Research Papers (Session 2)

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Research 1

Engagement Through Encouragement in Online Learning

— **Danika Wright**

We acknowledge the tradition of custodianship and law of the Country on which the University of Sydney campuses stand. We pay our respects to those who have cared and continue to care for Country.

THE UNIVERSITY OF
SYDNEY

Engagement ⟶ **Achievement**

Engagement → **Achievement**

Opportunity
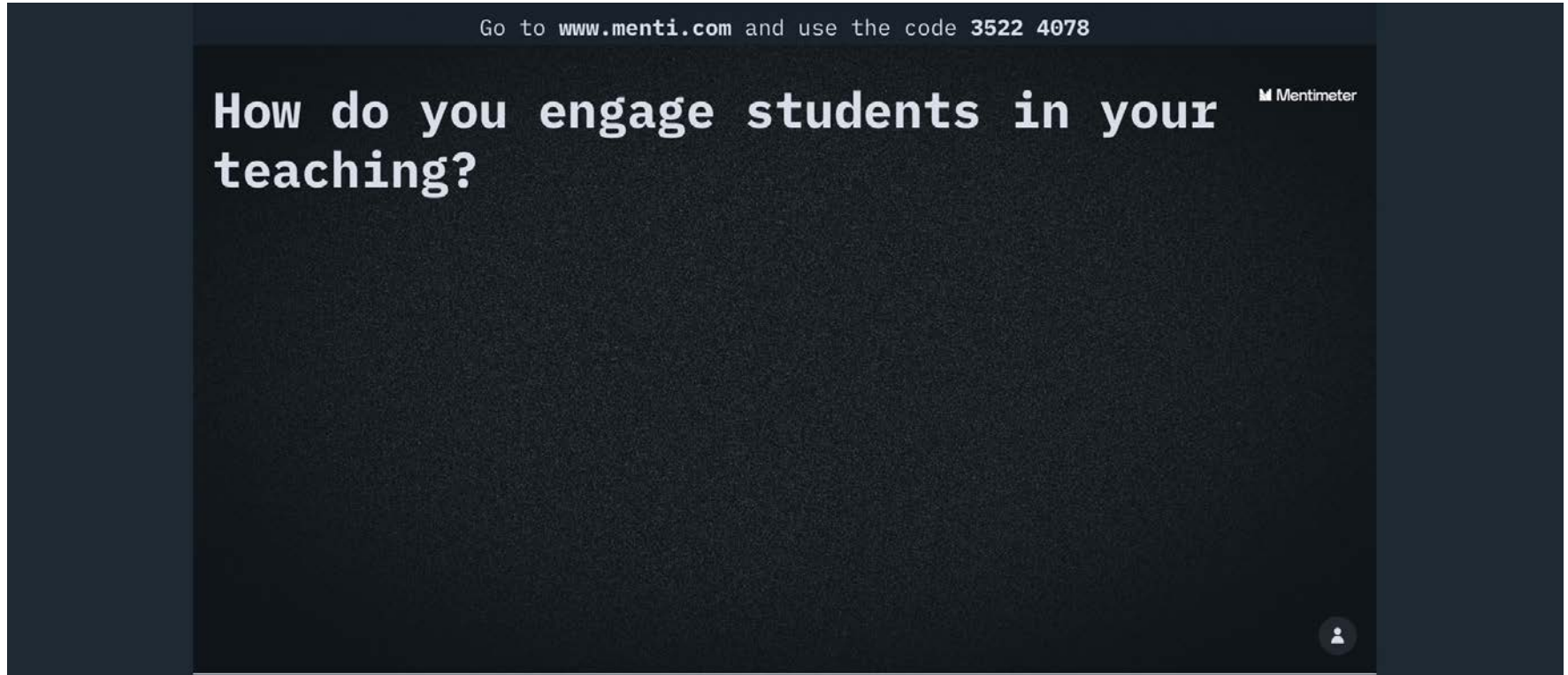
Three questions in this research

Q1: What do we mean by engagement?

Q2: Which students are most likely to engage?

Q3: What can we do to boost student engagement?

Engaging forum attendees…

Go to www.menti.com and use the code 3522 4078

How do you engage students in your teaching?

