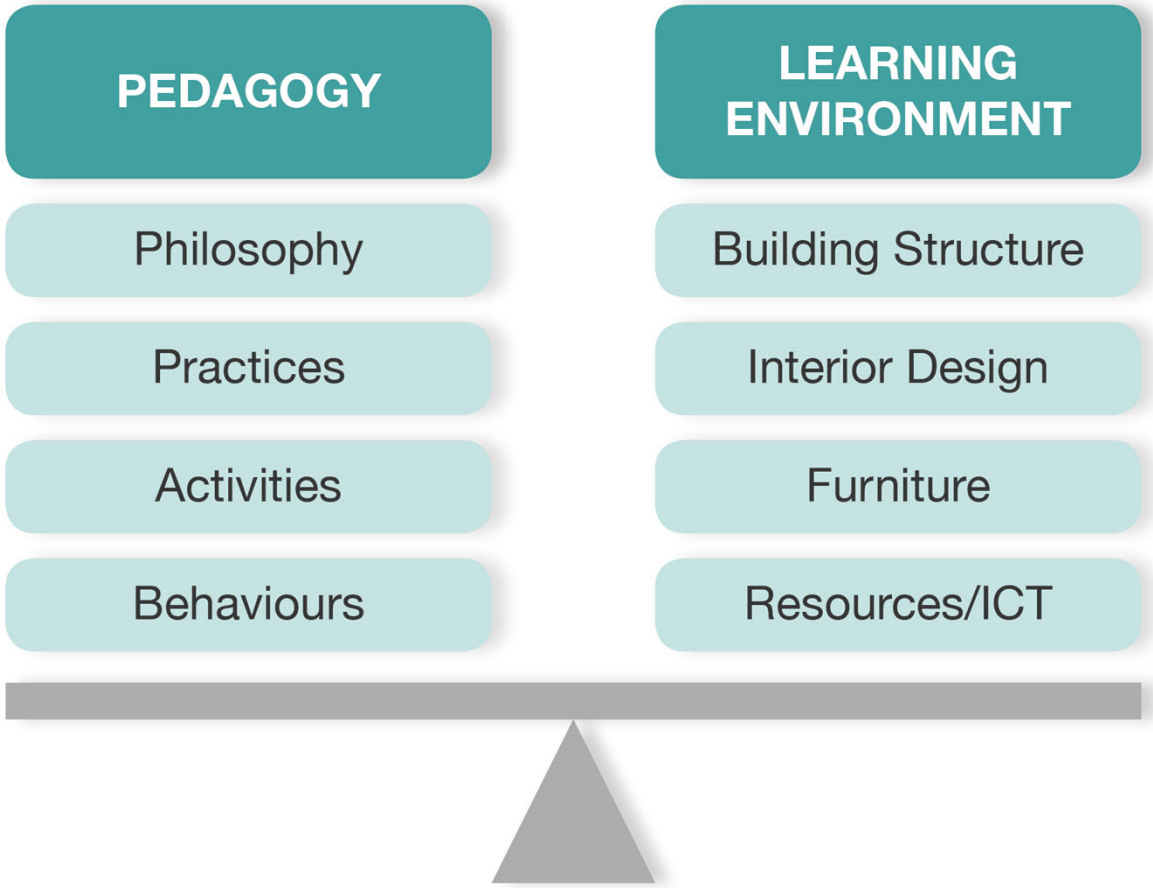
Distributed learning space

Images: Woods Bagot | **Diagrams adapted from:** Barabasi, A. L. (2002). Linked. The new science of networks. Cambridge, Mass. Perseus.

What types of learning spaces can support the educational programs and practices of the 21st century?



Aligning pedagogy & space



Complexity theory & sociology

- A move away from Newtonian reductionist models of scientific inquiry … to address holism.
- Recognises the emergent properties of systems produced via dynamic interactions between agents and/or components.
- A lens through which to investigate, but not predict, 'emergent' and 'self-organising' systemic properties associated with nonlinear systems that involve people.

Complexity theory & educational research

- "Complexity theory … offers considerable leverage into understanding societal, community, individual, and institutional change … In addressing holism, complexity theory suggests the need for case study research methodology, action research and participatory forms of research, premised in many ways on interactionist qualitative accounts" (Cohen, Manion & Morrison, 2007).

Dandenong High School by Hayball.

3

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. New York, NY: Routledge.

Complex adaptive systems

- Self-organising systems that are simultaneously economic, physical, technological, political and social (Urry, 2008).
- Characterised by 'positive feedback loops' which ensure a state of continuous change within a system (Urry, 2008).
- Dynamic and nonlinear nature thought to create systems that 'learn' as they respond to changes in the system (Davis & Sumara, 2006).

Urry, J. (2008). Climate change, travel and complex futures. *The British Journal of Sociology, 59(2)*, 261-279.

Davis, B. & Sumara, D. (2006). *Complexity and education: Inquiries into learning, teaching, and research*. Mahwah, NJ: Lawrence Erlbaum.

Complex adaptive systems & emergence

- Emergent properties may refer to the development of regularities of behaviour that transcend the component parts of the system (Urry, 2008).
- Complex adaptive systems generate emergent social behaviours through 'co-evolution' and 'mutual adaptation' (Urry, 2008).

Urry, J. (2008). Climate change, travel and complex futures. *The British Journal of Sociology, 59(2)*, 261-279..

Complexity & school architecture

- Schools as complex systems, with dynamic interactions between social and physical agents – both within and beyond the campus (Upitis, 2004).
- Educational reform cannot occur substantively in traditional school buildings/spaces (Upitis, 2004).

Upitis, R. (2004). School architecture and complexity. Complicity: An international journal of complexityand education, 1(1), 19–38.

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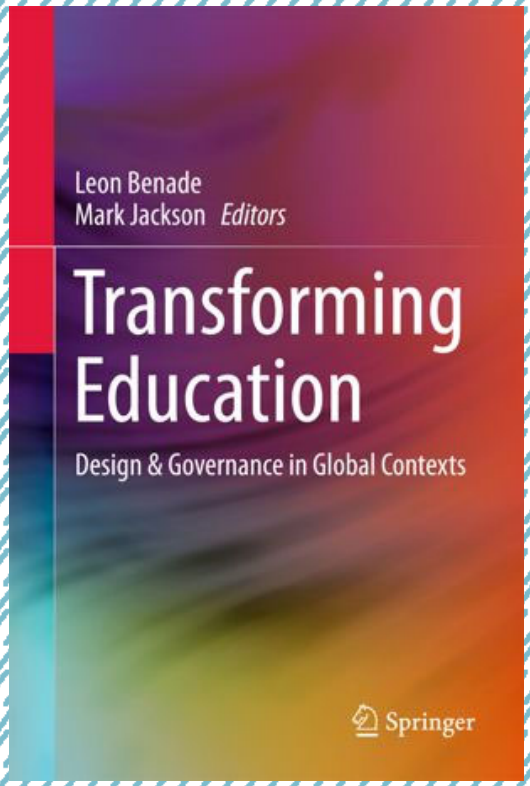
Cleveland, B. (2018). Innovative Learning Environments as Complex Adaptive Systems: Enabling Middle Years' Education. In L. Benade and M. Jackson (Ed.), *Transforming Education*, Singapore, Springer Nature.




