Effective course design

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Three pillars of good course design

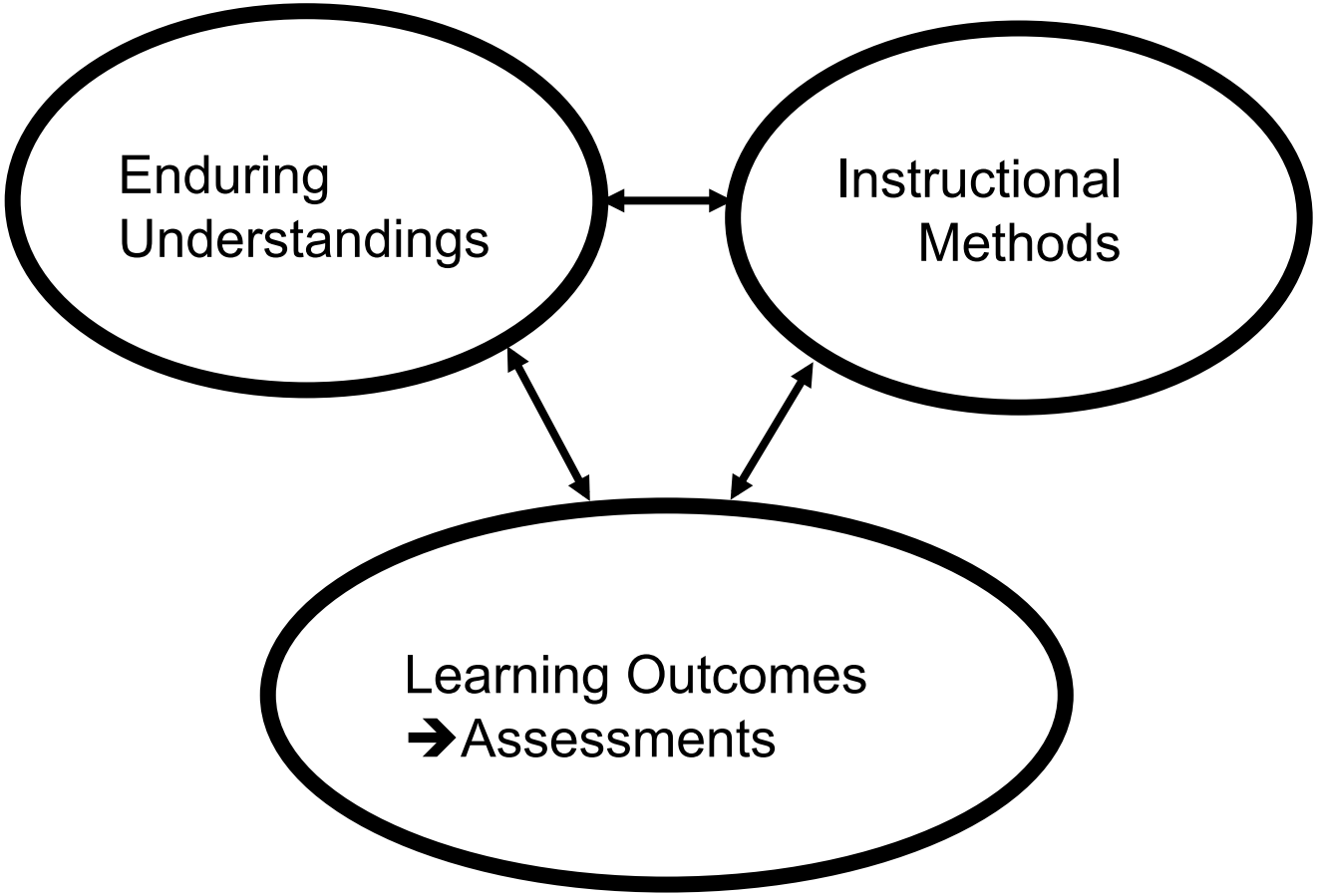
1. **Align** expected understandings, instructional methods, and outcomes (=assessments)
2. Use **backward design** to create scope, sequence, and assessments of course content
3. Enhance **motivation** by creating a positive classroom environment that builds a sense of community, and trust

Pillar 1: Alignment in a nutshell

"In aligned teaching, there is maximum consistency throughout the system. The curriculum is stated in the form of clear objectives, which *state the level of understanding required rather simply than a list of topics to be covered*. The teaching methods are chosen that are likely to realize those objectives; *you get students to do the things that the objectives nominate*. Finally, the assessment tasks address the objectives, so that you can test to see if the students have learned what the objectives state they should be learning."

