

Is ranking just a myth? How assessment kills imagination and creativity



Brown University
Providence, RI, 28 September 2015



Is ranking just a myth? How assessment kills imagination and creativity



@eric_mazur

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kosten

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

455

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-gekant

irreg.

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

428

think

**35 % retained
after 1 week**

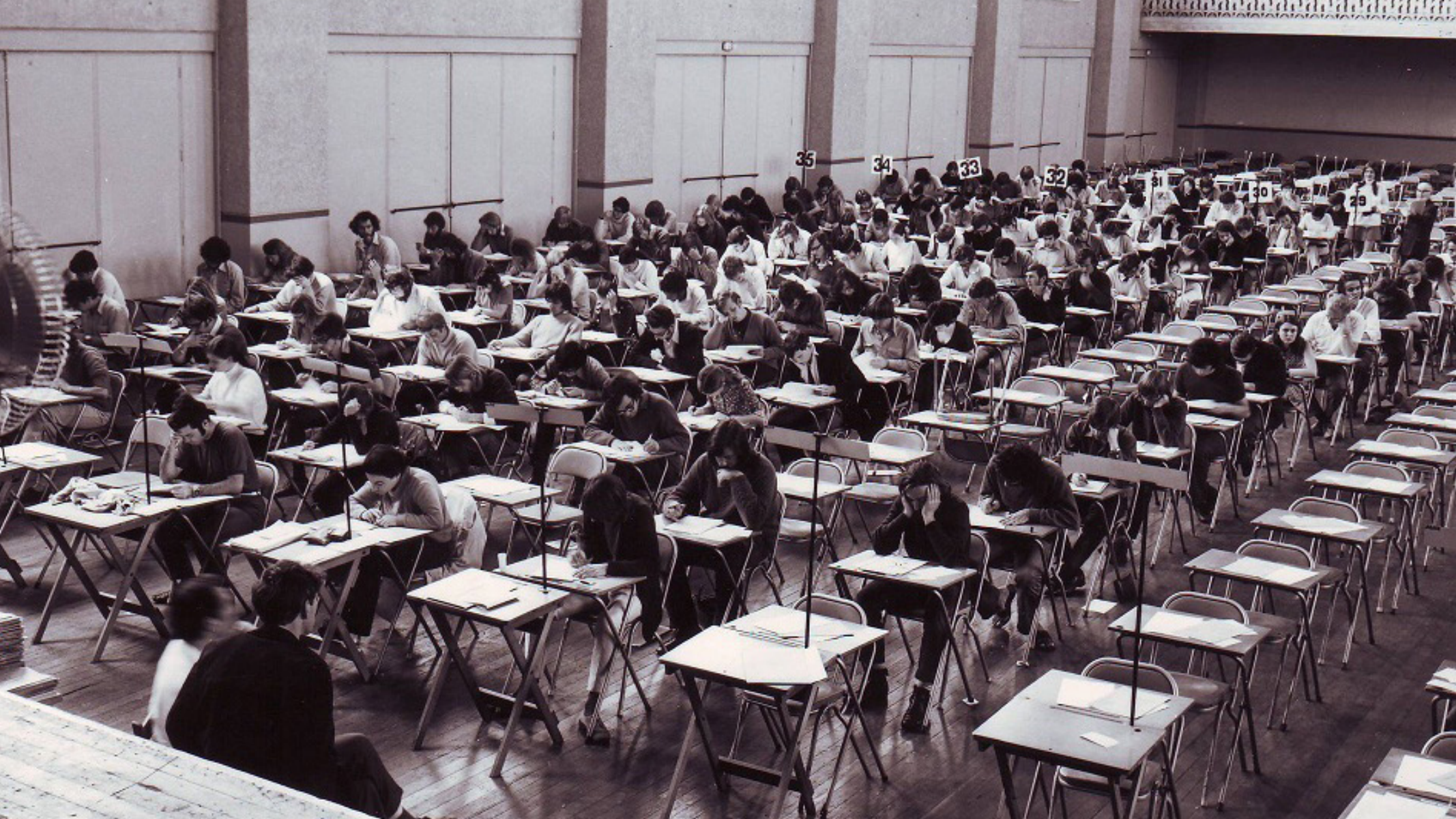
**we only guarantee
they'll pass the test**











A large, dimly lit classroom filled with students sitting at desks, appearing to be in a test or lecture setting. The students are mostly seen from behind or in profile, focused on their work. The room has high ceilings and large windows in the background. The text is overlaid in the center of the image.

