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THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
EDUCATION AND SOCIAL WORK

Towards a model of best practice in critical thinking

A snapshot in secondary teacher practice

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ABSTRACT: Research has identified critical thinking to be important for short and long term student achievement, but there appears to be inconsistent theoretical understanding and pedagogical approaches to its transfer (Abrami et al., 2015). Even with a perceived value of critical thinking embedded in the minds of educators, and its prominence among the objectives of school curriculums across sectors, there is a gap of research that specifically focuses on how it is perceived and developed in Secondary School classrooms (Davies & Meissel, 2015).

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1. **This presentation will share emerging *mixed methods* research findings of how 28 New Zealand secondary teachers across the subject areas of English, Science and Social Science perceive and develop critical thinking as part of their instructional practice.**

2. **It will also explore the initial outcomes of what a professional development focus on critical thinking has in supporting or shifting their views and practices.**

3. **It is through these outcomes that this presentation hopes to empower educators to explore and develop their models of best practice, as well as help ensure secondary students receive purposeful critical thinking instruction.**

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Presentation Overview:

- The values and ideas behind this research
- How the methodology and data collection has been conducted
- What early outcomes have come from this study
- Notes and comments on limitations & rationale

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Purpose and Mission which underpin this study

What responsibility do we have as a educator to my students in a rapidly changing society?

Do we want a society of individuals who are engaged, democratic, caring and innovative?

Does education act as a progressive agent in our society?

Do we teach our students to think critically and can there be a ‘right’ way of teaching it?

Where is all the evidence-based practice of critical thinking in secondary schools?

Rationale for this research project

- **The proposed benefits of this research include:**

  - **Students**:
    By supporting teacher practice which can increase opportunities for students to become citizens who are adaptable, engaged, represented and empowered to succeed against the challenges of our rapidly changing world.

  - **Teachers**:
    By supporting teachers in exploring how critical thinking can be contextualised for different subject purposes, offering evidence-based recommendations on how teachers can develop and apply critical thinking consistently.

  - **Schools**:
    By offering schools and educational policy makers an applicable model of theory and practice that can be appropriated and applied across diverse cultural and educational contexts in an increasingly globalised society.

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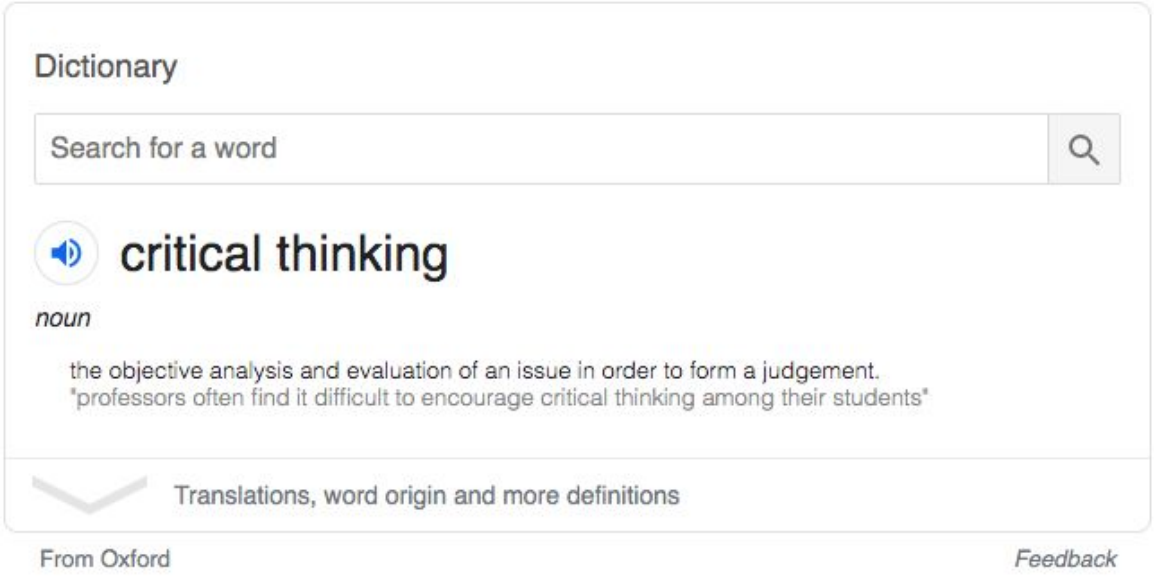
What is critical thinking?

Yes, surely we have all heard business executives, policy makers, civic leaders, and educators talking about critical thinking.

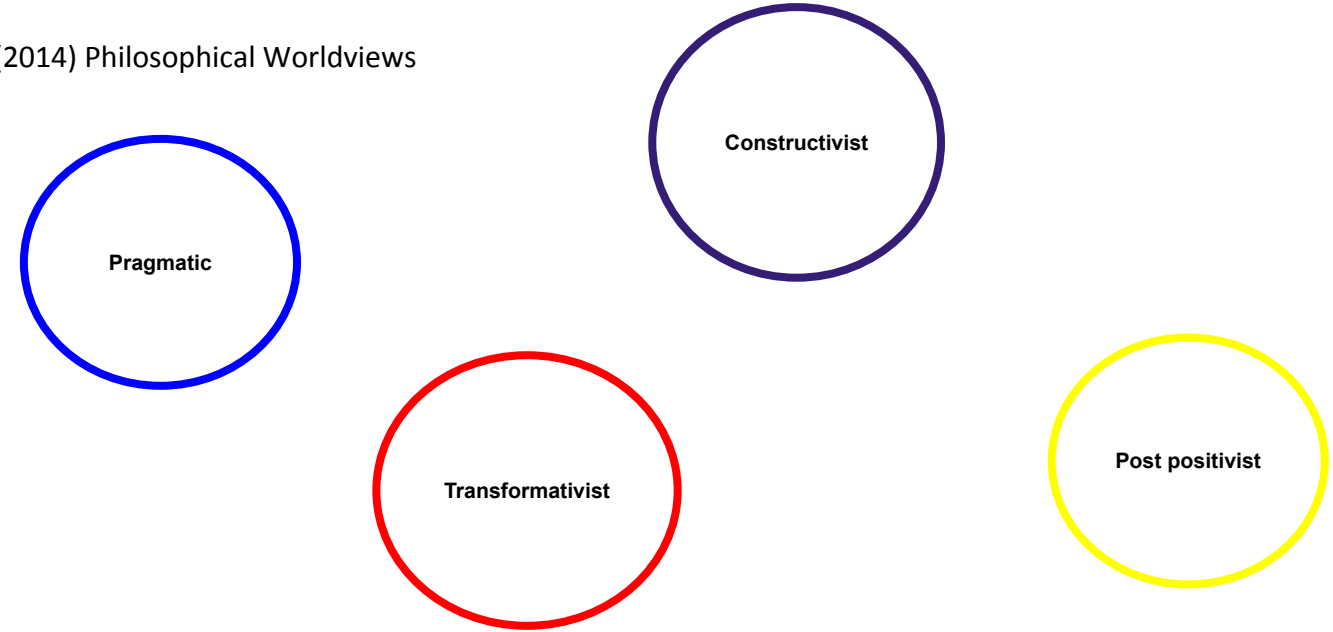
So how would you propose we go about defining "critical thinking." You do not really want a definition plopped on the page for you to memorize, do you? That would be silly, almost counterproductive. The goal here is to help you sharpen your critical thinking skills and cultivate your critical thinking spirit.

(Facione, 2015)


Dictionary
Search for a word
critical thinking
noun
the objective analysis and evaluation of an issue in order to form a judgement.
"professors often find it difficult to encourage critical thinking among their students"
Translations, word origin and more definitions
From Oxford
Feedback