VICTORIAN
SCHOOL BUILDING
AUTHORITY
SCHOOL FACILITY
AREA SCHEDULES
AND DESIGN
EXPLANATORY
BRIEF AND DESIGN
GUIDELINES
LAST UPDATED OCTOBER 19, 2018
VICTORIA
State
Government

Victorian School Building Authority

School Facility Area Schedules

3-layer approach informed by LEaRN

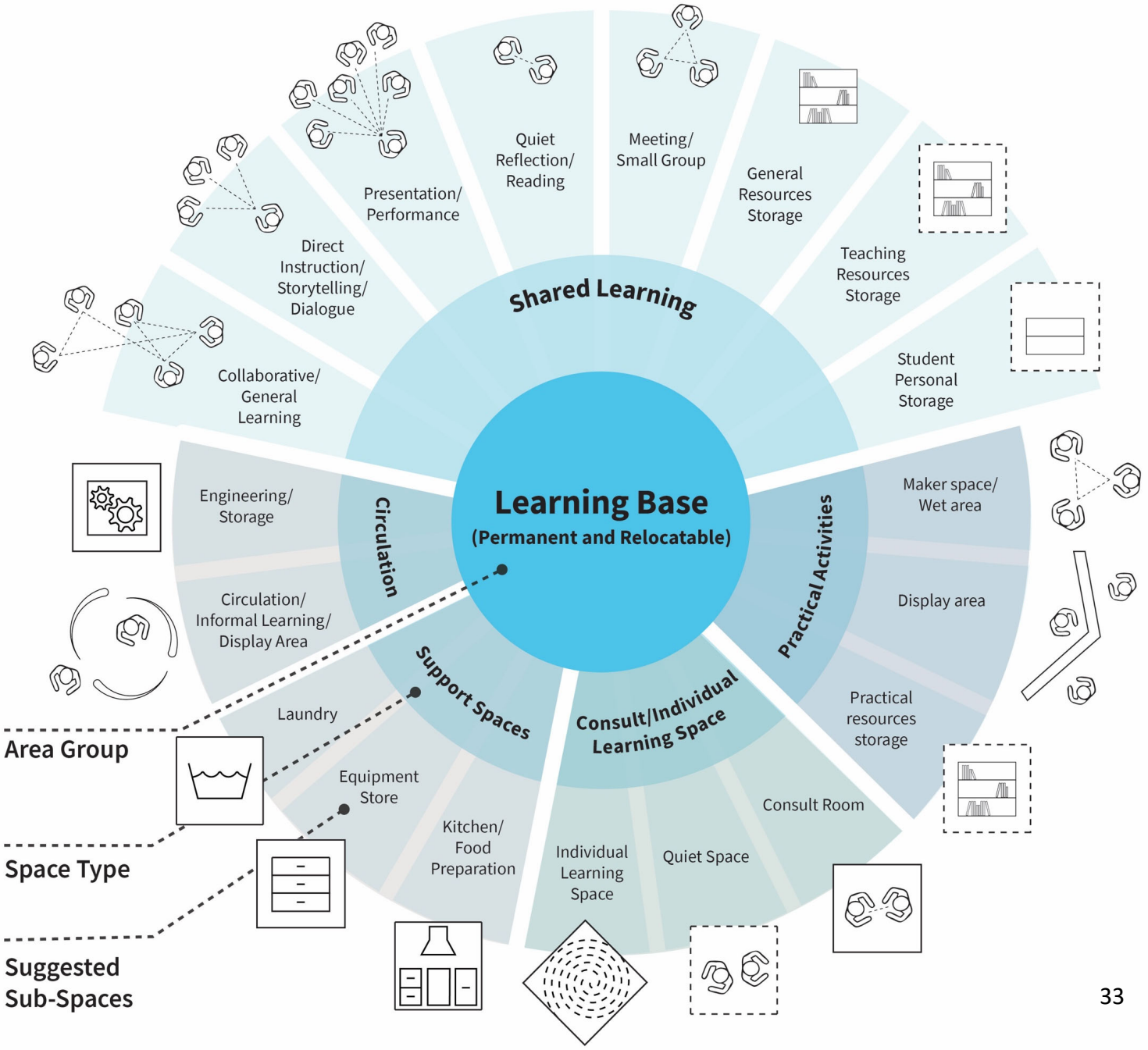
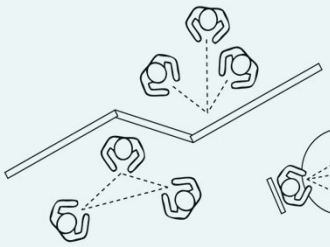


Image: LEaRN

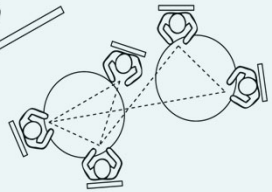
Fundamental spatial settings for learning

Collaborative/ shared learning

Standing

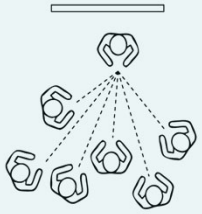


Sitting

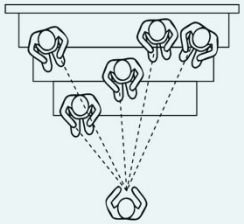


Presentation/ performance

Standing

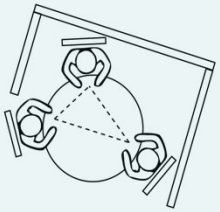


Sitting

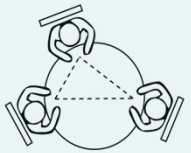


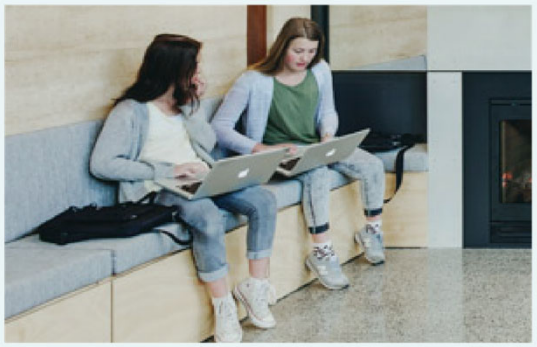
Meeting/withdrawal/ small group

Enclosed



Non-enclosed



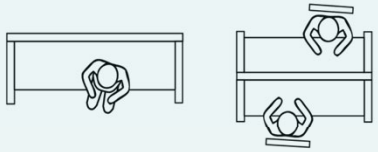


Source: LEaRN

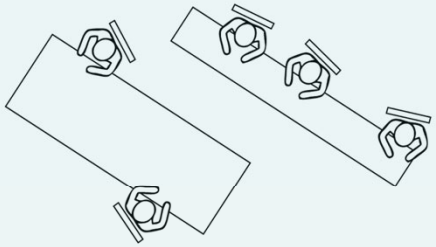
Fundamental spatial settings for learning

Quiet Reflection/Reading

Individual Setting

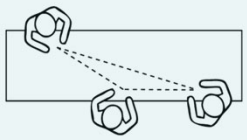


Shared Setting



Creative activities/ Makerspace

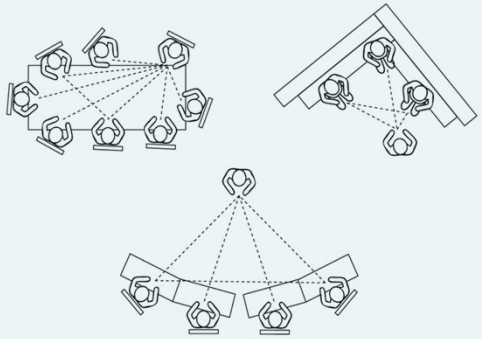
Sitting or Standing



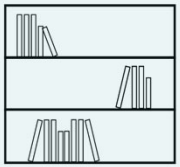
Source: LEaRN

Fundamental spatial settings for learning

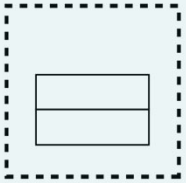
Direct instruction/ story-telling/dialogue

