Advancing change in education: The irrefutable role of *evidence*.

Associate Professor Wesley Imms

Learning Environments Applied Research Network (LEaRN)

The evidence: what do we know?

"Students are experiencing an explosion in information… Its better to teach them to access and process information, than to get them to commit a small percentage to memory"

"Teachers must be freely accessible to all, not stay at the front of the room…"

"Students learn well, even better, from each other."

"Spaces must allow students to use peers as fellow learners and teachers, and facilitate teachers as resources to help that learning."

The evidence: what do we know?

"Classrooms with flexible furniture and moveable walls are needed to allow freedom of movement, access to resources…"

"Students need individualised learning plans, individualised assessment strategies… spaces that provide the capacity to match a student's knowledge needs to a team of teachers, not just one."

"Spaces must reflect that no two students are the same, learn the same."

The evidence: what do we know?

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"Students need individualised learning plans, individualised assessment strategies… spaces that provide the capacity to match a student's knowledge needs to a team of teachers, not just one."

"Spaces must reflect that no two students are the same, learn the same."

Banyon School, USA, 1975.

Did they fail?

- Community resistance
- Loss of political support
- No evidence about educational successes

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The evidence: what do we know?

FINANCIAL REVIEW

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John Hattie tops Australia's most powerful in education in 20

The AFR Magazine's hotly anticipated annual Power issue includes lists of the key players across five different industry sectors. Here, the top five from education.

John Hattie's research as an education professor at the University of Melbourne brings big data to the problem of deciding which are the best, most cost-effective ways of improving schools.

Power is in flux in education, which is waiting for the next big idea after the failure of the last two attempts at sweeping reform. Labor's Gonski school funding reform was halted by the Abbott

The evidence: what do we know?

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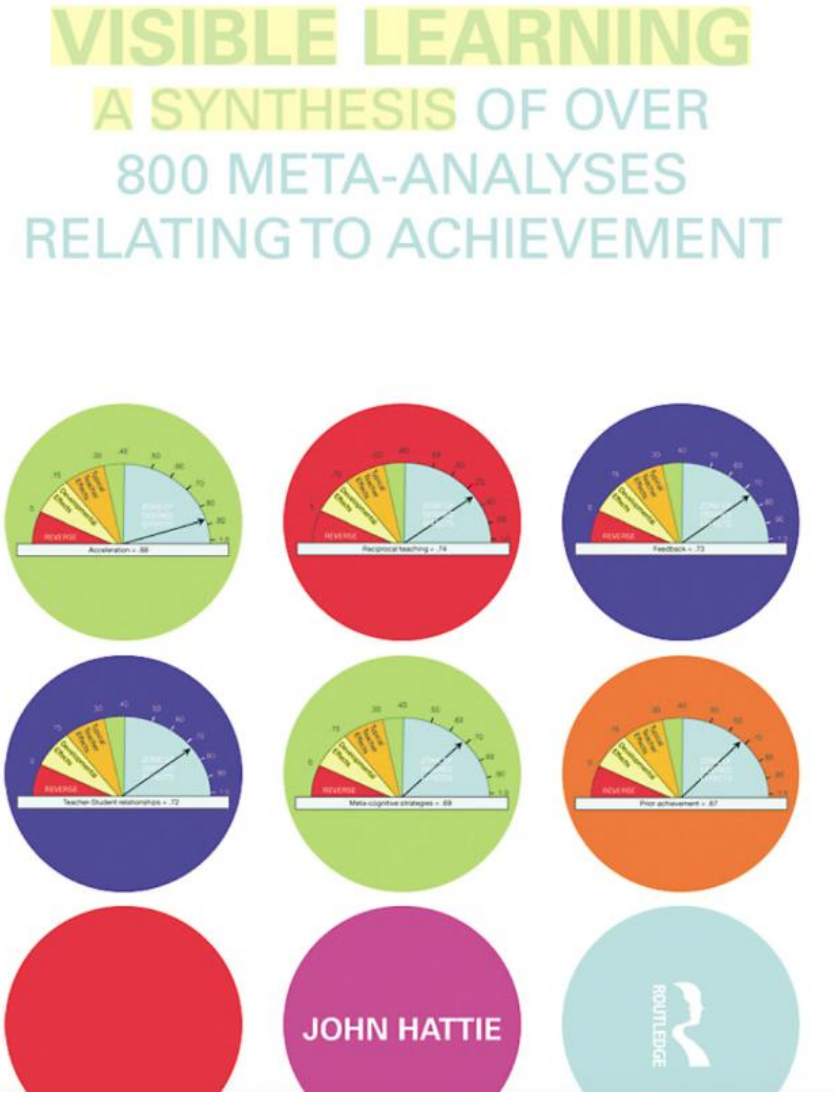
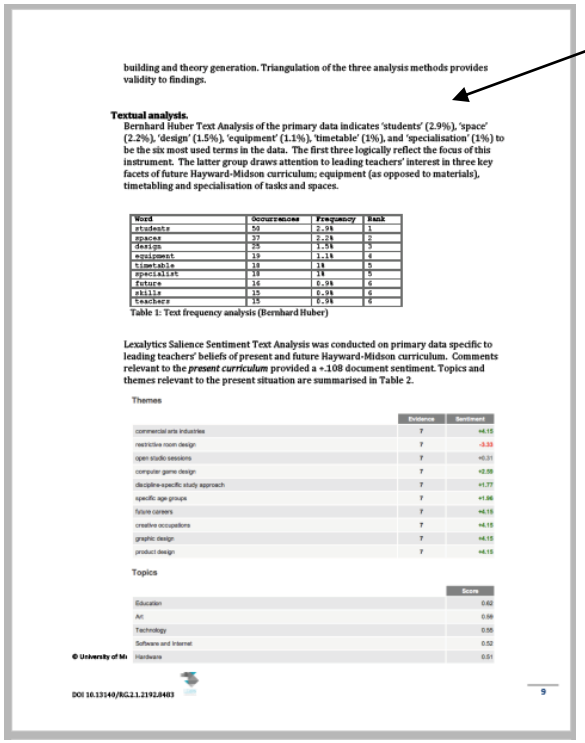


Research report, what impacts student learning?

Statement of outcomes



building and theory generation. Triangulation of the three analysis methods provides validity to findings.

Textual analysis.

Bernhard Huber Text Analysis of the primary data indicates 'students' (2.9%), 'space' (2.2%), 'design' (1.5%), 'equipment' (1.1%), 'timetable' (1%), and 'specialisation' (1%) to be the six most used terms in the data. The first three logically reflect the focus of this instrument. The latter group draws attention to leading teachers' interest in three key facets of future Hayward-Midson curriculum; equipment (as opposed to materials), timetabling and specialisation of tasks and spaces.

Word	Occurrences	Frequency	Rank
students	50	2.9%	1
spaces	37	2.2%	2
design	25	1.5%	3
equipment	19	1.1%	4
timetable	18	1%	5
specialist	18	1%	5
future	16	0.9%	6
skills	15	0.9%	6
teachers	15	0.9%	6

Table 1: Text frequency analysis (Bernhard Huber)

Lexalytics Salience Sentiment Text Analysis was conducted on primary data specific to leading teachers' beliefs of present and future Hayward-Midson curriculum. Comments relevant to the ***present curriculum*** provided a +.108 document sentiment. Topics and themes relevant to the present situation are summarised in Table 2.