Literature Review: An initial framework

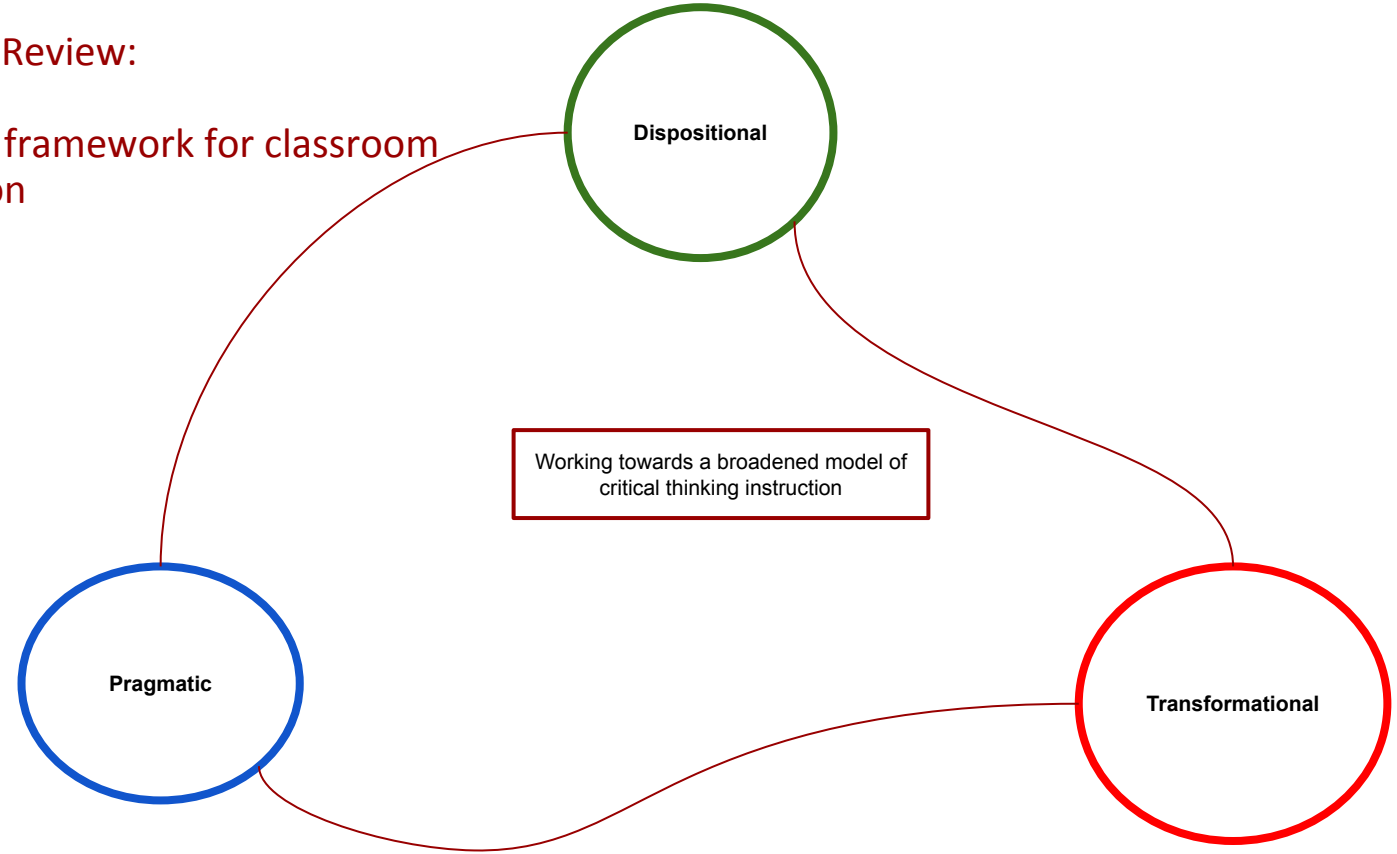
Creswell's (2014) Philosophical Worldviews



Literature Review - Navigating the mess of critical thinking

Literature Review:

A working framework for classroom observation



Pragmatic *(problem-solving)*

Descriptions and approaches to critical thinking which elicits problem-solving skills, logical argumentation, and higher-order thinking from within methodological frameworks.

Dispositional *(Openness)*

Descriptions and approaches to critical thinking which elicits collaboration, curiosity and principles of charity in developing self-awareness and empathy to the other perspectives on multifaceted issues. Encourages a disposition for low-ego/high-error tolerance with patience for ambiguity. A willingness to re-evaluate and be 'wrong'.

Transformational *(Problem-seeking)*

Descriptions and approaches to critical thinking which elicits problem-seeking and attempts at "deconstruction" by drawing out epistemological, socio-cultural, and critical praxis viewpoints. Transformational approaches to critical thinking are interested in the creation of new epistemological knowledge and agency over systems and methodologies.

Problem-solving
(Pragmatic)

Where I see a clear problem/question I need to solve.

- ❑ *"What do I need to do or explain before I can move forward?"*
- ❑ *"Have I collected enough evidence and how do they relate to one another?"*
- ❑ *"How reliable is the concept or source I am using?"*
- ❑ *"How could I prove or apply my answer/idea?"*

Key actions:
Solve, evaluate, analyze, prove, demonstrate, judge, **defend**

Openness
(Dispositional)

Where I am dealing with an idea that has more than one perspective or answer.

- ❑ *"How could I add to someone else's idea?"*
- ❑ *"How do my experiences reflect or differ from other people?"*
- ❑ *"To what extent does my opinion reflect how I live or act?"*
- ❑ *"How can I expand my idea to fit to other situations/groups?"*

Key actions:
Consider, explore, ask, share, reflect, listen, relate, **empathize**

Problem-seeking
(Transformative)

Where I am trying to challenge an idea or concept that is presented as fact.

- ❑ *"Where did this idea/definition come from?" i.e. Who is paying for this?*
- ❑ *"What values/biases/assumptions might influence this idea?"*
- ❑ *"Who wins and who loses by accepting this idea?*
- ❑ *"Does the idea change when applied either **regionally, nationally** or **globally**?"*
- ❑ *"How can I weaken this position?"*

Key actions:
Distrust, create, deconstruct, cross-culture(s), **challenge**

Shafer, 2017

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“Who are we to decide exactly how students should be critical thinkers beyond the context of the subject we teach them?”

With a focus on Critical Thinking…

Research questions:

1. In what ways do teachers deliver critical thinking instruction in their secondary school subject?

2. How do teacher perceptions about their teaching of critical thinking in secondary schools reflect their practice?

3. To what extent do teacher perceptions and practices about their teaching of critical thinking in secondary schools shift following intervention through professional development?

Data Collection: Who was included

- Five Auckland Secondary Schools
- 27* participant teachers
- Three subject areas (Science – English – Social Studies)
- Year 10 classroom focus over the school year

Problem-solving (Pragmatic) **Openness** (Dispositional) **Problem-seeking** (Transformative)

What happened?

As part of this research, participants:

- Were interviewed at their school during a time of their choosing during the First and Fourth Terms of the 2017 academic year.
- Were observed, at different times of the year, teaching normal classroom lessons during a time of their choosing.
- Participated in a mid-year professional development day at the University of Auckland with teachers across a range of local secondary schools.

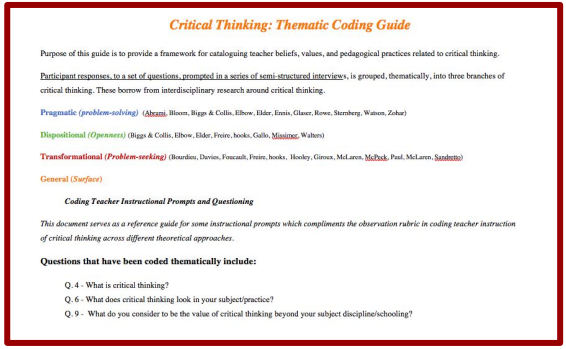
Study 1: Teacher perceptions of critical thinking and their practice

Method:

- Each participant were involved in an initial semi-structured interview exploring questions like:
  - How do you define critical thinking?
  - What does critical thinking looking in your practice?
  - What value does critical thinking have beyond your subject?

Coding:

- Each interview was transcribed and responses around Critical Thinking were coded based on the theoretical groupings of:
  - **Pragmatic**
  - **Dispositional**
  - **Transformational**



Critical Thinking: Thematic Coding Guide

Purpose of this guide is to provide a framework for cataloguing teacher beliefs, values, and pedagogical practices related to critical thinking.

Participant responses, to a set of questions, prompted in a series of semi-structured interviews, is grouped, thematically, into three branches of critical thinking. These borrow from interdisciplinary research around critical thinking.

Pragmatic *(problem-solving)* (Abrami, Bloom, Biggs & Collis, Elbow, Elder, Ennis, Glaser, Rowe, Sternberg, Watson, Zohar)

Dispositional *(Openness)* (Biggs & Collis, Elbow, Elder, Freire, hooks, Gallo, Missimer, Walters)

Transformational *(Problem-seeking)* (Bourdieu, Davies, Foucault, Freire, hooks, Hooley, Giroux, McLaren, McPeck, Paul, McLaren, Sandmitto)

General *(Surface)*

Coding Teacher Instructional Prompts and Questioning

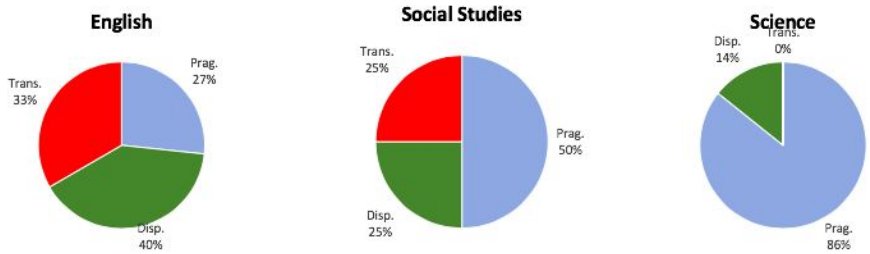
This document serves as a reference guide for some instructional prompts which compliments the observation rubric in coding teacher instruction of critical thinking across different theoretical approaches.