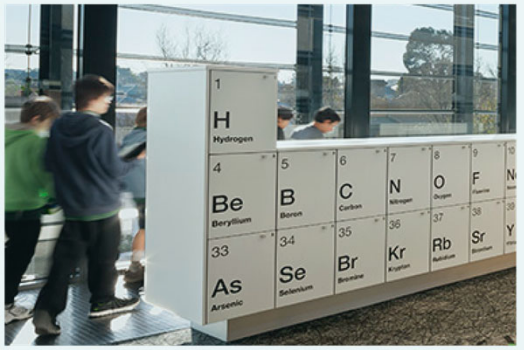


Readily accessible storage



Student personal storage





Source: LEaRN

South Melbourne Primary School

Learning Project

Awards submission

Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence-Based Approach

3 years
38 schools
43 learning environments
300 teachers
3872 students

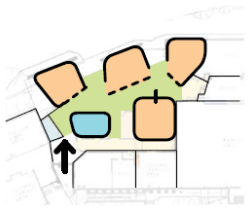
Dr Benjamin Cleveland
Dr Pippa Soccio
Ms Roz Mountain
A/Prof Wes Imms

LEARN
learnetwork.edu.au

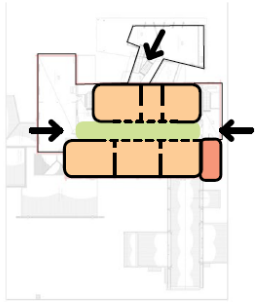
CATHOLIC EDUCATION MELBOURNE

Catholic Education Diocese of Parramatta

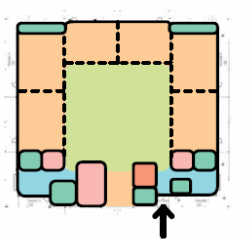
Melbourne | Type D Learning Environments



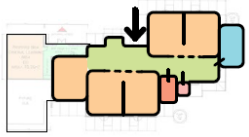
PRIMARY | 2016



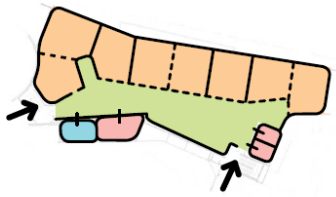
PRIMARY | 2016



PRIMARY | 2015



SECONDARY | 2015



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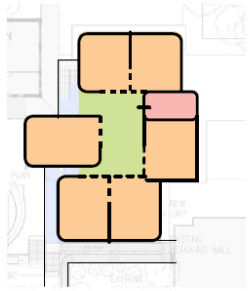
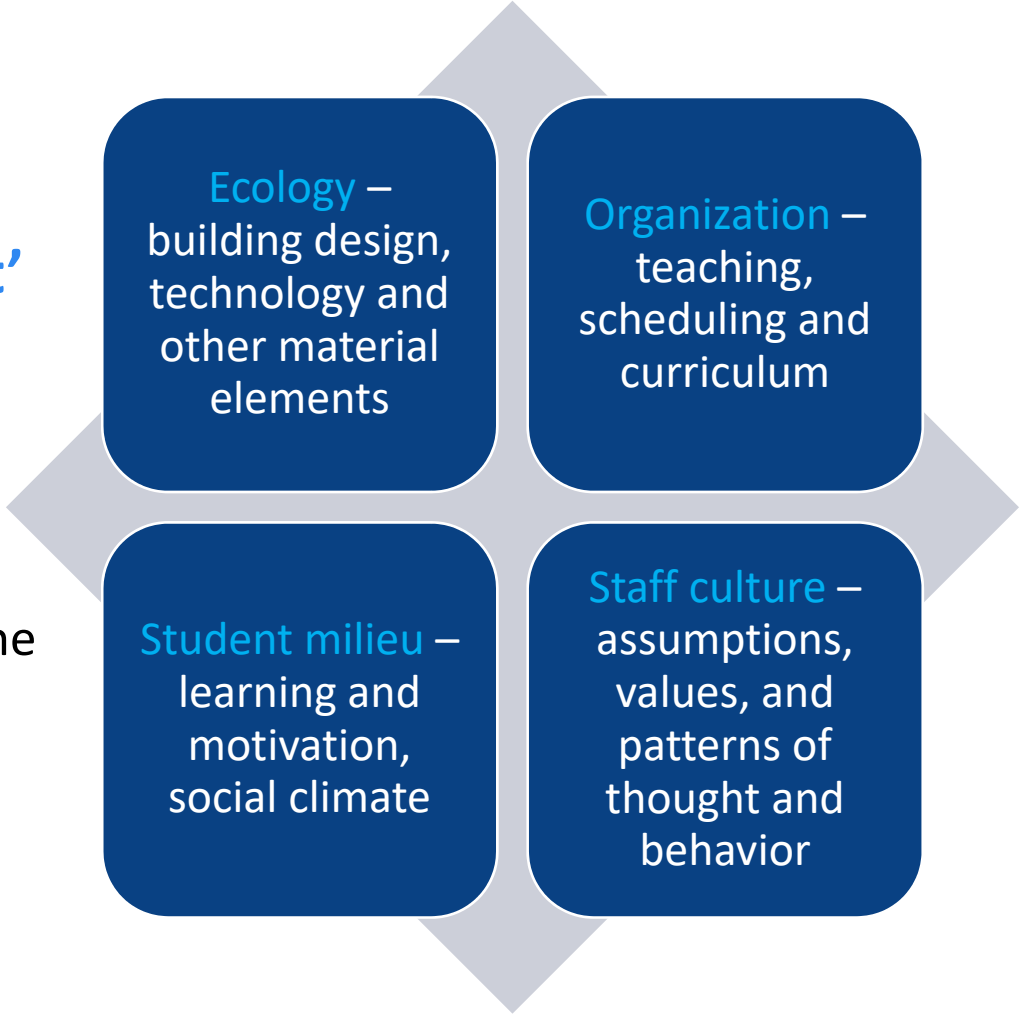


PRIMARY | 2016

Evaluating the effectiveness of ‘units of the environment’ as pedagogical settings:

Gislason’s (2010) adapted model for school design research addresses connections between the physical and social components of ‘units of the environment’ …



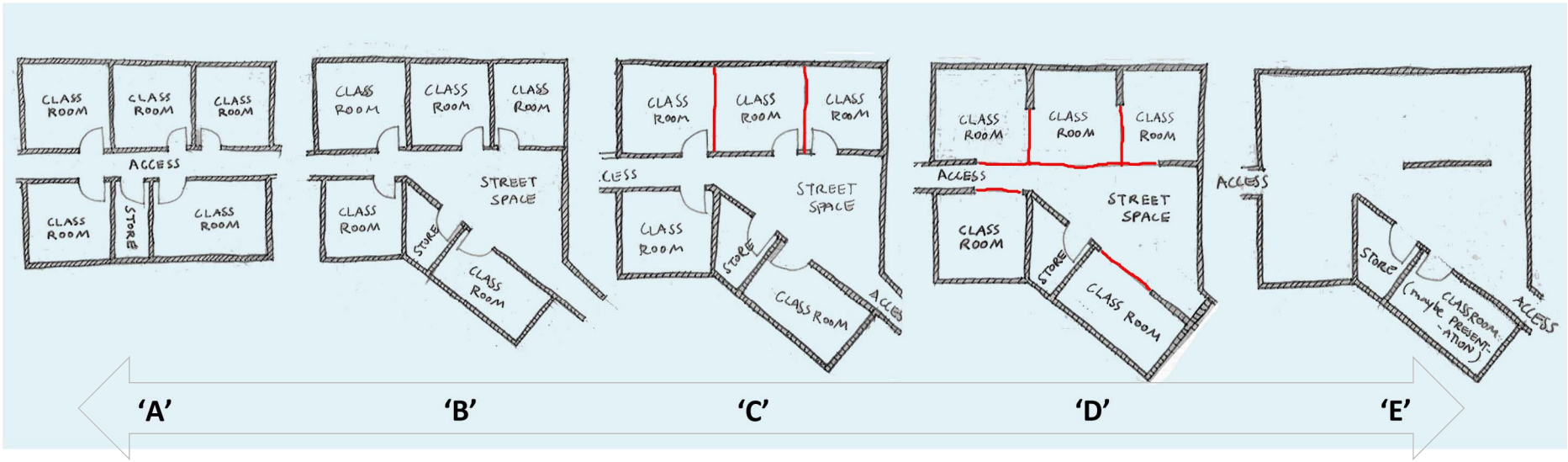
LEaRN Evaluation Module 3

- Activity Settings and Pedagogical Encounters
- Accessibility
- Safety
- Size and Scale
- Character and Aesthetics
- Furniture
- Agile and Flexible Use
- Learning Resources
- Storage
- Student Toilets
- Occupant Comfort (IEQ)
- Movement of People and Objects
- Provision and Use of Display Space
- Belonging and ownership
- Teacher Support spaces
- Teacher Professional Development
- School Timetable
- Overall impression

18 Survey Themes

Learning Environment Typologies

Dovey, K., & Fisher, K. 2014. Designing for adaption: The school as socio-spatial assemblage. The Journal of Architecture 19(1), 43-63.