Themes

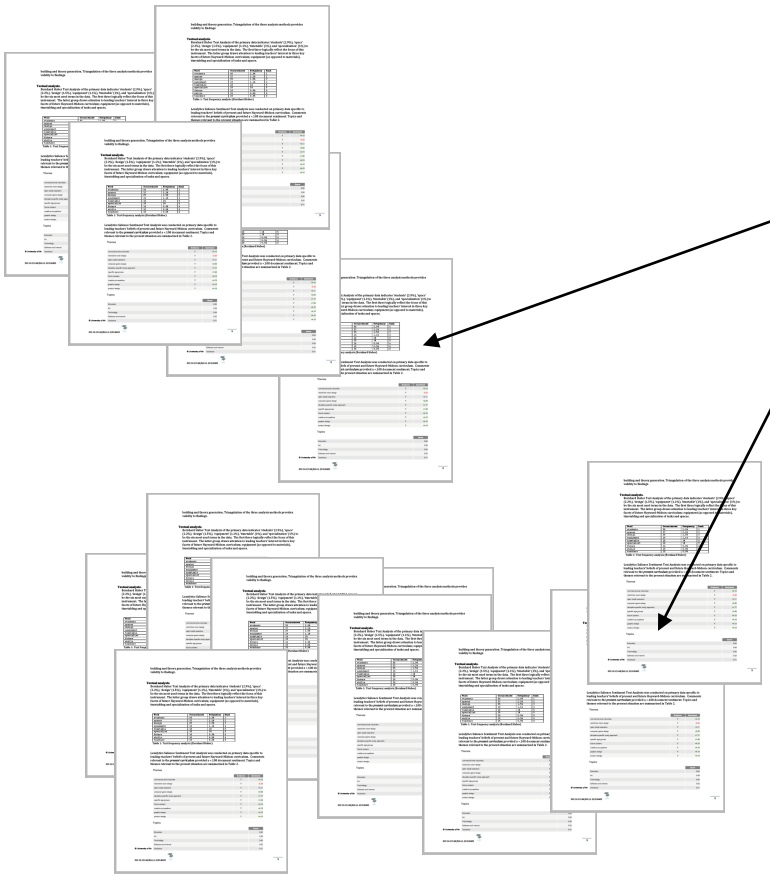
	Evidence	Sentiment
commercial arts industries	7	+4.15
restrictive room design	7	-3.33
open studio sessions	7	+0.31
computer game design	7	+2.58
discipline-specific study approach	7	+1.77
specific age groups	7	+1.96
future careers	7	+4.15
creative occupations	7	+4.15
graphic design	7	+4.15
product design	7	+4.15

Topics

	Score
Education	0.62
Art	0.59
Technology	0.55
Software and Internet	0.52
Hardware	0.51

DOI 10.13140/RG.2.1.2192.8483

Research reports…



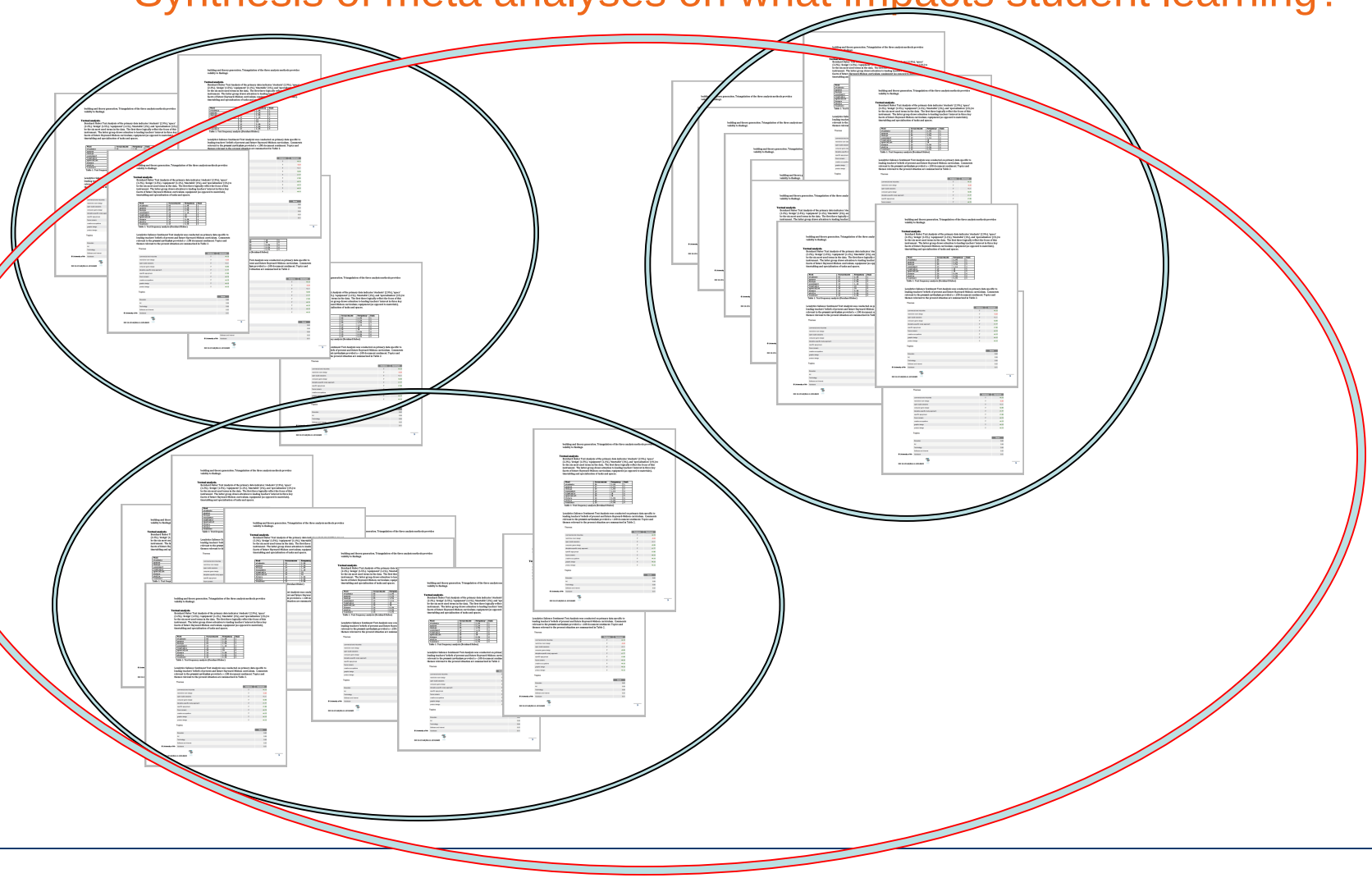
Multiple reports on research across topics on this issue,

The evidence: what do we know?

Meta analyses….

The evidence: what do we know?

Synthesis of meta analyses on what impacts student learning?



Hierarchy of what has most impact on student learning

1. *The teacher (collective efficacy)*
2. *Self-reported grades*
3. *Teachers' estimates of achievement*
4. *Cognitive task analysis*

Etc.

Etc.

Etc.

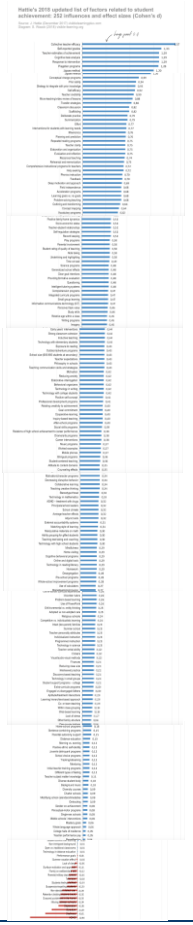
230. Inquiry learning

Effect size
d .0+ = negligible
d 1.0 = large

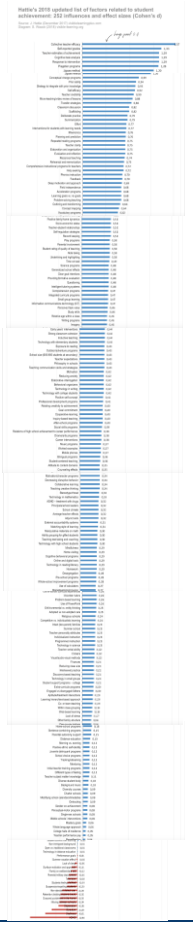
d <0.4 = hinge point – 'just turning up'

Aim is for 'growth'. What variables assist *d* >0.4 outcomes?