Teaching for Quality Learning at University, John Biggs, p. 27

Alignment


Enduring Understandings
Instructional Methods
Learning Outcomes
➔Assessments

Alignment: Teaching strategies

- Choose teaching strategies that are **targeted at achieving the learning outcomes**
- Give students **repeated practice** at achieving those outcomes in newer and more enriched contexts
- Give students repeated **formative feedback** on how well they are succeeding

Alignment: Assessments

- Assess only what you value (=outcomes)
- Assessments should measure achievement of stated outcomes
- Assessments should be of the *right kind*
- Assessments should be at *right level*
- Maximize number of *formative* assessments and *minimize* number of summative ones
- Align formative and summative assessments

Deep v. Surface Alignment

- Alignment *by itself* leads to more effective achievement of outcomes
- In general outcomes that lead to *deep learning* are better than those leading to *surface learning* (though sometimes surface learning can be appropriate)
- People learn deeply can usually perform well on surface outcomes *but not vice versa*

Deep learning

- Students set out to understand the *meaning* of the content
- Go below the surface (facts and details) of the material

RESULT

- They see the big picture
- They see how the facts and details fit into the big picture

Conditions conducive to deep learning

- Clear to students what the learning outcomes are, where they are going
- Students feel free to focus on task and are not pressured by urgent and ill-conceived assessments
- Students can work collaboratively and in dialogue with others

Surface learning

- Concentrate on facts and details
- Skate along the surface of the material
- Try to get assignments out of the way with minimal trouble, while appearing to meet requirements.

