Innovative Learning Environments and their impact on learning and instruction



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## **Partners**



Australian Research Council

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A SOUND EFFECT ON PEOPLE









Catholic Education Diocese of Parramatta

Education

WOODLEIGHschool



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MINISTRY OF EDUCATION Te Tähuhu o te Mataurunga

New Zealand Government

Te Kāwanatanga o Aotearoa





Child Development



Government of South Australia Department for Education and

AUSTRALIAN SCIENCE &

MATHEMATICS SCHOOL

## Context

- Teachers face challenges in adapting practices to new environments
- Architects face challenges aligning design with emerging teaching and learning practices, activities and behaviours
- Schools wish to leverage investment in new spaces



Introduction

## **Key Questions**

### Can altering the way teachers think about space unlock the potential of ILEs?

- How can the affordances of learning environments be identified and measured?
- What are the learning opportunities provided by ILEs?
- How are teachers using or not using ILEs?
- How can teachers' thinking about ILEs be identified?
- How do we identify and measure the impact of ILEs on deep learning?





Introduction

INNOVATIVE ENVIRONMI

RNING

## **Project timeline**



Workshops •

Theoretical framework

### **Evidence-based Practice in Educational Learning Environments (EBELE)**





Survey framework

#### **The Survey Framework**

What types of learning spaces do schools have?

What type of deep learning occurs within these learning spaces?

The Space, Design and Use (SDU) Survey What types of teaching approaches occur within these learning environments?

What are the teacher mind frames that 'drive' these teaching approaches?

How do the digital, physical and spatial affordances in school spaces facilitate the needs of student learning?



#### Survey framework

#### **The Survey Framework**



What types of learning spaces do schools have?

- Based on Dovey and Fisher (2014) typologies of space.
- percentage of each type of space that is prevalent in their school.



### **The Survey Framework**

Survey framework

Typology 1: Teacher facilitated presentation. direct instruction or large group discussion.

Typology 2: Teacher facilitated small group discussion or instruction.



What types of teaching approaches occur within these learning environments?

- Drawing on the fundamental spatial settings for learning, this study adopted a typology of six teaching approaches.

Typology 3: Team teacher facilitated presentation, direct instruction or large group discussion.



Typology 5: One-on-one instruction.





Percentage of time devoted to each teaching typology in their school. Collaborative/shared learning, supported by teachers



Typology 4:

as needed.

Typology 6: Individual learning.





### **The Survey Framework**

Survey framework

How well does the following meet the needs of student learning in your schools in terms of your school's desired pedagogy?						
1	Wi-Fi					
2	Mobile devices such as laptops, IPads, etc.					
3	Display technologies such as interactive whiteboards etc.					
4	Display areas for visual media and 2D work such as pin boards					
5	Display areas for 3D work such as shelves					
6	Hands-on resources such as texts and material objects					
7	Furniture for the desired learning activities					
8	Floor area for readily reconfiguring the learning space					

How do the digital, physical and spatial affordances in school spaces facilitate the needs of student learning?

- How well teaching and learning affordances (see Table 3) meet the needs of student learning in terms of the school's desired pedagogy
- A four-point Likert scale of Excellent, Good, Satisfactory and Poor.



Survey framework

### **The Survey Framework**

In my opinion, teachers at our school: 1 Believe that their fundamental task is to evaluate the effect of their teaching on students' learning and achievement. Believe that the success of students is 2 based on what teachers do (or don't do). 3 Want to coach and model different ways of learning, rather than teaching. 4 See assessment as feedback about their impact. 5 Engage in dialogue, not monologue. Enjoy a challenge and never retreat to 6 just 'doing their best'. 7 Believe that it is their role to develop positive relationships in learning spaces and staffrooms. Inform parents about the nature of 8 learning.

What are the teacher mind frames that 'drive' these teaching approaches?

- Hattie (2012) describes a teacher's mind frame as the mediating variable that directs how s/he thinks and acts when engaged in all aspects of teaching.
- Hattie (2012) presented eight teacher mind frames.
- A four-point Likert scale of Strongly agree, Agree, Disagree, and Strongly disagree was used.



Survey framework

### **The Survey Framework**

In my opinion, students at our school						
1	Find that at times studying makes them really happy and satisfied.					
2	Try to relate what they have learned in one subject to what they learn in other subjects.					
3	Feel that nearly any topic can be highly interesting once they get into it.					
4	Like constructing theories to fit odd things together.					
5	Work hard at their studies because they find the material interesting.					
6	Try to relate new material, as they are reading it, to what they already know on that topic.					
7	Spend a lot of their free time finding out more about interesting topics which have been discussed in different classes.					
8	Try to understand what the author means when reading a book.					
9	Come to most classes with questions in mind that they want answering.					
10	Like to do enough work on a topic so that they can form their own conclusions before they are satisfied.					

What type of deep learning occurs within these learning spaces?

- Ten items from the Learning Process Questionnaire (Biggs, 1987; Biggs, Kember, & Leung, 2004)
- A four-point Likert scale of Strongly agree, Agree, Disagree, and Strongly disagree was used.



