

Challenges for HE science teaching

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Approaches to learning

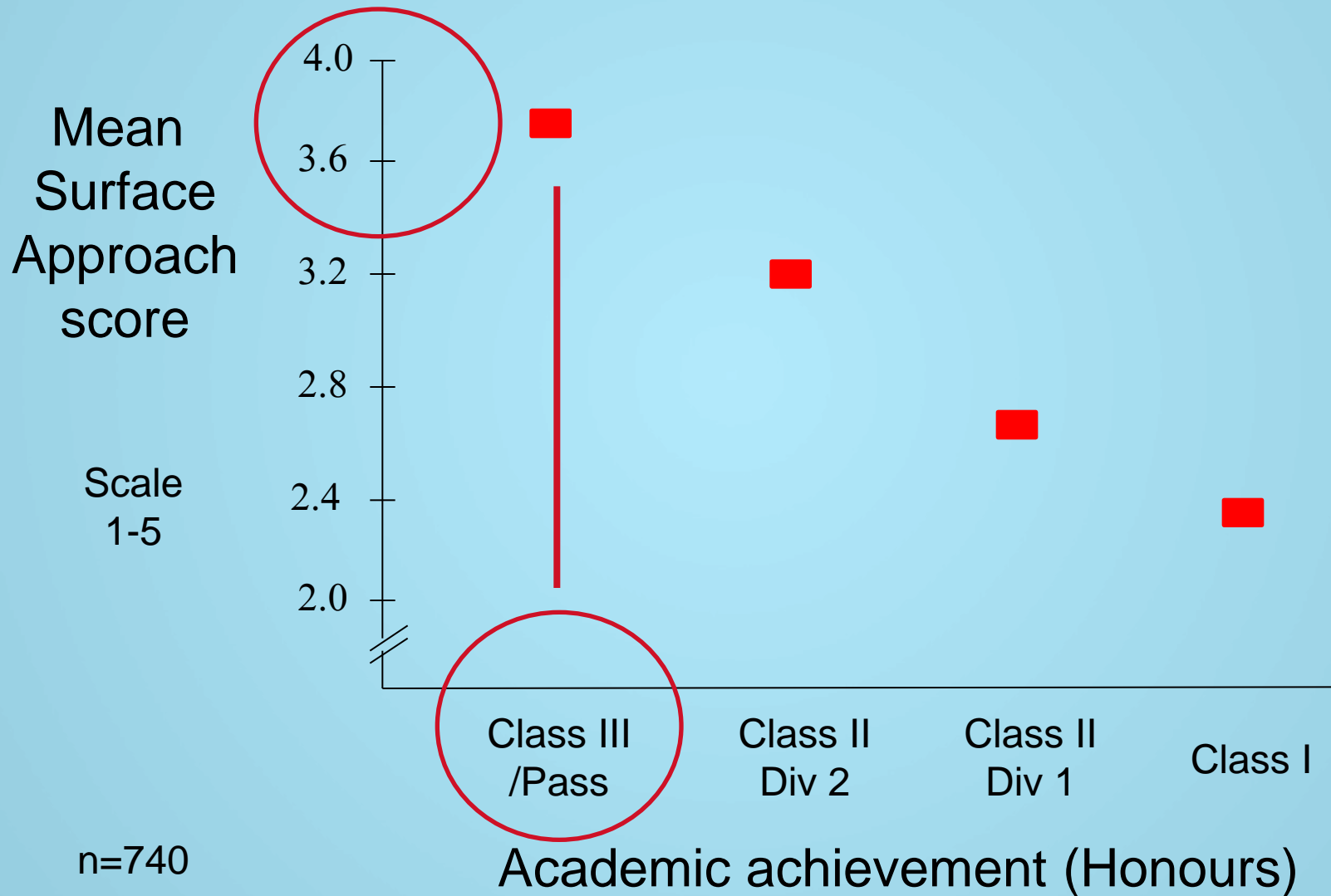
Deep approach (understanding)

Students focus their attention on the overall meaning or message in a class session, text or situation. They attempt to relate ideas together and construct their own meaning, possibly in relation to their own experience.

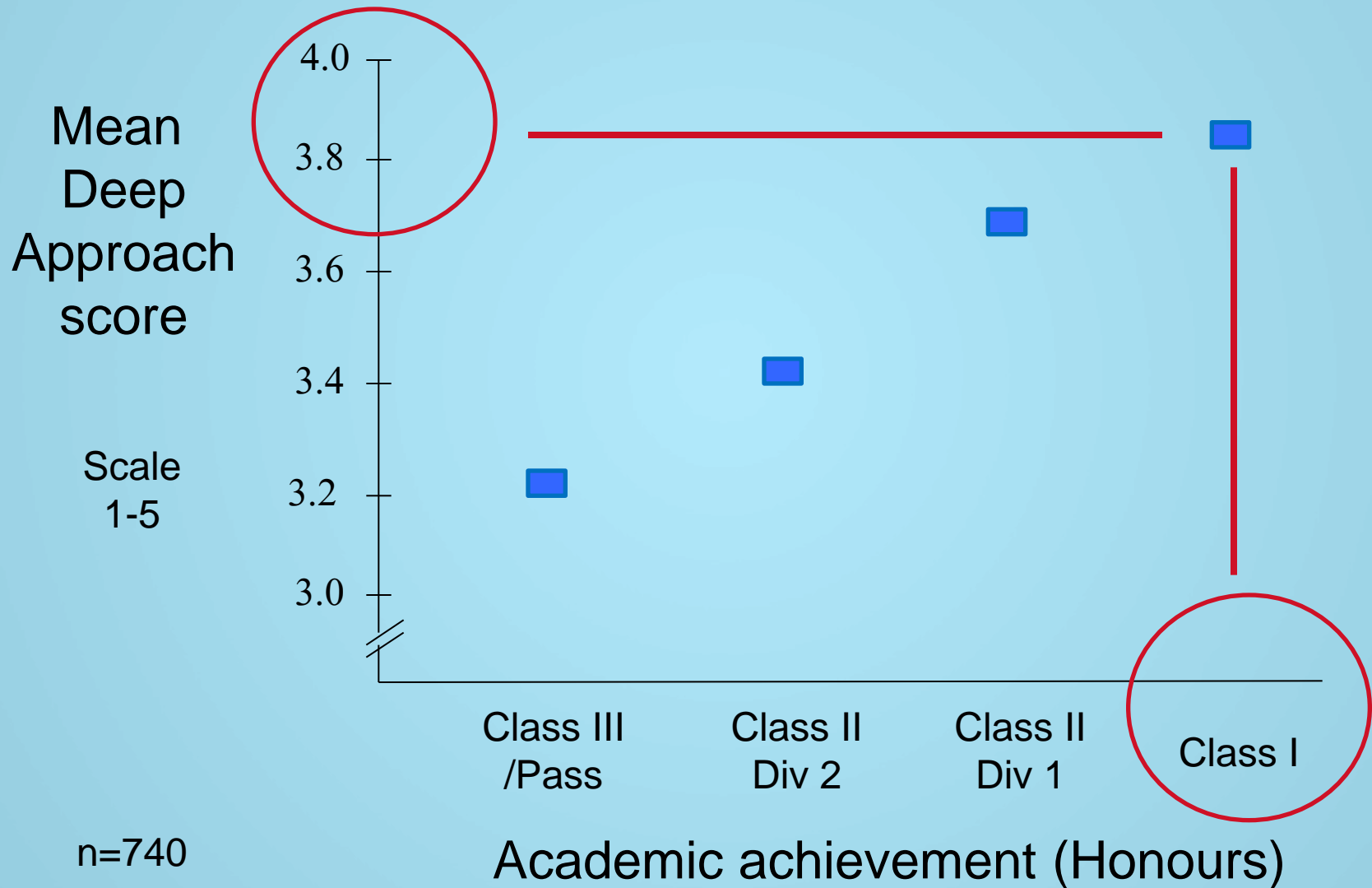
Surface approach (memorising)

Students focus their attention on the details and information in a class session or text. They are trying to memorise these individual details in the form they appear in the class or text or to list the features of the situation in order to pass the examinations.