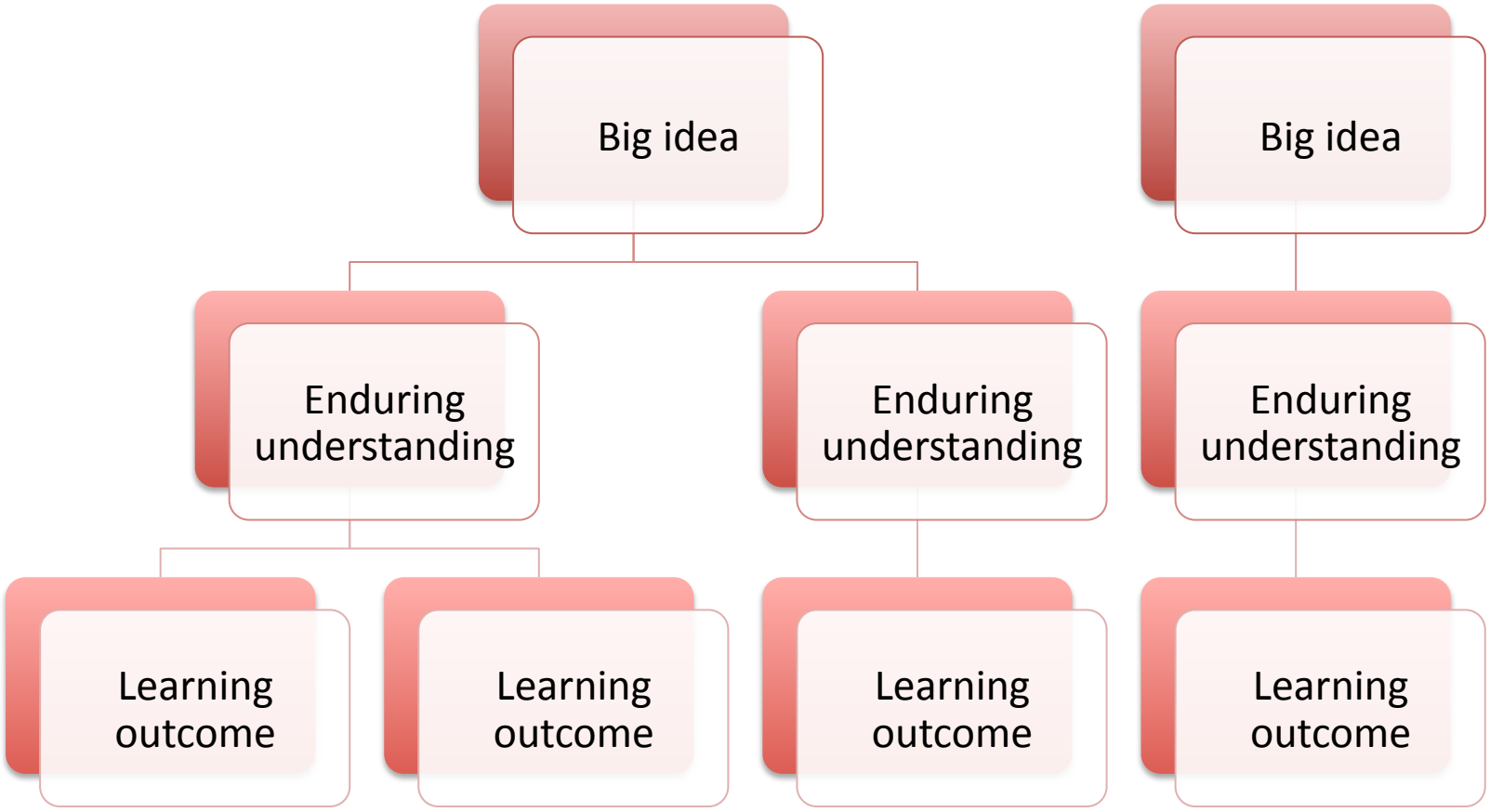
RESULT

- Students remember a set of disjointed facts
- Students do not understand the meaning or the point or the value of the course content

Conditions conducive to surface learning

- Insufficient time/too high a workload
- High anxiety because of low expectations of success
- Genuine inability to understand content at high level
- Teaching in a way that encourages cynicism
- Lack of alignment often caused by:
  - Misunderstanding requirements, e.g. thinking that factual recall is adequate
  - Teaching in piecemeal fashion, no focus on structure
  - Assessments mainly measure independent facts

Pillar 2: Backward Design



Backward design guidelines

- *Big ideas* consist of short phrases or keywords or fundamental vocabulary
- *Enduring understandings* are how instructors often describe what they expect students to learn from the course
- *Learning outcomes* should point directly to assessments that provide evidence of understandings

Points to note:

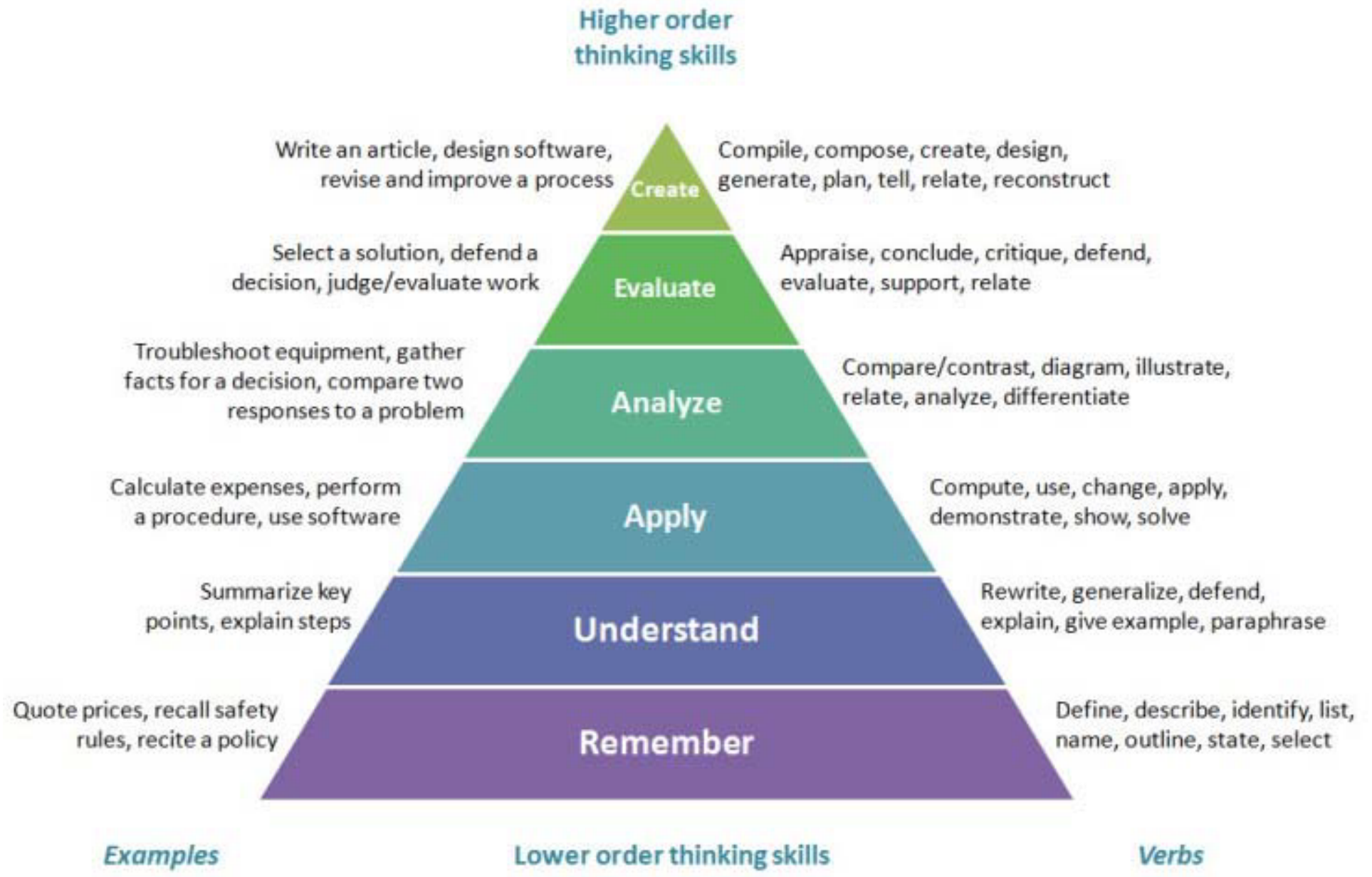
- Number of big ideas for a course: 1-3
- Number of learning outcomes: 5-10
- Number of enduring understandings should be in-between those two numbers
- Learning outcomes contain *verbs* that *point to assignments and assessments*