Mentimeter

Assessing student engagement

– **Literature identifies multiple components of engagement, e.g.:**

   – Behavioural

      • Effort, participation, conduct

   – Cognitive

      • Learning goals, self-regulation, investment

   – Emotional

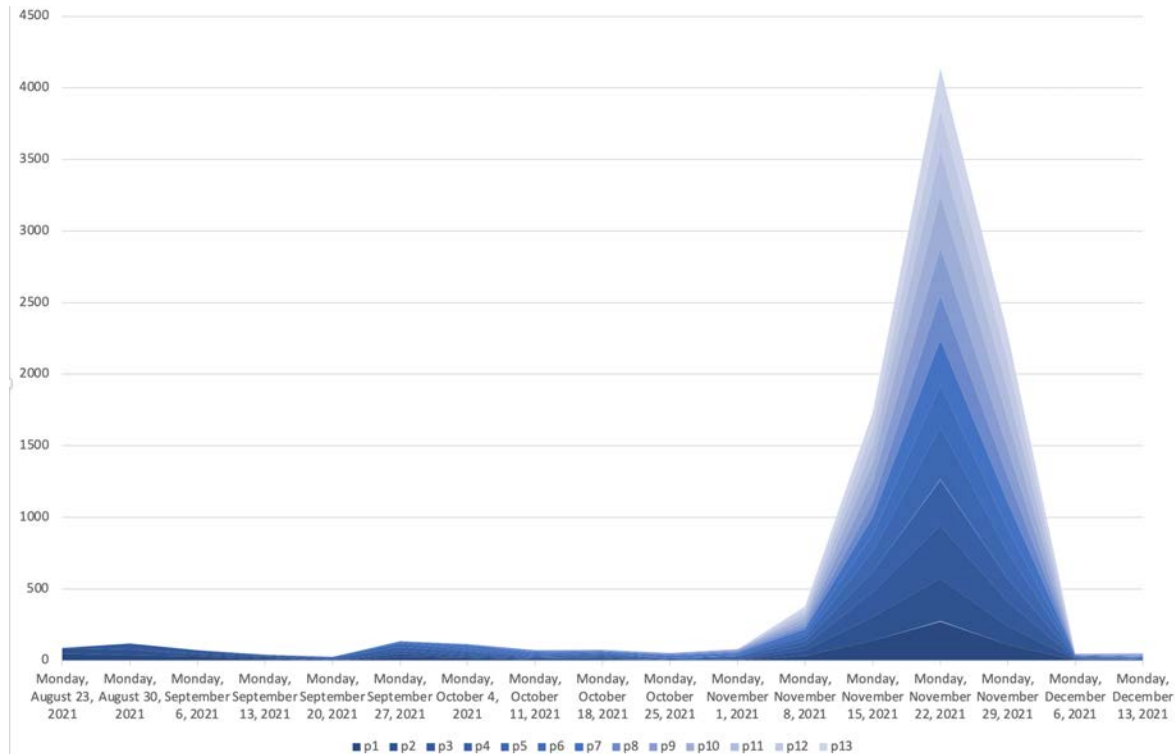   • Interest, sense of belonging, attitude

"Massing" as a measure of cognitive engagement

Example: Weekly quiz attempts
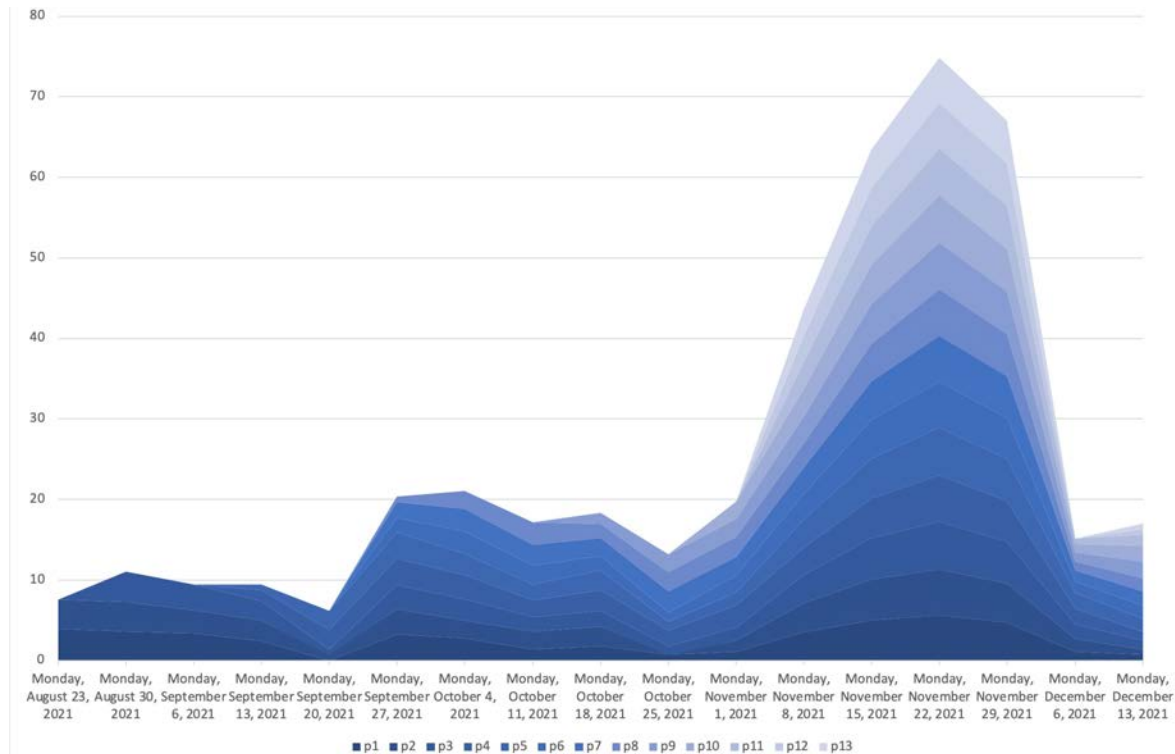
Example: Weekly quiz attempts (not log scale)

Revision massing index

- **How 'concentrated' is students' study over a semester?**
  - I adapt the Herfindahl-Hirschmann Index: $\text{HHI} = \sum_{i=1}^{N} s_i^2$

  - Massing index measures the relative dispersion of study over weeks of the semester
  - Ranges from 0 to 1, where 1 is the most concentrated indicating all study in a single week
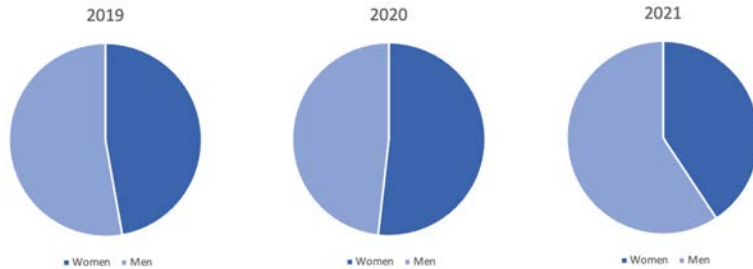
Data and sample

- **All students in large final year undergraduate finance unit**
  - 916 students in total across 2020 and 2021