Approaches to learning and outcomes



Approaches to learning and outcomes



The Challenge

Ways of thinking and practicing in teaching

Effects on student approaches to learning

Factors affecting teaching

Getting engagement by all faculty

Using evidence on teaching (today)

Gathering evidence on teaching (next Monday)

Structure

Relational model of teaching/learning system

Approaches to learning

Approaches to teaching

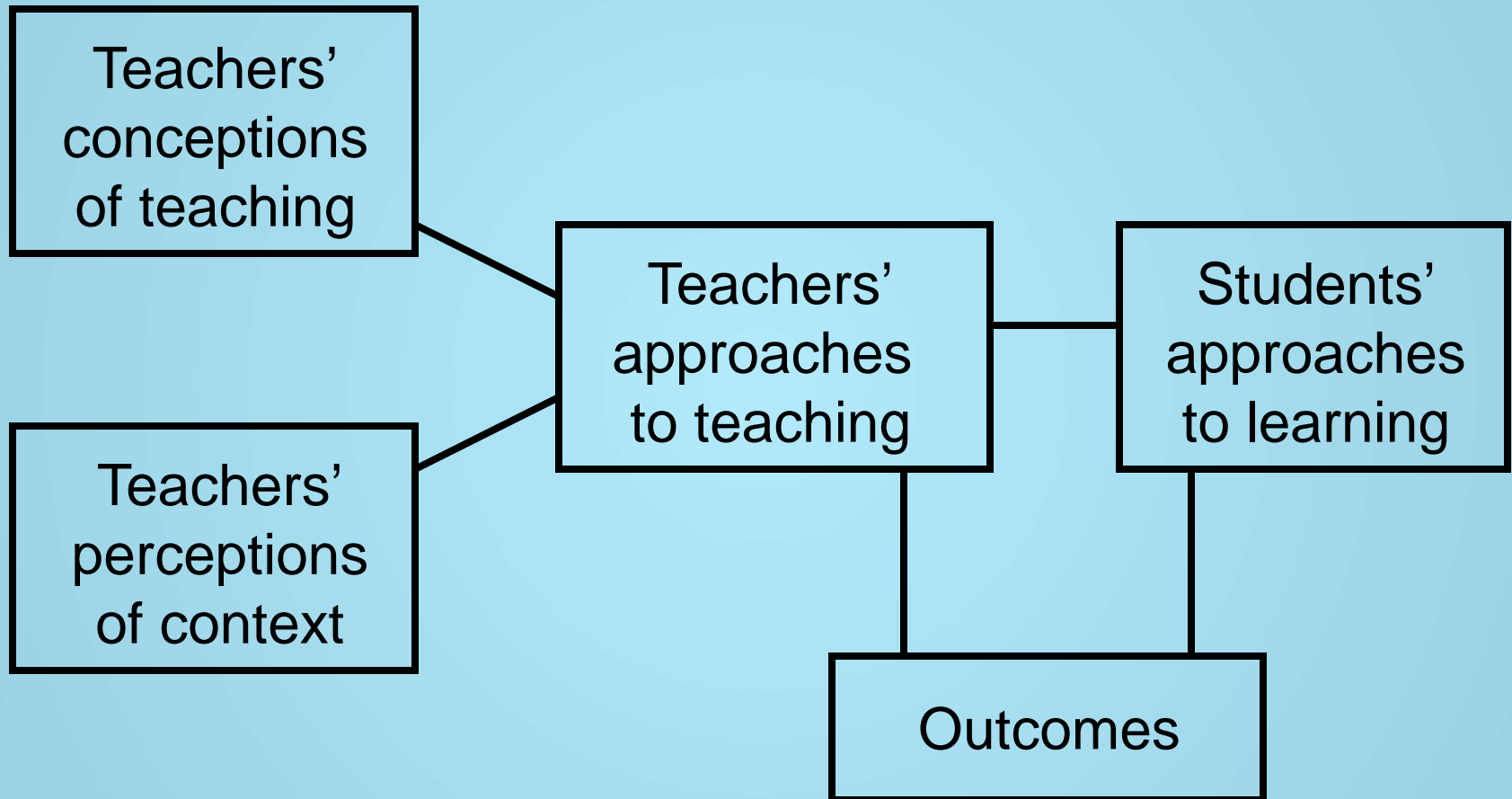
Relations between teaching and learning