Hierarchy of what has most impact on student learning

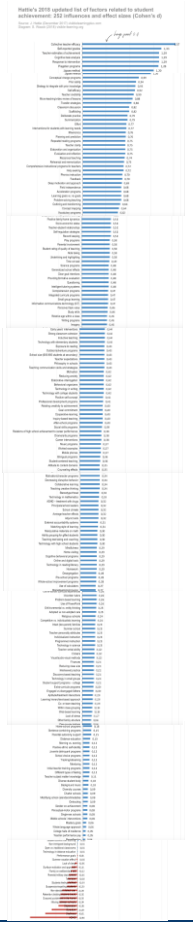


Hierarchy of what has most impact on student learning



Open versus traditional learning programs (≅ 220, *d=0.1)*

Hierarchy of what has most impact on student learning



- Chess instruction (≅140)
- Using Powerpoint (≅ 175)
- Summer Schools (≅ 180)
- Breastfeeding (≅ 210)
- Open versus traditional learning programs (≅ 220, *d=0.1)*

The Hattie Edict…

"Open classrooms make little difference to student learning outcomes". (p. 88)

Hattie's Mind Frames

Teachers' 'thinking' characteristics that correlate to improved student learning

1. I am an evaluator
2. I am an agent of change
3. I think of learning, not teaching
4. Assessment is about judging my impact
5. I engage in dialogue, not monologue
6. I do not retreat from doing my best
7. I build positive relationships
8. I teach the language of learning
9. I accept that learning is hard work
10. I collaborate

Innovative Learning Environments and Teacher Change

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

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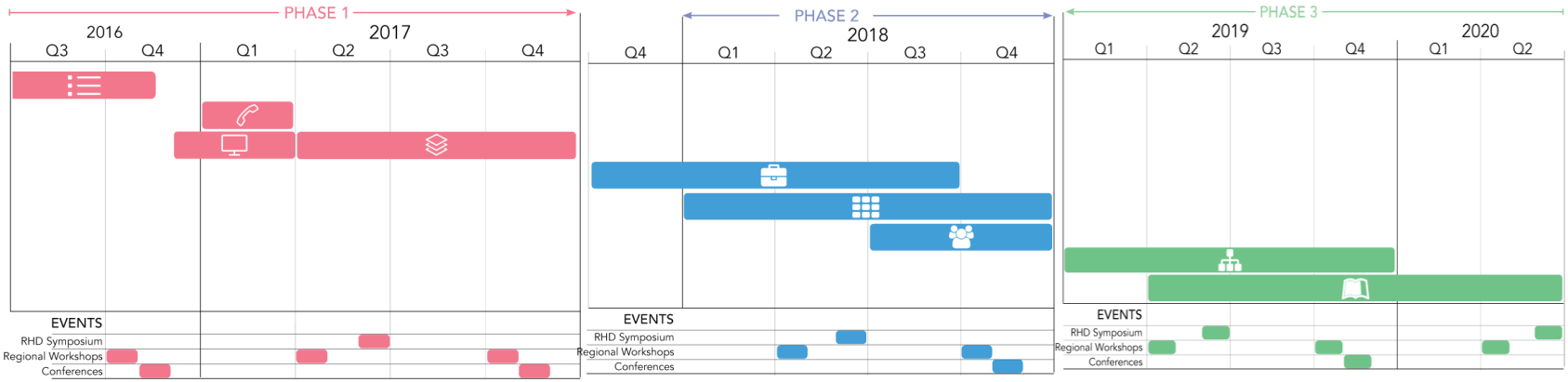

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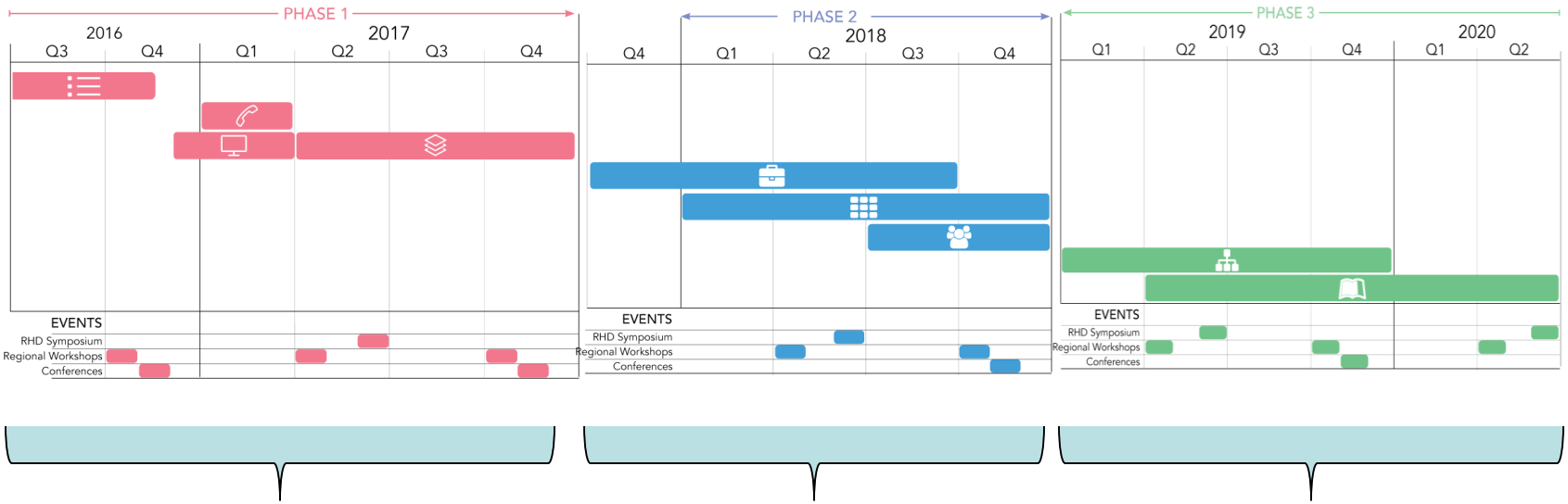


Baseline data

‘Toolkit’ development

Evaluation of impact

Systematic (Prisma) review for quality evidence

Search for ‘student learning outcomes + learning/classroom + space/environment.’

- 5,521 articles located
- 4,481 after duplicates omitted
- 72 after review of abstracts
- 21 after full text review

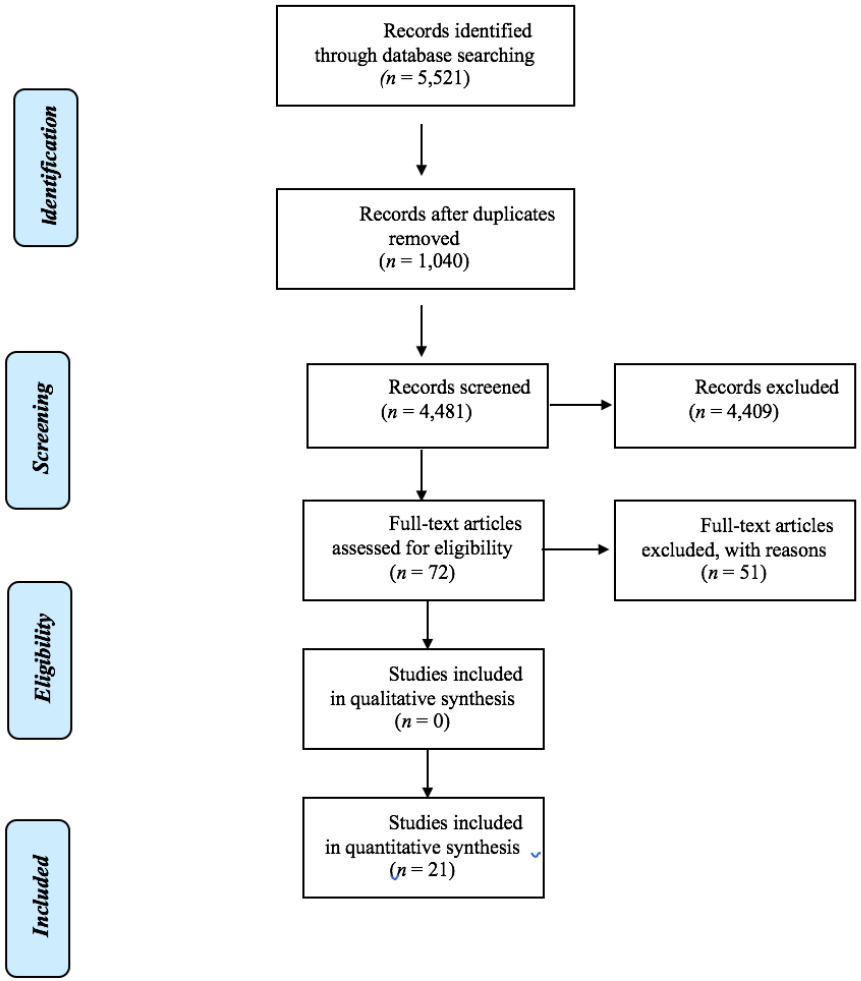


Figure 1. PRISMA flow diagram of the articles yielded during systematic review process

