

Assessment: The silent killer of learning



Higher & Tertiary Education Congress
EduTECH 2015
Brisbane, Australia, 3 June 2015



Assessment: The silent killer of learning



@eric_mazur

Higher & Tertiary Education Congress
EduTECH 2015
Brisbane, Australia, 3 June 2015



kosten

1. die Kosten (*pl.*)
2. kostbar

krank

1. die Krankheit, —, —en

cow

377

magnificent
glorious

1. magnificent
2. master

430

das Kind, —(e)s, —er

1. kindisch
2. kindlich

der Kellner, —s, —en

1. der Keller, —s, —en

kennen

kannte-gekannt *irreg.*

1. kennen-lernen
2. erkennen
3. bekannt
4. d.



kosten

1. die Kosten

2. 1. Kosten

think

428

kennen

kannte-gekannt

1. kennen

2. erkennen

3. bekannt

4. d.



**35 % retained
after 1 week**

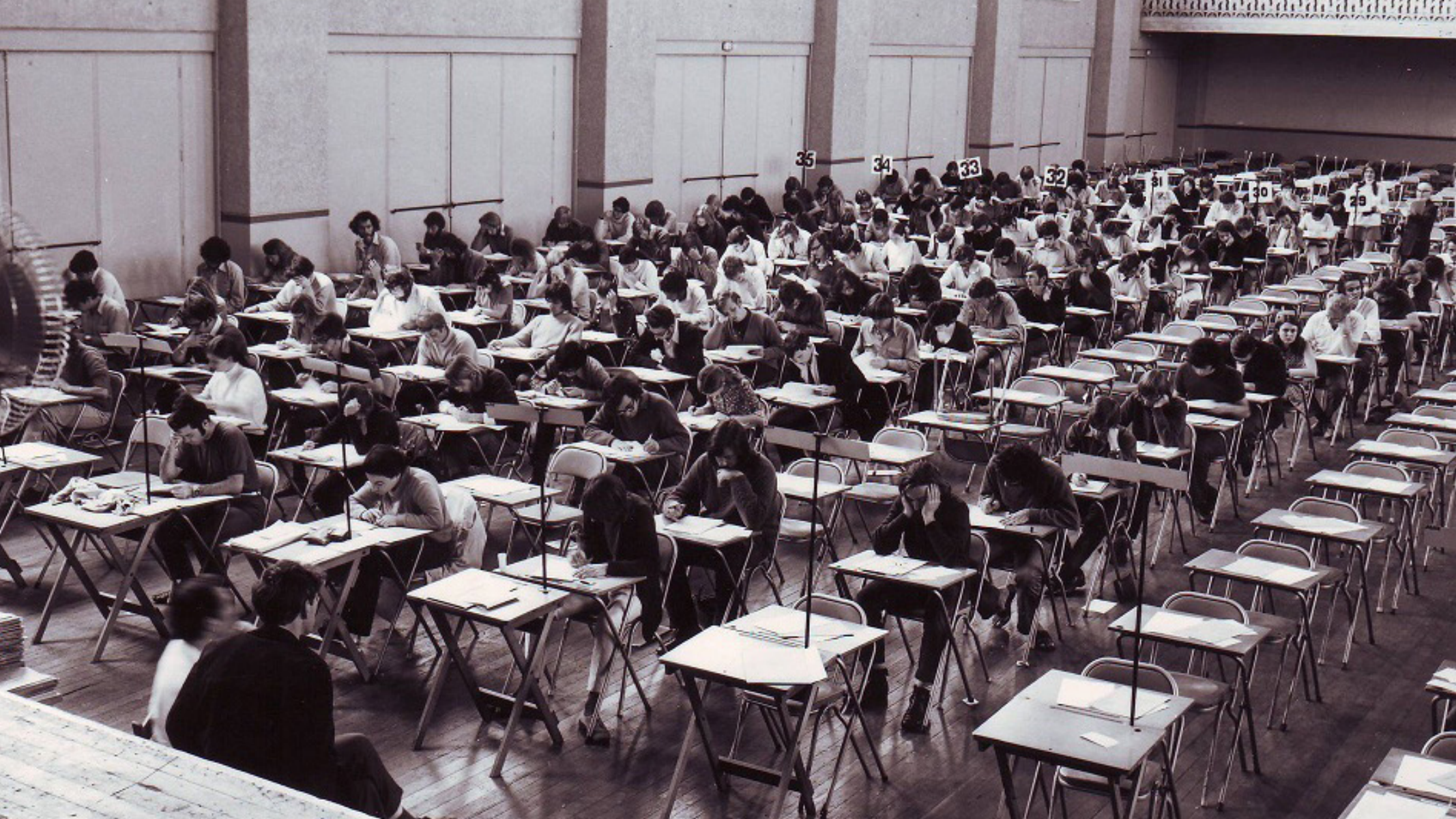
**we only guarantee
they'll pass the test**













**assessment focussed on ranking and classifying,
not on developing 21st century skills**



1 purposes



1 purposes

2 problems



1 purposes

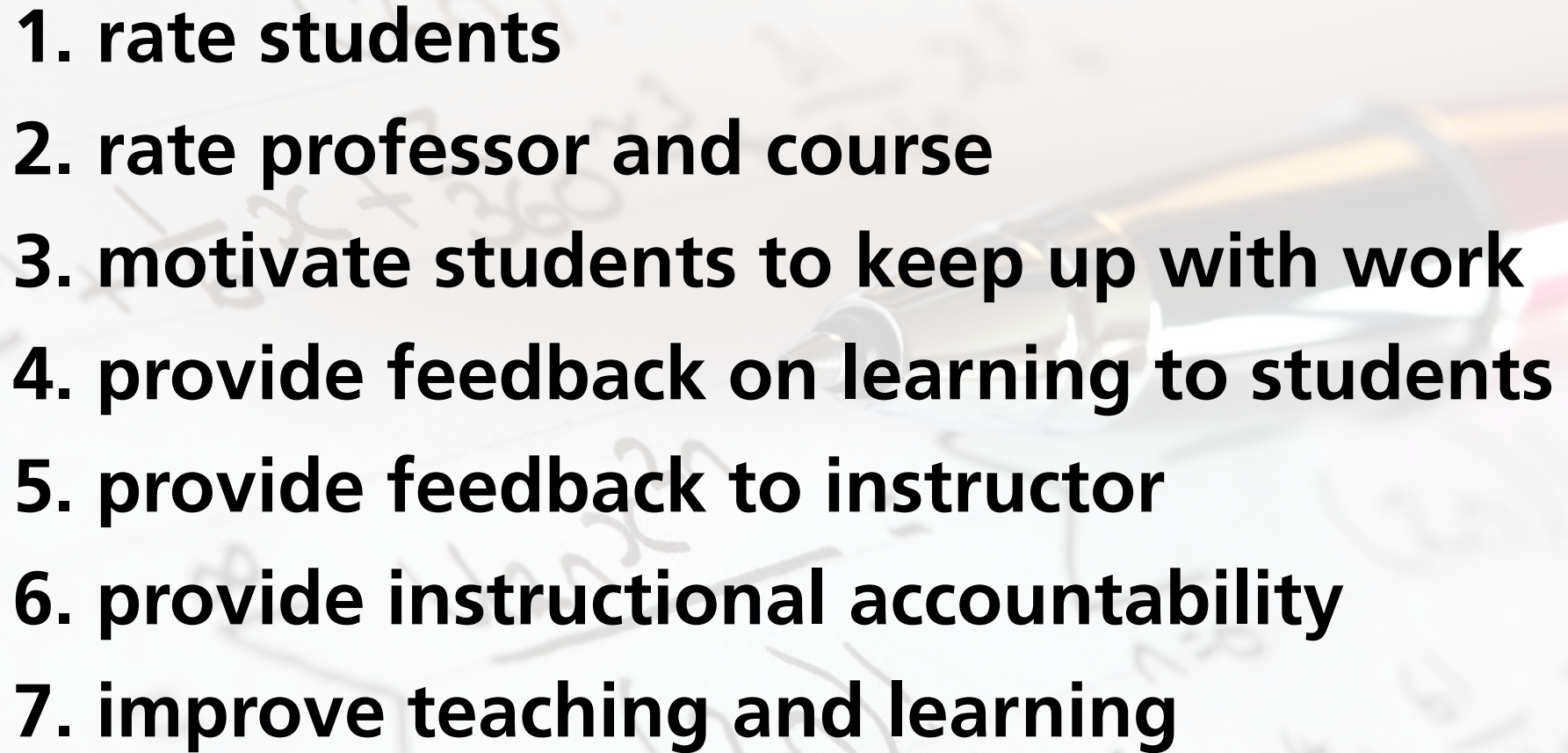
2 problems

3 improvements



**how many different purposes
of assessment can you think of?**

1 purposes

- 
- 1. rate students**
 - 2. rate professor and course**
 - 3. motivate students to keep up with work**
 - 4. provide feedback on learning to students**
 - 5. provide feedback to instructor**
 - 6. provide instructional accountability**
 - 7. improve teaching and learning**



1 purposes

2 problems



inauthentic tests

1 purposes

2 problems



what is the meaning/definition of...?