TRADITIONAL CLASSROOMS

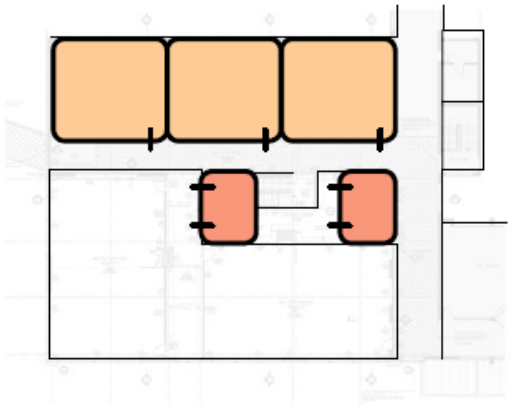
Solid walls

Operable walls

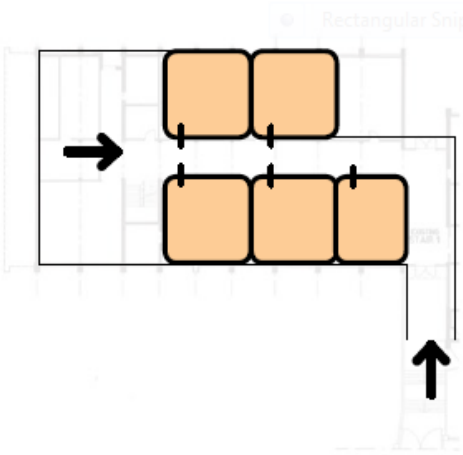
OPEN PLAN

Melbourne

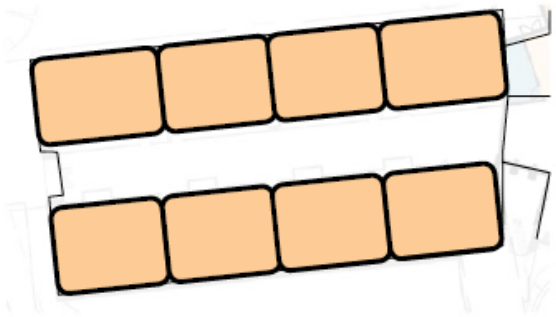
Type A Learning Environments



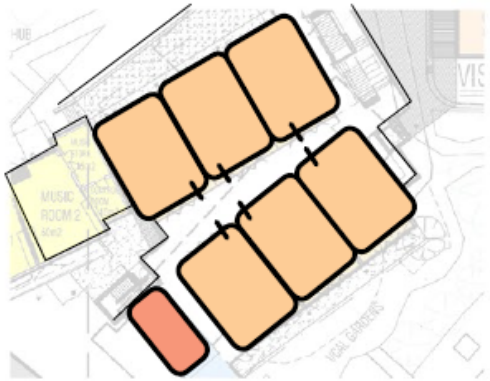
SECONDARY | 2016



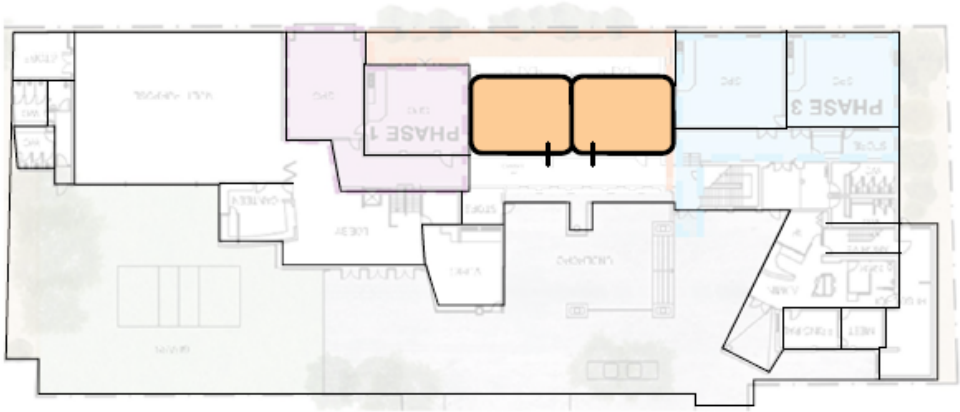
SECONDARY | 2015



PRIMARY, 2017



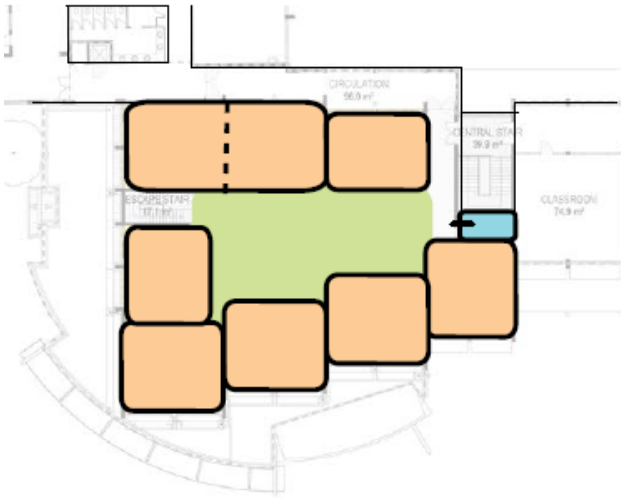
SECONDARY | 2017



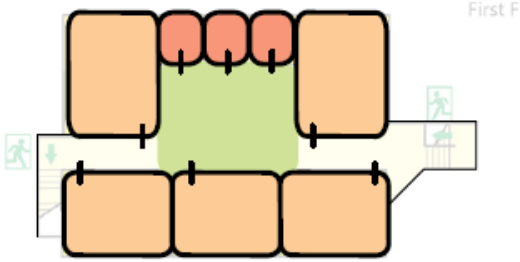
PRIMARY | 2015

Melbourne

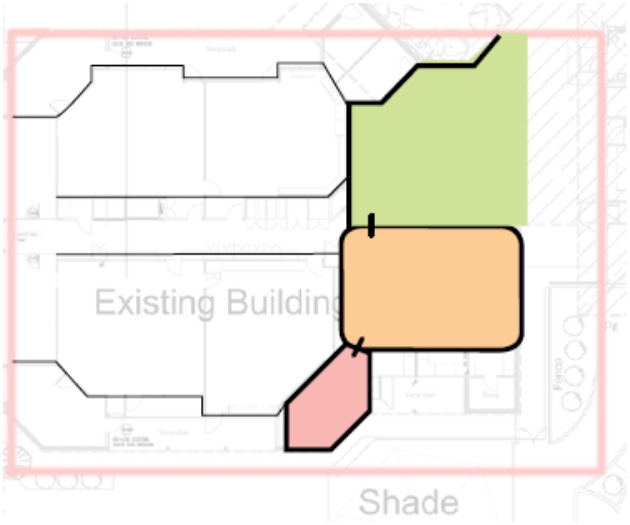
Type B Learning Environments



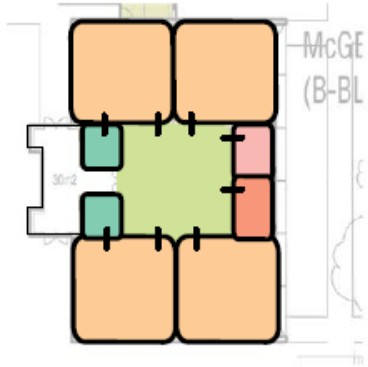
SECONDARY | 2016



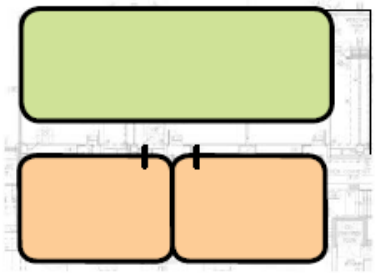
Secondary | 2015



PRIMARY | 2016



SECONDARY | 2017



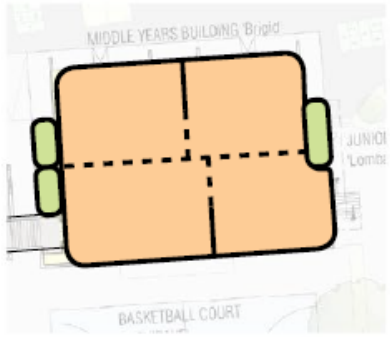