**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

- 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

EDUCACION

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

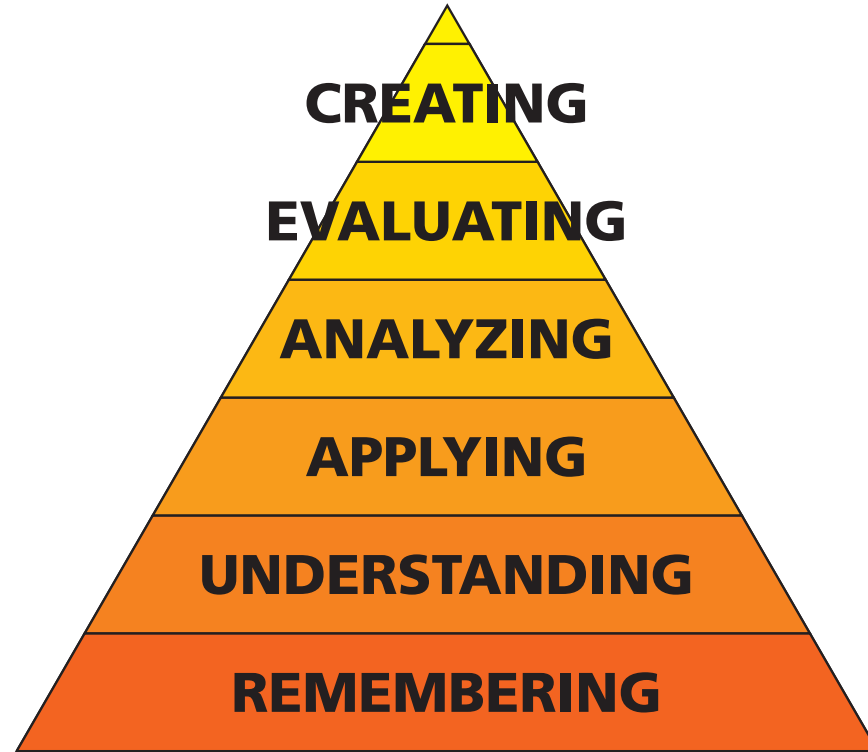
KNOWN

UNKNOWN

1 purposes

2 problems

Thinking skills



prob

prob

WIN

DOWN

1 purposes

2 problems

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.

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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.

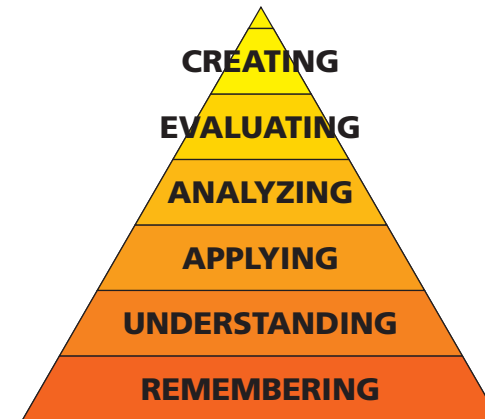
How long do you have to wait before someone frees up a space?

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.**

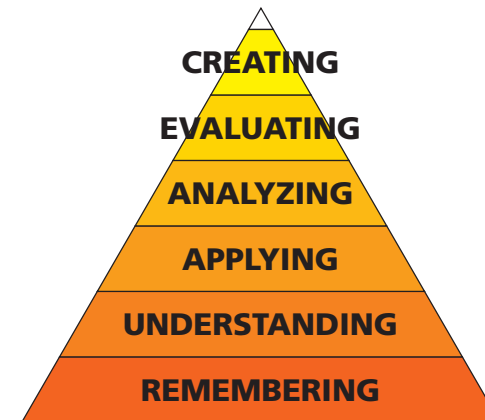
How long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with 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.