1 purposes

2 problems



inauthentic problem solving

1 purposes

2 problems



problem

1 purposes

2 problems



problem

outcome

1 purposes

2 problems

problem

outcome

KNOWN

1 purposes

2 problems

problem

solution

outcome

KNOWN

1 purposes

2 problems

problem

solution

outcome

UNKNOWN

KNOWN

1 purposes

2 problems

problem

solution

outcome

UNKNOWN

KNOWN

problem

1 purposes

2 problems

problem

solution

outcome

UNKNOWN

KNOWN

problem

procedure

KNOWN

1 purposes

2 problems

problem

solution

outcome

UNKNOWN

KNOWN

problem

procedure

answer

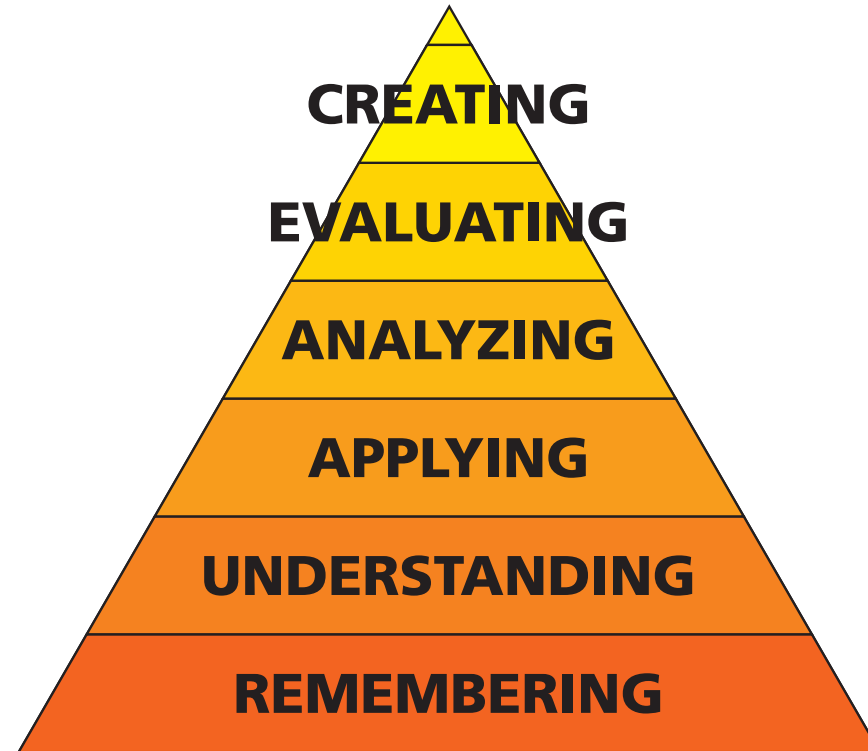
KNOWN

UNKNOWN

1 purposes

2 problems

Thinking skills



prob

prob

① purposes

② problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model

On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

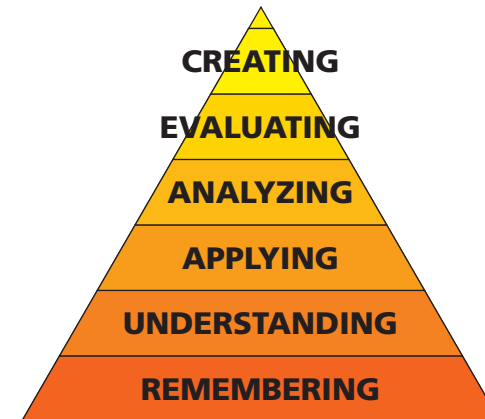
How long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. **On average people shop for 2 hours.**

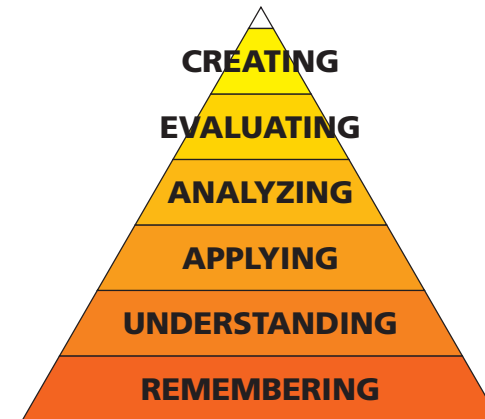
How long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

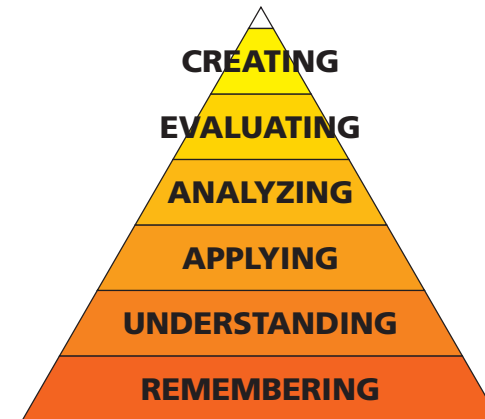
Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

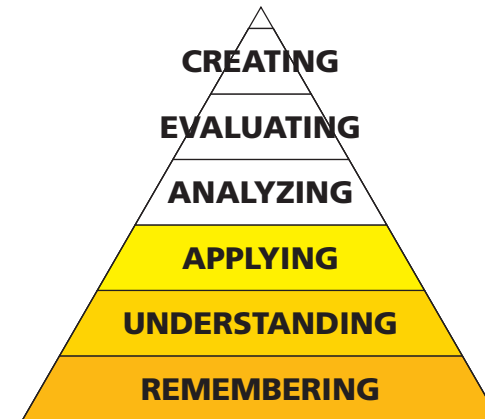
Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions

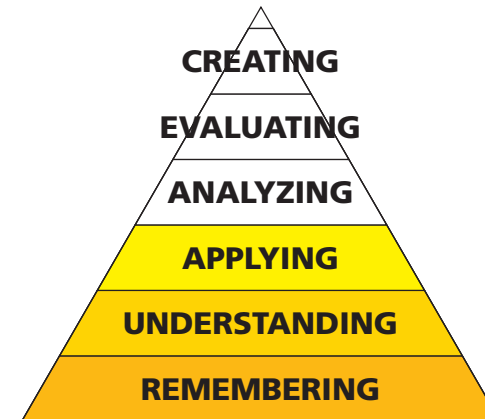
Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

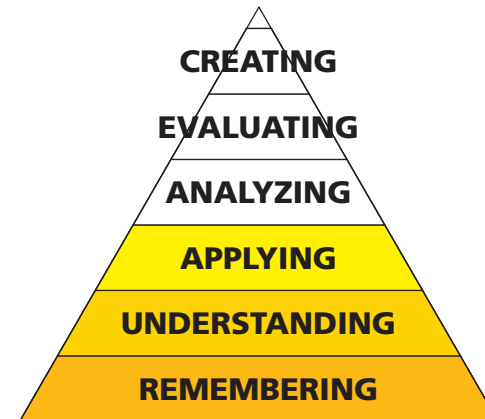
How long do you have to wait before someone frees up a space?



On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

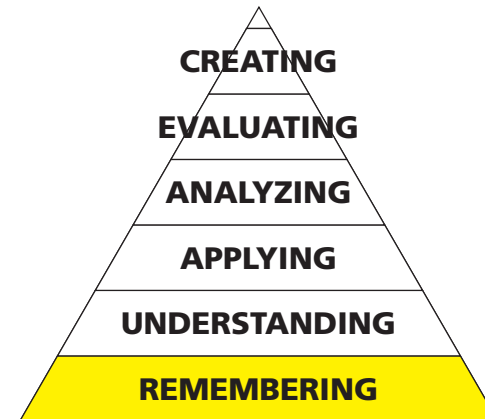
$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$



On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$





1 purposes

2 problems



1 purposes

2 problems



1 purposes

2 problems

problem

solution

outcome

problem

REAL
problem solving

1 purposes

2 problems

problem

approach 1

approach 3

approach 2

outcome

grading incompatible with real problem solving

1 purposes

2 problems



1 purposes

2 problems



isolation

1 purposes

2 problems

④ We will use spherical coordinates:

$$0 \leq \rho \leq 4, \quad 0 \leq \theta \leq 2\pi, \quad \leq \phi \leq \pi$$

integral is thus:

$$\int_0^4 \int_0^{2\pi} \int_0^\pi (\rho^2 \sin \phi) \rho \, d\phi \, d\theta \, d\rho$$
$$= \left\{ \int_{\rho=0}^4 \rho^3 \, d\rho \right\} \left\{ \int_{\theta=0}^{2\pi} d\theta \right\} \left\{ \frac{1}{2} \int_{\phi=0}^\pi \sin(2\phi) \, d\phi \right\} = \boxed{0}$$

A person with dark hair is sleeping at a desk. Their head is resting on their hand, and a pen is held in their other hand, poised over an open book. A white mug is on the desk to the left. The scene is dimly lit, suggesting a late night or early morning.

high-stakes examinations promote cramming



1 purposes

2 problems

A person with dark hair is sleeping at a desk, their head resting on their hand. A white mug is on the desk to the left. In the background, a clock is visible, showing the time is around 10:10. The text "information stored in short-term memory" is overlaid in the center.

information stored in short-term memory

1 purposes

2 problems



no retention
information stored in short-term memory
no transfer

1 purposes

2 problems

assessment produces a conflict

1 purposes

2 problems

assessment produces a conflict

coach or judge?