PRIMARY | 2016

LEGEND

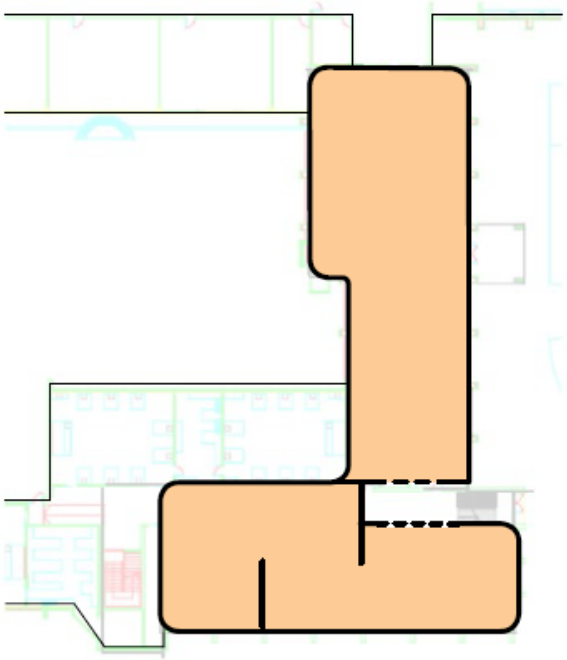
- Solid wall
- Operable wall
- General learning area "classroom"
- Breakout meeting rooms (enclosed)
- Storage (sometimes 'resources' or 'other')
- Breakout space/commons/street-space
- Teaching support office/coordinator office (staff only)
- Toilets (students)

Melbourne

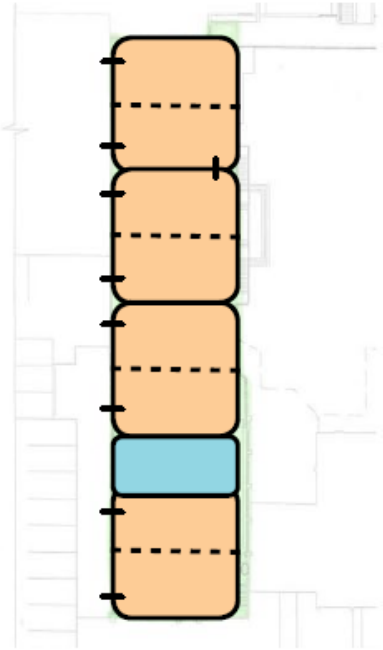
Type C Learning Environments



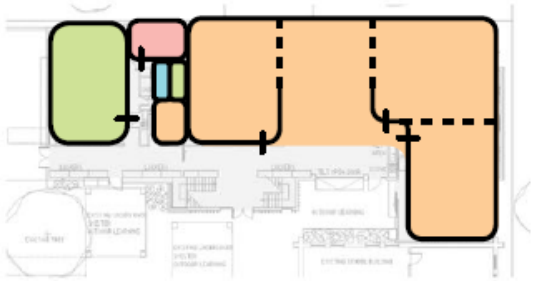
PRIMARY | 2017



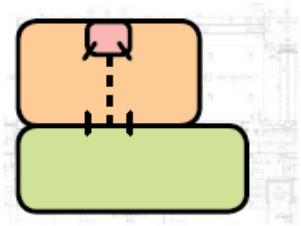
SECONDARY | 2017



S PRIMARY, 2016



PRIMARY | 2017



PRIMARY | 2017

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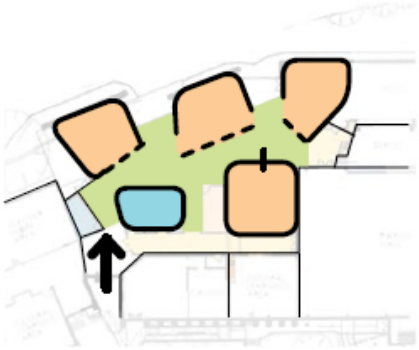
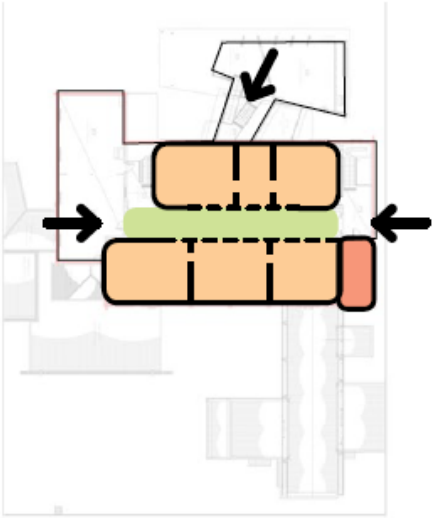
Melbourne