- **Academic performance**
  - Past and end-of-semester
- **Student characteristics and enrolment data**
  - Observable background information
- **Engagement behaviour**
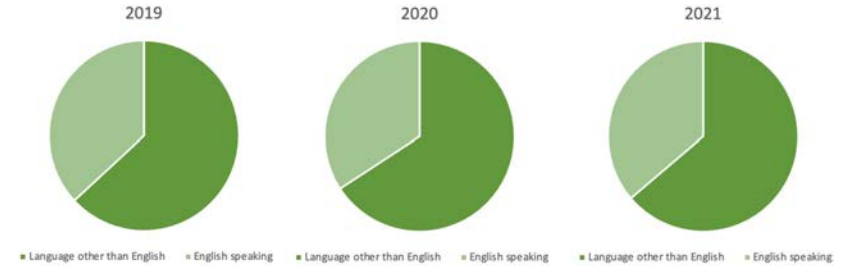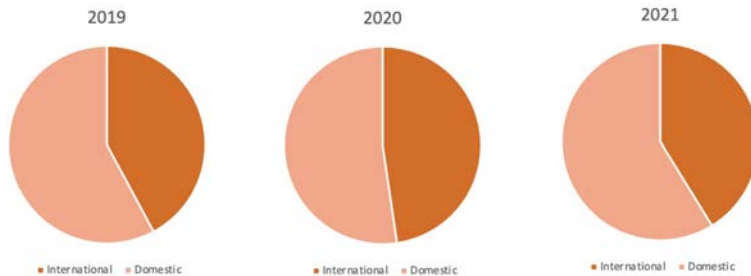 - Participation and self-regulated learning

Cohort consistency

Gender identity

2019   2020   2021

Women Men · Women Men · Women Men

Language spoken at home

2019   2020   2021

Language other than English English speaking · Language other than English English speaking · Language other than English English speaking

International / domestic

2019   2020   2021

International Domestic · International Domestic · International Domestic

Combined / single degree program

2019   2020   2021

Combined Degree Single degree · Combined Degree Single degree · Combined Degree Single degree
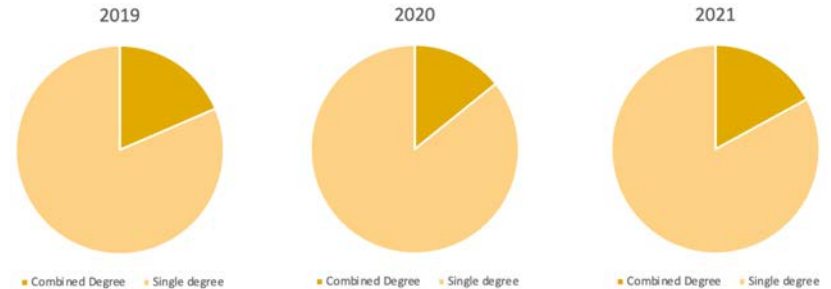
Classroom "experiments"

Practice questions - Module 03

Due No due date   Points 7   Questions 7   Time Limit None   Allowed Attempts Unlimited

Instructions

Hi everyone!

Here are some practice questions for Module 03.

This is for your own practice and revision and does not count towards your final grade. It's not compulsory. You can access this material as often as you like. You can take as long as you want, there is no time limit. Feedback and solutions are provided immediately after you complete the quiz.

Use the information in the table below to answer question this set of practice questions related to Holland Co and Deutsche Inc.

Holland Co (H) and Deutsche Inc (D) are two risky investments, both of which require an initial outlay of $500, and which will pay off one the following outcomes with given probability.

	Probability	H	D
Outcome 1	25%	400	800
Outcome 2	30%	600	700
Outcome 3	45%	900	750

Preview

‹ Previous   Next ›

1. Weekly quiz sets

— Short revision of module content

— Multiple choice questions involving applied calculation and providing detailed feedback

— Not assessed nor hurdle task

Classroom "experiments"

2. Student Relationship Engagement System (SRES) feedback

— 'Personalised' emails with detailed feedback, encouragement, and targeted study advice

— Sent following individual assignments

— In 2021 only, a 'check-in' message also sent

Re: Are you on track to do your best in FINC3017?

AT ████████████████████

To: Danika Wright

Thu 30/09/2021 14:06

Hi Danika,

Thanks for reaching out, I really appreciate coordinators who go above and beyond.

I am planning on completing these soon - I am very busy with mid semester exams preparation at the moment. I am also currently enrolled in Industry Placement Program which doesn't have a mid sem break.

I absolutely believe the quizzes are important and appreciate them being released.

I really enjoyed the challenge of report 1 and am learning so much in this unit.

Kind Regards,

████████████████████

From: Danika Wright <danika.wright@sydney.edu.au>
Sent: Thursday, September 30, 2021 1:59:19 PM
To: ████████████████████
Subject: Are you on track to do your best in FINC3017?

Hi ; ████████████████████

I hope you're enjoying studying Investments and Portfolio Management (FINC3017). Thanks for choosing to take this unit with me this semester.

I just wanted to check-in with you since we're at the halfway point in the unit.

I saw that you hadn't attempted any of the end-of-module quizzes yet when I checked Canvas a couple of days ago.

I want to help you do your best in this unit. I recommend you start trying out these quizzes. This can be a great way to consolidate what you learn in each module and to test how you're going in IPM.

I'll also be posting the details for Report 2 soon. If you want to start planning for that, it will cover topics including the Treynor-Black model, portfolio risk management and the choice between passive and active investment strategies, and will be due on Thursday 4th November.

Keep using your tutorial and Ed discussion board to ask questions so that you do your best in FINC3017 this semester. The tutor team and I look forward to seeing you (virtually) back in class next week!