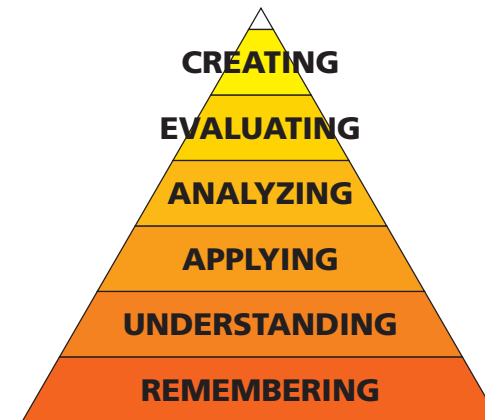
Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with 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.

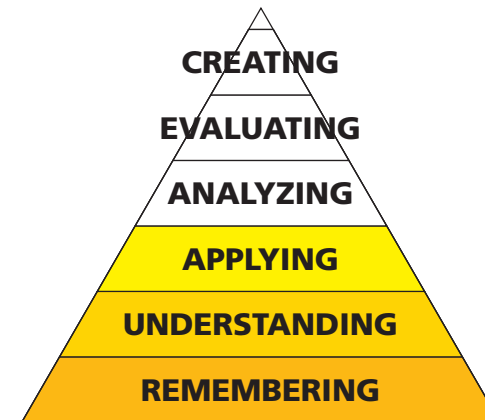
Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions

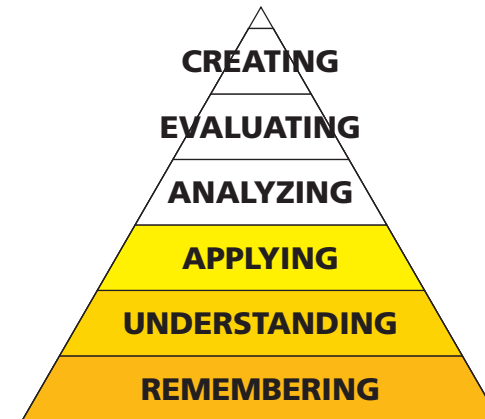
Developing a model

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.

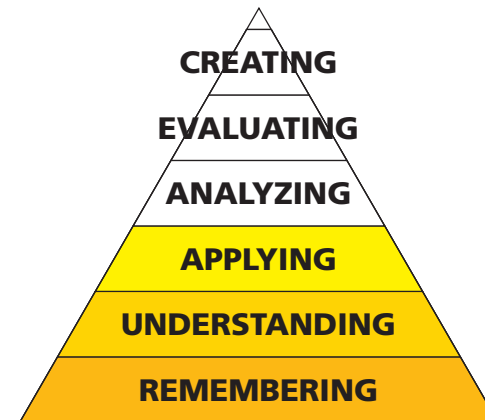
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How long do you have to wait before someone frees up a space?

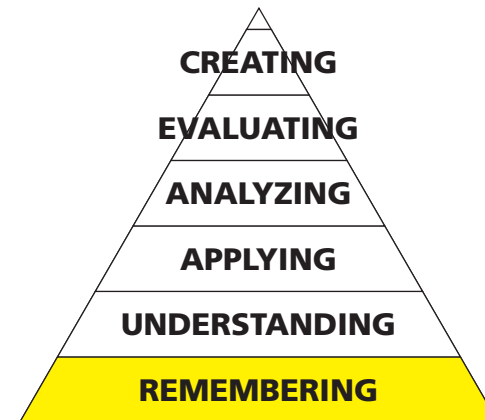
$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$



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?

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



pro

**computers
can do this!**

outcome

problem

procedure

answer

KNOWN

KNOWN

KNOWN

UNKNOWN

1 purposes

2 problems



1 purposes

2 problems



1 purposes

2 problems

problem

solution

outcome

UNKNOWN

KNOWN

problem

problem solving

KNOW

REAL

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:

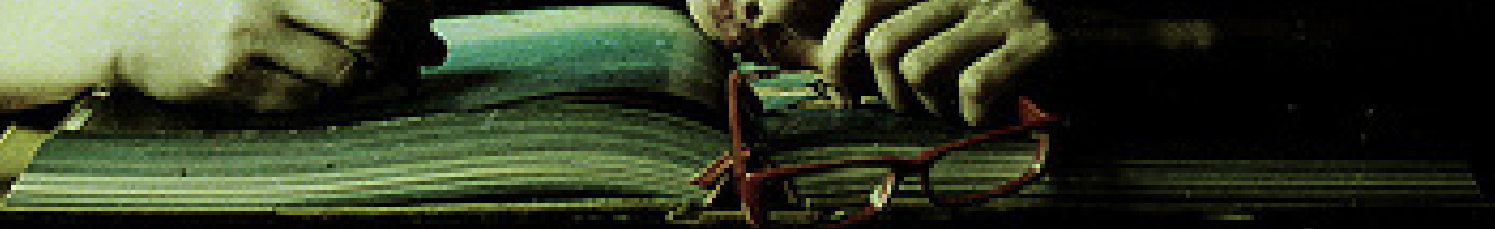
$$0 \leq \rho \leq 4, \quad 0 \leq \theta \leq 2\pi, \quad \frac{\pi}{2} \leq \phi \leq \pi$$