Questions that have been coded thematically include:

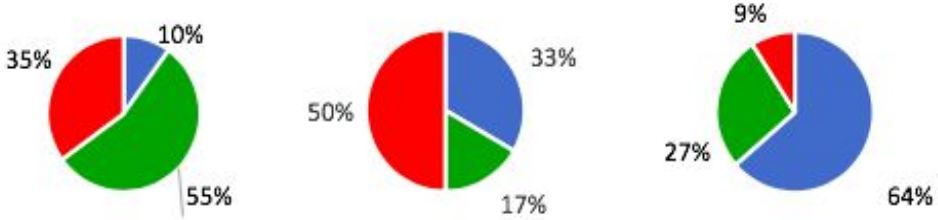
Q. 4 - What is critical thinking?
Q. 6 - What does critical thinking look in your subject/practice?
Q. 9 - What do you consider to be the value of critical thinking beyond your subject discipline/schooling?

Critical thinking: teacher beliefs

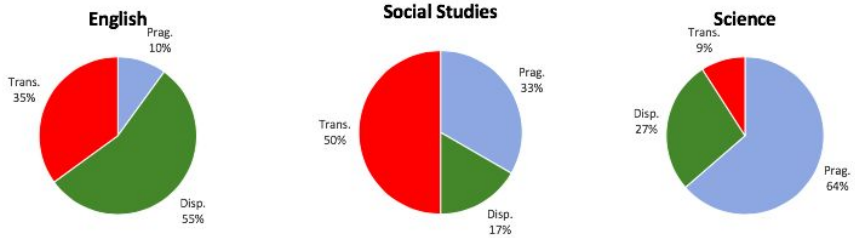
How do you define critical thinking?



What does critical thinking looking in your practice?



What value does critical thinking have beyond your subject?



Question	Participant Sub.	Sample Size	Responses Coded	Coded Themes	#	% of sub. part. total	% total repons. coded
How do you define critical thinking?	English	13	15	Pragmatic	4	30.76	26.66
				Dispositional	6	46.15	40.00
				Transformational	5	38.46	33.33
	Social Studies	8	12	Pragmatic	6	75.00	50.00
				Dispositional	3	37.50	25.00
				Transformational	3	37.50	25.00
	Science	7	7	Pragmatic	6	85.71	85.71
				Dispositional	1	14.28	14.28
				Transformational	0	0.00	0.00
What does CT look like in your practice?	English	13	20	Pragmatic	2	15.38	10.00
				Dispositional	11	84.61	55.00
				Transformational	7	53.84	35.00
	Social Studies	8	12	Pragmatic	4	50.00	33.33
				Dispositional	2	25.00	16.66
				Transformational	6	75.00	50.00
	Science	7	11	Pragmatic	7	100.00	63.63
				Dispositional	3	42.85	27.27
				Transformational	1	14.28	9.09
What value does CT have beyond subject?	English	13	18	Pragmatic	3	23.07	16.66
				Dispositional	7	53.84	38.88
				Transformational	8	61.53	44.44
	Social Studies	8	14	Pragmatic	4	50.00	28.57
				Dispositional	6	75.00	42.85
				Transformational	4	50.00	28.57
	Science	7	8	Pragmatic	5	71.42	62.50
				Dispositional	0	0.00	0.00
				Transformational	3	42.85	37.50

Visualised: What does critical thinking looking in your practice?

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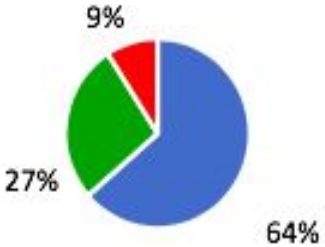
English

Social Studies

Science



- Pragmatic
- Dispositional
- Transformational

Question	Participant Sub.	Sample Size	Responses Coded	Coded Themes	#	% of sub. part. total	% total repons coded
What does CT look like in your practice?	English	13	20	Pragmatic	2	15.38	10.00
				Dispositional	11	84.61	55.00
				Transformational	7	53.84	35.00
	Social Studies	8	12	Pragmatic	4	50.00	33.33
				Dispositional	2	25.00	16.66
				Transformational	6	75.00	50.00
	Science	7	11	Pragmatic	7	100.00	63.63
				Dispositional	3	42.85	27.27
				Transformational	1	14.28	9.09
	Total coded	28	**43**	Pragmatic	13	46.42	30.23
				Dispositional	16	57.14	37.20
				Transformational	14	50	32.55

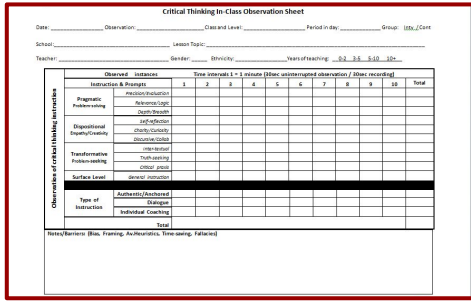
Study 2: Teacher instructional practice of critical thinking, linked back to perceptions

Method:

- Each participant was observed by the researcher on two occasions, for an approx. total of 50 minutes.

Coding:

- Participant instructional prompts during observation were coded based on the theoretical groupings of:
  - **Pragmatic**
  - **Dispositional**
  - **Transformational**
  - **General**
- They were also paired with teaching style, to see if certain styles led to higher distribution of instructional themes:
  - Anchored (Transmissive)
  - Dialogue (Co-constructive)
  - Individual (Coaching)



Critical Thinking In-Class Observation Sheet

Date: _____ Observation: _____ Class and Level: _____ Period in day: _____ Group: Intv / Cont

School: _____ Lesson Topic: _____

Teacher: _____ Gender: _____ Ethnicity: _____ Years of teaching: 0-2 3-5 5-10 10+

Observed instances		Time intervals 1 = 1 minute (30sec uninterrupted observation / 30sec recording)										
Instruction & Prompts		1	2	3	4	5	6	7	8	9	10	Total
Pragmatic Problem-solving	Precision/motivation											
	Reference/Logic											
	Depth/Breadth											
Dispositional Empathy/Creativity	Self-reflection											
	Charity/Curiosity											
	Discursive/Collab											
Transformative Problem-seeking	Inter-textual											
	Truth-seeking											
	Critical praxis											
Surface Level	General instruction											
Type of instruction	Authentic/Anchored											
	Dialogue											
	Individual Coaching											
Total												

Observables of critical thinking instruction

Notes/Barriers: (Bias, Framing, Av./Heuristics, Time-saving, Fallacies)

Problem-solving (Pragmatic) **Openness** (Dispositional) **Problem-seeking** (Transformative)

Critical thinking: teacher practices

Critical Thinking In-Class Observation Sheet

Date: _____ Observation: _____ Class and Level: _____ Period in day: _____ Group: Inty / Cont