Danika

Help us improve: Was this message helpful? [Yes] [No]

Cross-sectional analysis I

- **Past performance (WAM) highly related to current performance and engagement**

  - Investment in positive study habits from an early stage support success throughout education

  - Achievement also related to measures of opportunity

	F+PS	CR	D+HD
Observations	313	321	282
Panel A: Student performance			
Final total grade	68.50	71.19	79.95
Final exam improvement	-3.35%	-2.48%	9.99%
WAM	60.42	70.15	79.22
ATAR	92.46	94.56	97.91
Failed units	15.02%	7.17%	2.13%
Dalyell	1.60%	8.10%	56.38%
Panel B: Student engagement			
LMS page views	559.07	627.56	706.43
LMS participations	44.50	53.21	61.35
Revision massing (HHI)	0.72	0.65	0.59
Total quiz attempts	16.55	20.87	24.79
"Low-quiz" students (<10)	29.07%	15.58%	5.67%
"No-quiz" students	12.14%	5.30%	0.35%
"High-quiz"students (>30)	9.90%	20.25%	27.66%
Late assignments	31.31%	32.09%	27.66%
Panel C: Student characteristics			
Age	21.10	20.47	20.07
Women	51.12%	48.91%	40.78%
International	67.73%	42.99%	21.99%
Disability	2.88%	5.61%	4.26%
Language other than English	79.87%	61.37%	52.48%
Part-time enrolment	2.88%	2.49%	1.42%
Index of Rel. Social Disadvantage	1053.72	1055.67	1065.17
Combined Degree	5.75%	13.40%	28.37%

Cross-sectional analysis II

- **Revision massing index related to both performance and behavioral engagement measures**
  - Most room for improvement in highest-massing quartile
  - Massing also related to measures of opportunity

- What is the impact of opportunity on engagement?

	Q1	Q2-Q3	Q4
Observations	231	426	259
Panel A: Student performance			
Final total grade	75.73	73.79	69.15
Final exam improvement	7.24%	2.08%	-6.13%
WAM	72.82	71.79	68.44
ATAR	95.86	95.71	94.74
Failed units	6.49%	6.57%	12.74%
Dalyell	26.84%	20.89%	15.06%
Panel B: Student engagement			
LMS page views	781.19	636.40	479.10
LMS participations	71.76	53.85	33.96
Revision massing (HHI)	0.35	0.62	0.99
Total quiz attempts	29.13	21.23	11.96
"Low-quiz" students (<10)	3.03%	9.62%	42.08%
"No-quiz" students	0.00%	0.00%	21.62%
"High-quiz"students (>30)	39.39%	18.31%	1.93%
Late assignments	22.08%	34.27%	31.66%
Panel C: Student characteristics			
Age	20.42	20.48	20.82
Women	43.72%	48.36%	48.26%
International	35.50%	38.73%	63.71%
Disability	3.46%	4.69%	4.25%
Language other than English	59.74%	58.92%	79.54%
Part-time enrolment	1.30%	3.29%	1.54%
Index of Rel. Social Disadvantage	1064.13	1059.22	1052.03
Combined Degree	19.05%	15.73%	11.58%

Cross-sectional analysis III

- **Index of Relative Social Disadvantage**
  - National socio-economic index, standardized to 1,0000
  - Lowest quartile IRSD students generally least engaged

- Appears to be a gap between school-university achievement

	Q1	Q2-Q3	Q4
Observations	544	234	138
Panel A: Student performance			
Final total grade	71.49	75.14	75.12
Final exam improvement	-0.47%	3.97%	2.18%
WAM	69.37	73.03	73.95
ATAR	95.12	95.44	96.41
Failed units	10.85%	4.70%	4.35%
Dalyell	13.79%	29.49%	33.33%
Panel B: Student engagement			
LMS page views	590.81	681.29	687.16
LMS participations	46.79	59.30	65.07
Revision massing (HHI)	0.70	0.60	0.59
Total quiz attempts	17.99	23.49	25.99
"Low-quiz" students (<10)	20.77%	14.96%	6.52%
"No-quiz" students	9.01%	2.56%	0.72%
"High-quiz"students (>30)	12.32%	25.64%	34.06%
Late assignments	27.76%	32.05%	38.41%
Panel C: Student characteristics			
Age	20.69	20.43	20.30
Women	58.64%	33.76%	24.64%
International	75.18%	1.28%	0.00%
Disability	2.76%	7.26%	5.07%
Language other than English	90.07%	32.48%	21.01%
Part-time enrolment	1.29%	2.56%	5.80%
Index of Rel. Social Disadvantage	955.82	1075.97	1117.25
Combined Degree	8.64%	23.93%	27.54%

Baseline performance regression model

– **Model 1:**

  Overall grade = $f\{$Student characteristics,location,year controls$\}$

– **Model 2:** Remove location controls

– **Model 3:** Sub-sample of students with Australian home address to capture IRSD

Baseline performance model

	Overall grade		Overall grade		Overall grade	
Age	-0.8364	***	-0.9705	***	-1.2454	***
Women	-0.3529		-0.5723		-1.2586	
International	6.3569	*	0.1885		2.4413	
Disability	1.0777		-1.2572		-1.4250	
Language other than English	1.0722		-1.2784		-0.2550	
Part-time enrolment	-3.0725		-3.3085	*	-3.4468	
Combined Degree	1.9189	*	2.1603	**	1.8102	**
Failed units	-5.7518	***	-6.0960	***	-5.0085	***
Dalyell	7.6657	***	7.9735	***	8.4515	***
IRSD					0.0167	***
Constant	n/a		95.6518	***	83.2281	***
Year Controls	Yes		Yes		Yes	
Location Controls	Yes		No		No	
Sample period	2020-2021		2020-2021		2020-2021	
Observations	915		916		487	
R^2	0.5183		0.3100		0.3359	