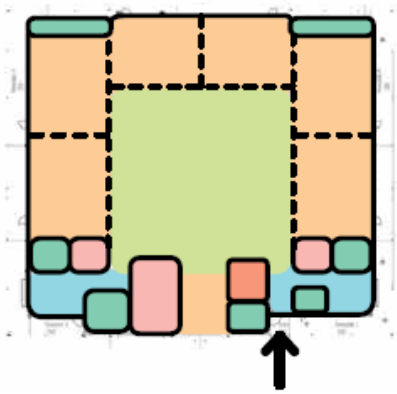
Type D Learning Environments



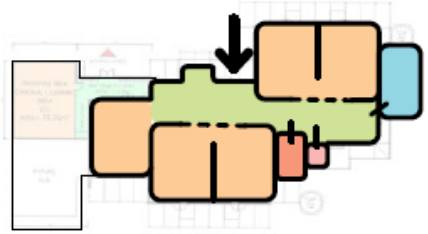
PRIMARY | 2016



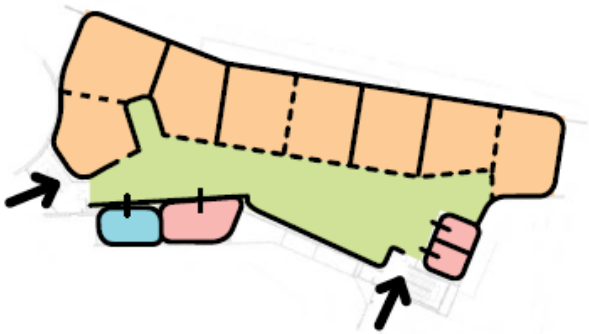
PRIMARY | 2016



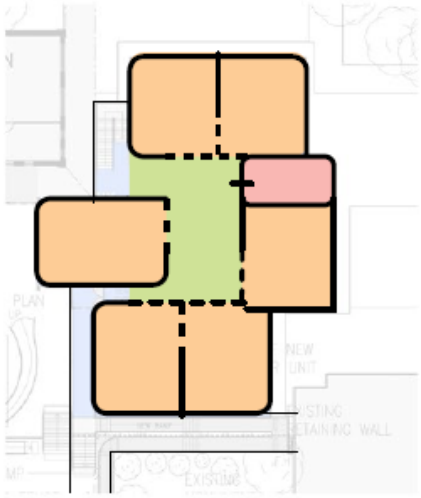
PRIMARY | 2015



SECONDARY | 2015



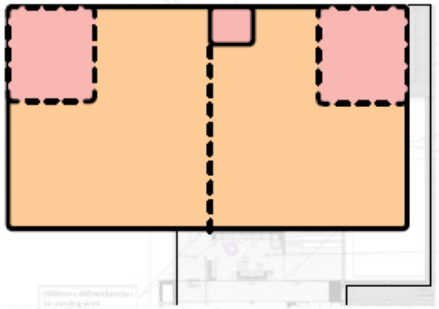
SECONDARY | 2015



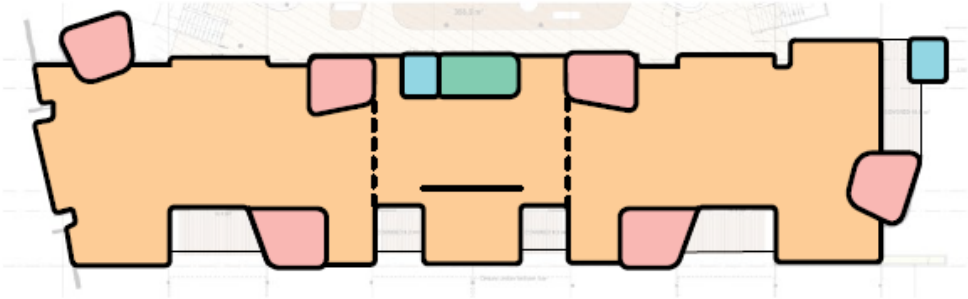
PRIMARY | 2016

Parramatta

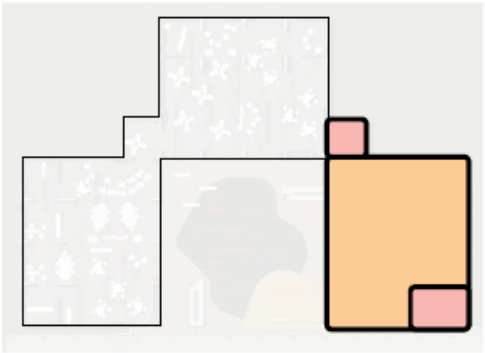
Type E Learning Environments



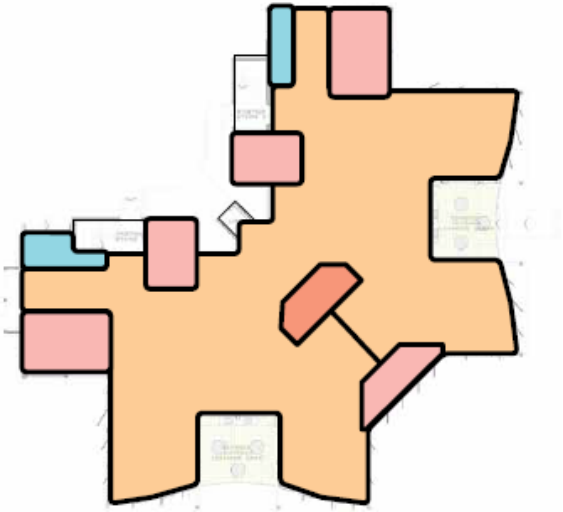
SECONDARY | 2017



PRIMARY | 2017



PRIMARY | 2017



PRIMARY | 2017

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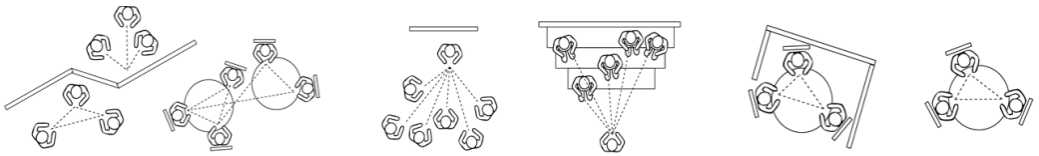
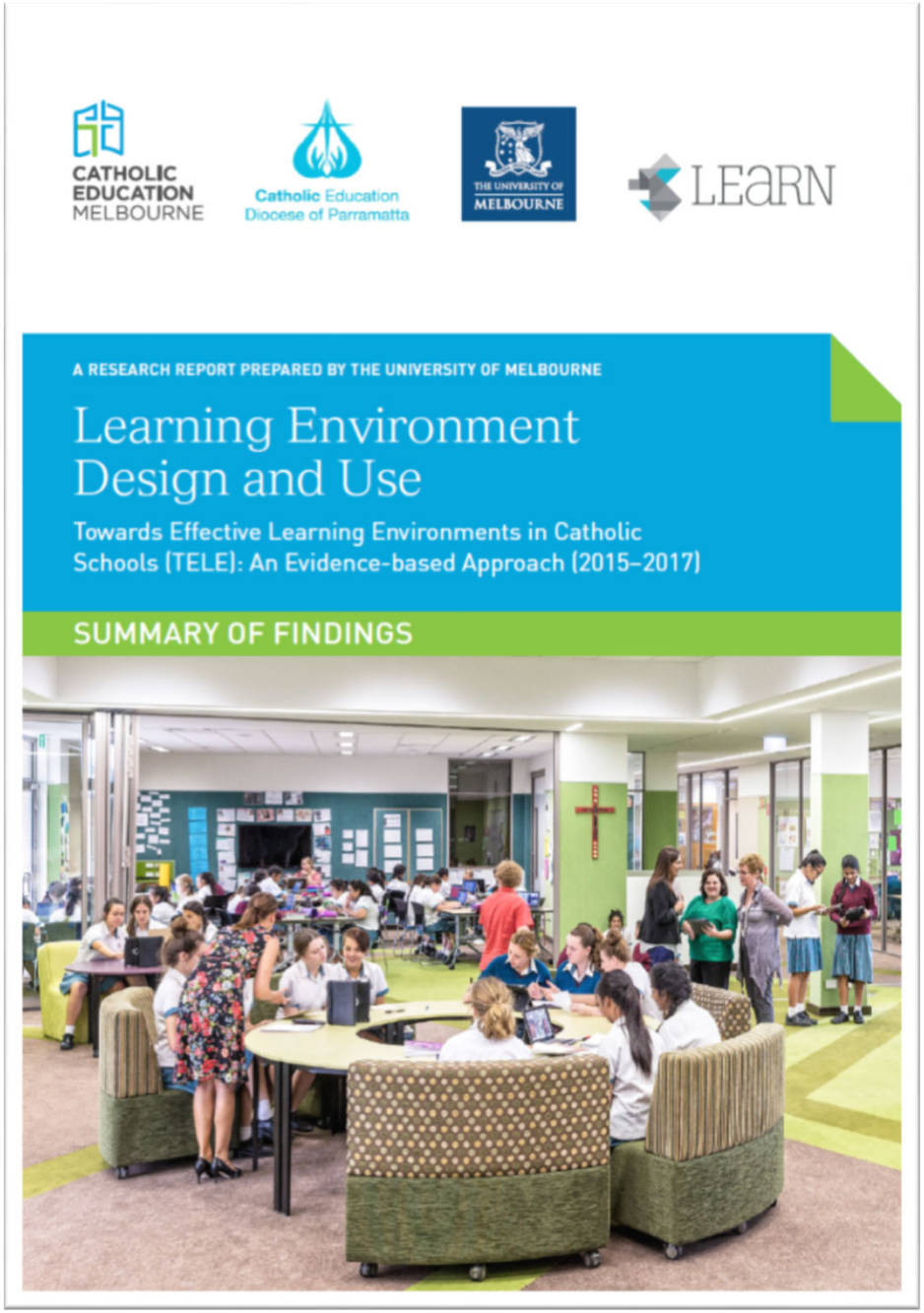
9 principles of designing and using learning environments to best pedagogical effect:

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 slight-lines***, 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.***

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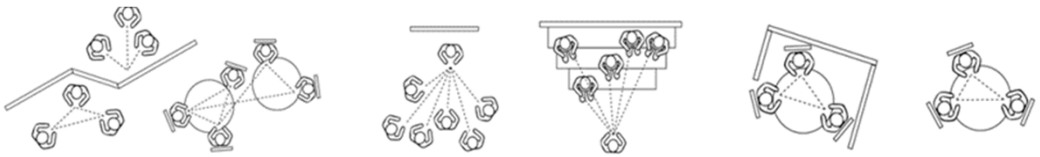
A RESEARCH REPORT PREPARED BY THE UNIVERSITY OF MELBOURNE
Learning Environment Design and Use
Towards Effective Learning Environments in Catholic Schools (TELE): An Evidence-based Approach (2015–2017)
SUMMARY OF FINDINGS

Where is the front?

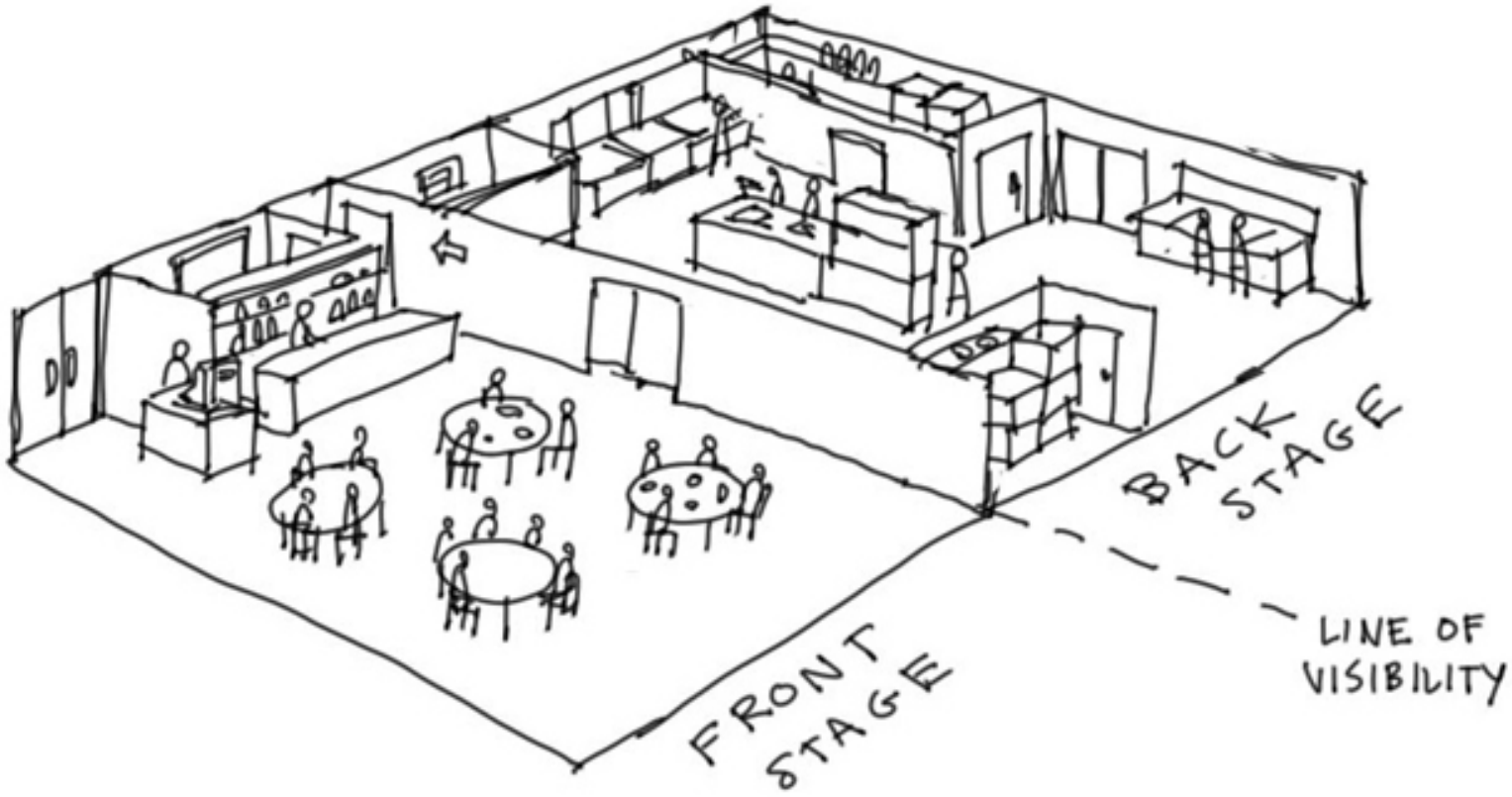
The kids were all standing around thinking what do we do now, and the teacher said to me, “Where is the front?”, and I said, “What”, and she said, “Where is the front of the room, where do I stand?”, and I said, “Well, wherever you want to stand”, and she said, “No, no, no, to teach, where do you want me to stand?”, and I said, “Well, that depends on what you are doing”, and she said, “I don't understand what you mean”. So I said, “Well, if you want to use the whiteboard you stand over there, and if you are going to do a demonstration over there”. But she said, “No, no, no, when I am teaching, where do you want me to stand?” And at that moment I thought oh!