Factors affecting quality teaching

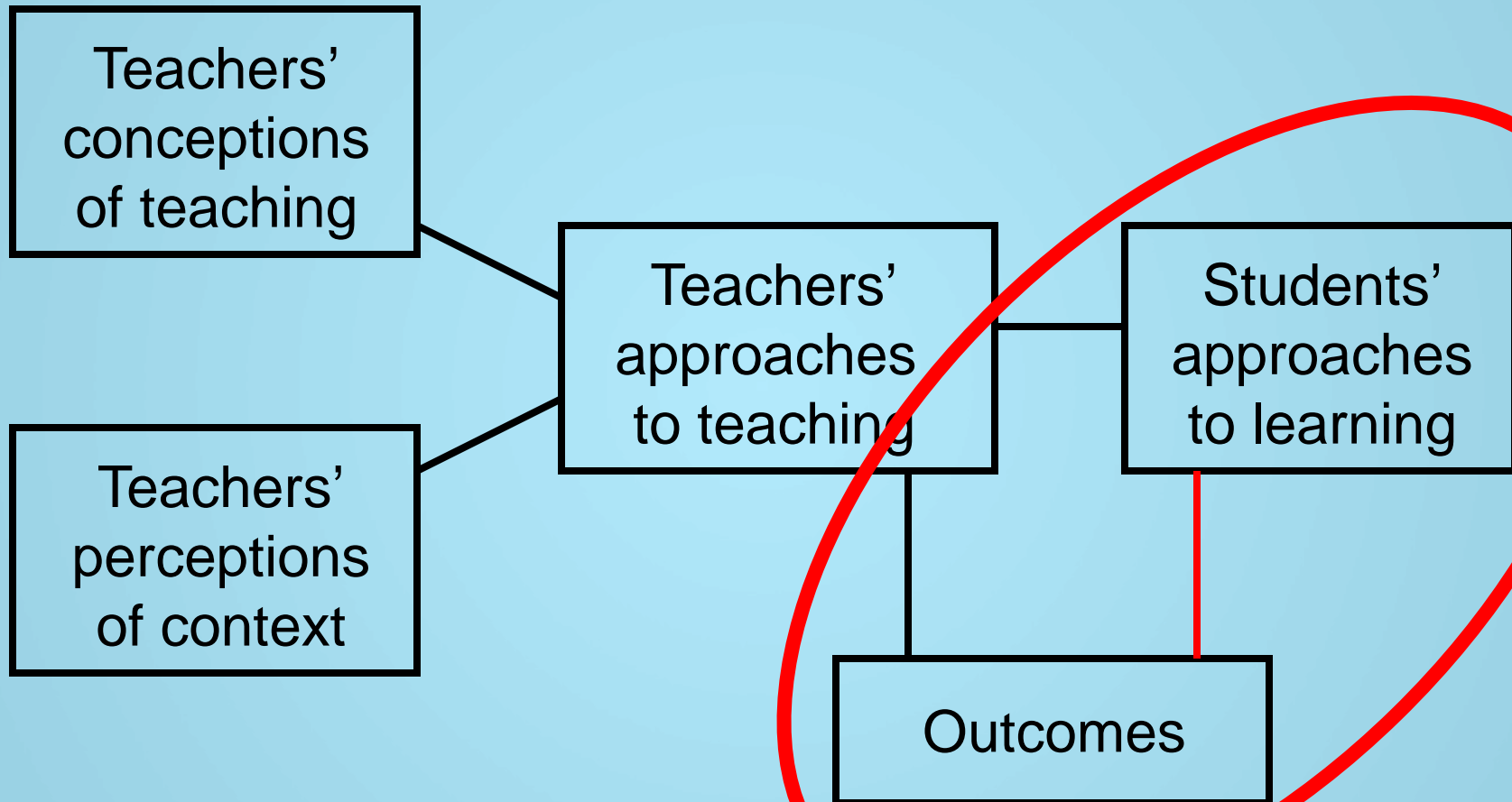
Implications

Scholarship of teaching and learning

Model of teaching-learning



Model of teaching-learning



Students adopt
qualitatively different
approaches to learning
that are related to
outcomes of learning

Structure

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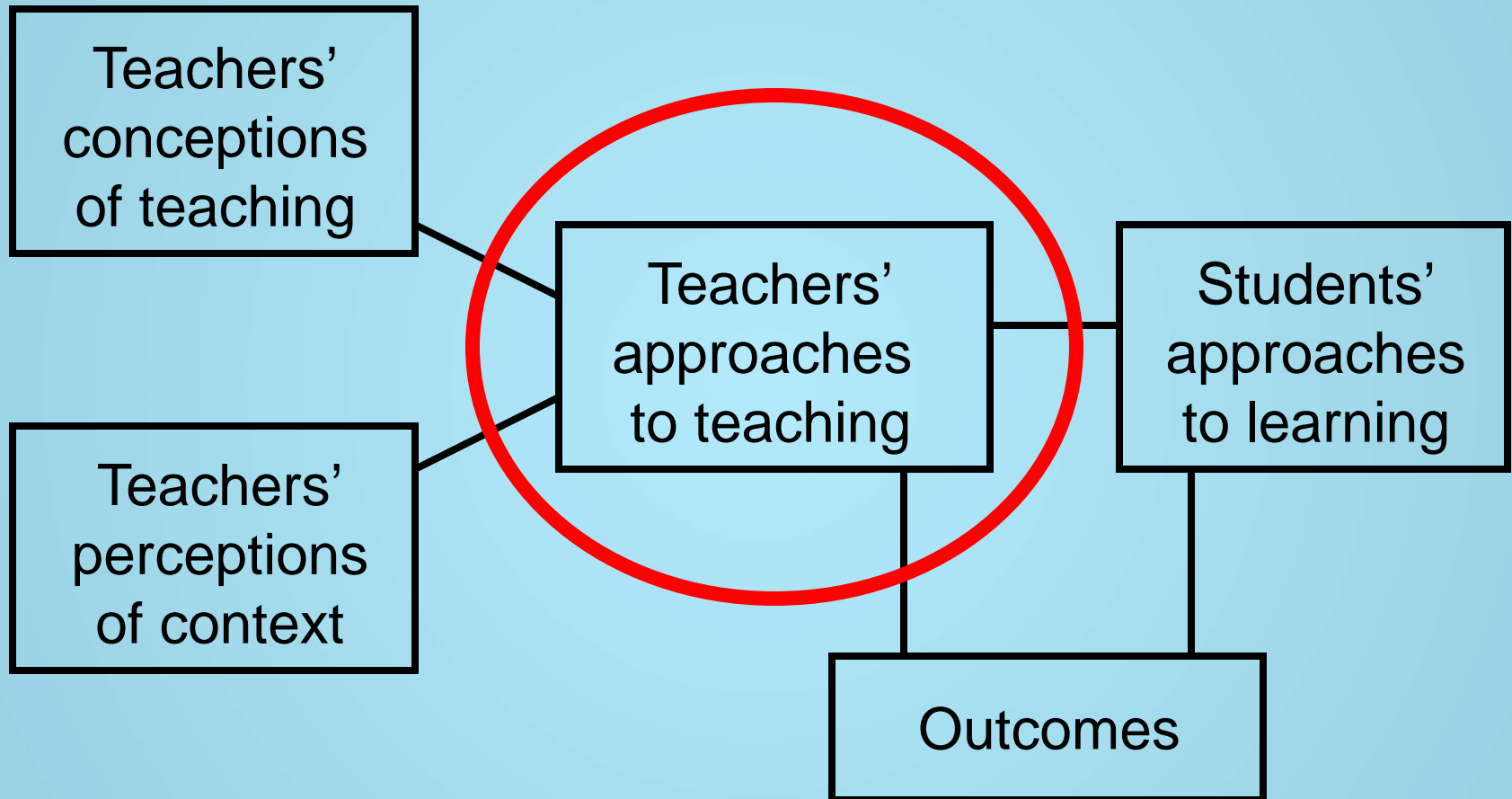
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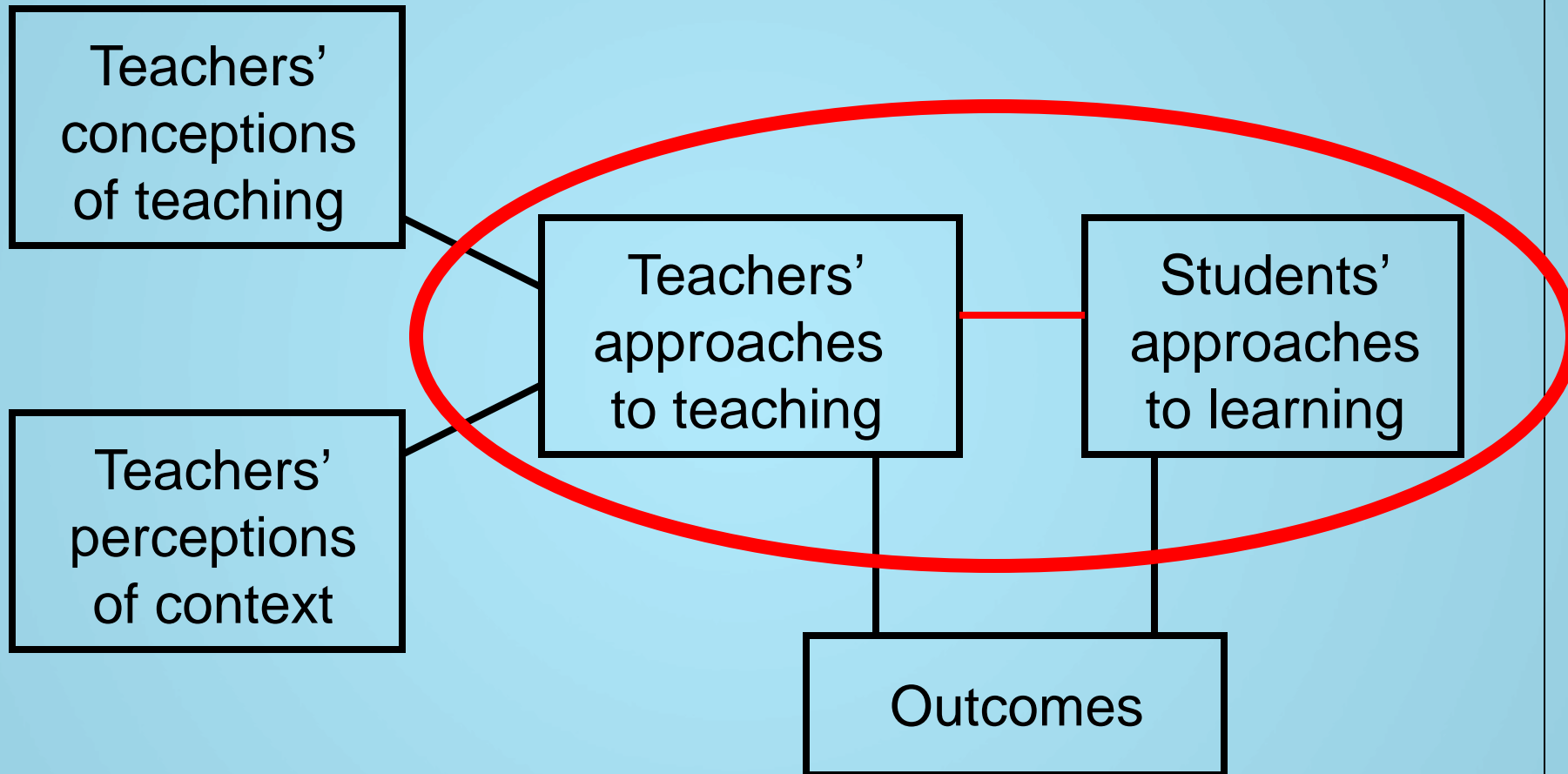
Approaches to teaching