Benefit of engagement

– Extend baseline performance regression model to include measures of engagement

– Engagement positively associated with grade, though past performance and opportunity continue to explain influence results

	Overall grade		Overall grade		Overall grade	
Age	-0.5366	**	-0.7495	***	-1.0898	***
Women	0.0173		-0.3213		-1.0586	
International	6.7251	**	1.0233		4.5153	
Disability	1.4501		-0.6028		-1.7000	
Language other than English	1.0773		-1.4012	*	-0.5186	
Part-time enrolment	-3.1173		-3.1554	*	-3.4170	*
Combined Degree	1.4996		1.9702	**	1.7501	*
Failed units	-4.5222	***	-4.8178	***	-4.3187	**
Dalyell	7.4171	***	7.5617	***	8.0422	***
IRSD					0.0162	***
Revision massing (HHI)	-3.6642	***	-3.7377	***	-1.2194	
LMS page views	0.0034	***	0.0033	***	0.0031	**
LMS participations	-0.0248	*	-0.0108		-0.0044	
SRES1 opens	0.0014		0.0105		0.0293	
SRES2 opens	0.0557	**	0.0545	**	0.0565	*
Late assignments	-1.6780	**	-1.4406	**	-0.9447	
"Low-quiz" students (<10)	-4.6299	***	-4.0281	***	-4.3232	***
Constant	n/a		92.4920	***	79.9954	***
Year Controls	Yes		Yes		Yes	
Location Controls	Yes		No		No	
Sample period	2020-2021		2020-2021		2020-2021	
Observations	900		901		479	
R^2	0.5674		0.3731		0.3789	

"Motivation is thus necessary, but not sufficient for engagement."

(Appleton et al, 2006)

Connecting with "*all*" students

- **Students across all IRSD quartiles connect with SRES messages**
  - Not the case with other engagement measures

	Q1	Q2-Q3	Q4
Observations	544	234	138
Panel A: Average message reads			
SRES0 message (only 2021)	3.44	2.27	2.40
SRES1 message	3.93	3.33	4.08
SRES2 message	3.55	3.16	3.63

	IRSD Q1	Non-Q1	t-stat	
Panel B: *t*-tests				
Participations	590.8	683.5	4.09	***
Page views	446.79	61.44	6.78	***
HHI	0.70	0.60	-5.97	***
All quizzes	17.99	24.42	7.13	***
Low quiz	0.21	0.12	-3.70	***
SRES0 message (only 2021)	3.44	2.33	-1.43	
SRES1 message	3.93	3.60	-0.57	
SRES2 message	3.55	3.33	-0.31	

Discussion

- **There is a complex dynamic between student engagement, achievement, opportunity**
  - Improving our understanding of these relationships and identifying strategies that enhance each component is vital to supporting an environment where all students thrive

- **High-touch, bespoke support for a few, methods for sustainable, scaled support for all**

Addressing issues in current approaches

- **Representative student voice**
  - Good teaching practice refers to student voice, gathering feedback, co-design
  - But… Which student voices are being heard? How do we ensure all voices are heard, potentially where our actions can have the most impact?

2032 USYD strategy

– **Data and research to better understand students' needs, limits**

—Emphasis on diversifying undergraduate student cohorts

—Feed into stronger uni pathways for less advantaged students
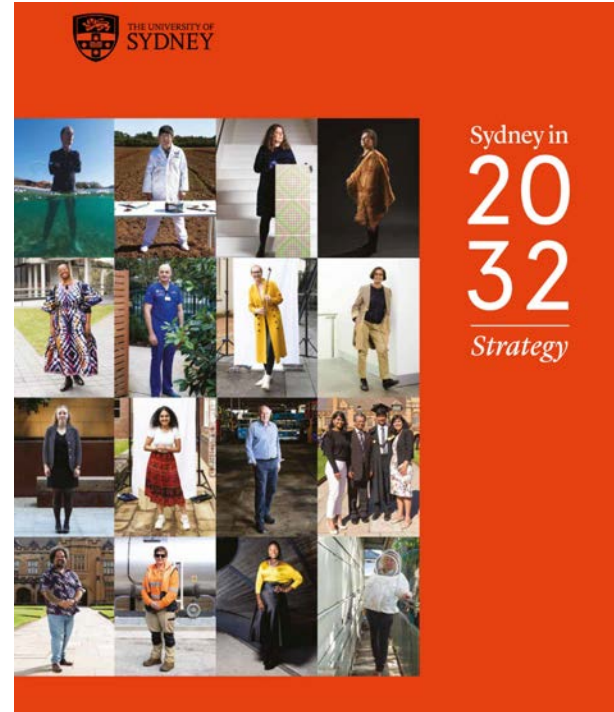
Improving secondary-tertiary engagement gap

– **What preparations can students make for university while at school?**

– **Student perspective on pros / cons of study 'freedom'**

– **Formal support structures**

– **Informal and peer networks**

Summing up

- Innovative approach to measuring cognitive engagement: Massing index

- Performance, engagement and opportunity are closely related

- Tailored messaging is one approach to connecting with all students

Q1: What do we mean by engagement?

Q2: Which students are most likely to engage?

Q3: What can we do to boost student engagement?

Question?

Research 2

How to Teach Critical Thinking, a Buddhist Perspective

— **Max Baker**

Critical thinking: A Buddhist Perspective

Max Baker

Thanks and Aim

- Thank you for the invitation

- Blown away!!

- Aim:
  - small goal: introduce Buddhist philosophy
  - big goal: Start/continue a conversation about inner experience of critical thinking.