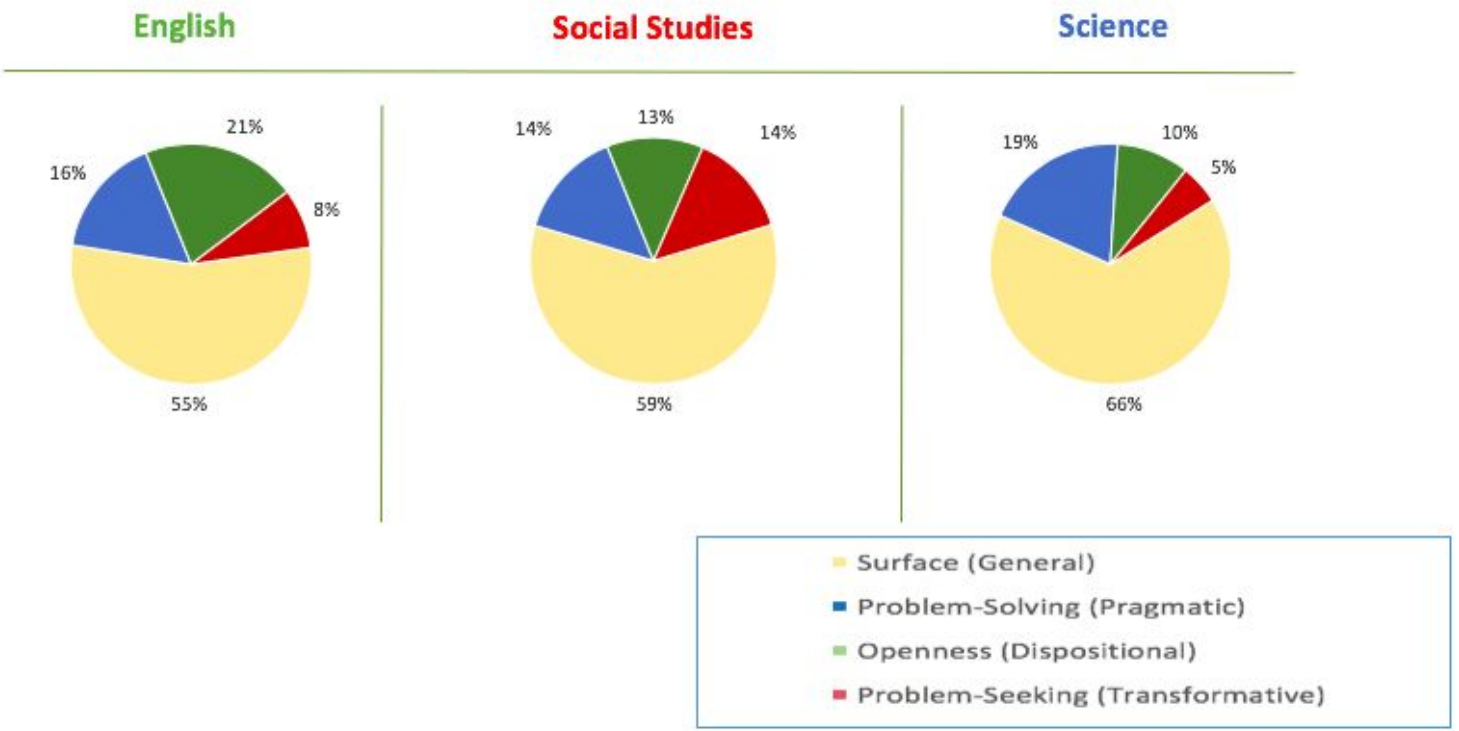
School: _____ Lesson Topic: _____

Teacher: _____ Gender: _____ Ethnicity: _____ Years of teaching: 0-2 3-5 5-10 10+

Observation of critical thinking instruction	Observed instances	Time intervals 1 = 1 minute (30sec uninterrupted observation / 30sec recording)										
Instruction & Prompts		1	2	3	4	5	6	7	8	9	10	Total
Pragmatic Problem-solving	*Precision/Evaluation*											
	Relevance/Logic											
	Depth/Breadth											
Dispositional Empathy/Creativity	*Self-reflection*											
	Charity/Curiosity											
	Discursive/Collab											
Transformative Problem-seeking	*Inter-textual*											
	Truth-seeking											
	Critical praxis											
Surface Level	*General instruction*											
Type of Instruction	Authentic/Anchored											
	Dialogue											
	Individual Coaching											
	Total											

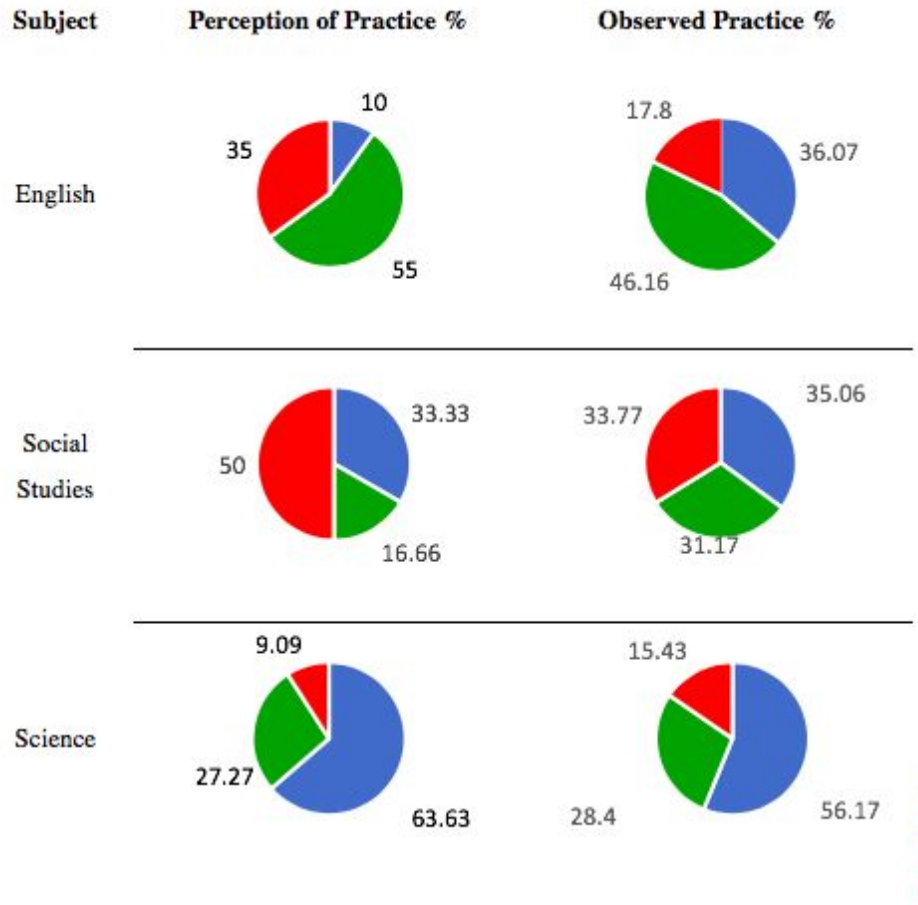
Notes/Barriers: (Bias, Framing, Av.Heuristics, Time-saving, Fallacies)

Critical thinking: *what* teachers taught [Baseline]



What does critical thinking look like in the classroom?

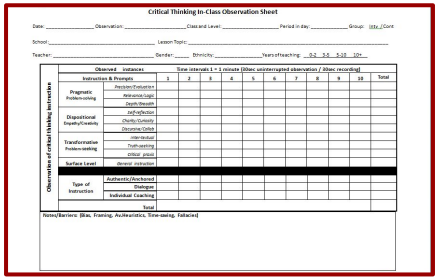
Perceptions vs. Practice



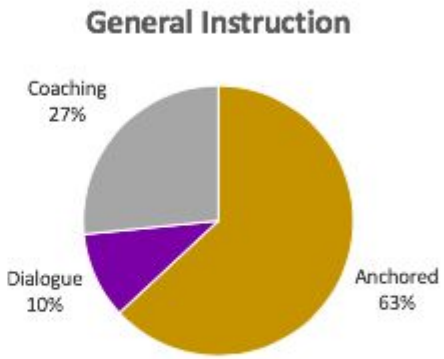
Subject	Coding Theme	Perception of Practice %	Observed Practice %	Observed Difference %
English	Pragmatic	10.00	36.07	+26.07
	Dispositional	55.00	46.16	-8.84
	Transformational	35.00	17.8	-17.2
Social Studies	Pragmatic	33.33	35.06	+1.73
	Dispositional	16.66	31.17	+14.51
	Transformational	50.00	33.77	-16.23
Science	Pragmatic	63.63	56.17	-7.46
	Dispositional	27.27	28.4	+1.13
	Transformational	9.09	15.43	+6.34
All Subjects	Pragmatic	30.23	42.43	+12.2
	Dispositional	37.20	35.24	-1.96
	Transformational	32.55	22.33	-10.22

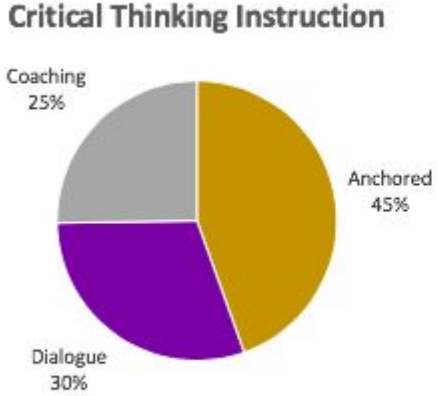
Critical thinking: *how* teachers taught [Baseline]

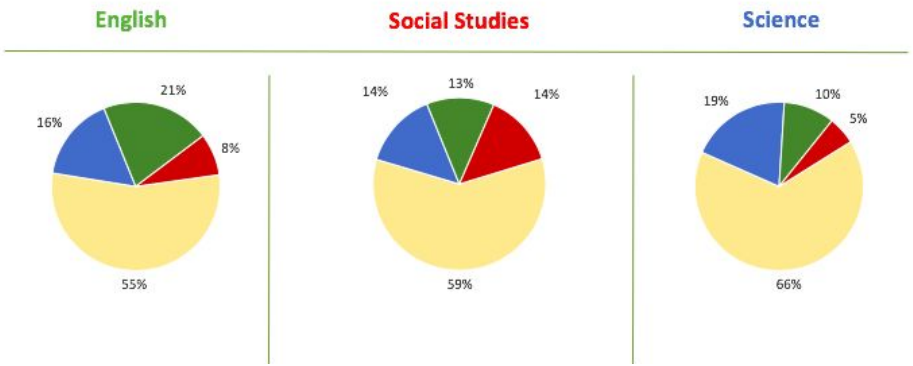
All Subjects Pedagogy	Coded Prompts by Theme %					
	Prag.	Disp.	Trans.	All CT themes	General	All prompts coded
Anchored (Whole Class)	139 (12.66%)	125 (11.38%)	101 (9.2%)	365 (33.24%)	733 (66.76%)	1098
Dialogue (Group Discussion)	97 (26.36%)	102 (27.72%)	49 (13.32%)	248 (67.4%)	120 (32.8%)	368
Coaching (Individual)	90 (17.44%)	88 (17.05%)	29 (5.62%)	207 (40.12%)	309 (59.88%)	516
All styles	326 (39.76%)	315 (38.41%)	179 (21.83%)	820 (41.37%)	1162 (58.63%)	1982