integral is thus:

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

Final Exam

high-stakes examinations promote cramming



1 purposes

2 problems

A person with dark hair is sleeping at a desk. They are holding a pen over an open book. A white mug is on the desk to the left. A clock is visible in the bottom left corner. The scene is dimly lit, suggesting a quiet study environment.

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

Law Model

Describe the Law of conservation of mass: Sometimes called the Law, states that mass of a closed system will remain constant, regardless of the process. Also, matter cannot be created nor destroyed.

Mass makes me
happy in humanity

List the three important concepts that the Law of conservation of Energy leads to:

- Equilibrium (boiling)
- Thermodynamics (boiling)
- Kinetics (bow-chicka-wow-wow)

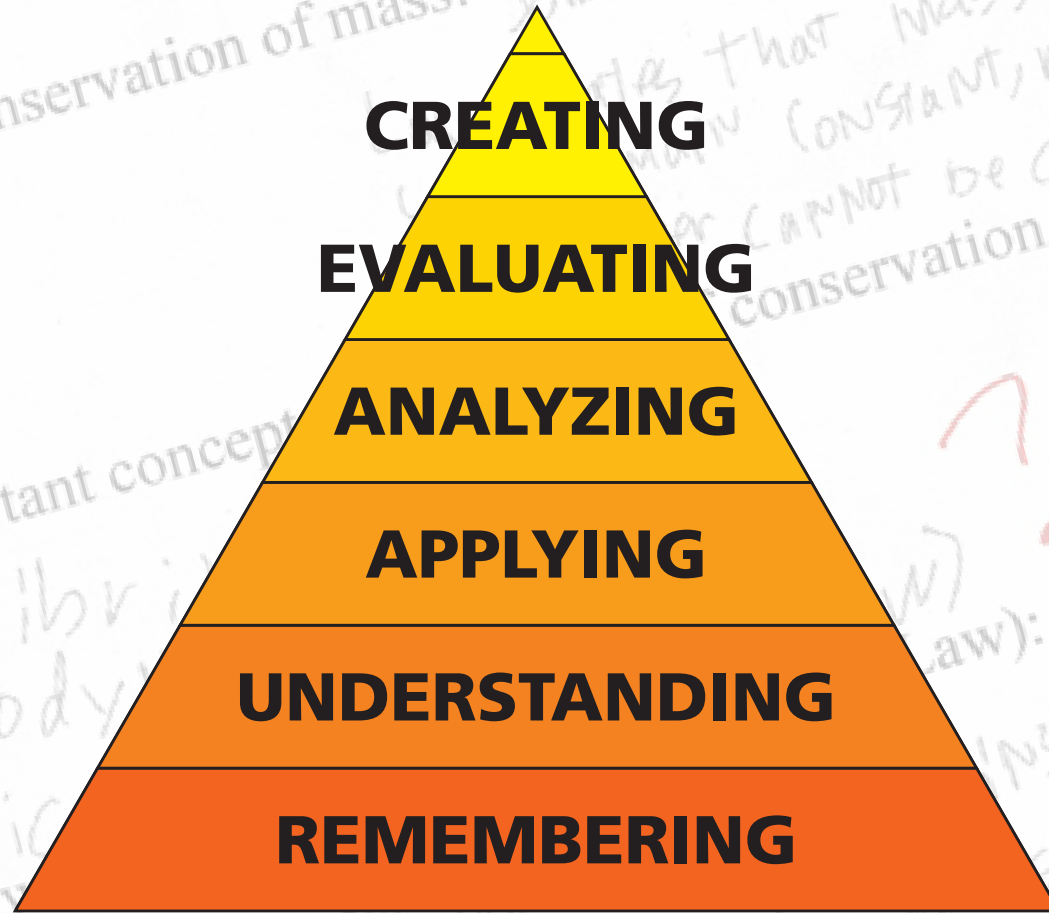
... but ...