Critical thinking: A personal note

- Personal motivation for the paper that rises out of
- Course design
- Assessment design
- Conversations with colleagues
    - 'critical thinking' synonymously with a range of other ideas such as good reasoning, pluralistic thinking, questioning assumptions and creativity
    - Reflects expansion of definition in education literature
- My personal issue with how 'critical thinking' is talked about as a black box. If we do it why can't we articulate the experience it.
- I have engaged with similar concepts in the past:
    - Baker, M., Andrew, J., Roberts, J. (2022). Accounting talk: developing conversation analysis in accounting research. *Accounting, Auditing and Accountability Journal*.
    - Baker, M., Modell, S. (2019). Rethinking performativity: A critical realist analysis of accounting for corporate social responsibility. *Accounting, Auditing and Accountability Journal*.
    - Baker, M., Roberts, J. (2011). All in the mind? Ethical Identity and the Allure of Corporate Responsibility. *Journal of Business Ethics*.

What is Critical Thinking in education literature?

- Kurfiss (1988) drawing on Dewey: investigating a problem with a conclusion as the end goal... (teleological?)

- Stark and Lowther (1988): "an examination of issues rationally logically and coherently, to acquire, evaluate and produce information and knowledge such that one is able to make decisions in both familiar and unfamiliar circumstances".

Paul's (1990, p. 51): "thinking about one's own thought process, as well as being organised and rational in their approach". (recursive definition)

Not a single definition but thought to be high-level thinking skill (Condon & Kelly-Riley 2004)

Often identified as types activities and attributes... (implication?) →

Critical think has become synonymous with activities associated with good thinking.
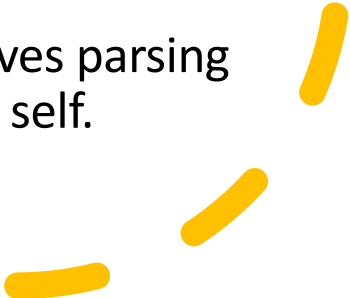
Table 1. Dimensions and traits of critical thinking (Richard Paul)

Qualities of perfect thought	Elements of thought	Traits of critical thinking
• Clarity • Precision • Specificity • Accuracy • Relevance • Consistency • Logicalness • Depth • Completeness • Significance • Fairness • Adequacy (for purpose)	• the problem or question at issue • the purpose or goal of the thinking • the frame of reference or points of view involved • assumptions made • central concepts and ideas involved • principles or theories used • evidence, data, or reasons advanced • interpretations and claims made • inferences, reasoning, and lines of formulated thought • implications and consequences which follow	• intellectual humility • intellectual courage • intellectual empathy • intellectual good faith (integrity) • intellectual perseverance • faith in reason • intellectual sense of justice

Phenomenology as an approach to CT

- The study of phenomena as it arises in the mind
- The study of how the mind apprehends the world from the point of view of the subject.
- Recursive (Paul from before) – interrogating thoughts.

Older work on CT has phenomenological definitions

- Seigel (1988) defines CT as the process that comes about when we justify our own beliefs to ourself
- Kahane (1971) argues that CT involves parsing thought as it constitutes notions of self.

# Problems with how critical thinking is conceived of

Basic critique

- A lack of logic and specificity.
  - What is not critical thinking?
  - What do these expanded lists of sets have in common? Aristotelian ontology and set theory
- Where is the thinking part?
  - Frege, Wittgenstein and Crane.
- Critical of what? How critical?
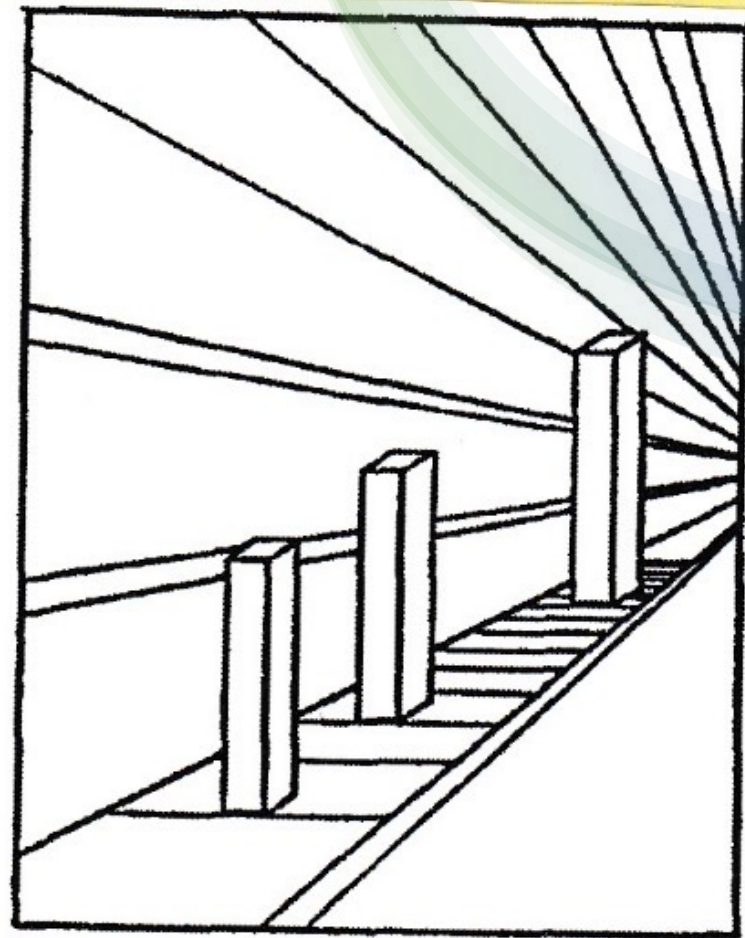
Leads to a practical critique
  - How will I encourage Critical Thinking in my students if I cannot articulate its specific arousal in my own mind?