1 purposes

2 problems

conflict resolved by:

objectivity (fairness, reliability)

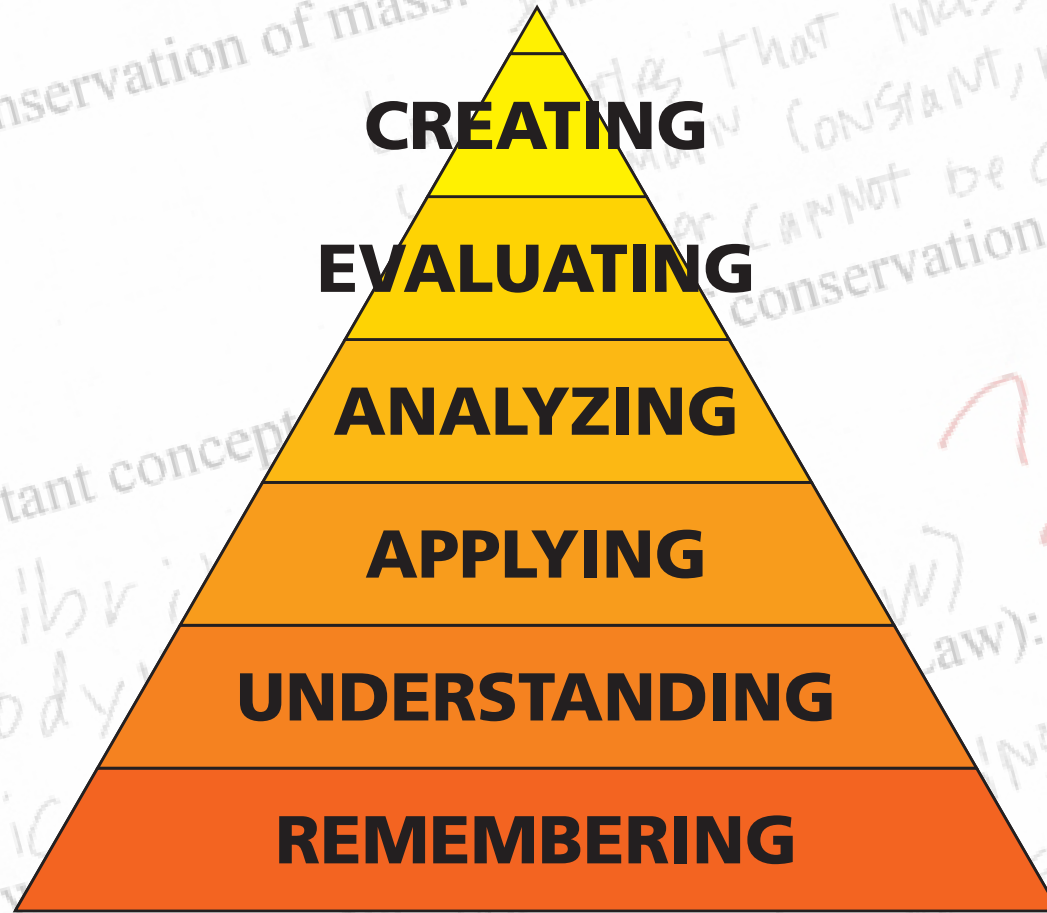
1 purposes

2 problems

...but ...

1 purposes

2 problems



1 purposes

2 problems

**only lowest order thinking skills
can be judged objectively**

REMEMBERING

1 purposes

2 problems

and then there is...