- A: Teacher-focused strategy with the intention to transmit information**
- B: Teacher-focused strategy with the intention that students acquire the concepts**
- C: Teacher-student interaction strategy with the intention that students acquire the concepts**
- D: Student-focused strategy with the intention to develop conceptions**
- E: Student-focused strategy with the intention to change conceptions**

Approaches to teaching

A: Teacher-focused strategy with the intention to transmit information	12
B: Teacher-focused strategy with the intention that students acquire the concepts	7
C: Teacher-student interaction strategy with the intention that students acquire the concepts	3
D: Student-focused strategy with the intention to develop conceptions	1
E: Student-focused strategy with the intention to change conceptions	1

Model of teaching-learning



Approaches to teaching

- A: Teacher-focused strategy with the intention to transmit information**
- B: Teacher-focused strategy with the intention that students acquire the concepts**
- C: Teacher-student interaction strategy with the intention that students acquire the concepts**
- D: Student-focused strategy with the intention to develop conceptions**
- E: Student-focused strategy with the intention to change conceptions**

Approaches to teaching

A: Teacher-focused strategy with the intention to transmit information

ITTF

E: Student-focused strategy with the intention to change conceptions

CCSF

Approaches to teaching

Information Transmission/Teacher-focused (ITTF)

Faculty focus their attention on what *they* do (forward planning, good management skills, an armoury of teaching competencies, use of the literature, ability to use IT ...).

They attempt to transmit the information about the curriculum on the assumption that students will learn from that process. That information is often complex and requires organisation and presentation skill.

Approaches to teaching

Conceptual Change/Student-focused (CCSF)

Faculty focus their attention on the students and monitor their perceptions, activity and understanding. Transmission is seen to be not enough.

They assume students construct their own knowledge, and the task of the teacher is to involve the student, and challenge current ideas through questions, discussion and presentation.

Includes mastery of techniques, including those associated with transmission, but this is an empty display without learning.

A CCSF approach
includes elements
of an ITTF
approach, but
not *vice versa*

Using buzz groups in a lecture theatre

Do you know what buzz groups are?

What do others think they are?

Turn to the people near you and ask them.

**Please finish your conversations when I raise
my arm.**

Using buzz groups in a lecture theatre

A teacher-focused approach

“Buzz groups give me and the students a break. Research shows students lose concentration if there are no breaks in a one-hour lecture.”

A student-focused approach

“Buzz groups are a means by which students can try out their understanding, and in so doing also give me an awareness of that understanding.”

Approaches to Teaching Inventory

Two scales: CCSF, ITTF, 11 items in each scale
Scale reliability = 0.83 and 0.86 respectively

Scale scores range from 1 (low) to 5 (high)

ITTF sample item:

It is important to present a lot of facts to students so that they know what they have to learn for this subject

CCSF sample item:

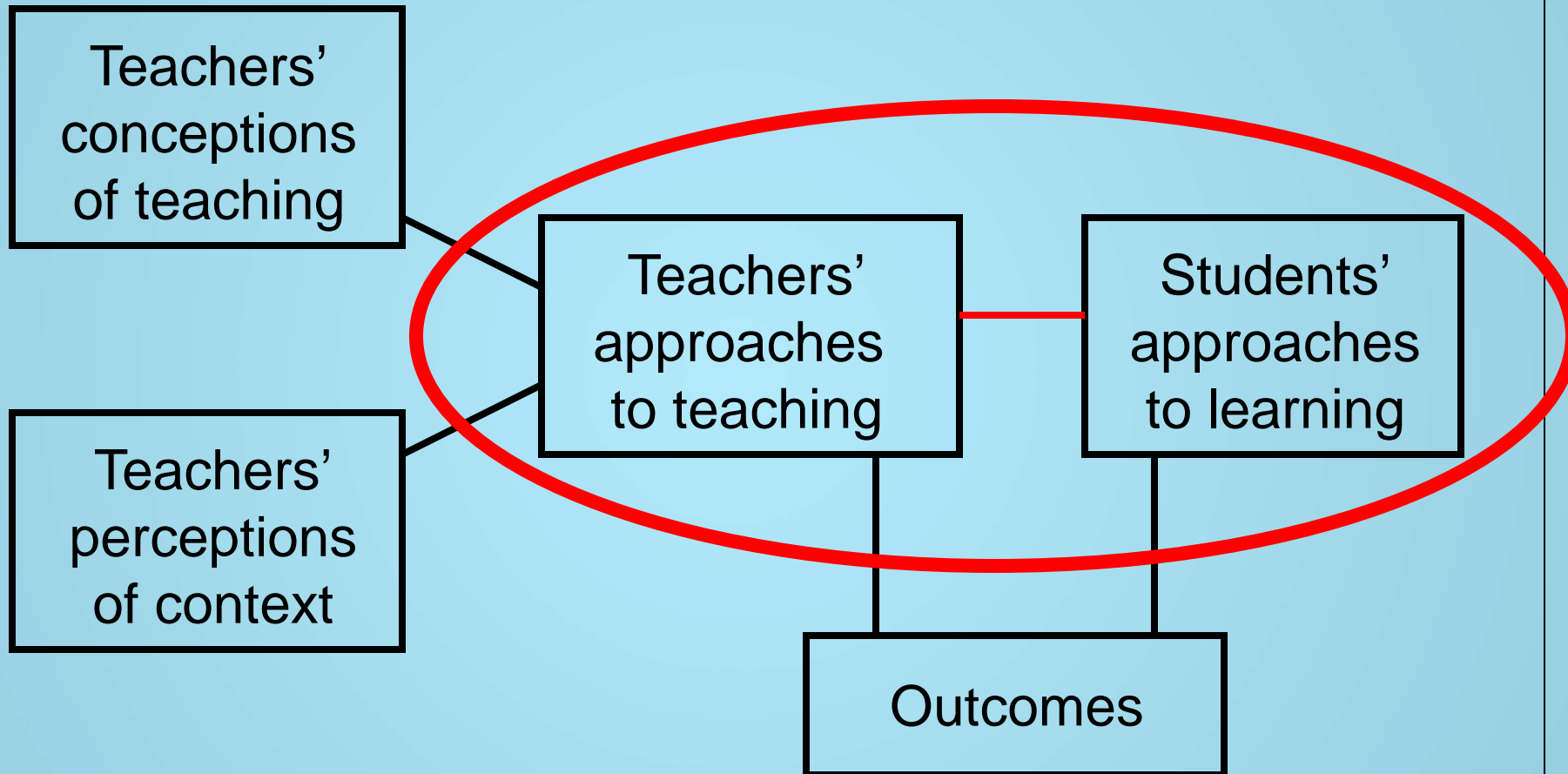
A lot of teaching time in this subject should be used to question students' ideas

Approaches to teaching & satisfaction

Variable	Variable
	Satisfaction with teaching R
Inform. Transm./Teacher-focus (ITTF)	-.03
Conceptual Change/Student-focus (CCSF)	.34*

*p < .001; N = 497; Trigwell and Lindblom-Ylänne, 2004

Model of teaching-learning



Approaches to teaching & learning

Learning Variable	Teaching Variable	
	Inform. Transm. Teacher-focus (ITTF)	Concept. Change Student-focus (CCSF)
Surface Approach (SA)	.37**	-.46**
Deep Approach (DA)	-.14	.34*

N = 55 Trigwell, Ramsden, Prosser, Martin (1998)