### The Sample

Survey framework

# 6139 schools in five educational jurisdictions in Australia and New Zealand



822 principals/lead teachers responded for a response rate of 14%



# What are we learning?

### A typical school



### Has traditional classrooms

(Type A and B space = 70%)



Utilise **teacher-led approaches** (Typology 1, 2 and 3 = 72%)



Survey

## What are we learning?

### A typical school



**Teacher mind frames** that are positive (Mean = 3.07)

**BUT** students do not necessarily exhibit **deep learning** characteristics (Mean = 2.77)

**Survey** 



# What are we learning?

## A typical school



Has better **digital technologies** and **resources** in the learning space, as compared to **display** and **spatial affordances.** 





**Survey** 



Theoretical framework

### **Evidence-based Practice in Educational Learning Environments (EBELE)**





## **Data effect**

	1	2	3	4	5	6	7
Learning Spaces							
A:Traditional classrooms	81.8%	17.3%	88.5%	11.5%	17.8%	6.8%	8%
B:Traditional classrooms w/ b.out space							
	5%	9.3%	4.8%	2.3%	73.5%	0.2%	0.8%
C:Traditional classrooms w/flexible walls							
& breakout space	4.5%	66.5%	3.2%	1.7%	4.2%	0%	2.2%
<b>D</b> :Open plan w/the ability for separate							
c/rooms	4	3.5%	1.5%	78.7%	1.7%	6.7%	3.8%
E:Open plan w/some adjoining spaces	4.7%	3.5%	2%	6	3%	86.3%	85%
Teaching approaches							
1: Teacher facilitated presentation,	20%	29.2%	68.2%	12.2%	28%	3%	17.5
direct instruction, large groups							
2: Teacher facilitated small group	32.2%	27.8%	15.5%	22.3%	28.5%	8.5%	30.2%
discussion							
3: Team teacher facilitated	12.2%	12%	5%	14.7%	9.5%	14%	14.8%
presentation, direct instruction or large							
group discussion							
4: Collaborative shared learning,	19%	17.7%	5.8%	30%	18.8%	63%	18.2%
supported by teachers as needed							
5: One-on-one instruction	8.5%	6.3%	3%	8.5%	8.2%	6.2%	8.8%
6: Individual learning	8.2%	7%	2.5%	12%	7%	5.3%	10.2%
Teacher mind frames	3.2	3.1	2.8	3.3	3.2	3.4	3.2
Student deep learning	2.9	2.8	2.5	3.0	2.8	3.1	2.9
Number of schools in cluster	242	78	269	43	87	20	83
Percentage of total	29.5%	9.5%	32.8%	5.2%	10.6%	2.4%	10.1%

Evidence



## **Data effect**

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Evidence

 Australian Science and Maths School (Adelaide)
– Cluster 7

Sietc INNOVATIVE LEARNING ENVIRONMENTS AND TEACHER CHANGE

## **Data effect**

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Australian Science and Maths School (Adelaide) – Cluster 7

Evidence

 Woodleigh (Victoria) – Cluster 1

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 Churchie (Brisbane) – Cluster 1



## **Design effect**

"A' "C' 'D' "B" 'E' TRADITIONAL **OPEN-PLAN** ----- Bi-folding wall Learning spaces Learning spaces Solid wall Classroom Commons Store room Street-space INNOVATIVE L ENVIRONME EARNING

Design

## **Design effect**

Means of Teacher Mind Frames

Design



Means of Student Deep Learning

Design

## **Design effect**

Building the Education Revolution (BER) was anAustralian government A\$16.2 billion schoolinfrastructure initiative in response to the GFC.What is the impact of new learning spaces?



### FURNITURE VARIATIONS WITHIN TEMPLATE SPACES



BUILDING THE EDUCATION REVOLUTION

IS A UNIQUE RESEARCH OPPORTUNITY TO COMPARE THE TEMPLATE DESIGNS AT DIFFERENT SCHOOLS

THE UNIVERSITY OF

### LIFE CYCLE COSTING FOR DIFFERENT TEMPLATE DESIGNS







Smart Green Schools

IS A UNIQUE RESEARCH OPPORTUNITY TO COMPARE THE TEMPLATE DESIGNS AT DIFFERENT SCHOOLS



## **People effect**



People 6.



## **People effect**

Means of Teacher Mind Frames

3.2 3.1 **Traditional classrooms** Type D - Open plan with the 3 other teaching approaches ability for separate classrooms Type E - Open plan with 2.9 some adjoining spaces Type B - Traditional classrooms 2.8 with breakout space Type C - Traditional classrooms with flexible walls and breakout space 2.7 Type A Traditional classrooms 2.6Traditional classrooms teacher facilitated presentation, direct instruction or large group discussion 2.52.8 3 3.4 2.9 3.1 3.2 3.3 3.5

Means of Student Deep Learning



# **DEEP LEARNING COMPETENCIES**





## Implications

- Slow progress towards widespread implementation of ILEs
- Pedagogies in those spaces conflicts in teaching styles, co-teaching
- Strong correlation between 'good' teacher mind frames, 'good' student learning and ILEs.
- Teachers are using these spaces reasonably well
- Change focus to more explicitly on teacher transition into ILEs.



# What is next?

## **Case studies**

- Teacher practices
- Teacher transitions
- 'Curated' learning
- ICT
- Design affordances
- Spatial affordances
- Measurement practices
- Design thinking skills



















## **Contact information**

INNOVATIVE LEARNING ENVIRONMENTS AND TEACHER CHANGE



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