- grade inflation
- cheating

1 purposes

2 problems



1 purposes

2 problems

3 improvements



mimic real life

1 purposes

2 problems

3 improvements

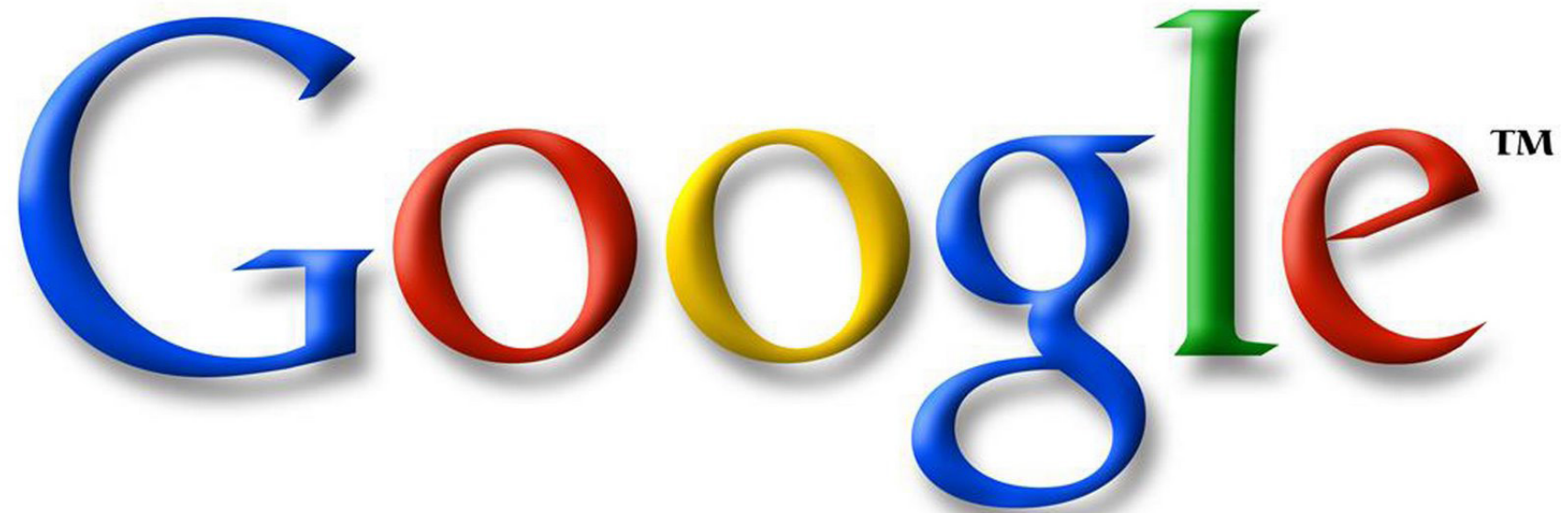


open-book exam

1 purposes

2 problems

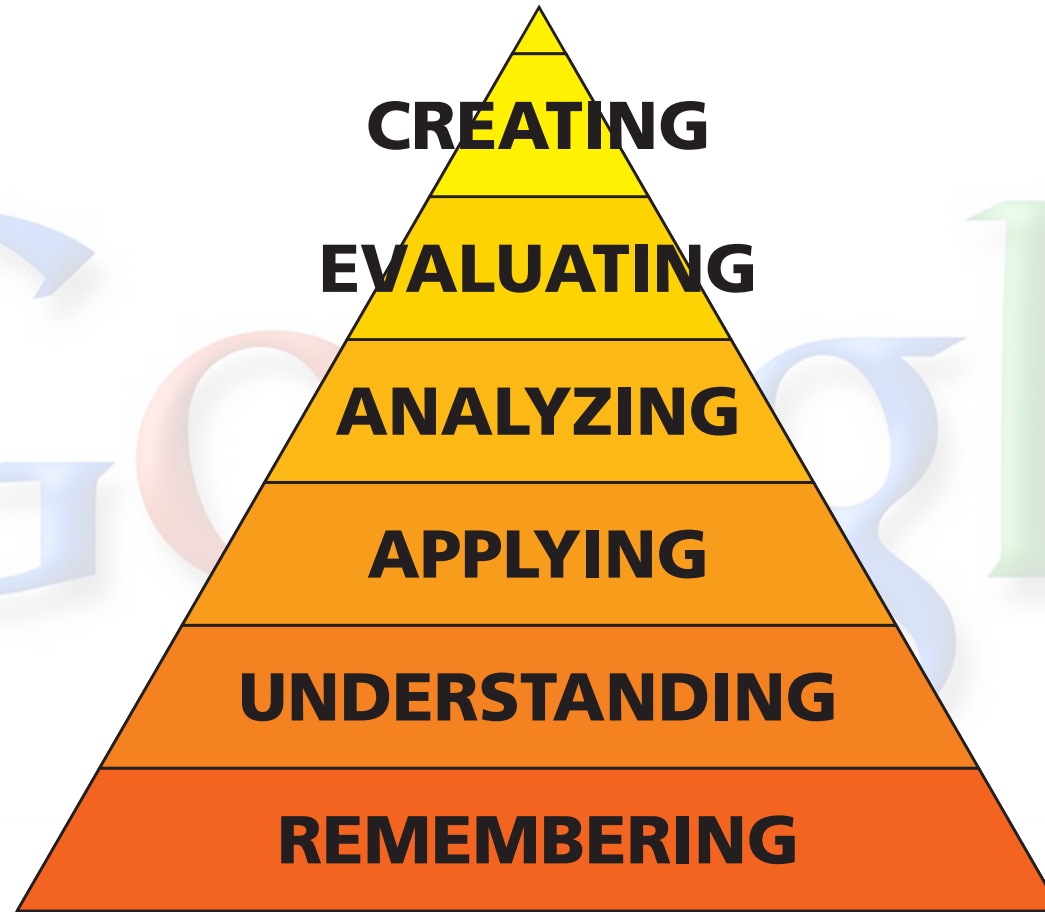
3 improvements



1 purposes

2 problems

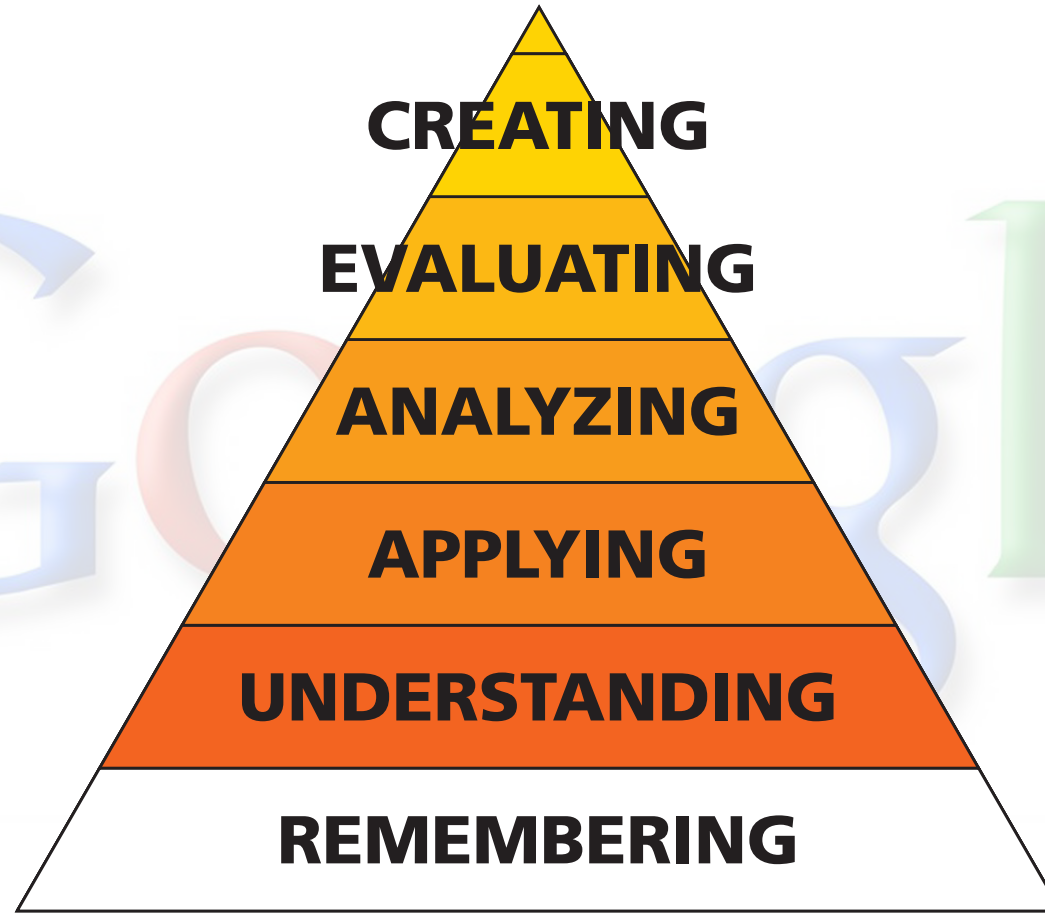
3 improvements



1 purposes

2 problems

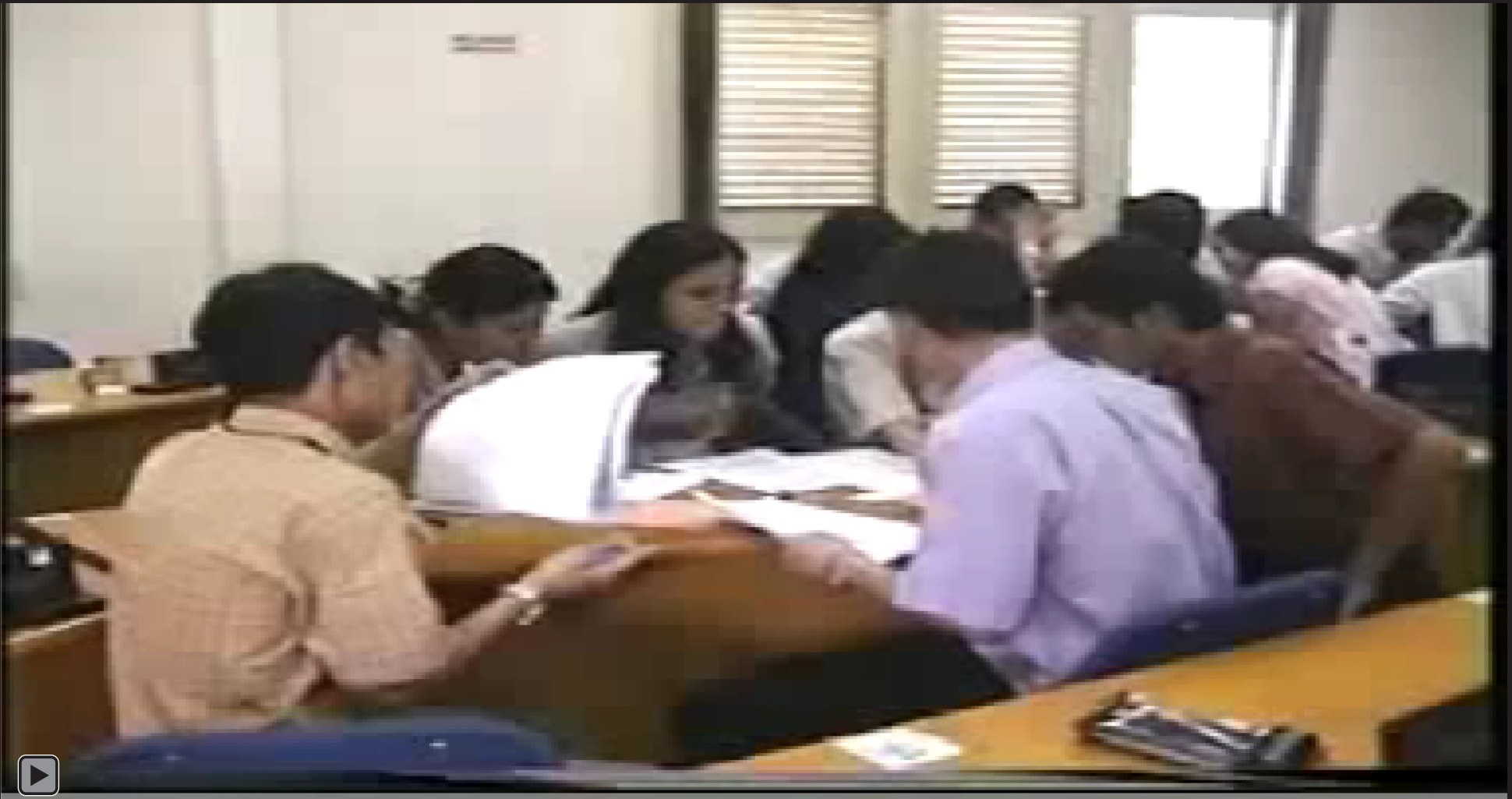
3 improvements



1 purposes

2 problems

3 improvements



1 purposes

2 problems

3 improvements

IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF AT)

Name Team #3

Test # 1

Subject _____

Total 23

SCRATCH OFF COVERING TO EXPOSE ANSWER

	A	B	C	D	Score
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>4</u>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>1</u>
5.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>4</u>
6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>4</u>
7.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>0</u>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u> </u>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u> </u>

- 1 purposes
- 2 problems
- 3 improvements



1 purposes

2 problems

3 improvements

Session 389314

This is the individual round; work on these questions on your own.



Jump to ▼

1

2

3

4

5

expression question

What is the derivative of $f(x) = 3x^2 - 6x$?

Submit response

Enter an expression, e.g., x^2 for x^2 , $\ln(y) - \sin(x)$ for $\ln y - \sin x$, $x/(y+1)$ for $\frac{x}{y+1}$, $(1/2)x$ for $\frac{1}{2}x$. Do not enter a complete equation.

Current team: **Blue team**  [Change team](#)

 [Change seat](#)

 [Send a message to the instructor](#)

 [Join another](#)

1 purposes

2 problems

3 improvements

This is the individual round;

expression question

What is the derivative of $f(x) = 3x^2 - 6x$?

Submit response

Enter an expression, e.g., x^2 for x^2 , $\ln(y) - \sin(x)$ for $\ln y - \sin x$

1 purposes

2 problems

3 improvements

This is the individual round;

expression question

What is the derivative of $f(x) = 3x^2 - 6x$?

Submit response

Enter an expression, e.g., x^2 for x^2 , $\ln(y) - \sin(x)$ for $\ln y - \sin x$

1 purposes

2 problems

3 improvements

$6x - 6$

Brian Lukoff

$6x$

Brent Jones

$6x - 6$

Beth Sawyer

$6x^2 - 6$

Kip Harmon

expression question

What is the derivative of $f(x) = 3x^2 - 6x$?