Variation in
approaches to
teaching
is related to
variation in
student learning

Structure

Relational model of teaching/learning system

Approaches to learning

Approaches to teaching

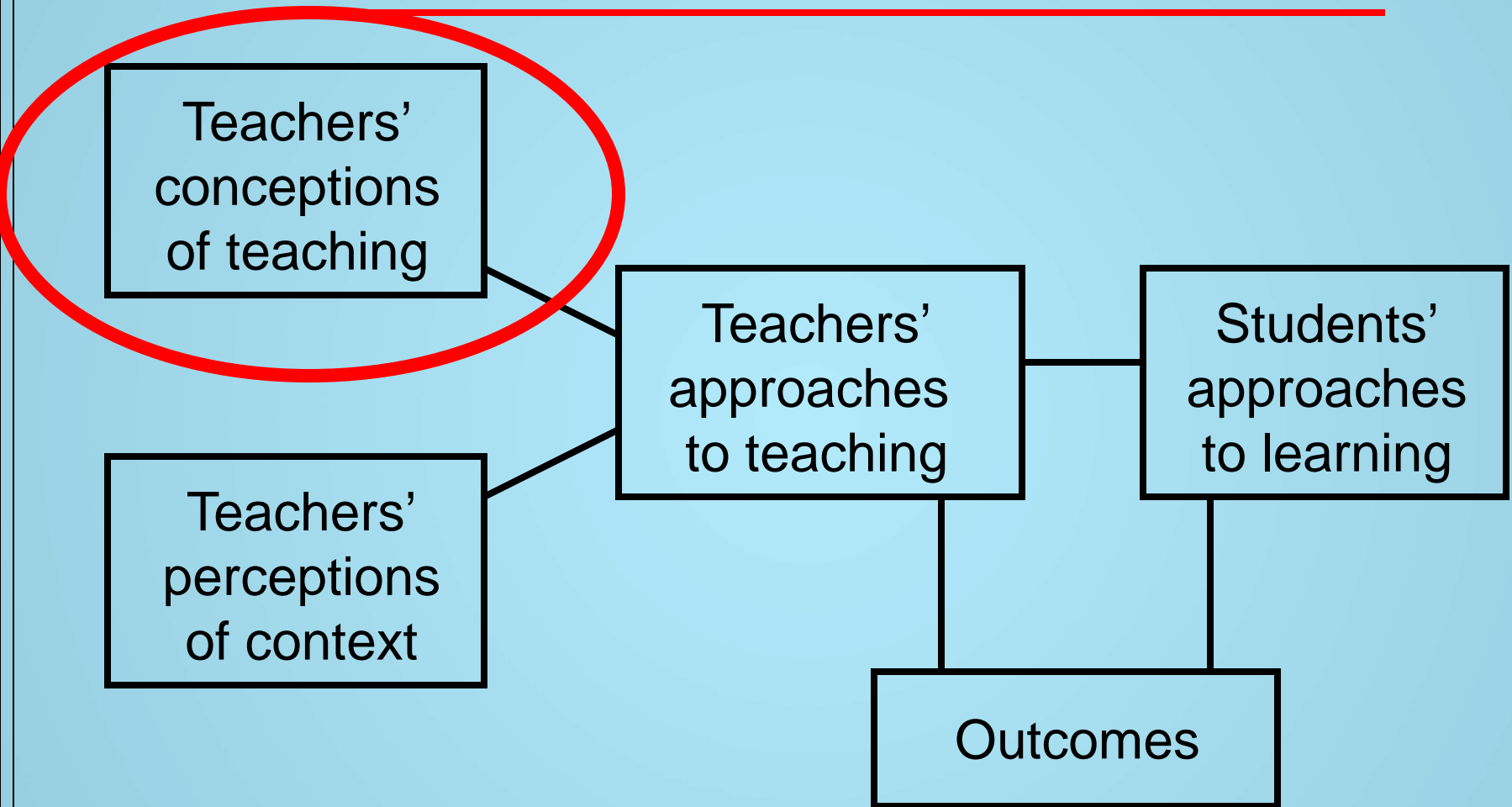
Relations between teaching and learning

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Conceptions of teaching

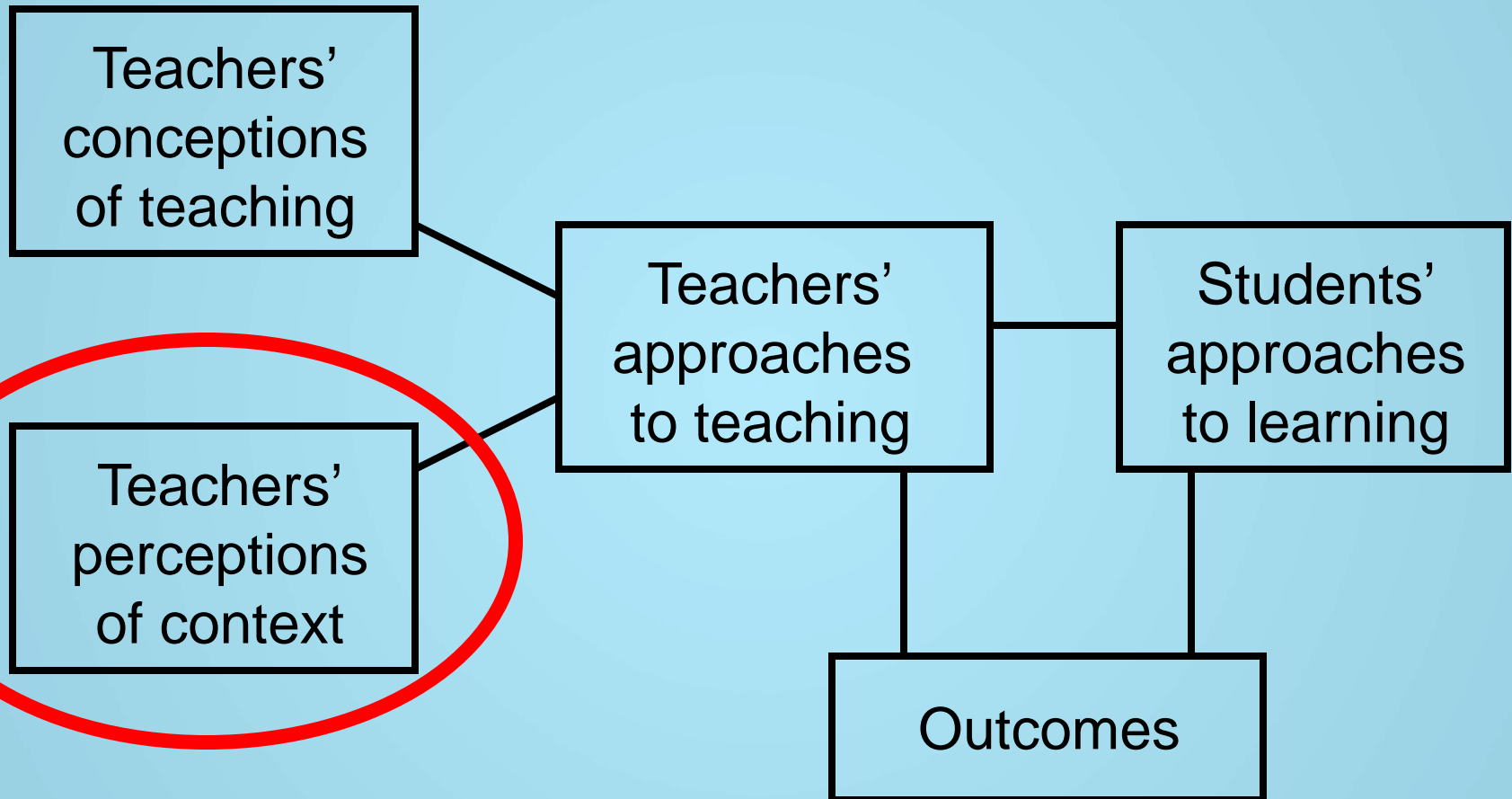
Level 1 Focus: What the student is

Level 2 Focus: What the teacher does


Level 3 Focus: What the student does

Different
conceptions of
teaching lie behind
the variation in
teaching approach

Model of teaching-learning



Approaches to teaching & context

Variable	Variable
	ITTF CCSF
Transformative leadership	
Collaborative management	
Support for student learning	
Class size	
Student characteristics	
Teacher control	
Teacher's workload*	

N = 439, Ramsden, Prosser, Trigwell, Martin (2007)

Approaches to teaching & context

Variable	Variable	
	ITTF	CCSF
Transformative leadership	-.04	.13
Collaborative management	-.13	.05
Support for student learning	-.22	.20
Class size	-.11	.10
Student characteristics	-.14	.18
Teacher control	-.22	.15
Teacher's workload*	-.24	.27

N = 439, Ramsden, Prosser, Trigwell, Martin (2007)

Teaching approach & discipline

Means of approaches to teaching by discipline (N=497).

	Pure Hard	Pure Soft	Applied Hard	Applied Soft	p
CCSF					
ITTF					

(Lindblom-Ylanne, et al., 2006)

Teaching approach & discipline

Means of approaches to teaching by discipline (N=497)

	Pure Hard	Pure Soft	Applied Hard	Applied Soft	p
CCSF	3.61	4.05	3.74	3.93	.000
ITTF	3.13	3.01	3.26	2.98	.003

Scale is 1 (low) to 5 (high)

(Lindblom-Ylanne, et al., 2006)

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Ways of thinking about teaching

Teaching online

Questions from an ITTF perspective:

Is this strategy likely to be the most efficient method of dissemination?

What amount of coverage is likely to be achieved using this approach?

Questions from an CCSF perspective:

Is this strategy likely to achieve the student learning aims?

What type of learning is likely to be encouraged by using this strategy?

Ways of thinking about teaching

Curriculum design

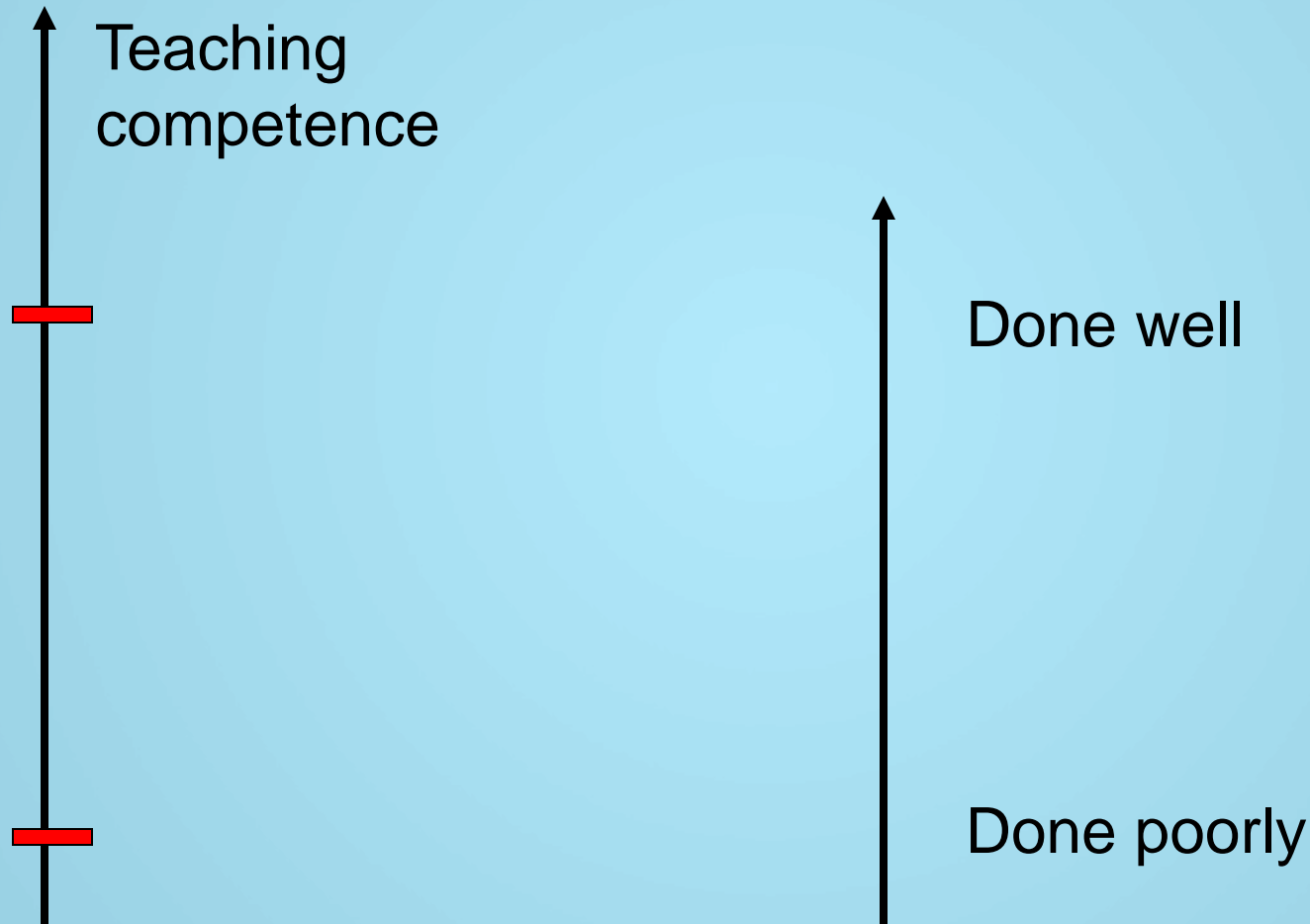
From an ITTF perspective:

I am the knowledge expert in this field and I should be able to teach the content as I see fit and in a way that makes sense to me.

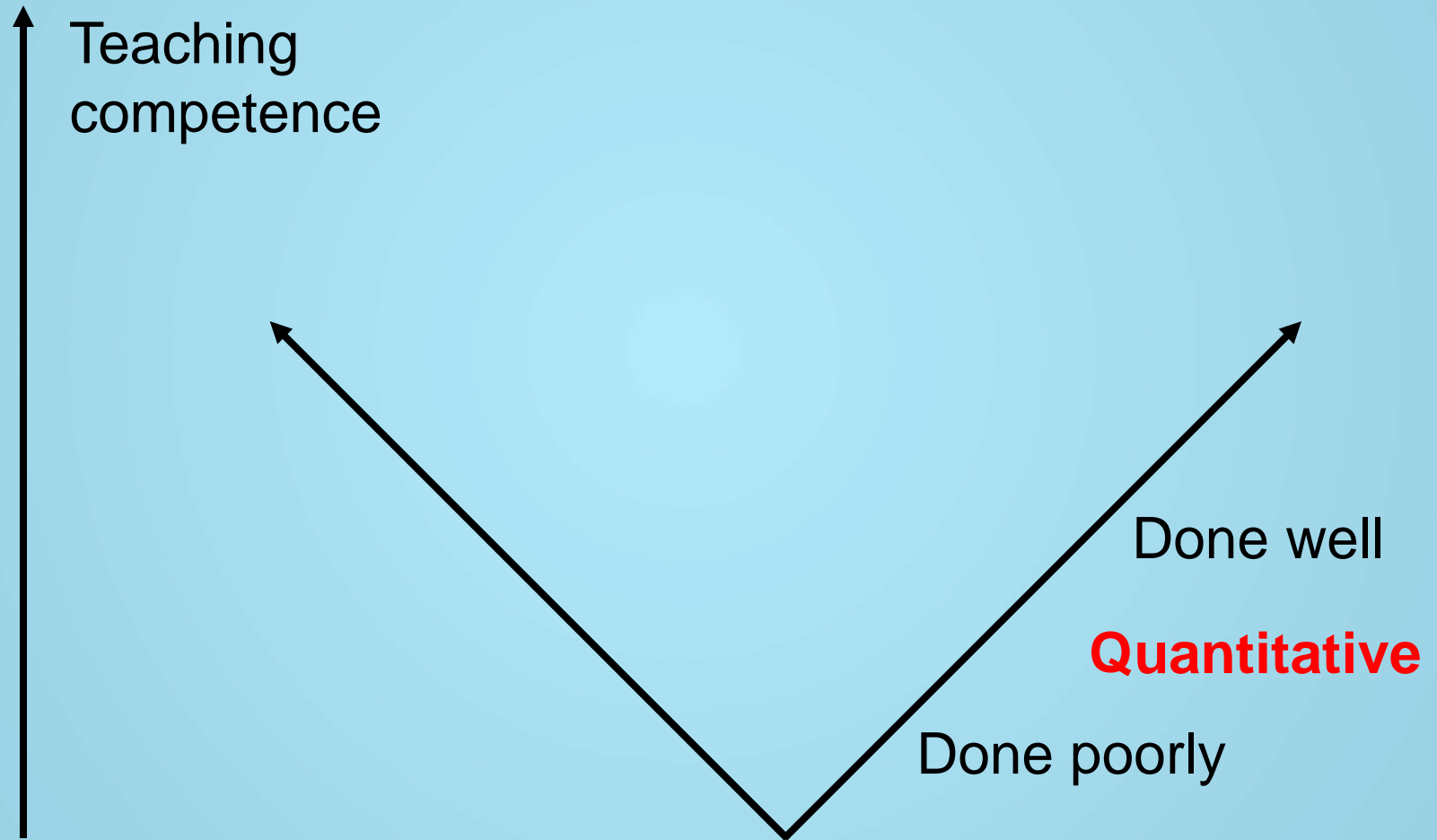
From an CCSF perspective:

It is important that students are able to experience coherence within a subject and between subjects, so curriculum is a collaborative academic pursuit.