Baseline: All Participants' instructional style to thematic coding

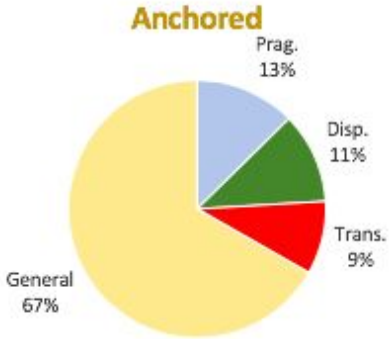


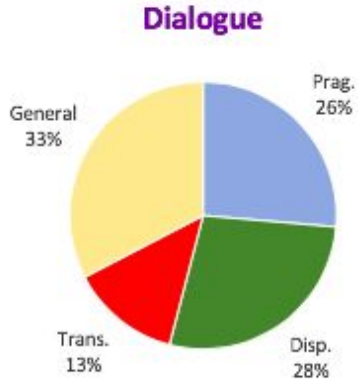


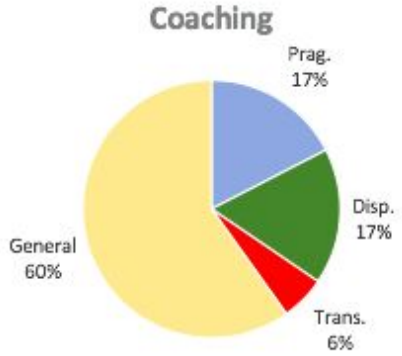


All Subjects' thematic coding	Critical Thinking Theme distributed by teaching style %			
	Anchored	Dialogue	Coaching	Sum all styles
Pragmatic	139 (42.64%)	97 (29.75%)	90 (27.61%)	**326**
Dispositional	125 (39.68%)	102 (32.38%)	88 (27.94%)	**315**
Transformational	101 (56.42%)	49 (27.37%)	29 (16.2%)	**179**
All CT Themes	365 (44.51%)	248 (30.24%)	207 (25.24%)	**820**
General	733 (63.08%)	120 (10.33%)	309 (26.59%)	**1162**
All Coded themes	1098 (55.4%)	368 (18.57%)	516 (26.03%)	**1982**

Baseline: All Participants' instructional coding by teaching style







All Subjects Pedagogy	Coded Prompts by Theme %					
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All styles	326 (39.76%)	315 (38.41%)	179 (21.83%)	820 (41.37%)	1162 (58.63%)	1982

Intervention: Professional Development towards critical thinking

9:30

Segment 1:

Meet and greet + Group discussion

10:10

Segment 2:

What is critical thinking? A big picture review with activities

11:00

Morning Tea

11:15

Segment 3:

Sharing of best practice

12:00

Segment 4:

Data presentation & reflection

12:30

Segment 5:

Strategies around fostering CT in both the classroom and beyond.

1:00

Lunch

1:30

Segment 6:

Co-construction & Final Reflections

2:30

Finish

Study 3: Intervention & shifts in teacher instructional practice of critical thinking

- An outcome of the professional development day was that participants received an individualised data report, and used it to help frame an CT goal for the next phase of the study.

Method:

- Each participant were observed by the researcher for a full lesson in Term 3, approx. total of 50 minutes.
  - 9 participant teachers were observed again to explore retention late Term 4.

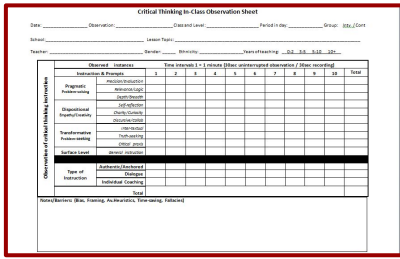
Coding:

- Participant instructional prompts during observation were coded based on the prior thematic groupings.
- They were also paired again with instructional style, to see if certain styles shift and/or led to higher distribution of instructional themes.

Problem-solving
(Pragmatic)

Openness
(Dispositional)

Problem-seeking
(Transformative)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Date: _____ Observation: _____ Class and Level: _____ Period in day: _____ Group: Intv / Cont

School: _____ Lesson Topic: _____

Teacher: _____ Gender: _____ Ethnicity: _____ Years of teaching: 0-2 3-6 6-10 10+

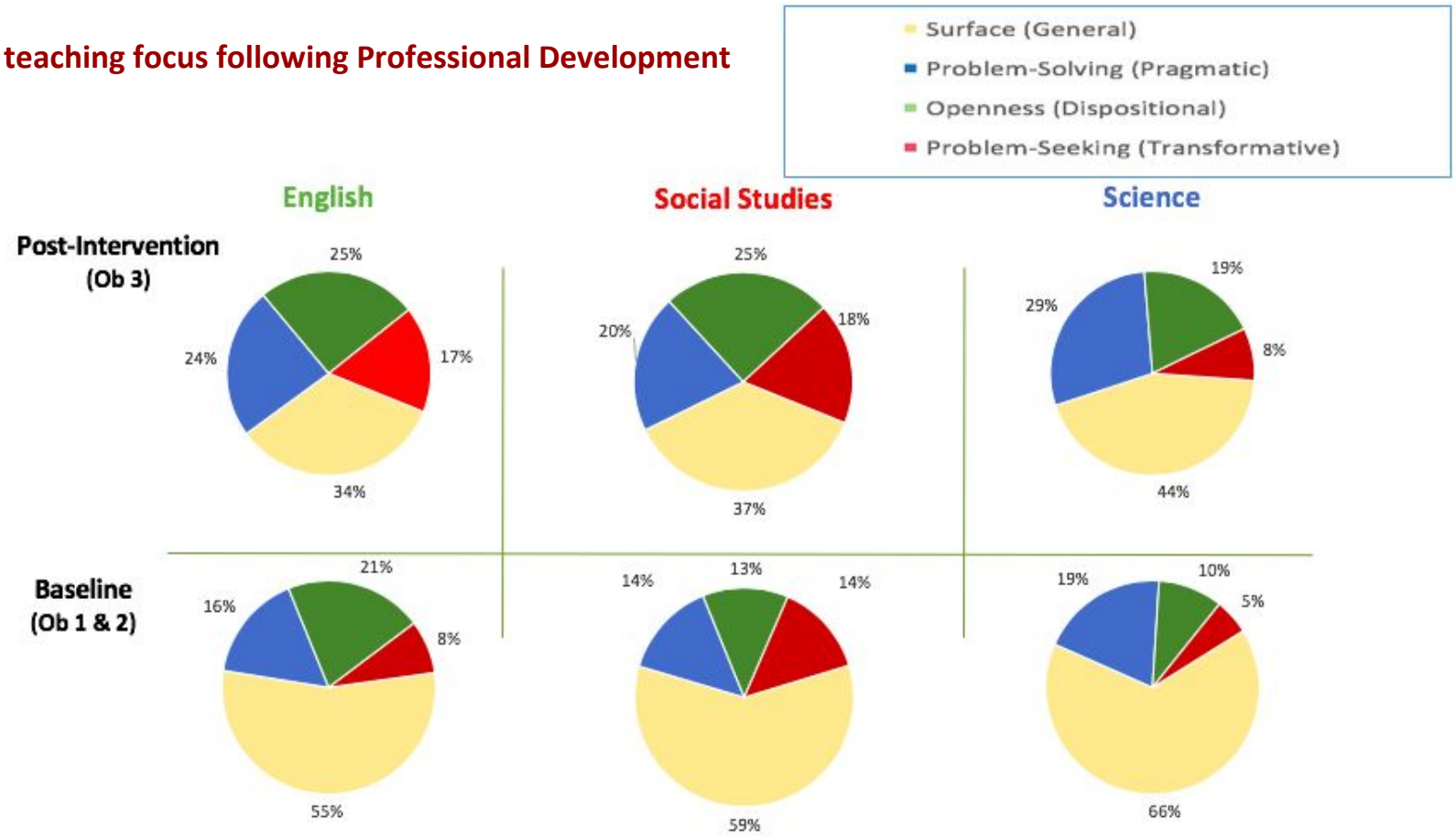
Observed Instances — Time intervals 1 = 1 minute (Max: uninterrupted observation / 30sec recording)

Observation of critical thinking instruction		Instruction & Prompts	1	2	3	4	5	6	7	8	9	10	Total
	Pragmatic Problem-solving	Precision/Instruction											
		Relevance Logic											
		Depth/Breadth											
	Dispositional Empathy/Creativity	Self-reflection											
		Charity/Curiosity											
		Intellectual Humility											
	Transformative Problem-seeking	Open-mindedness											
		Truth-seeking											
		Other: Jeans											
	Surface Level	Behavior Instruction											
	Type of Instruction	Authentic/Backward Dialogue											
		Individual Coaching											
		Total											