Let me see if I can arouse critical thinking in you.
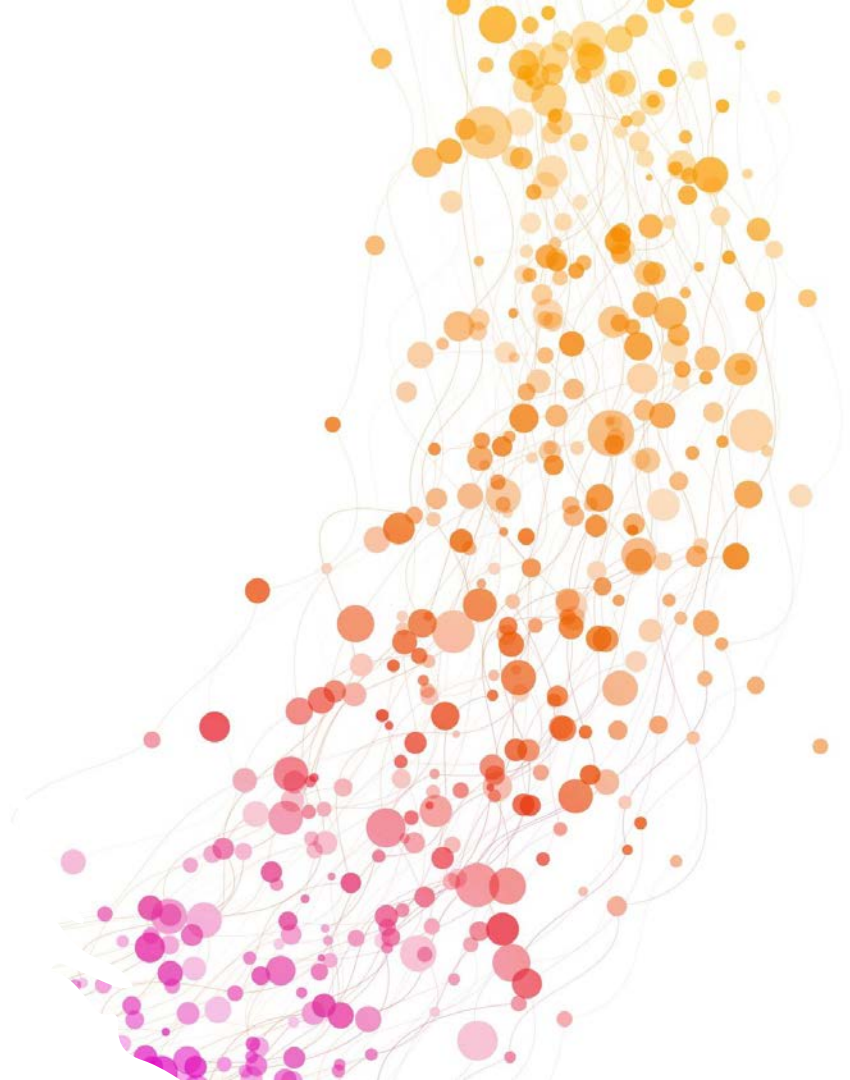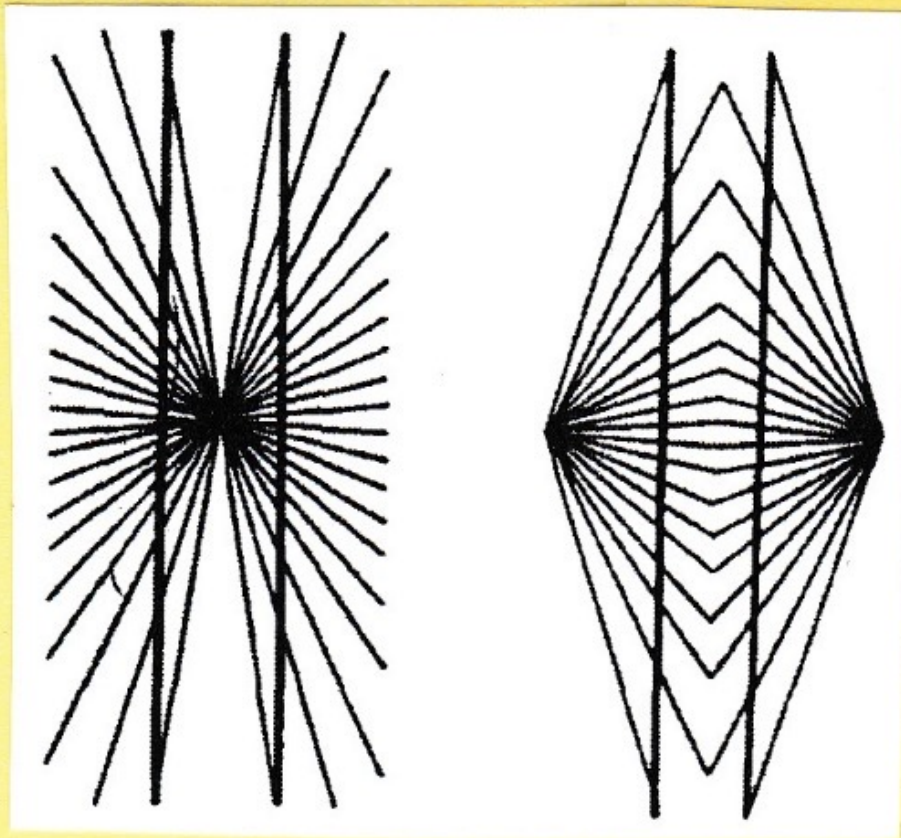
Optical illusion example

Optical illusion example

- The most basic thought trope or "mode" involved in critical thinking.

- Hoefler (1994) that stands out by, in true phenomenological fashion, producing the *experience* of critical thinking using optical illusions.

- Hoefler argues that critical thinking is the process in which we experience the deceptive nature of our own senses and thoughts, while simultaneously coming to a 'rational' conclusion.