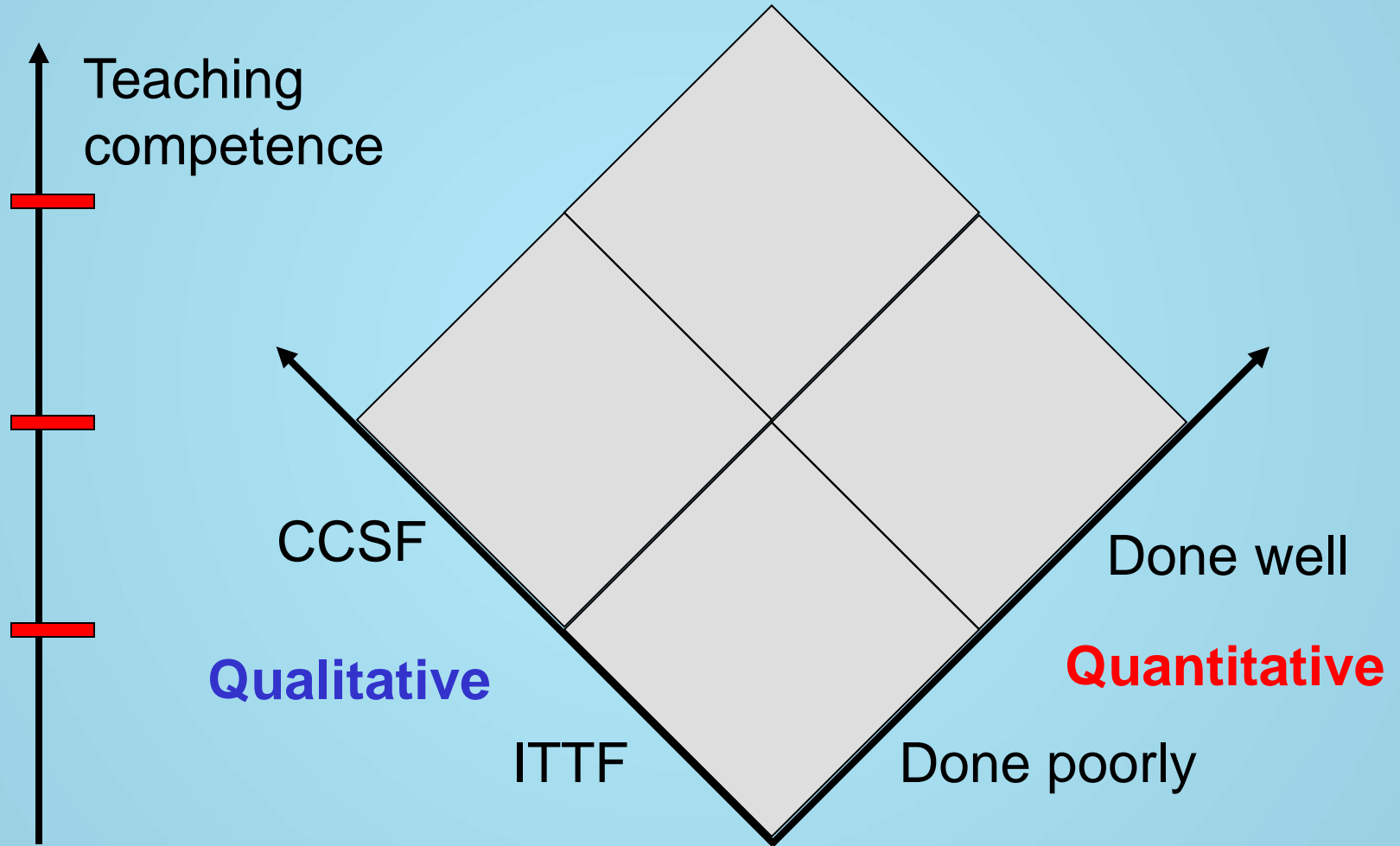
A model for judging teaching



A model for judging teaching



A model for judging teaching



Structure

Relational model of teaching/learning system

Approaches to learning

Approaches to teaching

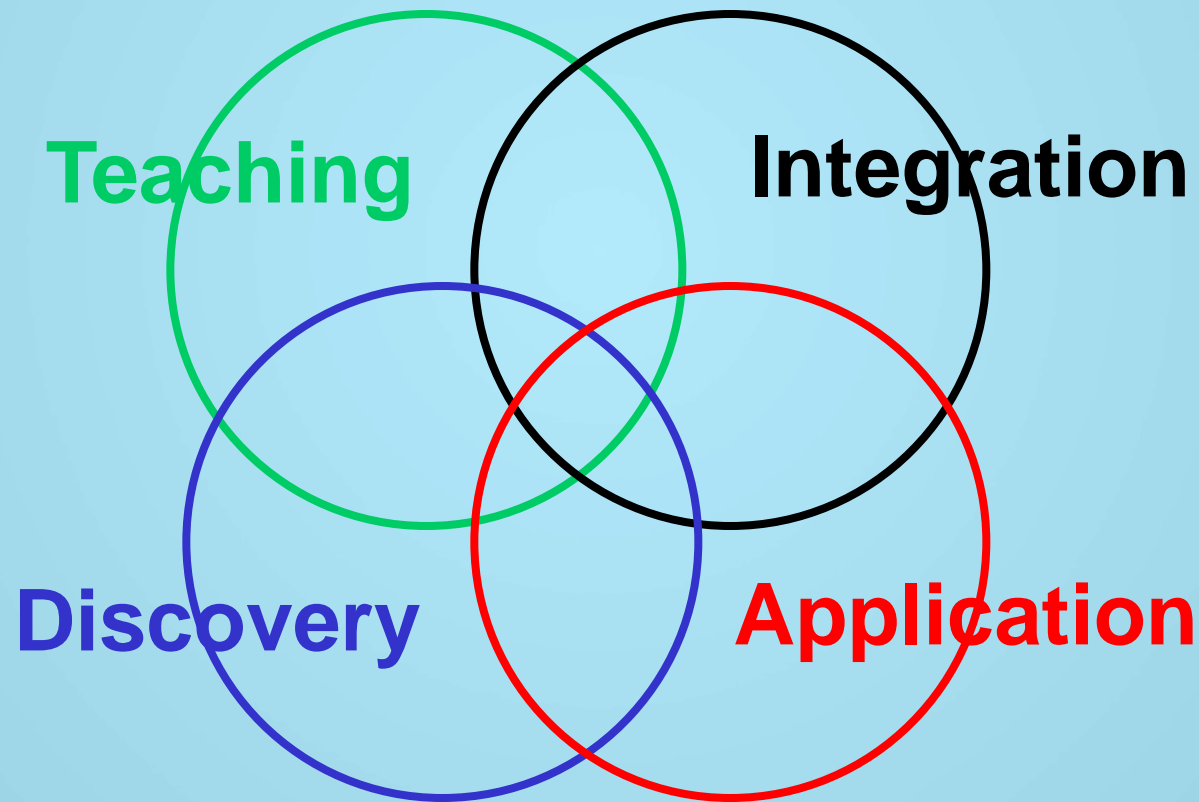
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Boyer's overlapping scholarships



Scholarship

To be **scholarly** is to be engaged in personal, but rigorous intellectual inquiry and development involving values such as honesty, integrity, open-mindedness, scepticism and intellectual humility.

To be engaged in **scholarship** is to take that process, for scrutiny, into the public arena.

It is to make transparent the processes and outcomes of scholarly activities.

Scholarship of teaching

If teaching is about making learning possible ...

... then the scholarship of teaching is about making transparent how learning is being made possible.

If teaching is about collaborative meaning-making

...
... then the scholarship of teaching is about making transparent how collaborative meaning-making is happening.

Levels of pedagogic investigation

Level	Purpose of investigation	Evidence gathering processes will be	Investigation results in
1	To inform oneself	Verified by self	Personal knowledge
2	To inform a group within a shared context	Verified by those within the same context	Local knowledge
3	To inform a wider audience	Verified by those outside of that context	Public knowledge

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Conclusions

- CCSF approaches are more likely to lead to adoption of deep approaches to learning.
- They involve encouraging self-directed learning, taking time to discuss problems, assessing to encourage conceptual change, encouraging debate
- ...but most crucially, ‘quality teaching’ involves *a way of thinking* in which there is more of a focus on what the student is perceiving and doing, than on the teacher, ...
- ... and the scholarship of teaching is about inquiry that has, as the main focus, the facilitation and improvement of student learning.