Systematic review of quality evidence

Tanner et al (2008)	Found improving quality of design correlated with an increase in student academic scores.
Tanner et al (2000)	Identified seven design factors that positively correlated to improved student academic scores.
Bartlett et al (2017)	Identified that the built environment accounted for 8% (reading) and 12% (maths) improvement in student academic scores.
Chandra & Lloyd (2008)	A blended environment (ILE + technology) positively impacted student academic scores.
Cicek & Taspinar (2016)	Found that student achievement, retention and positive attitudes were positively impacted by innovative spaces.
Fößl et al (2016)	Elementary/Primary students in an ILE engaged in video learning outperformed students in a traditional setting.

Systematic review of quality evidence

Barrett (2015)	Environmental design factors account for 16% of variance in student academic outcomes.
Byers et al. (2014)	Students in ILEs showed up to 17% improvement in academic scores compared to like-ability peers in traditional spaces.
Chang et al (2006)	Could not differentiate academic scores between students in ILEs and traditional spaces.
Reiss et al (1975)	Limited correlation between open learning environments and student persistence on difficult tasks.
Solomon et al (1976)	Found open classrooms performed worse than traditional spaces in terms of academic achievement on standardized tests.
Kazua et al (2014)	Students in blended (technology + ILE) spaces outperformed students in traditional spaces.

ILETC Stage 1, Phase 1 Survey

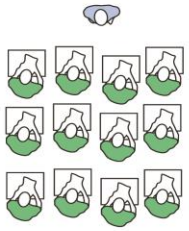
- Three clusters of questions;
  - What types of ILEs and what % of the total school infrastructure?
  - Principal perceptions of the type of teaching that is happening in most predominant classroom type?
  - Principal perceptions of degree of student ‘deep learning’ happening in most predominant classroom type?
- 14% response rate (822 schools)*

The evidence: what do we know?

Type A	Type B	Type C	Type D	Type E
57%	14%	13%	4%	12%

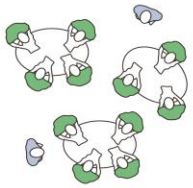
The evidence: what do we know?

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



Typology 2:
Teacher facilitated small group discussion or instruction.

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



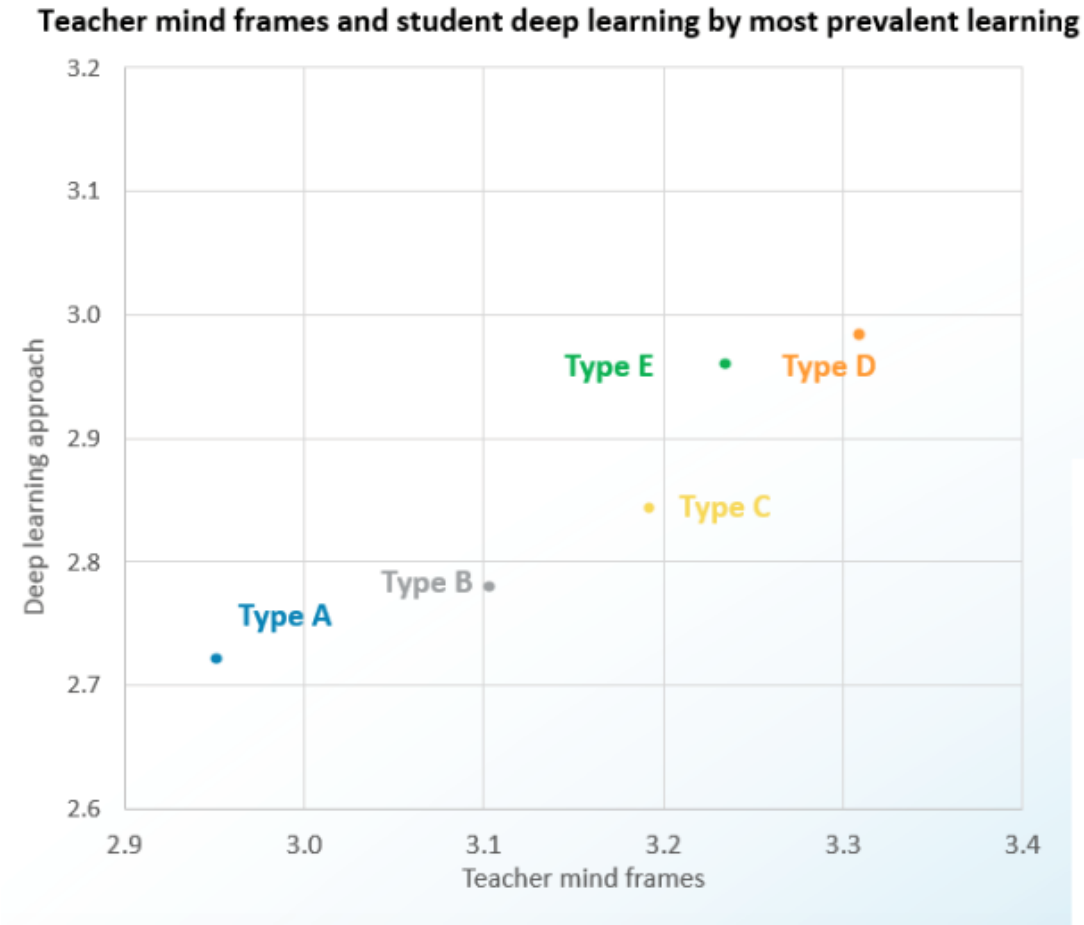
Typology 4:
Collaborative/shared learning, supported by teachers as needed.

Typology 5:
One-on-one instruction.

Typology 6:
Individual learning.