- Critical thinking is a mature understanding of our own phenomenological conditioning.
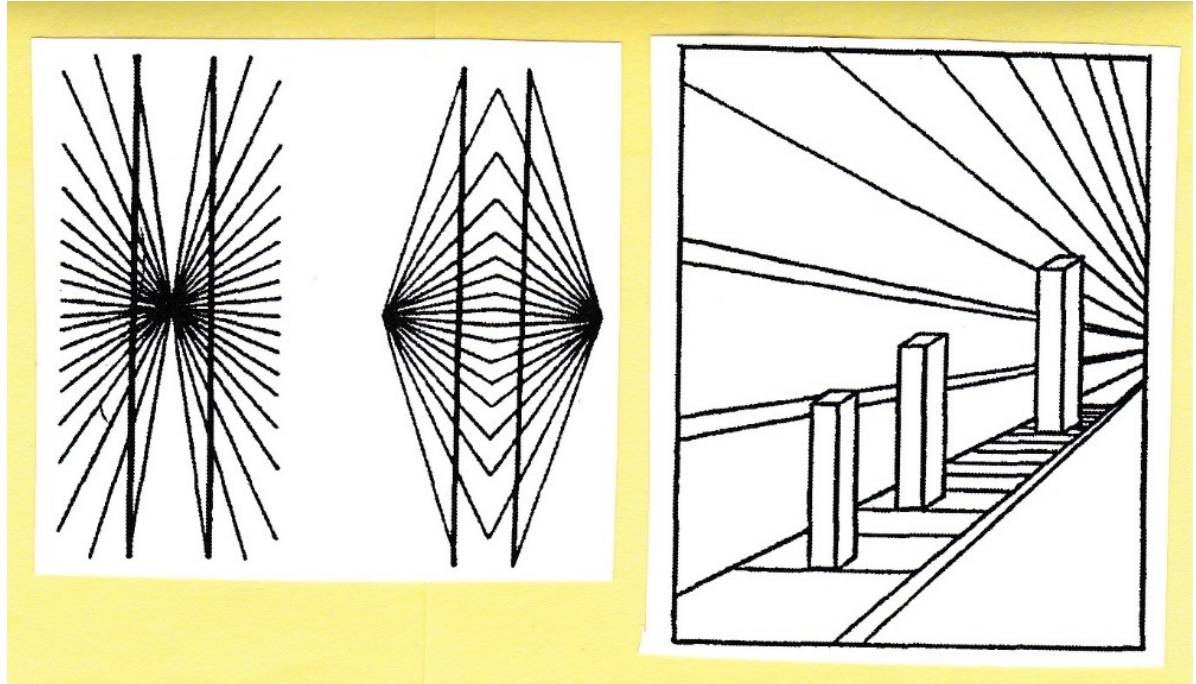
Develop this idea with Buddhism

- I wanted to develop this optical illusion analogy with Buddhist philosophy

- Relevant text here in Buddhism is the Madhyamaka (100 CE)

- Written by the 'Socrates of Asia': Nāgārjuna

- Madhyamaka contends that all thought and language has a delusive quality because it projects distinctiveness on phenomena that is inherently empty of such distinctions.

- Important idea is that our perceptions and thinking is fraught by nature.

- This is an important basis for understanding Critical Thinking.

Madyamaka and Critical Thinking

- The Madyamaka makes a very clear claim.

- In order to understand and improve our thinking (to think critically) we need to experience three types of thought.

1. To be deceived

2. To realise the deception

3. To learn, change, mature as a result

Class example

Student   Teacher

2 approaches

1: Non-critical thinking

Teacher tells student what a mirage is. Explains air density, refraction. Students learns nothing about self or thought, senses or mind. But learns about a mirage

2: Critical thinking

Teacher shows thirsty student a distant well of water in the desert. Student is about run off. Teacher stops student, puts polarised sunglasses on student. Mirage disappears for student. Explains air density, refraction. Students realises they were deceived. They realise the short comings of perception, the pull of the mind and that phenomena and its qualities arise in the mind. They learn about mirages AND about themselves.

Deep understanding of phenomena as it arises in the mind

I teach about many different mirages

The takeaway

We need to begin to discuss how we think critically – what is critical thinking to us?

We can then encourage the same experience/thoughts in our students.

I have offered one version of critical thinking – do you agree/disagree?

If you have your own version, it must be simple, applicable and expressed phenomenologically – not from the outside.

Thank you

Extra Slides

Example of the problem

"Teachers' Perceptions in Applying Mathematics Critical Thinking Skills for Middle School Students: A Case of Phenomenology" – Ridwan et al., 2022.

"Teachers' perceptions of applying critical thinking skills of high school students in learning mathematics have two main aspects, namely aspects of difficulty and teacher activities in using students' critical thinking skills in secondary schools in the South Sulawesi region. The first aspect, the difficulty of teachers in applying critical thinking skills, is students' lack of knowledge in understanding the subject matter. Another difficulty is the lack of planning and time allocation and teachers' ability to apply critical thinking skills in learning mathematics. The second aspect, teacher activities in using critical thinking skills, need support from models or approaches in learning, focus on learning materials, and knowledge of indicators of critical thinking skills in learning mathematics. The school supports increasing teacher knowledge in applying students' critical thinking skills in the South Sulawesi region, providing motivational support and infrastructure. Another effort is to permit teachers to participate in several pieces of training or seminars related to learning mathematics."

Question?

Next session

See the L &T Forum website for next session:

- 5 minutes break and walk to Lecture Theatre 1130, Level 1, Abercrombie Building H70

- **4:45pm – 5:00pm**

  People's Choice Awards Presentation &

  Closing Address

Scan me

L&T Forum Website