Submit response

Enter an expression, e.g., x^2 for x^2 , $\ln(y) - \sin(x)$ for $\ln y - \sin x$

1 purposes

2 problems

3 improvements



1 purposes

2 problems

3 improvements



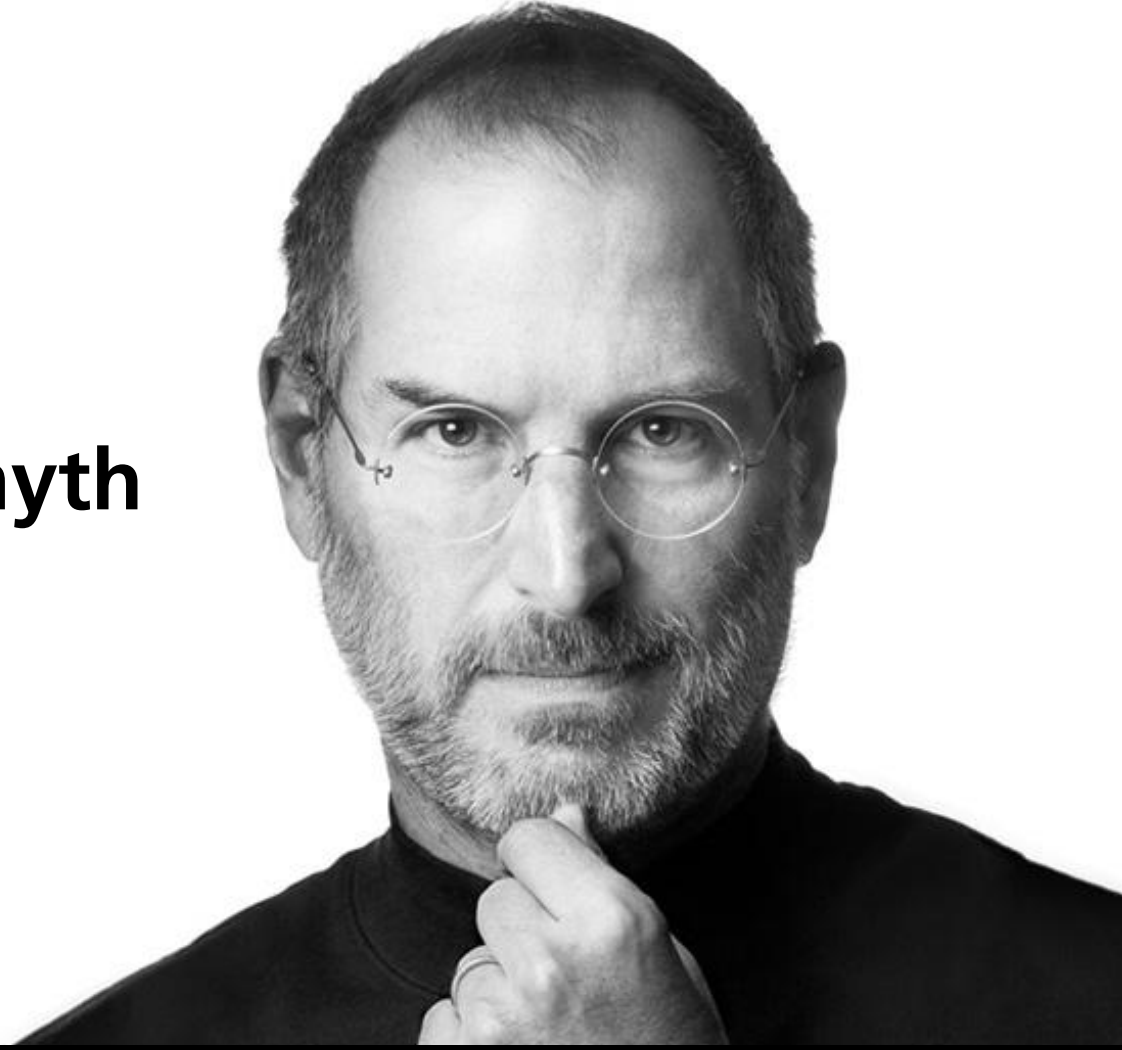
focus on feedback, not ranking

1 purposes

2 problems

3 improvements

objective ranking: a myth

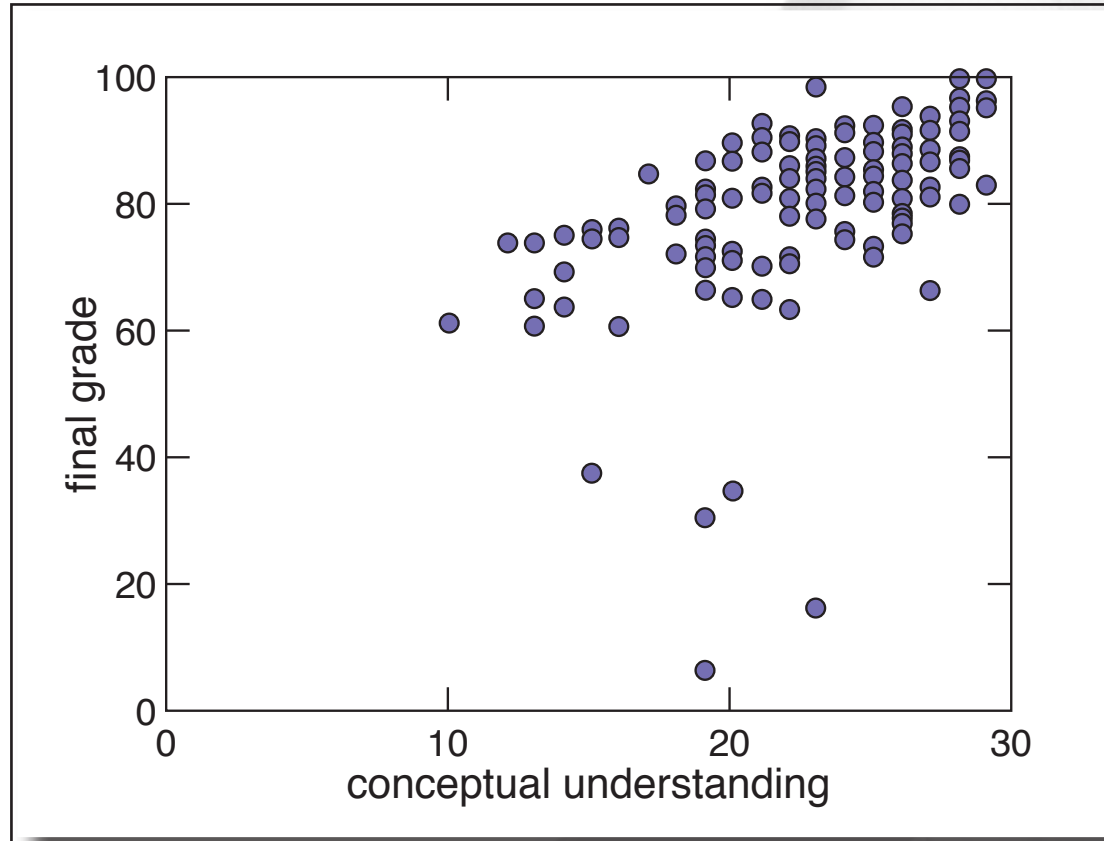


1 purposes

2 problems