INNOVATIVE LEARNING ENVIRONMENTS AND TEACHER CHANGE
A 2016-2019 ARC LINKAGE PROJECT

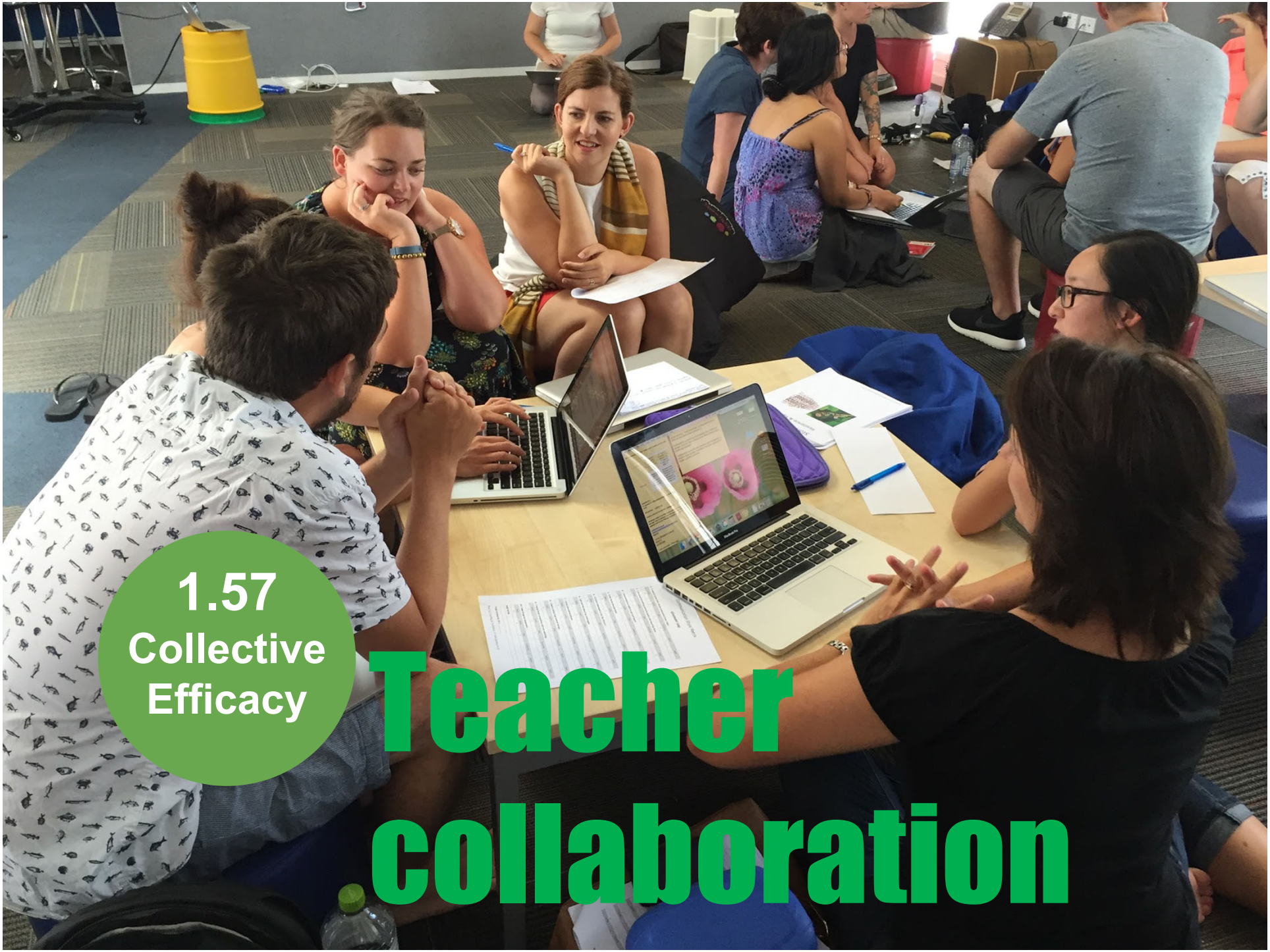
Innovative learning environments + teacher change

ARC Linkage project funded for 4 years (2016-2019)



The becoming of contemporary learning environments …

Image: www.adaptivepath.com/ideas/serving-experience-as-the-product/


1.57
Collective
Efficacy
Teacher
collaboration

Collective impact

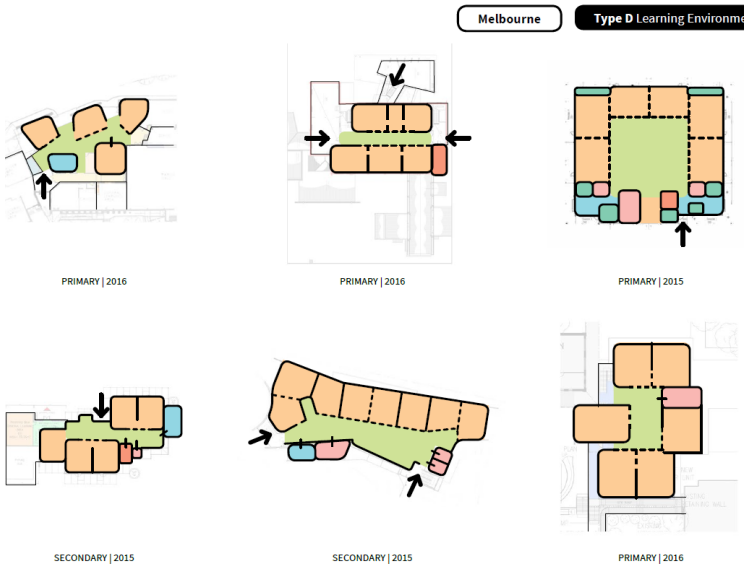
"The essence of teachers professionalism is the ability to **collaborate with others** to maximise impact"

Hattie, 2016

Concluding idea!

School learning environments, schools and school systems may be considered as '**complex adaptive systems**':

educational settings that can adapt and 'learn' in response to positive feedback loops …



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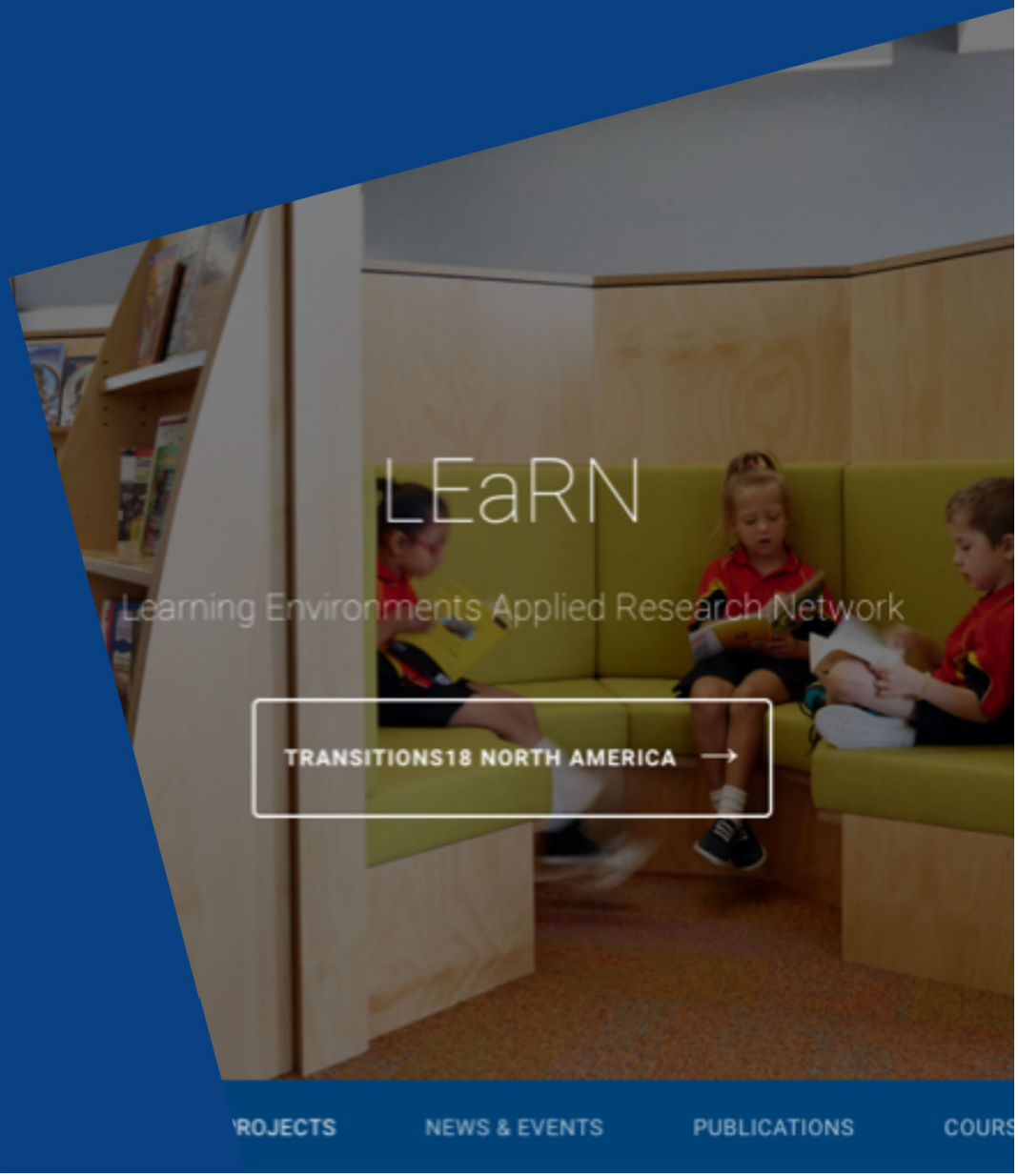
Thank you



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