Backward course content design

- Identify the things that you want your students to **understand**
- Identify all the things that you expect students to be able to **do** that demonstrate these understandings.
- Limit these ‘learning outcomes’ to about **ten at most**
- Use them as the framework to select the topics to be covered, their depth, and their sequence
- Share learning outcomes with students so they can monitor their own progress (teaches metacognition)

‘Understanding’ phrases

- Understand …
- Appreciate …
- Know …
- Learn …
- Comprehend …
- Develop …
- Introduce …
- Become aware …
- Become familiar with …


Higher order thinking skills
Write an article, design software, revise and improve a process
Create
Compile, compose, create, design, generate, plan, tell, relate, reconstruct
Select a solution, defend a decision, judge/evaluate work
Evaluate
Appraise, conclude, critique, defend, evaluate, support, relate
Troubleshoot equipment, gather facts for a decision, compare two responses to a problem
Analyze
Compare/contrast, diagram, illustrate, relate, analyze, differentiate
Calculate expenses, perform a procedure, use software
Apply
Compute, use, change, apply, demonstrate, show, solve
Summarize key points, explain steps
Understand
Rewrite, generalize, defend, explain, give example, paraphrase
Quote prices, recall safety rules, recite a policy
Remember
Define, describe, identify, list, name, outline, state, select
Examples
Lower order thinking skills
Verbs

Which of these are really outcomes?

1. Demonstrate a basic knowledge and synthesis of facts, terms, and concepts …
2. Develop a solid comprehension of …
3. Understand the physiological …
4. Provide exemplars of …
5. Realize the interplay and significance of …
6. Analyze the design …
7. Acquire a solid comprehension of …
8. Apply knowledge to the analysis of case studies …

Example: SAGES course

Title of course

The Evolution of Scientific Ideas

Big ideas

- Truth in science
- Demarcation criteria
- Scientific revolutions

Big Ideas	Enduring Understandings	Learning outcomes
Truth in science	Knows what makes up a scientific paradigm and its relationship to truth	• Can distinguish pre-paradigmatic states from post-paradigmatic states • Can explain the differences between normal science and extraordinary science • Can explain what 'the problem of induction' is and how it has been addressed
	Understands why science seems to always show progress (towards truth?)	• Can explain how crises arise in science and how the scientific community reacts to them • Can compare scientific progress with evolution and political revolutions