3 improvements

2 metrics, 2 results

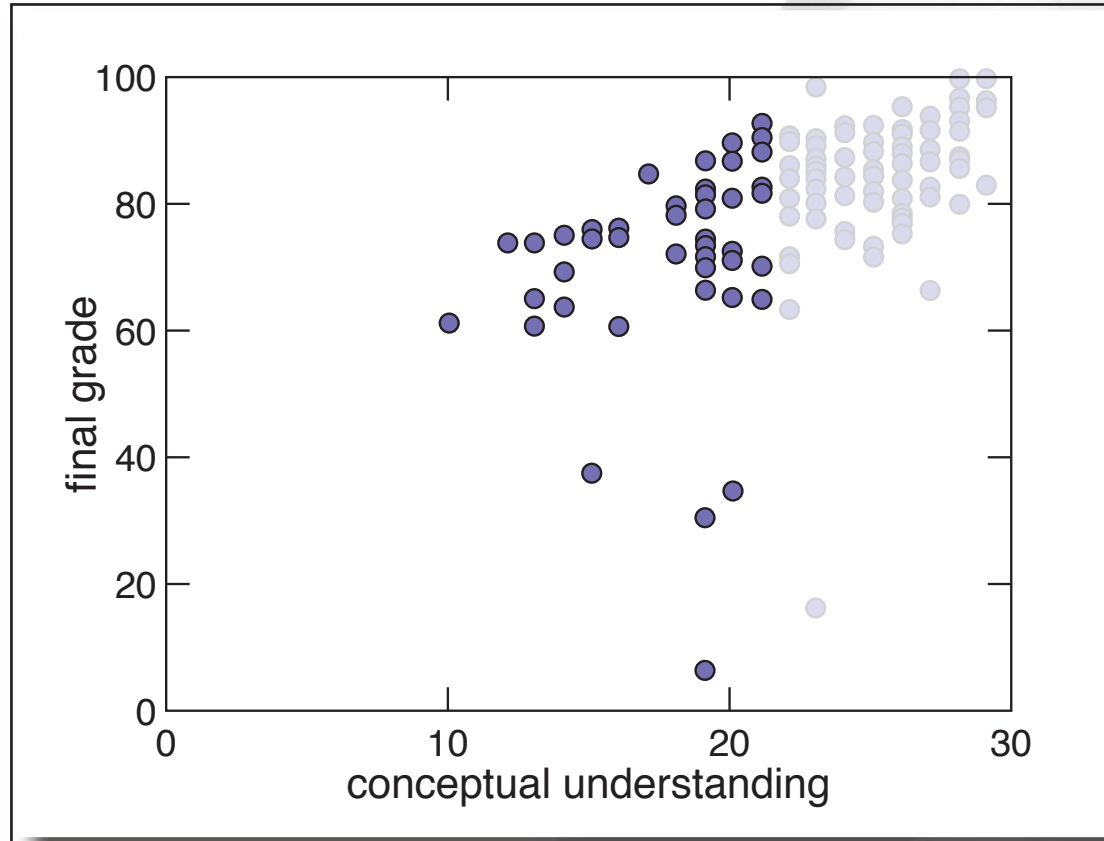


① purposes

② problems

③ improvements

Aristotelian thinkers

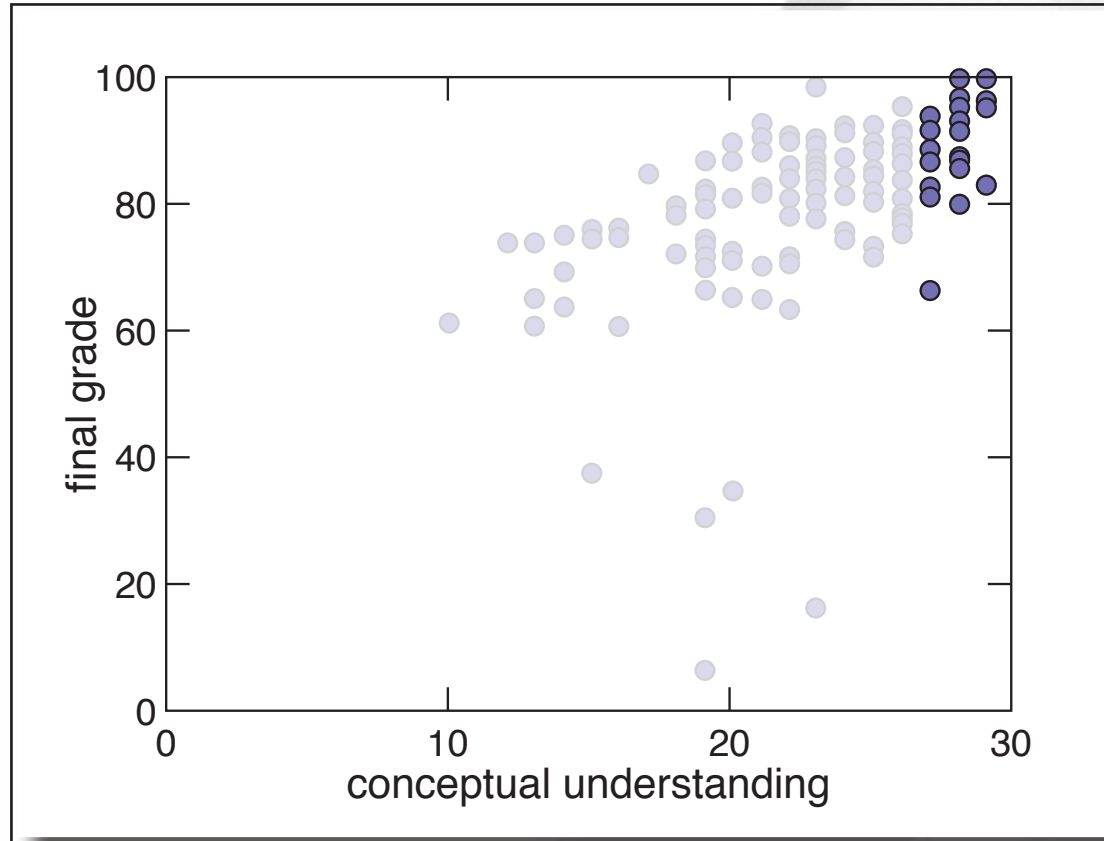


① purposes

② problems

③ improvements

top performers, broad grade distribution

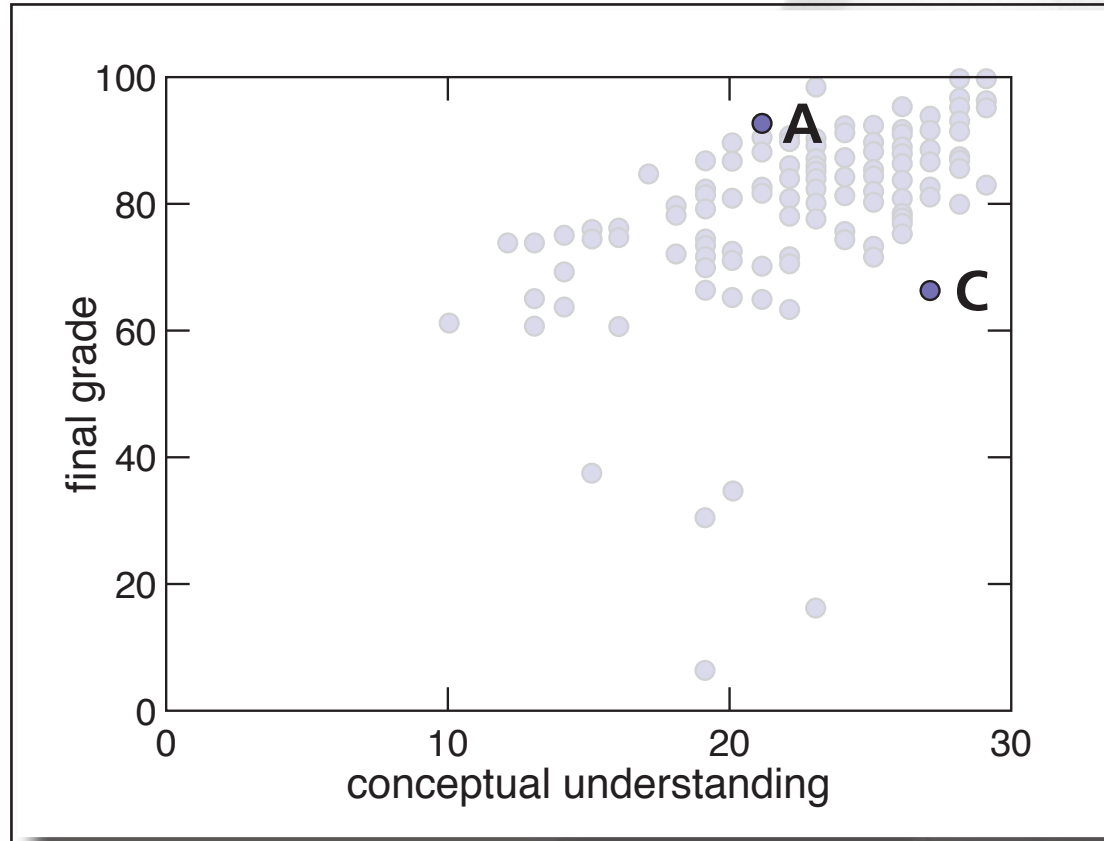


① purposes

② problems

③ improvements

objectivity or injustice?