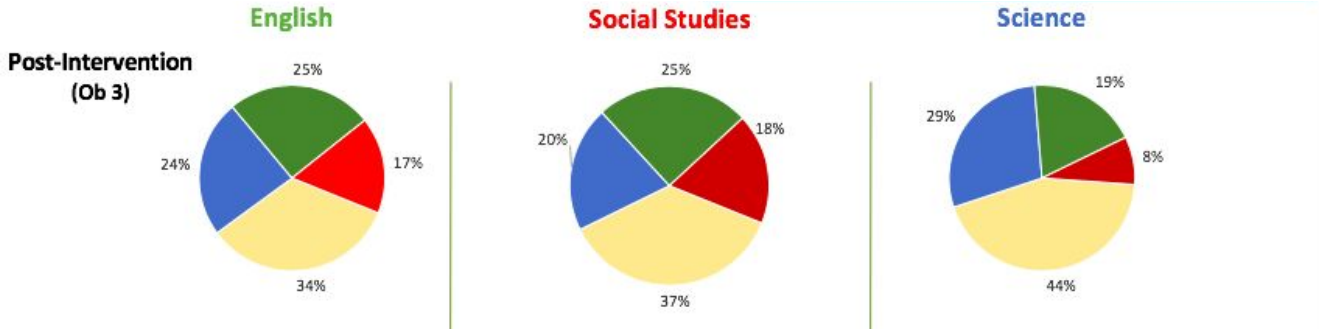
Notes/Barriers: (Bias, Framing, Ad-Hominem, Time-saving, Fallacies)

Initial Findings

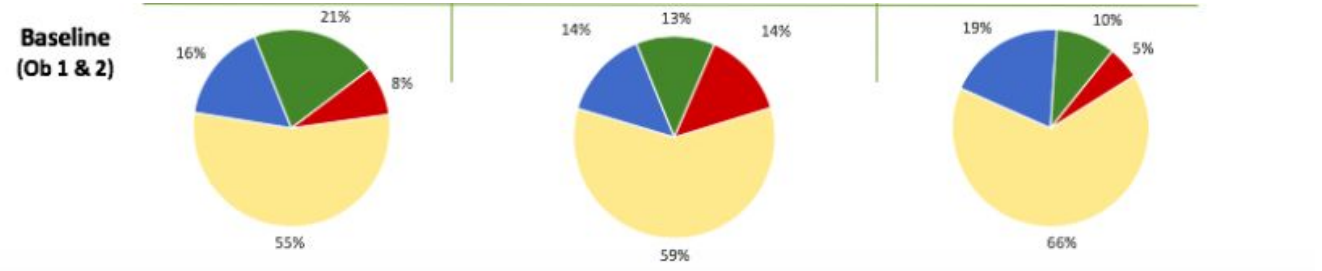
Shifts in teaching focus following Professional Development



Initial Findings

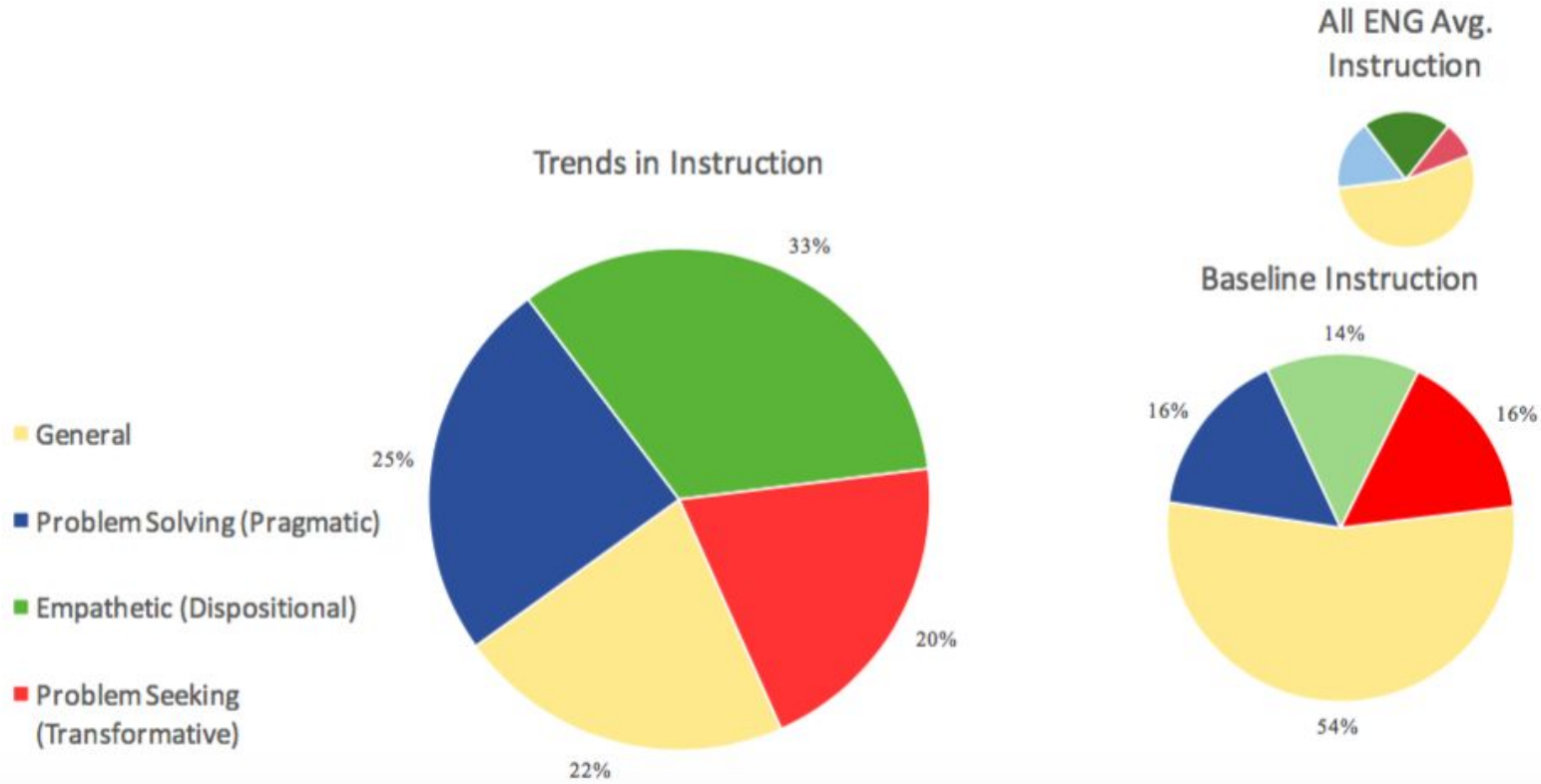


- An average 20% shift away from *General* instruction, towards critical thinking.
- Distribution of critical themes carried on from some baseline trends, though English saw the greatest growth in *Transformational* themes.
- Where there were significant increases in participant teachers' critical thinking instruction, it often matched an increase of teachers' instructional use of *dialogue*.



Sample Teacher Profile 1:

- Crystal St Cyr, HoD English



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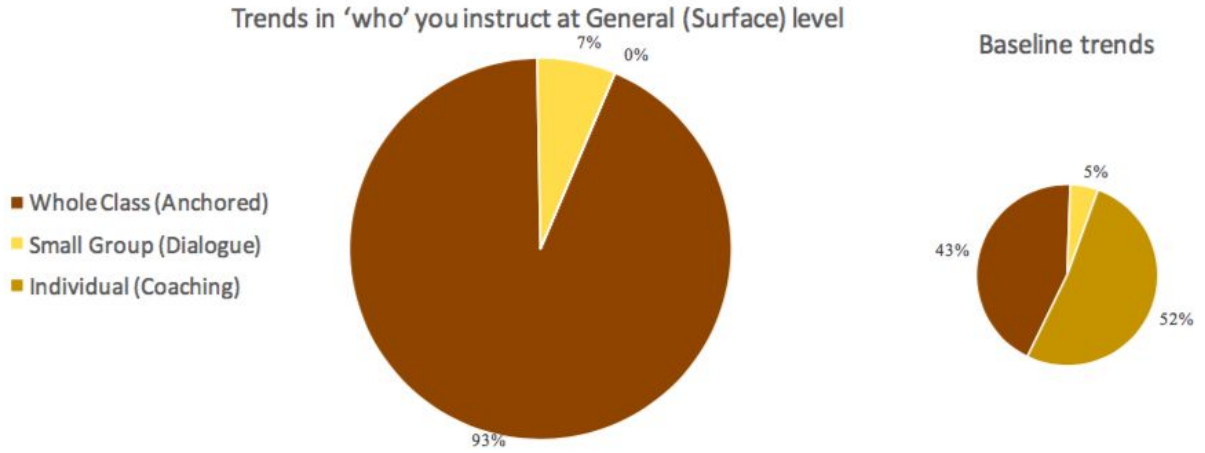