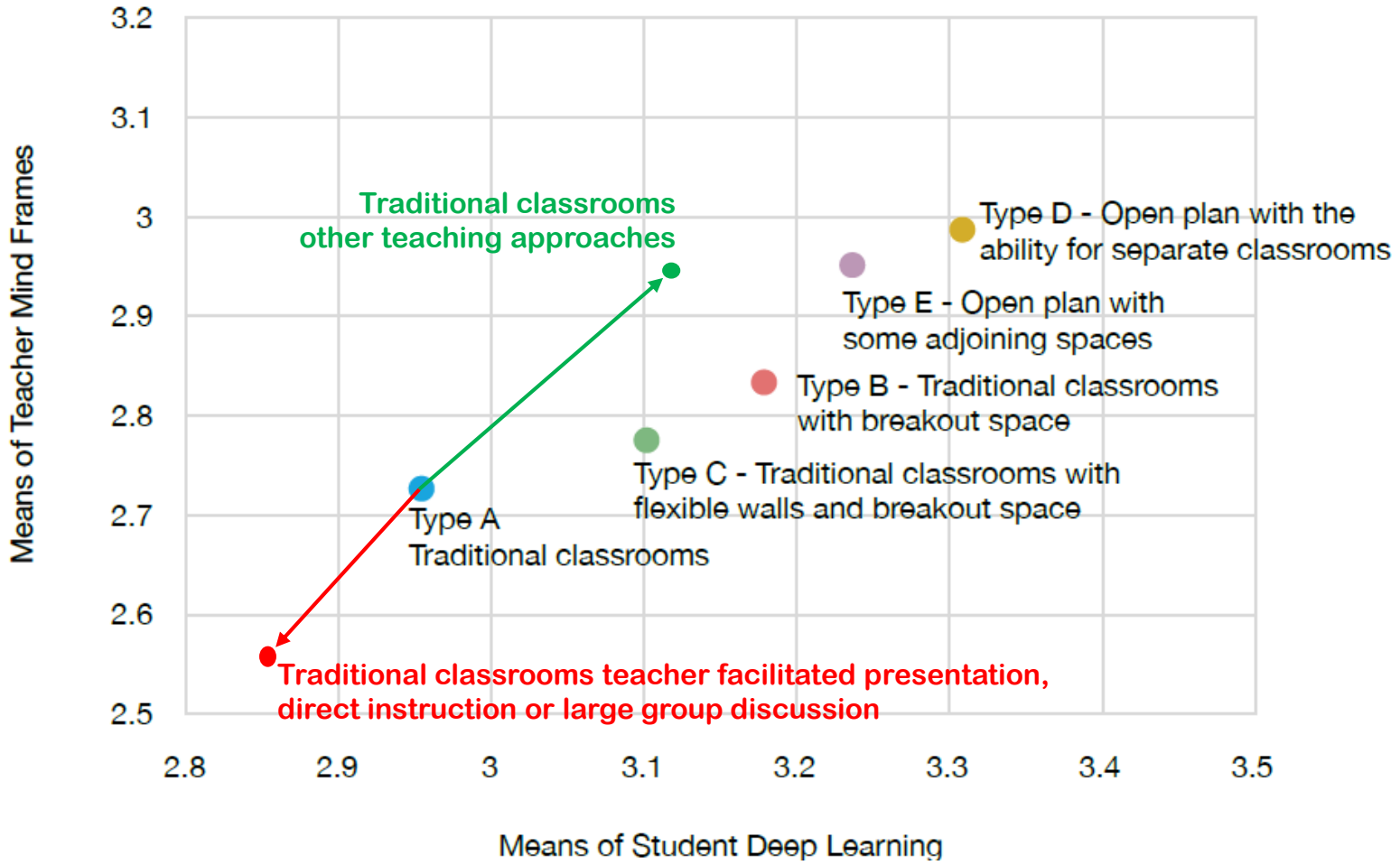
Typology 1	53%
Typology 2	22%
Typology 3	7%
Typology 4	9%
Typology 5	5%
Typology 6	4%

ILETC Stage 1 Survey



Imms, W., Mahat, M., Murphy, D. & Byers, T. (2017). Type and Use of Innovative Learning Environments in Australasian Schools – ILETC Survey. Technical Report 1/2017. ILETC Project: Melbourne.

The evidence: what do we know?



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- Many teachers are developing effective strategies for using ILEs well, but these lack structure, and are hard to disseminate.
- Given our massive investment in school infrastructure, we have little evidence to show its impact.

The evidence: what do we know?

ILETC Phase 1 activity (2017)

- 30+ case studies
- 3 Prisma Systematic Reviews
- 6 Teacher workshops in 2 countries
- 3 Industry think tanks on three continents
- Survey of 6,000 schools.
- Three PhD research symposia in three continents

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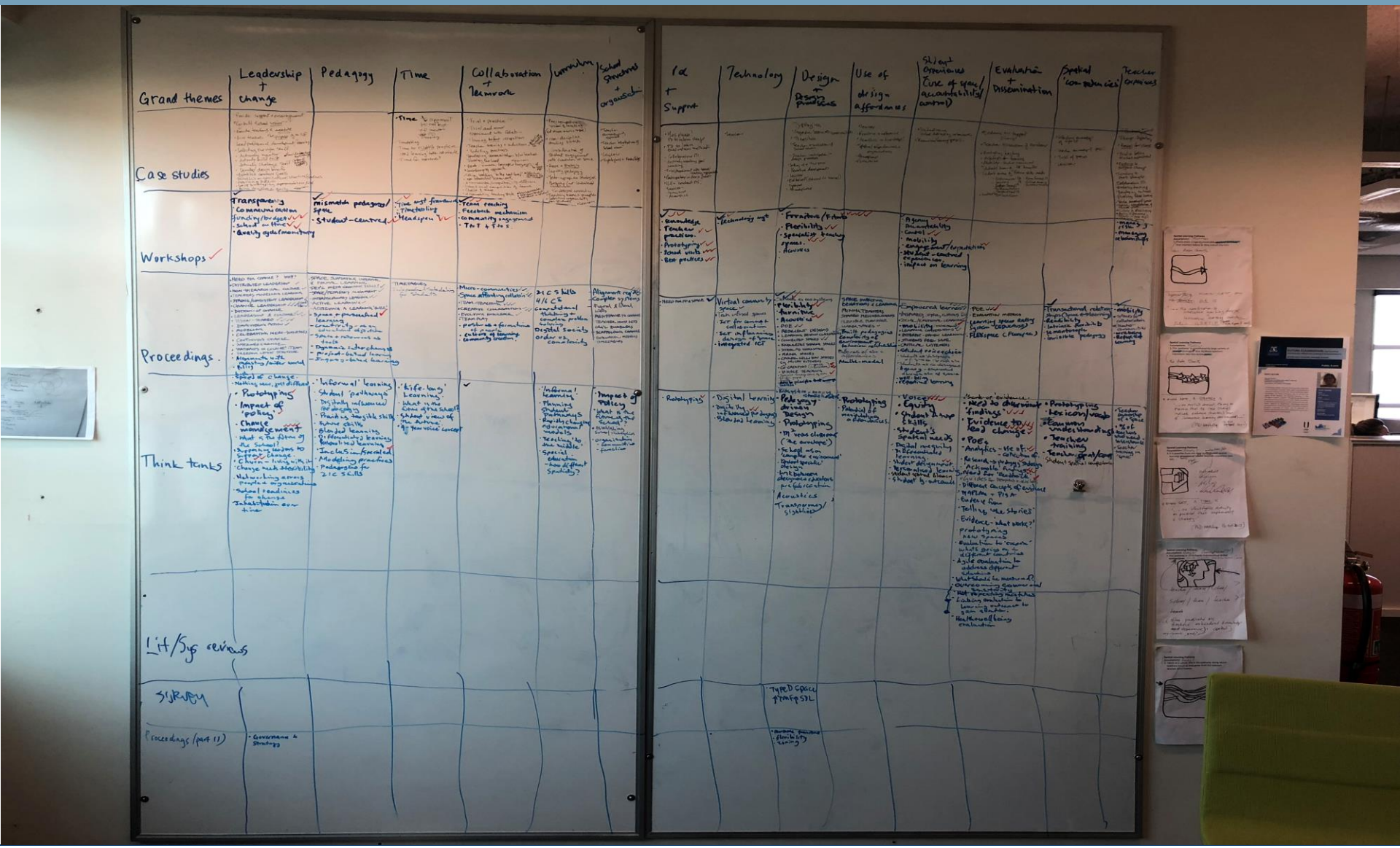
The evidence: what do we know?