① purposes

② problems

③ improvements

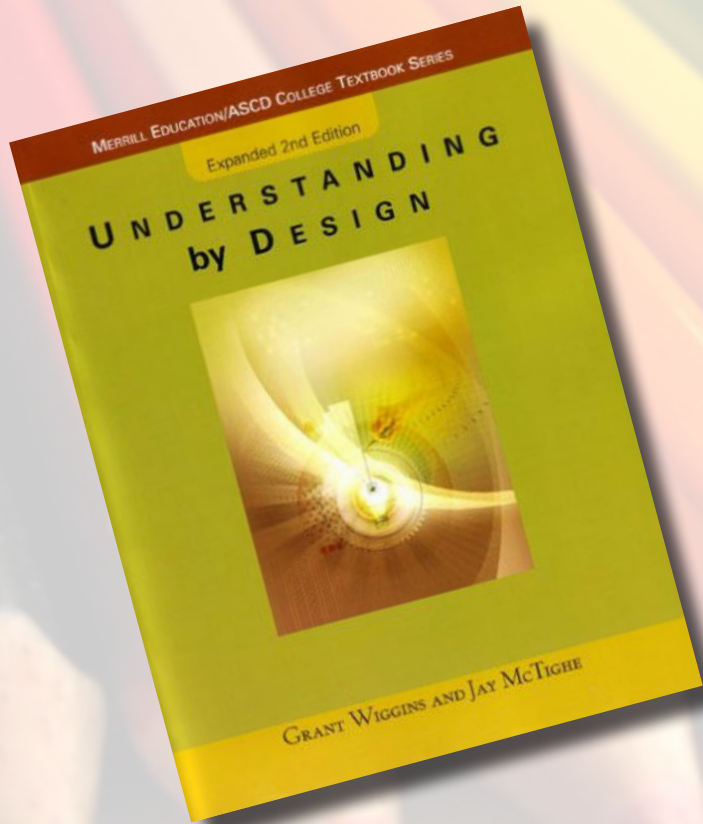


focus on skills, not content

1 purposes

2 problems

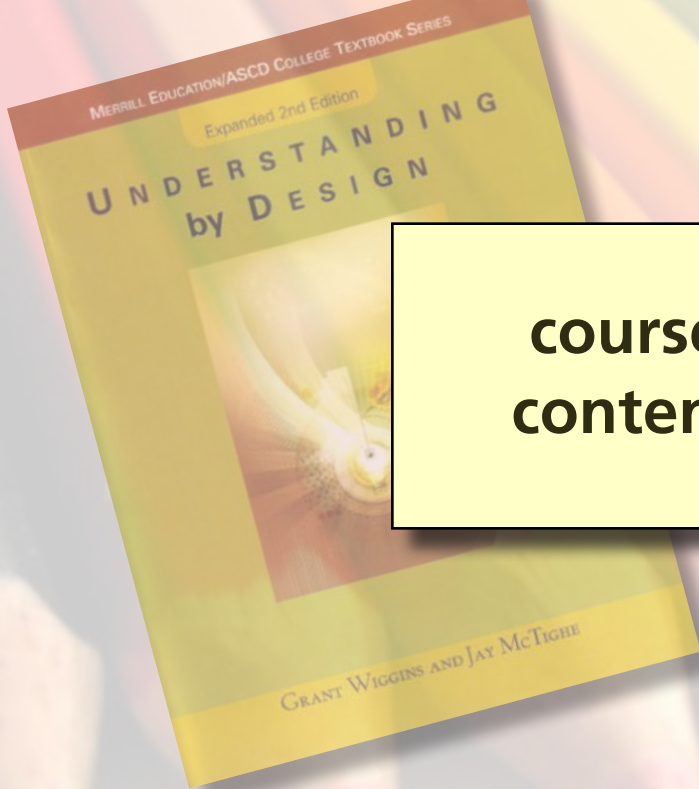
3 improvements



Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

- 1 purposes
- 2 problems
- 3 improvements

Traditional approach to course planning



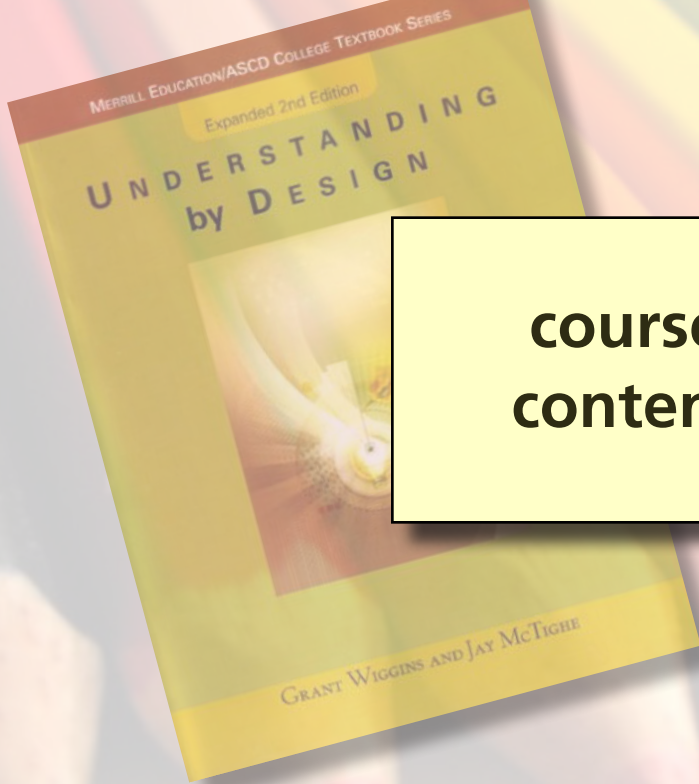
**course
content**

1 purposes

2 problems

3 improvements

Traditional approach to course planning



**course
content**



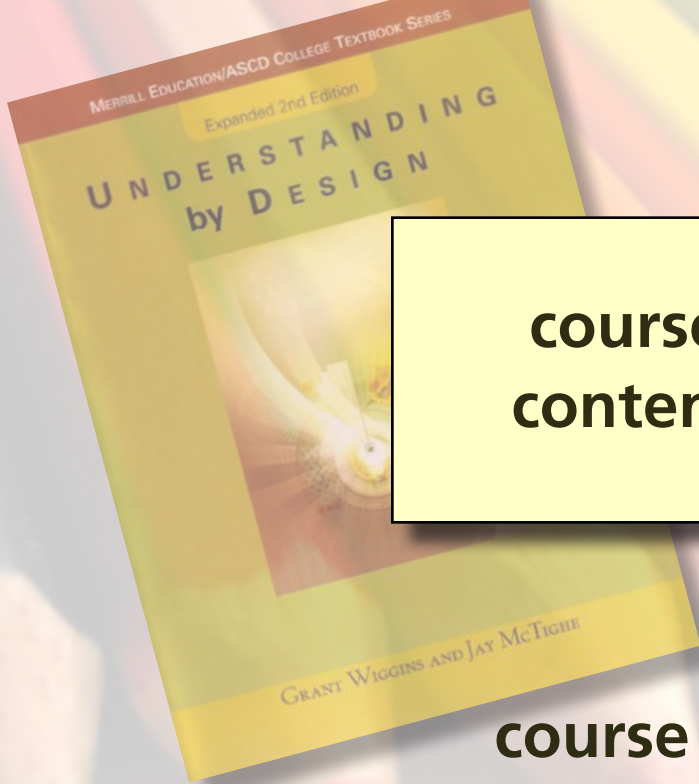
assessment

1 purposes

2 problems

3 improvements

Traditional approach to course planning



**course
content**



assessment

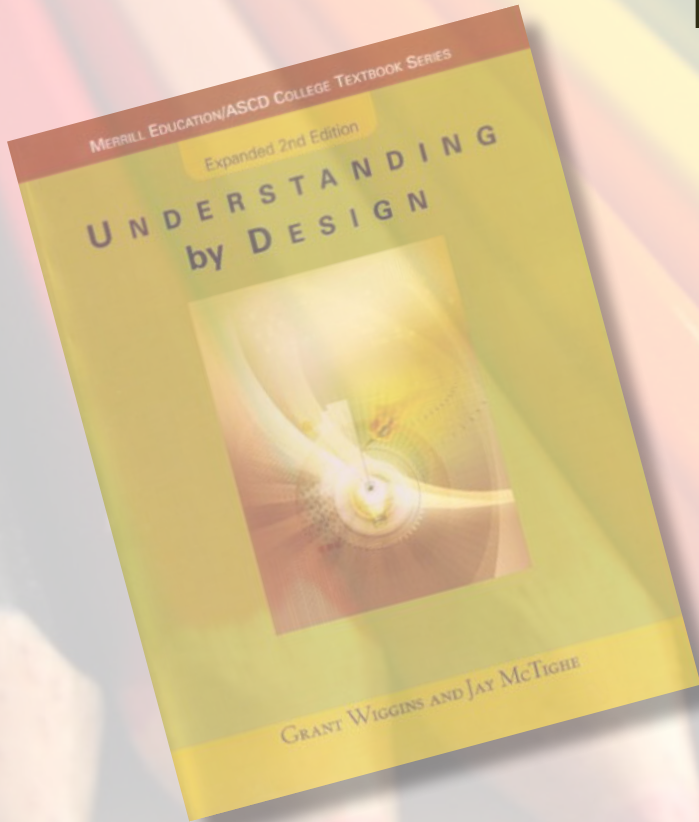
course determined by content

1 purposes

2 problems

3 improvements

Backward design



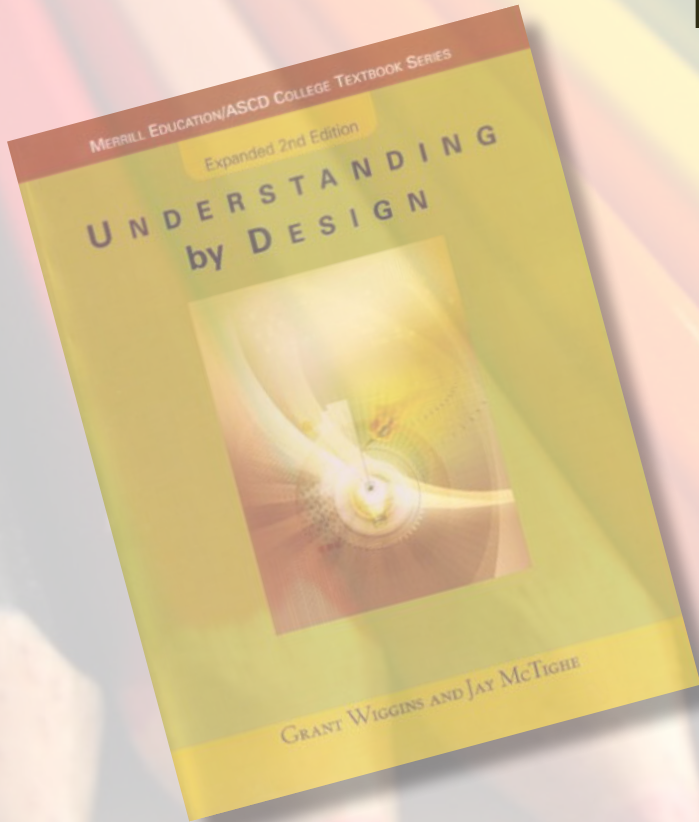
**desired
outcomes**

1 purposes

2 problems

3 improvements

Backward design



**acceptable
evidence**



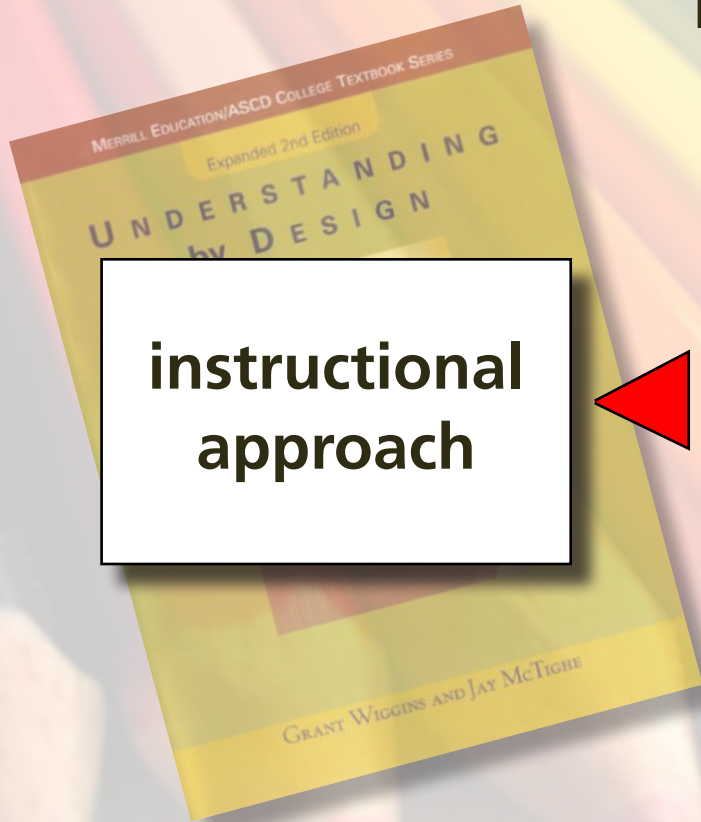
**desired
outcomes**

1 purposes

2 problems

3 improvements

Backward design



**instructional
approach**



**acceptable
evidence**



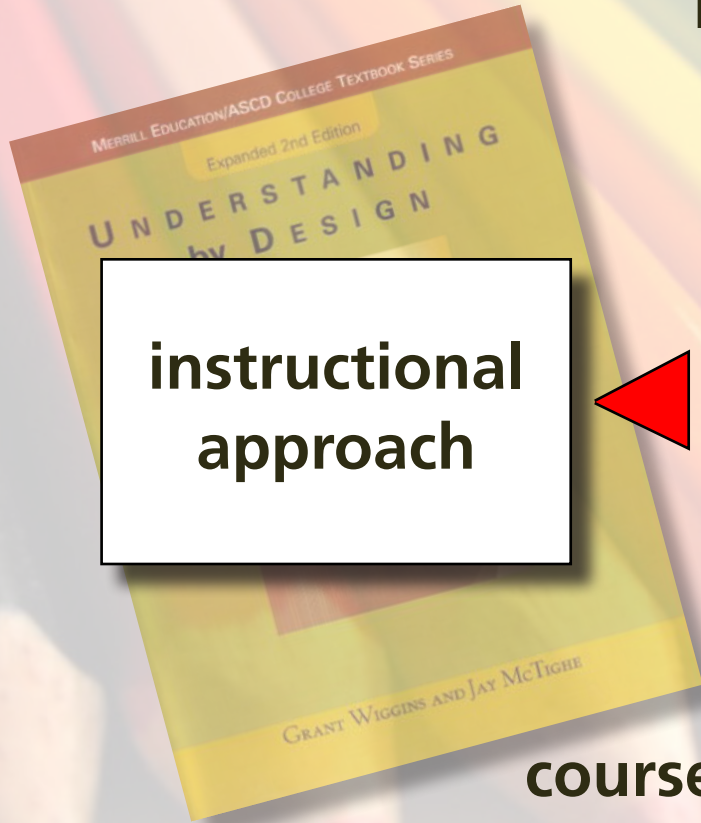
**desired
outcomes**

1 purposes