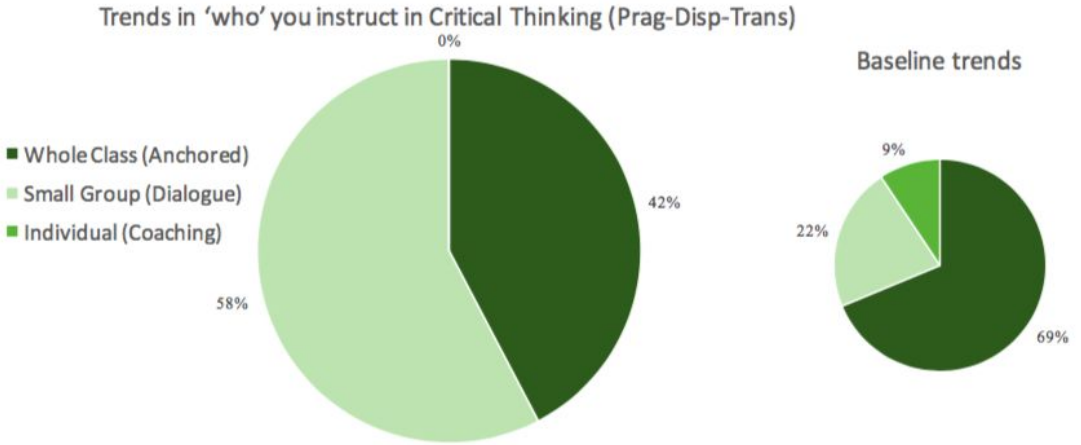

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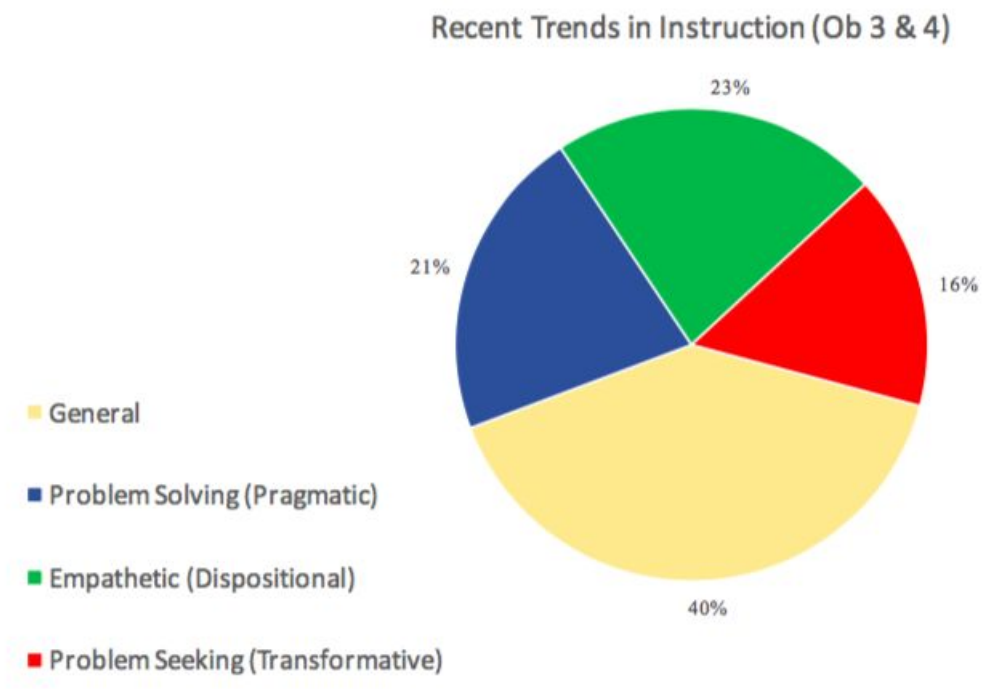
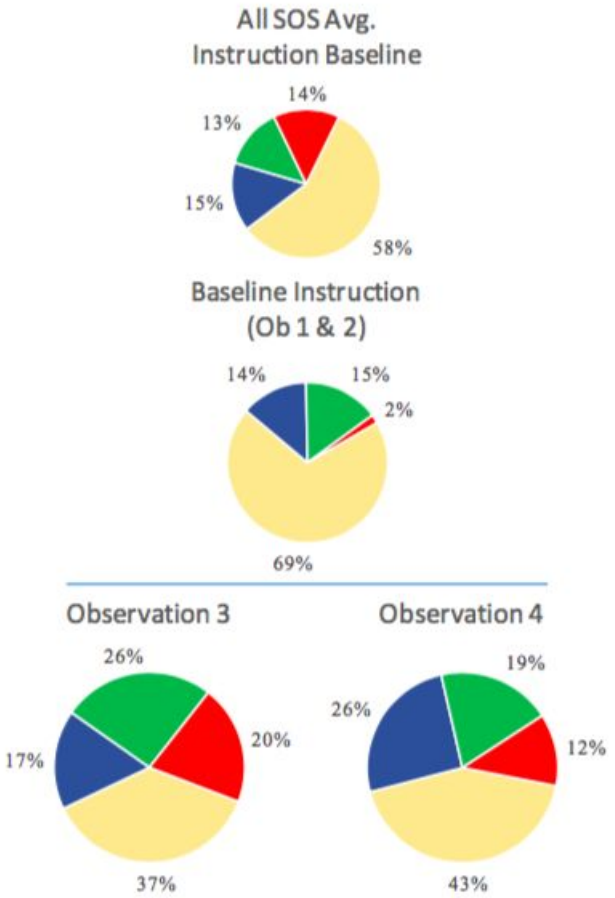
Sample Teacher Profile 2:

- Sharon West, Social Studies B.T.





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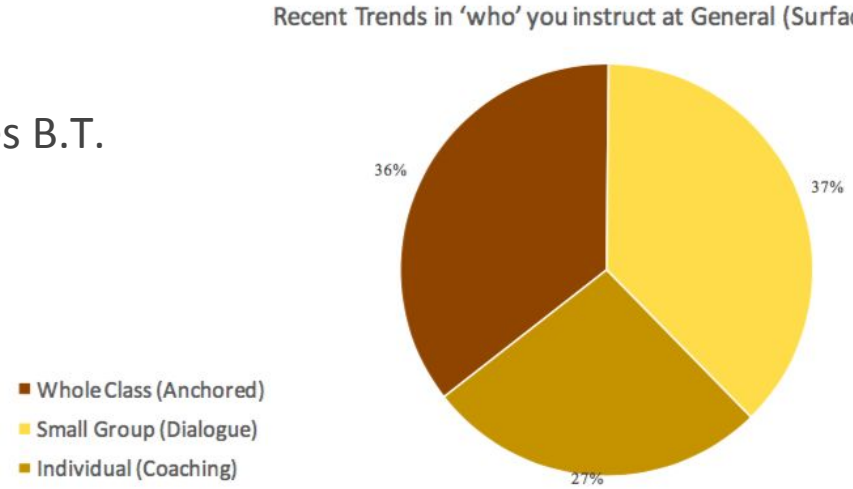