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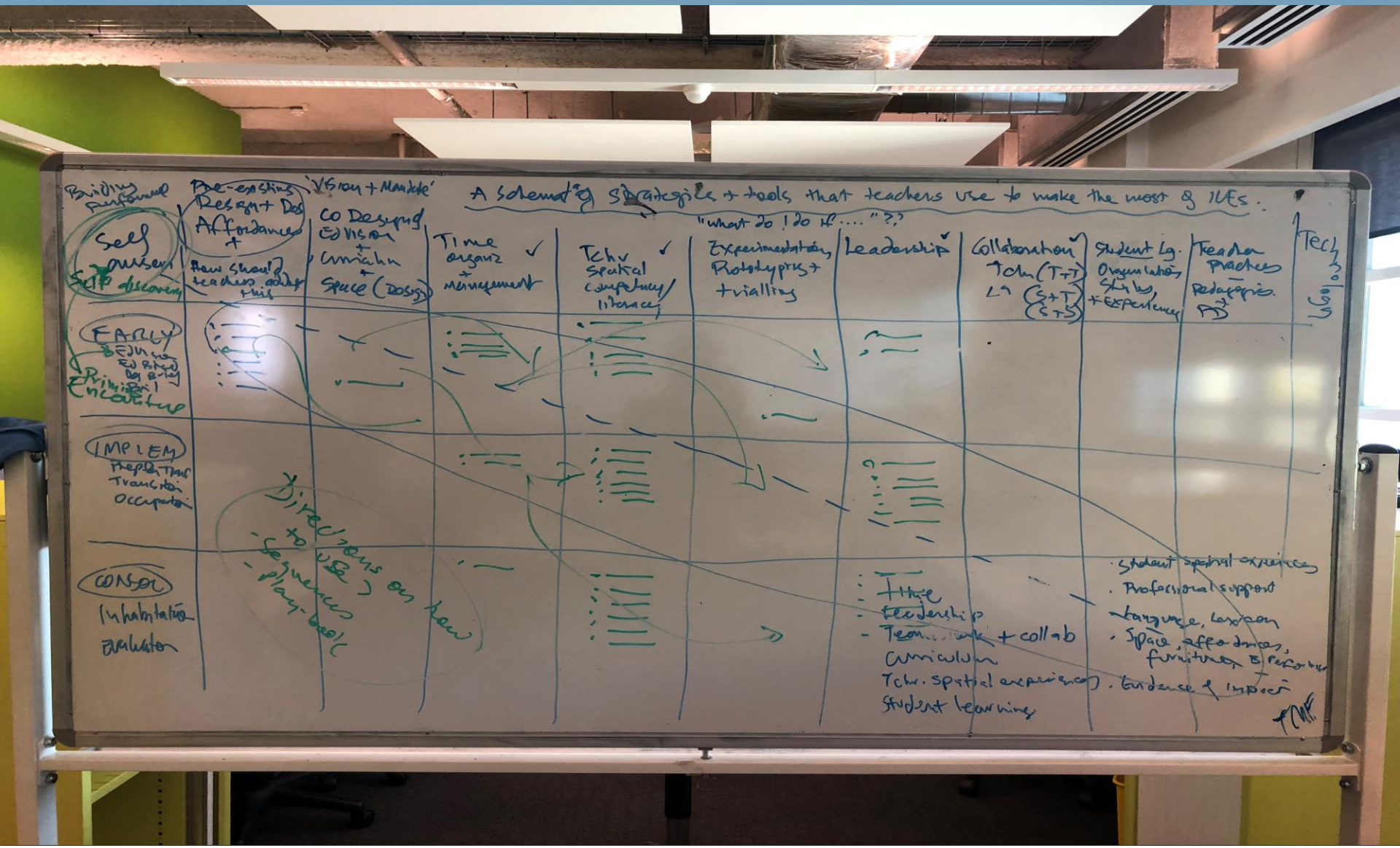

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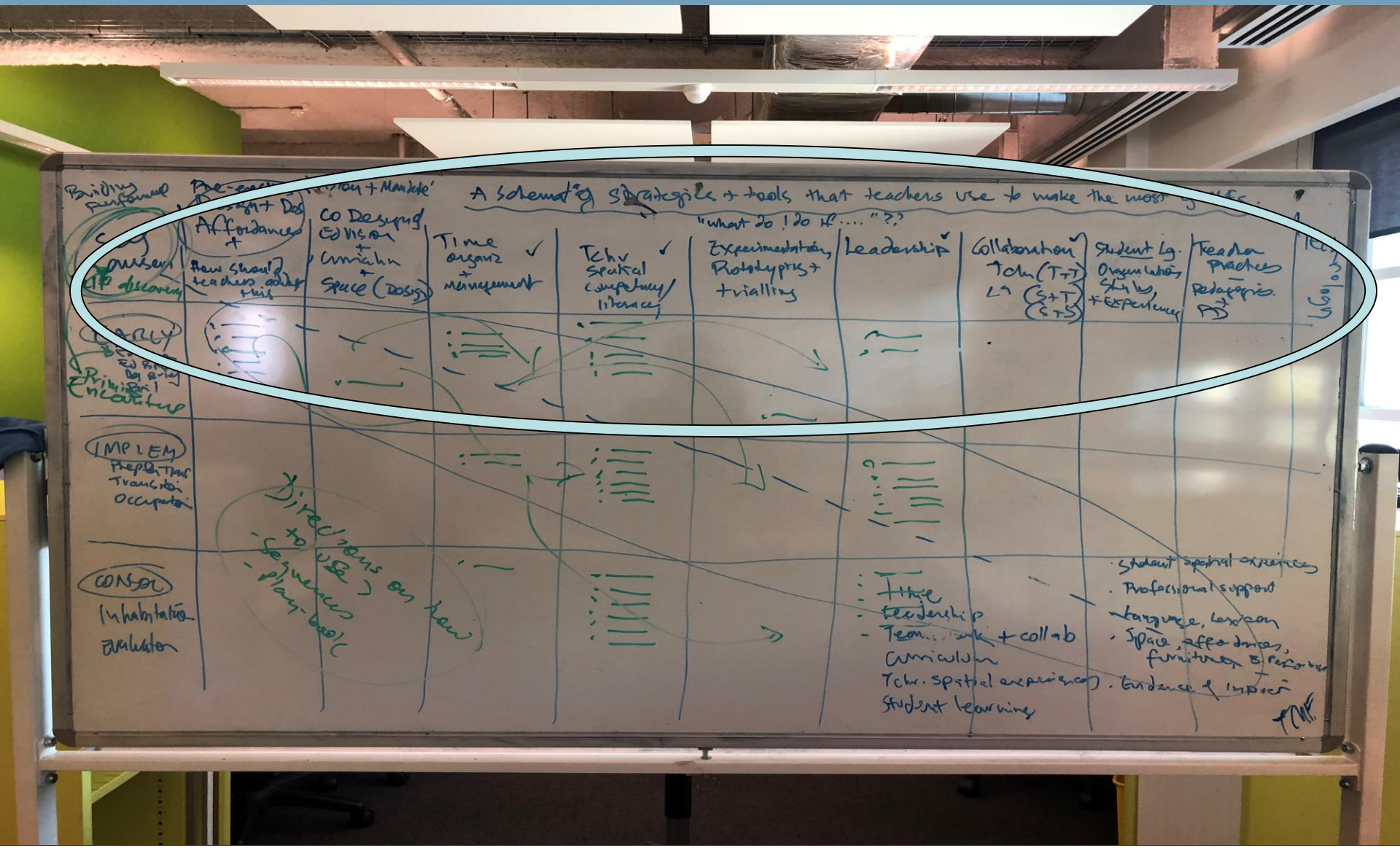
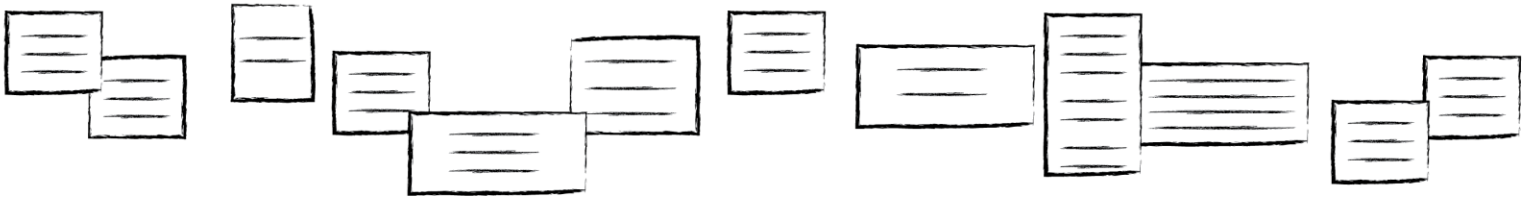
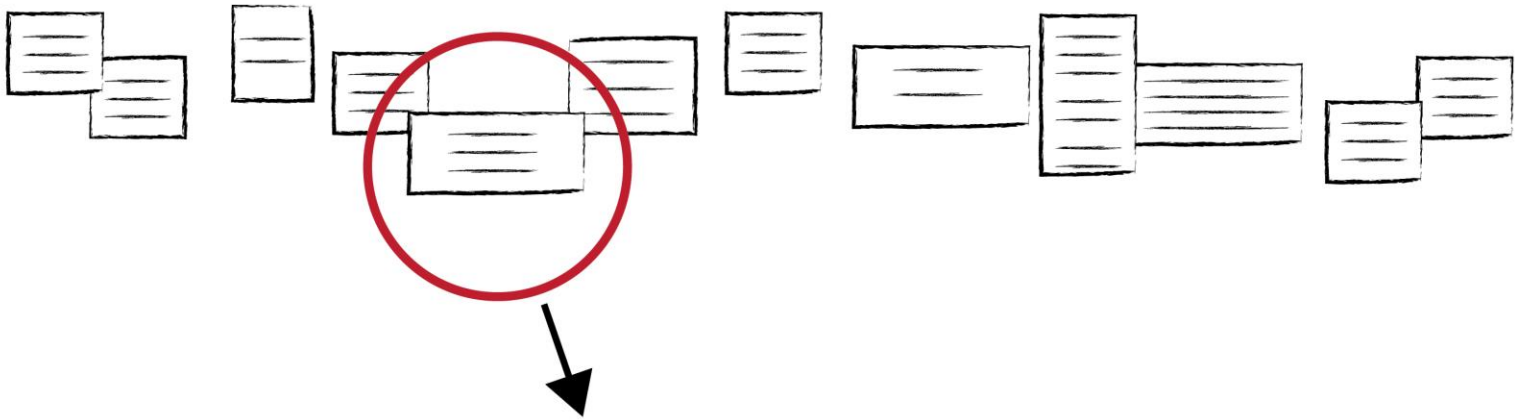