Big Ideas	Enduring Understandings	Learning outcomes
Demarcation criteria	Appreciates desire for demarcation rules	• Can judge what is science, pseudo-science, or non-science • Can explain role in political battles over curriculum
	Is aware of the historical attempts at creating demarcation rules	• Can compare and contrast Aristotelian, verificationist, and falsificationist approaches • Can compare and contrast the models of Duhem, Popper, Kuhn, and Lakatos

Big Ideas	Enduring Understandings	Learning outcomes
Scientific revolutions	The processes by which old scientific theories are replaced by new ones	• Can describe the difference between normal science and extraordinary science • Can explain the role of crises in science and describe how scientists respond to them,
	Why revolutions always seem positive	• Can explain the 'success' of science despite its fallibility
Scholarly presentations	Awareness of the qualities that make up scholarly work	• Is able to write a *scholarly* paper on a scientific revolution • Is able to deliver a *scholarly* talk on a scientific revolution

Pillar 3: Enhancing motivation

- People enter a new environment (course, school, workplace) with two concerns: Do I belong here? Have I the skills to succeed here?
- Use class climate literature to get off to a good start:
  - Create safe space to take risks
  - Have everyone learn everyone else's names
  - Model inclusive language, behavior, attitudes
- Use motivation literature to create *situational* interest using 3C+F model (content, choice, collaboration, feedback)

What motivates people ? (Alfie Kohn)

What tasks do people push *themselves* to succeed at?

- Things they select for themselves
- Things that are seen as worth doing for their own sake - challenging, intriguing, useful
- Things for which they feel they have a *reasonable* chance of success

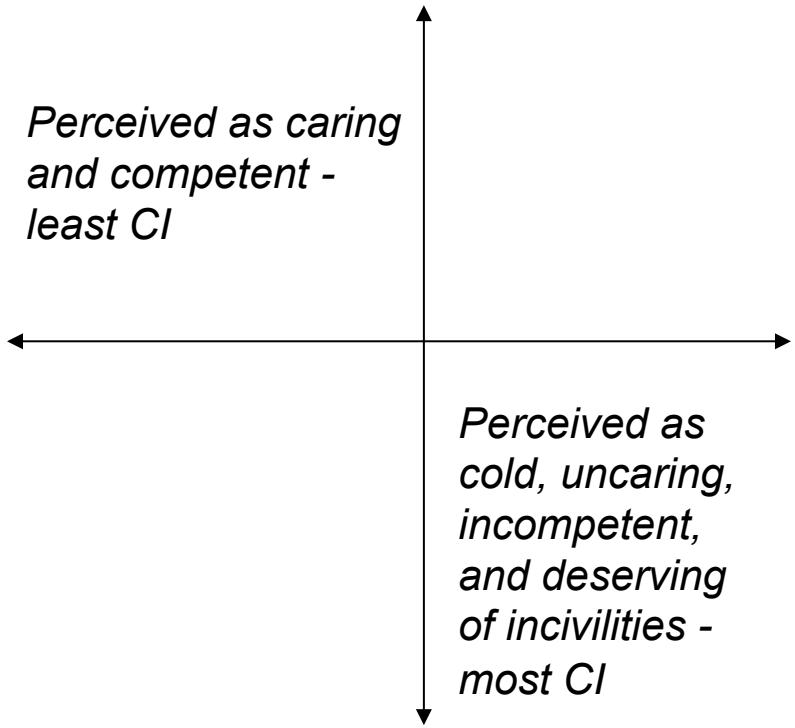
USE THIS KNOWLEDGE TO FRAME INSTRUCTION

Classroom climate factors

- MOTIVATOR CONTINUUM: Be pro-social (being encouraging and supportive) rather than anti-social (using threats and guilt induction).
- IMMEDIACY CONTINUUM: From immediate (because of verbal and non-verbal signals of warmth, friendliness, and liking such as making eye contact, smiling, open postures with forward leans, walking around the class) to distant (aloofness, distancing)

Prosocial motivators (encouraging, supportive, interested, coaching, positive responses to questions)

Immediacies (warmth, friendliness, liking, forward leans, approachability, mingling, eye contact, open postures)



Nonimmediacies (unsmiling, aloof, immobile, late arrival, hasty departure)

Antisocial motivators (threats, guilt induction, rudeness, condescension, arrogance, disdain)

Motivation

"Motivation is a product of good teaching, not a prerequisite for it."

- John Biggs, *Teaching for Quality Learning at University* (1999)

MYTH

We could be better teachers if we only had better students

REALITY

Better teaching produces better students

Thank you!