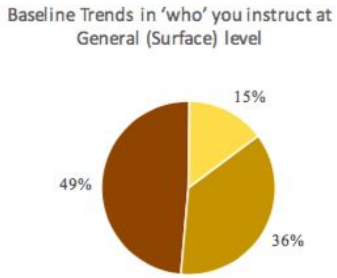

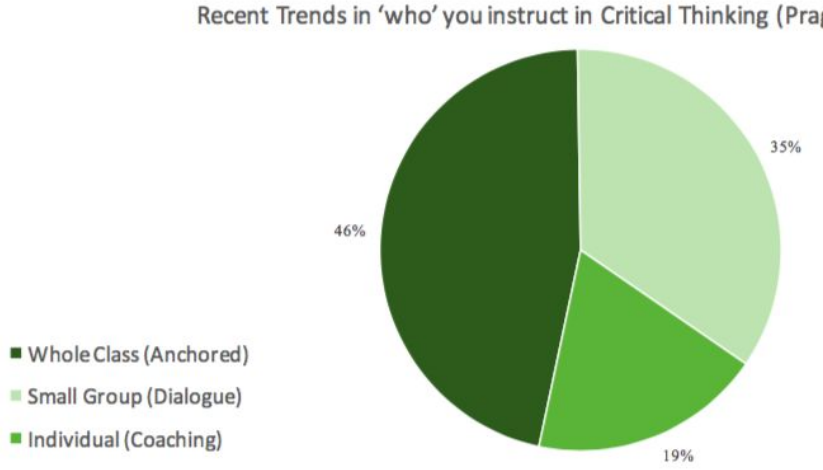

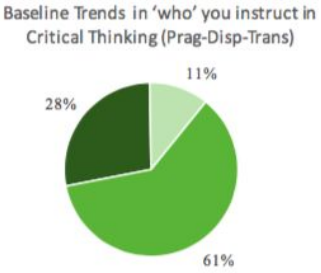

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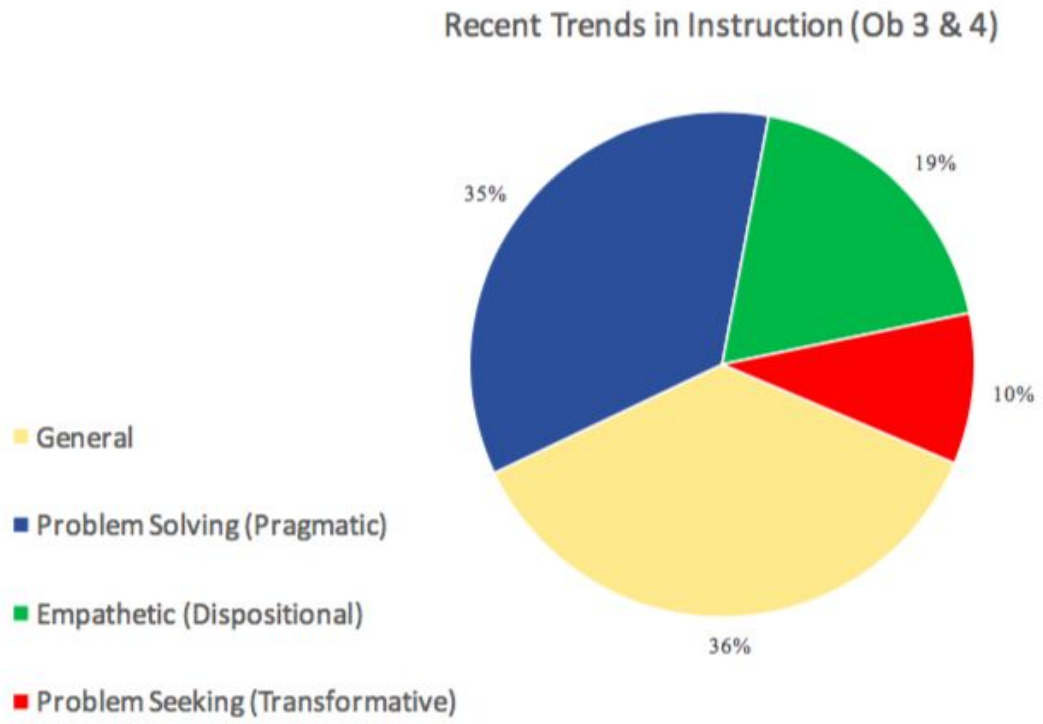
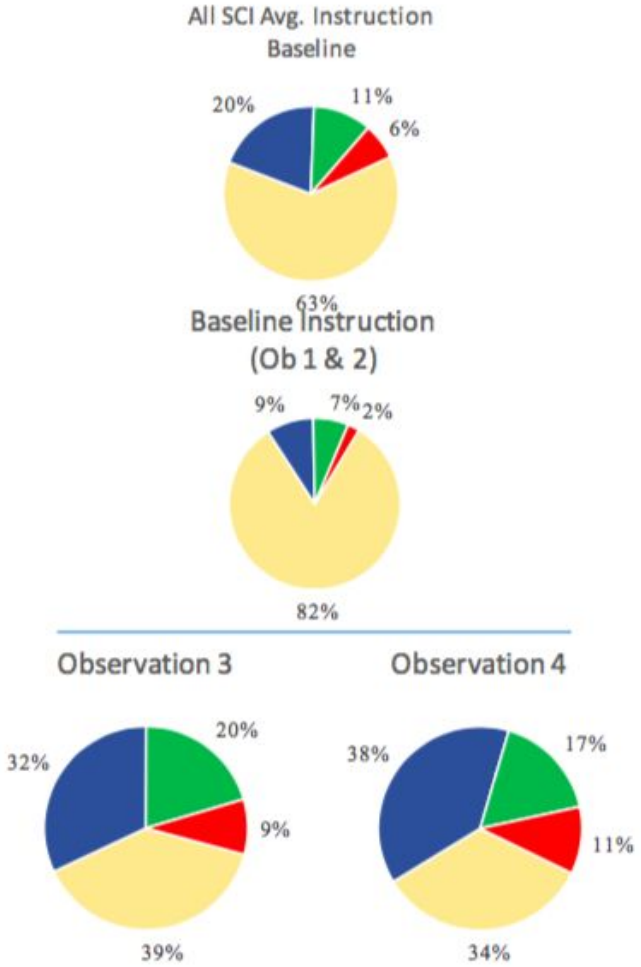
Sample Teacher Profile 3:

- Peter Andrews, Science





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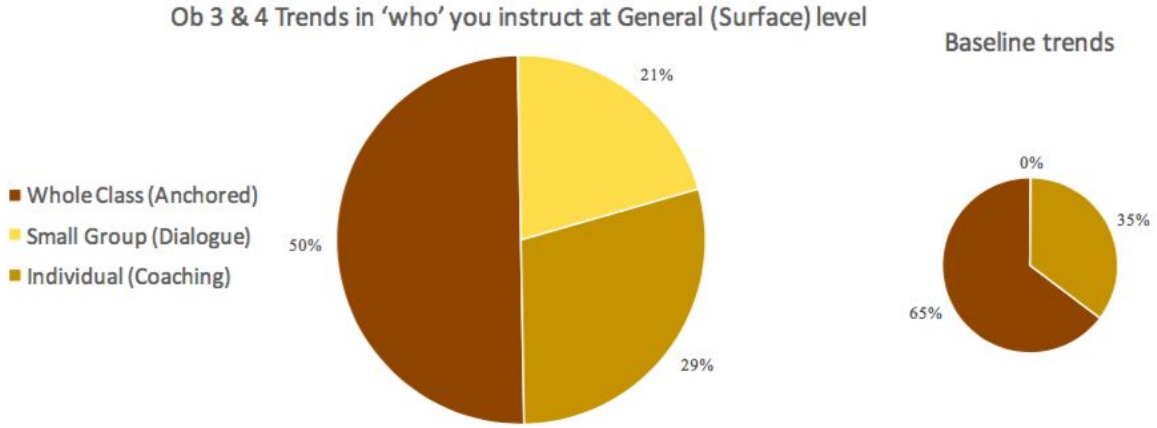

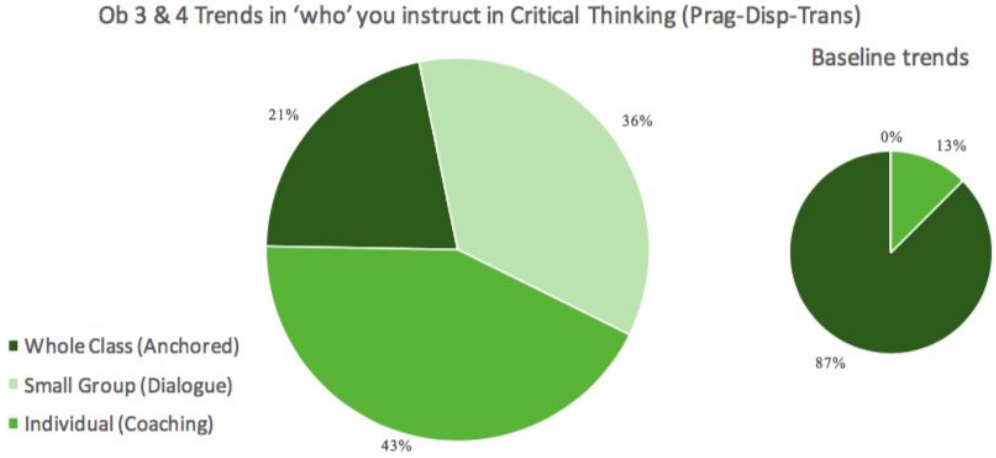

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Summary

- Providing professionals with an opportunity to come together and explore theories and pedagogical practices can help to better engage teachers with their craft and how they value CT in their subject area.
- Quantitative data collection does suggest shifts in how teachers engage in CT across each of the subject areas of English, Social Studies and Science.
- Conceiving CT across curriculum lines may help to better transfer it to students as both teacher and students make links beyond the context of one individual, or learning problem, or system(s) of knowledge…

Problem-solving (Pragmatic)

Openness (Dispositional)

Problem-seeking (Transformative)

Problem-solving (Pragmatic) Openness (Dispositional) Problem-seeking (Transformative)

Limitations

Data collection:

- Participant teachers were self-selected and wanted to develop their practice.
- Data collection was restricted to what the teachers were doing, rather than what the students were demonstrating as part of their learning.
- Results may impacted by a range of variables, including: time of year, researcher presence and interpretation,

On impact & retention:

- Most teachers were not confident that their students could explain how their teachers might be facilitating critical thinking, and saw it as a focus moving forward.

- An overall increase in teacher employing *Dialogue* as part of instructional practice, which produced strongest links to critical themes.