Collaboration and teamwork

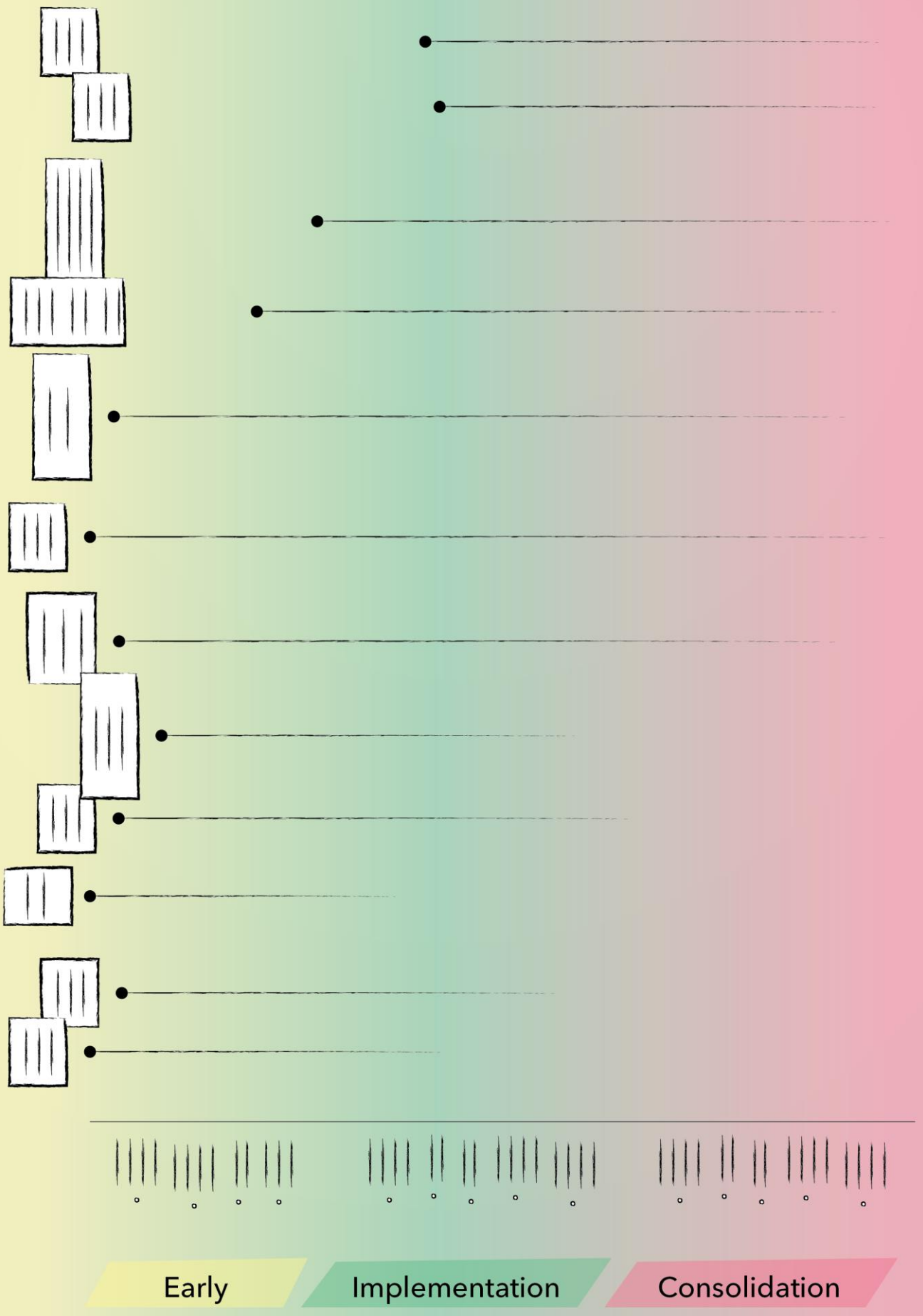
- *teacher and teacher, teacher and student, student and student*