2 problems

3 improvements

Backward design



**instructional
approach**



**acceptable
evidence**



**desired
outcomes**

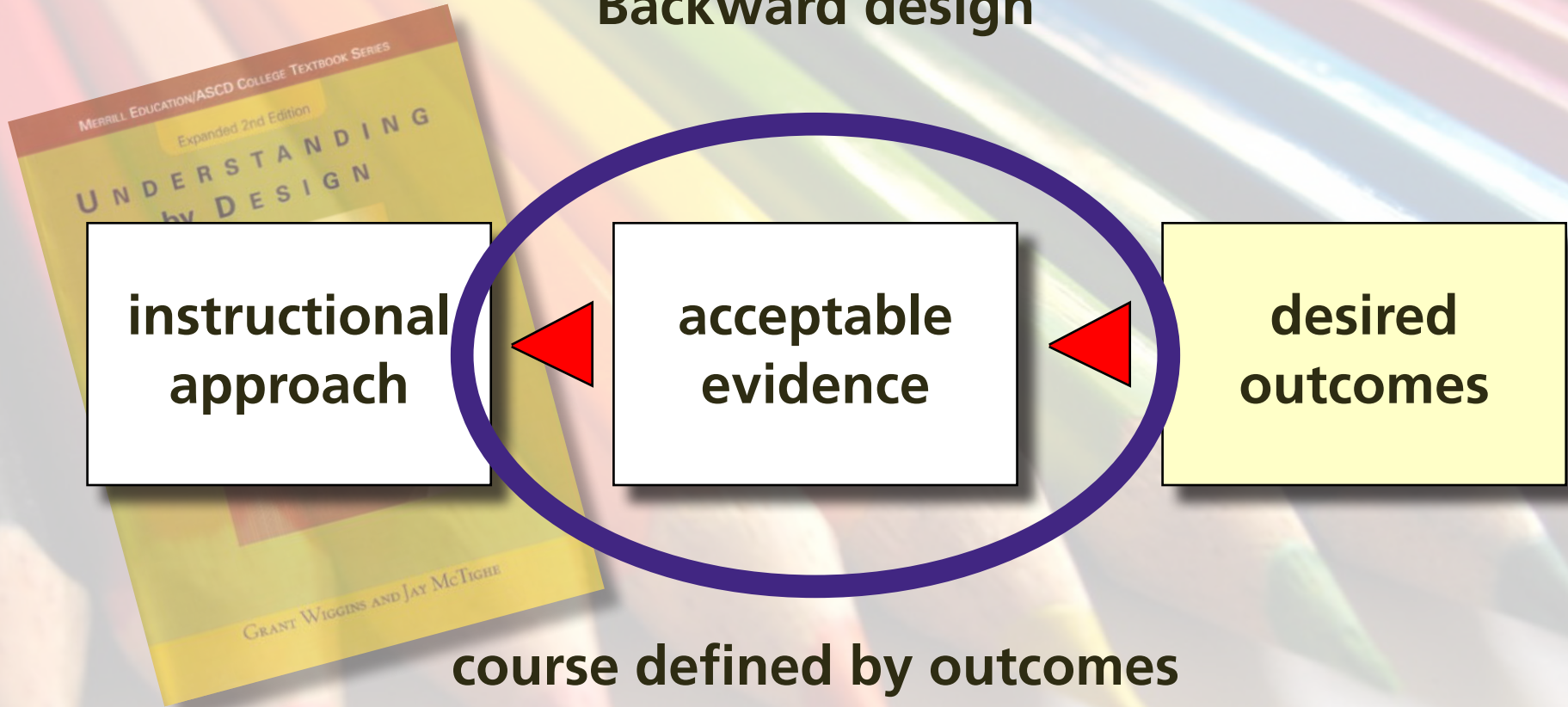
course defined by outcomes

1 purposes

2 problems

3 improvements

Backward design



1 purposes

2 problems

3 improvements



resolve coach/judge conflict

1 purposes

2 problems

3 improvements

use external evaluators

1 purposes

2 problems

3 improvements

peer- and self-assessment

1 purposes

2 problems

3 improvements

Calibrated Peer Review

cpr.molsci.ucla.edu

1 purposes

2 problems

3 improvements



A large, empty classroom with rows of desks and chairs, overlaid with the text "rethink assessment". The classroom is filled with rows of light-colored wooden desks and black chairs, arranged in a grid pattern. The floor is light blue with yellow and red lines marking the aisles. The walls are a light beige color, and there are several doors visible in the background. The text "rethink assessment" is written in a large, bold, black font with a blue outline, centered over the image.

**rethink
assessment**



For a copy of these slides:

ericmazur.com

Follow me!



[eric_mazur](https://twitter.com/eric_mazur)