Early

Implementation

Consolidation

Education vision
Education brief
Design brief
Build
Preparation for transition


Early
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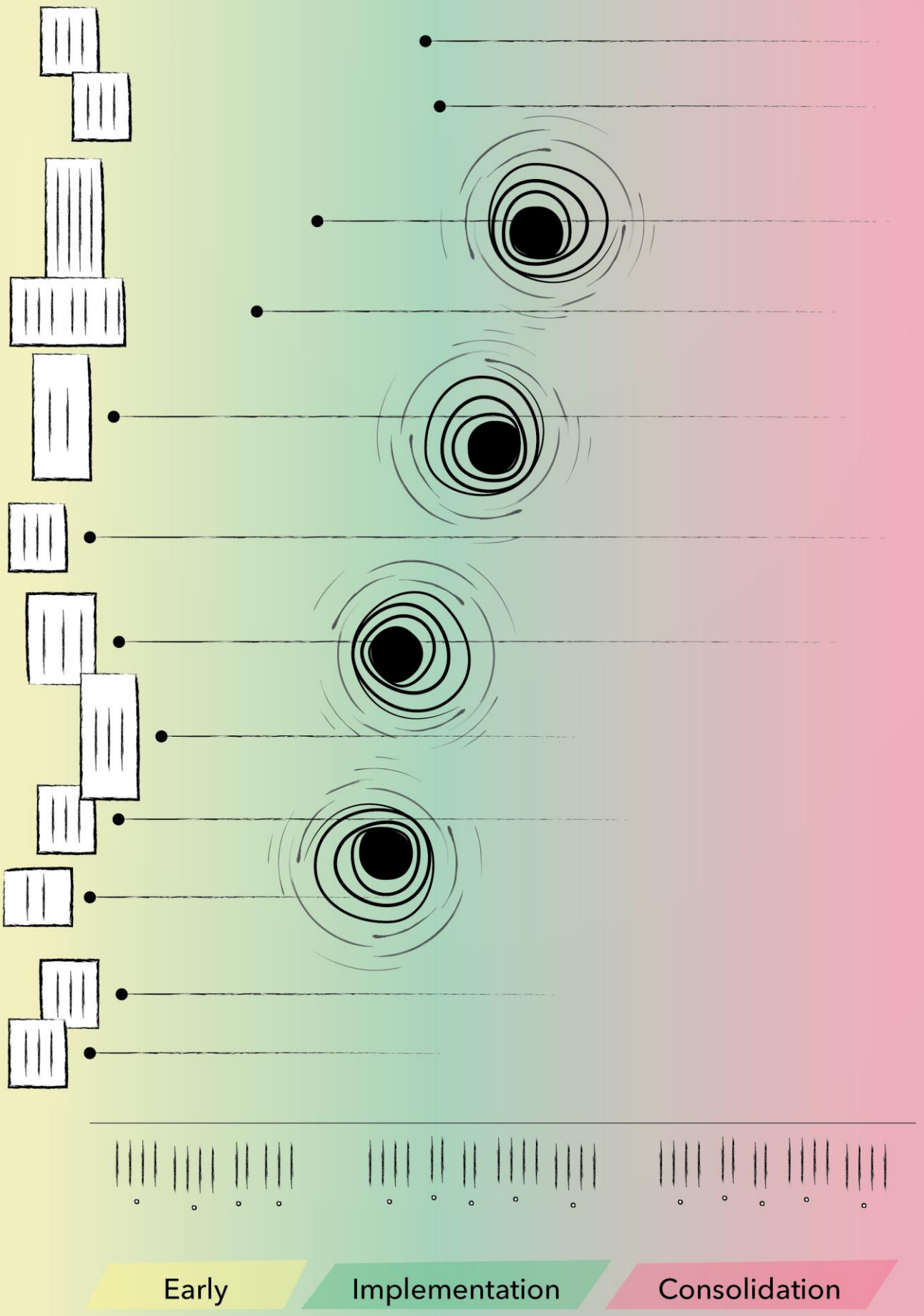
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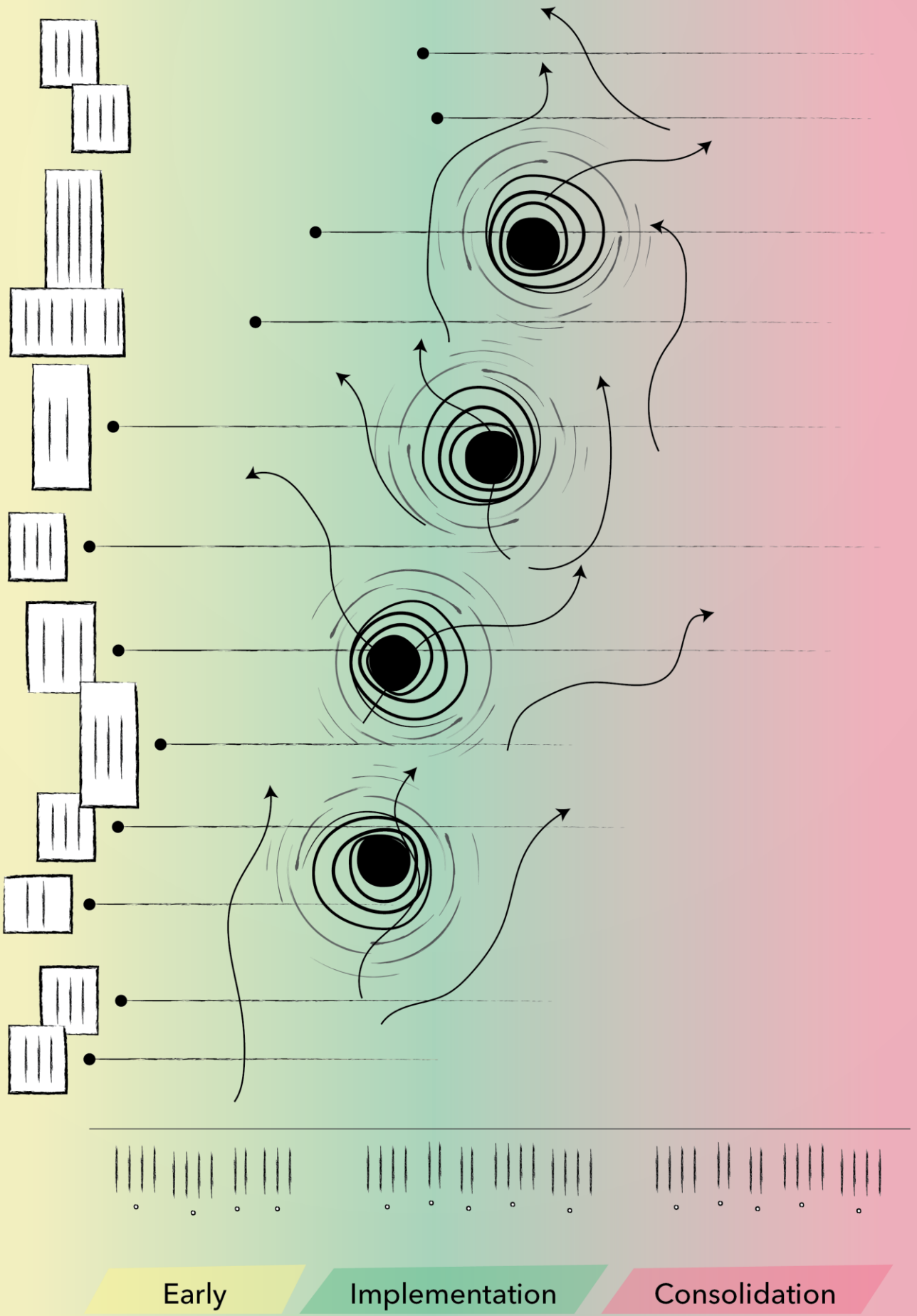
Early
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ILETC in progress (2018)

- Survey 2
- Three sub-projects
  - Acoustics
  - Furniture
  - ICT
- Three ‘teacher friendly 'typologies’
- The Pathway ‘population’

(c)	**Traditional classrooms with flexible walls and breakout space** 	☐
(d)	**Open plan with the ability for separate classrooms** 	☐
(e)	**Open plan with some adjoining spaces** 	☐
6.	In your opinion, how long does it take for teachers to successfully transit from a traditional classroom into an ILE? Success is defined as?	------- days ------- months ------- years

Section B: Spatial Competency Please complete all items of the questionnaire. There are no right or wrong answers. The best answers are those that reflect your true feelings about each statement.		**Strong disagree**	**Disagree**	**Agree**	**Strongly disagree**
1.	I know how to use the affordances of an innovative learning environment to affect student learning.	☐	☐	☐	☐
2.	I use teaching strategies that makes use of the affordances of an innovative learning environment to improve student learning.	☐	☐	☐	☐
3.	I select a range of teaching strategies that makes use of the affordances of innovative learning	☐	☐	☐	☐

The Hattie Edict…

All the credible evidence shows…

"Open classrooms make little difference to student learning outcomes". (p. 88)

The Age, Victoria Australia. November 24th 2015

The Hattie Edict…

All the credible evidence shows…

"Open classrooms make little difference to student learning outcomes". (p. 28)

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Schools hit a wall with open-plan classrooms

November 23, 2015 Read later

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Education Reporter at The Age
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New dividing walls separate classes in open-space rooms at Laverton P-12 College. *Photo: Jason South*

They knocked down walls to revolutionise learning and now they are putting them up again.

Open-plan classrooms have caused nothing but trouble for many schools, which are putting up partitions and walls to counter the deafening noise created in the barn-like spaces.

The Age, Victoria Australia. November 24th 2015

wesleyi@unimelb.edu.au

www.iletc.com.au

www.e21le.com

Website in progress