Describe the Law of definite composition (Dalton's Law):
... always contains exactly the same parts by mass.

1 purposes

2 problems

... at a party, Law
Friedrich



1 purposes

2 problems

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

1 purposes

2 problems

and then there is...

- grade inflation
- cheating

1 purposes

2 problems



1 purposes

2 problems

3 improvements



1

mimic real life

1 purposes

2 problems

3 improvements



open-book exam

1 purposes

2 problems

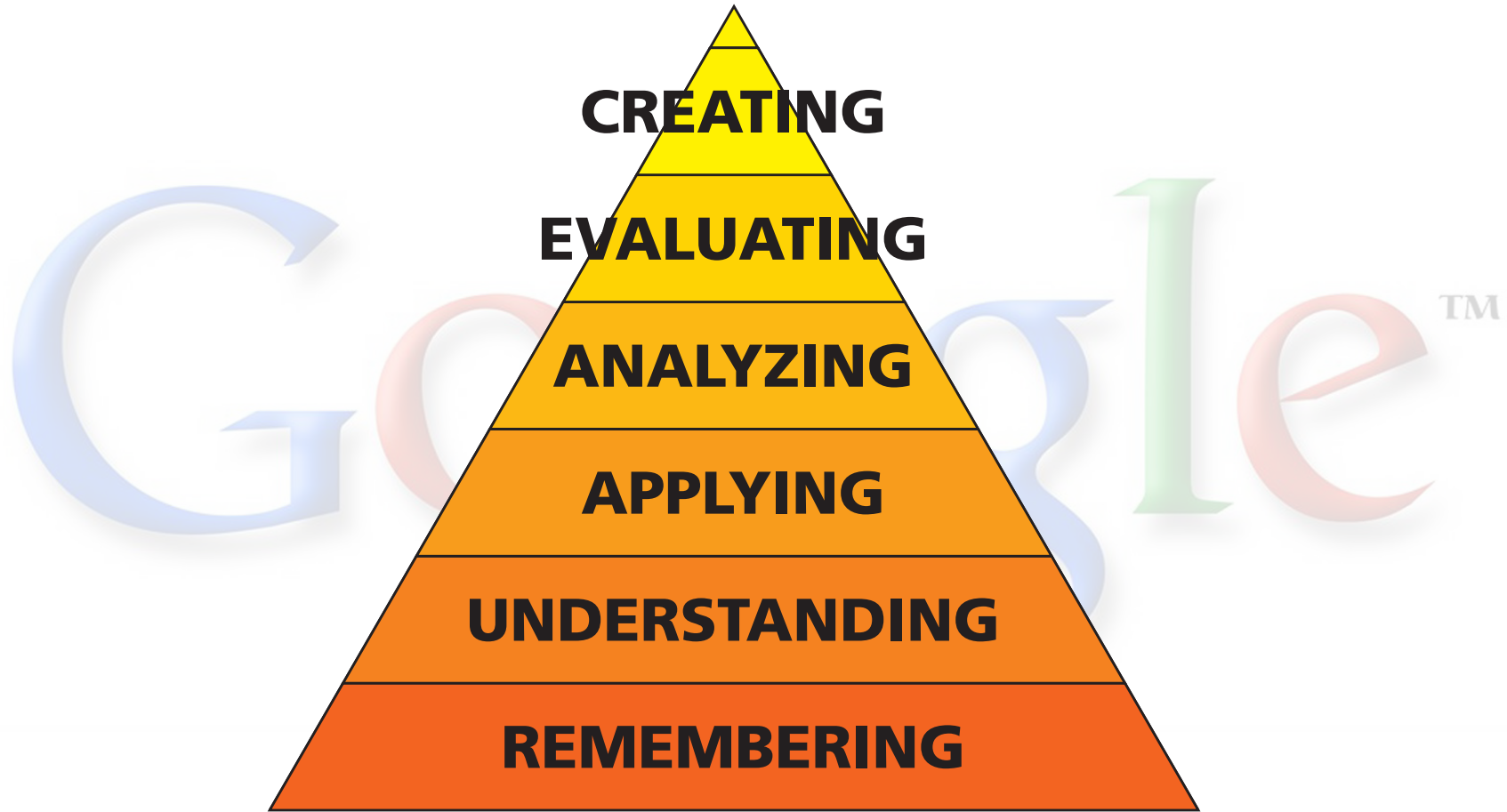
3 improvements

Google™

1 purposes

2 problems

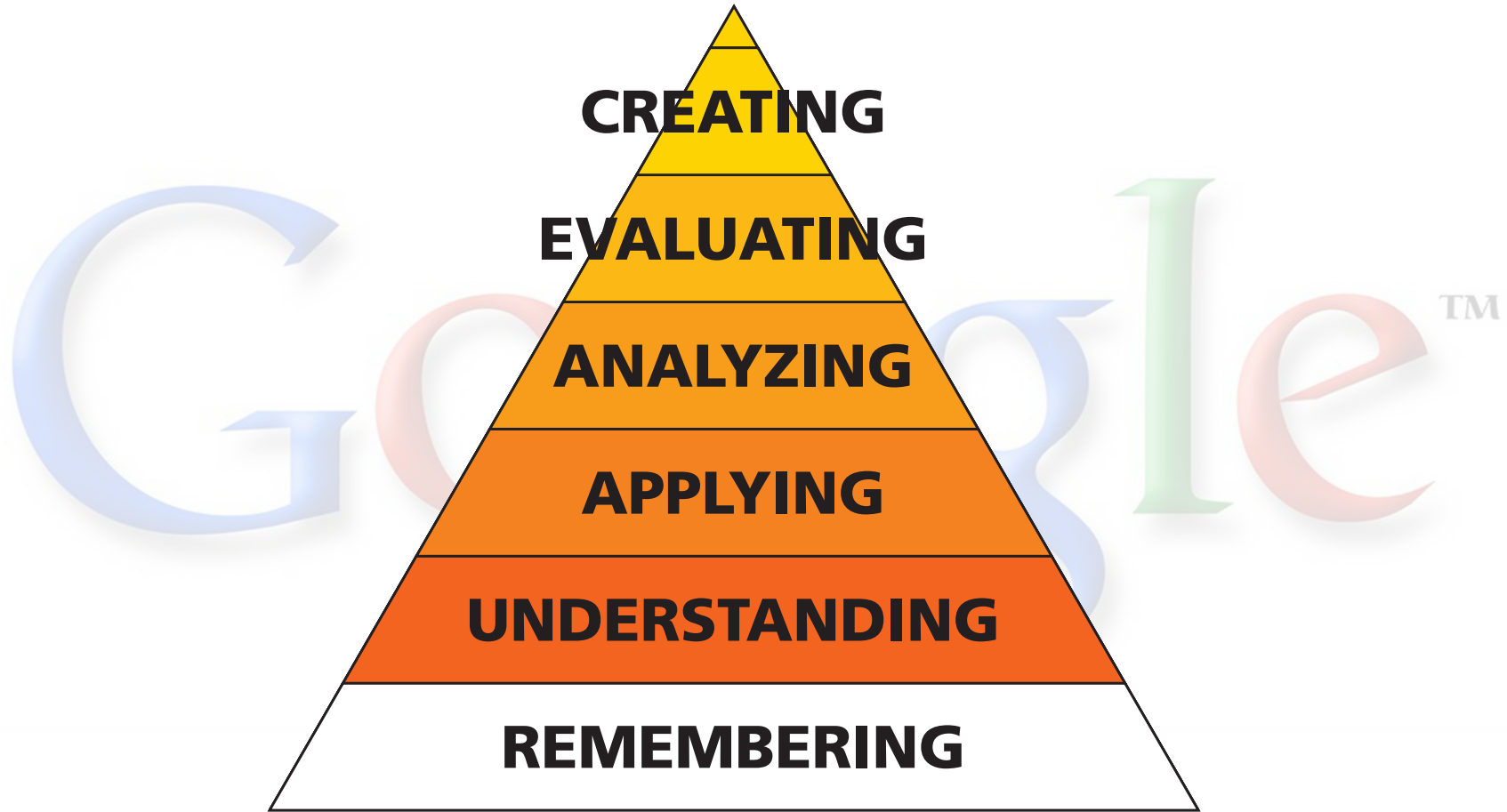
3 improvements



1 purposes

2 problems

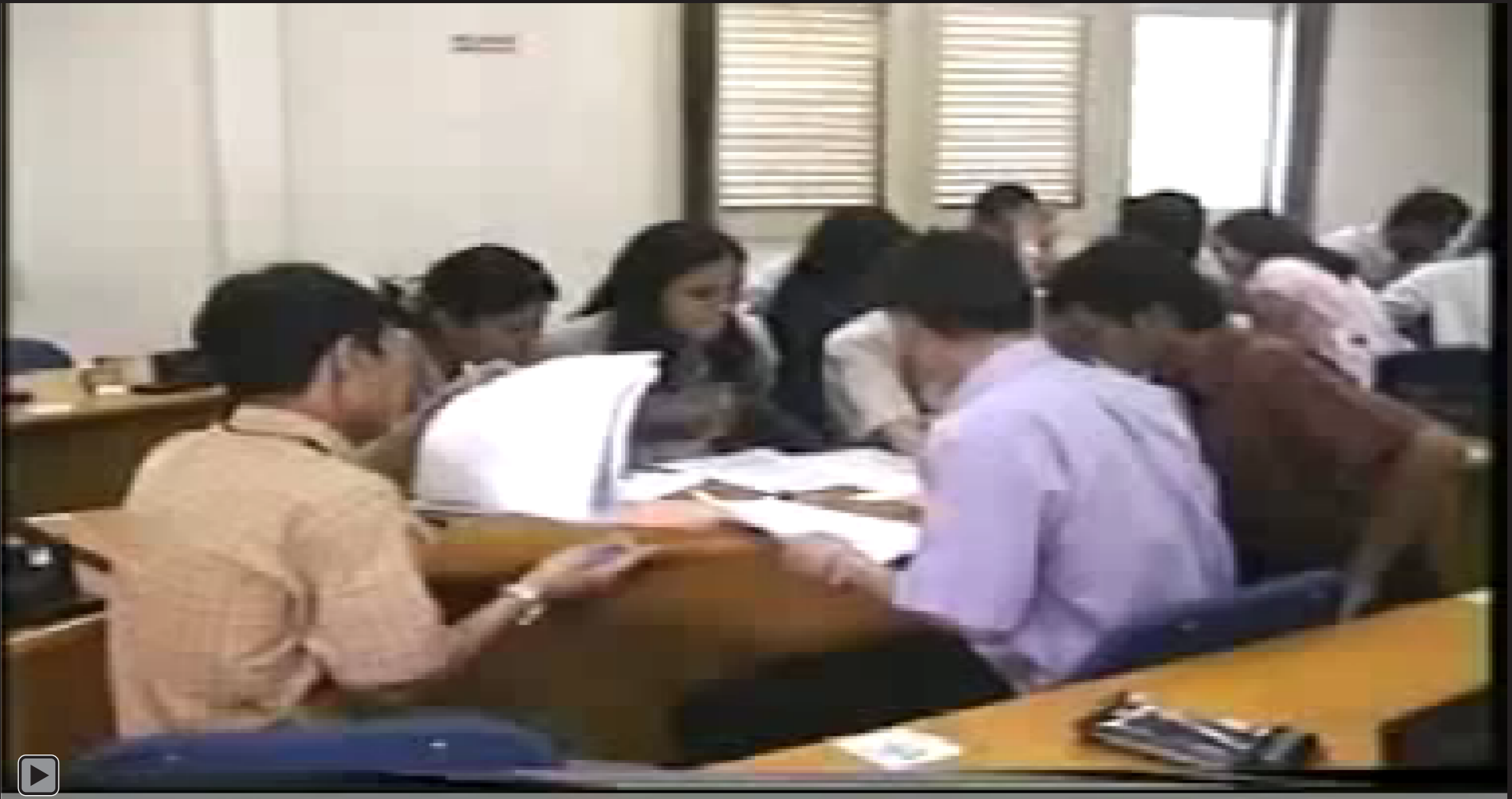
3 improvements



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 $\ln y - \sin$

1 purposes

2 problems

3 improvements

This is the individual round;

expression question

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Submit response

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

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 $\ln y - \sin$

1 purposes

2 problems

3 improvements



1 purposes

2 problems

3 improvements



2

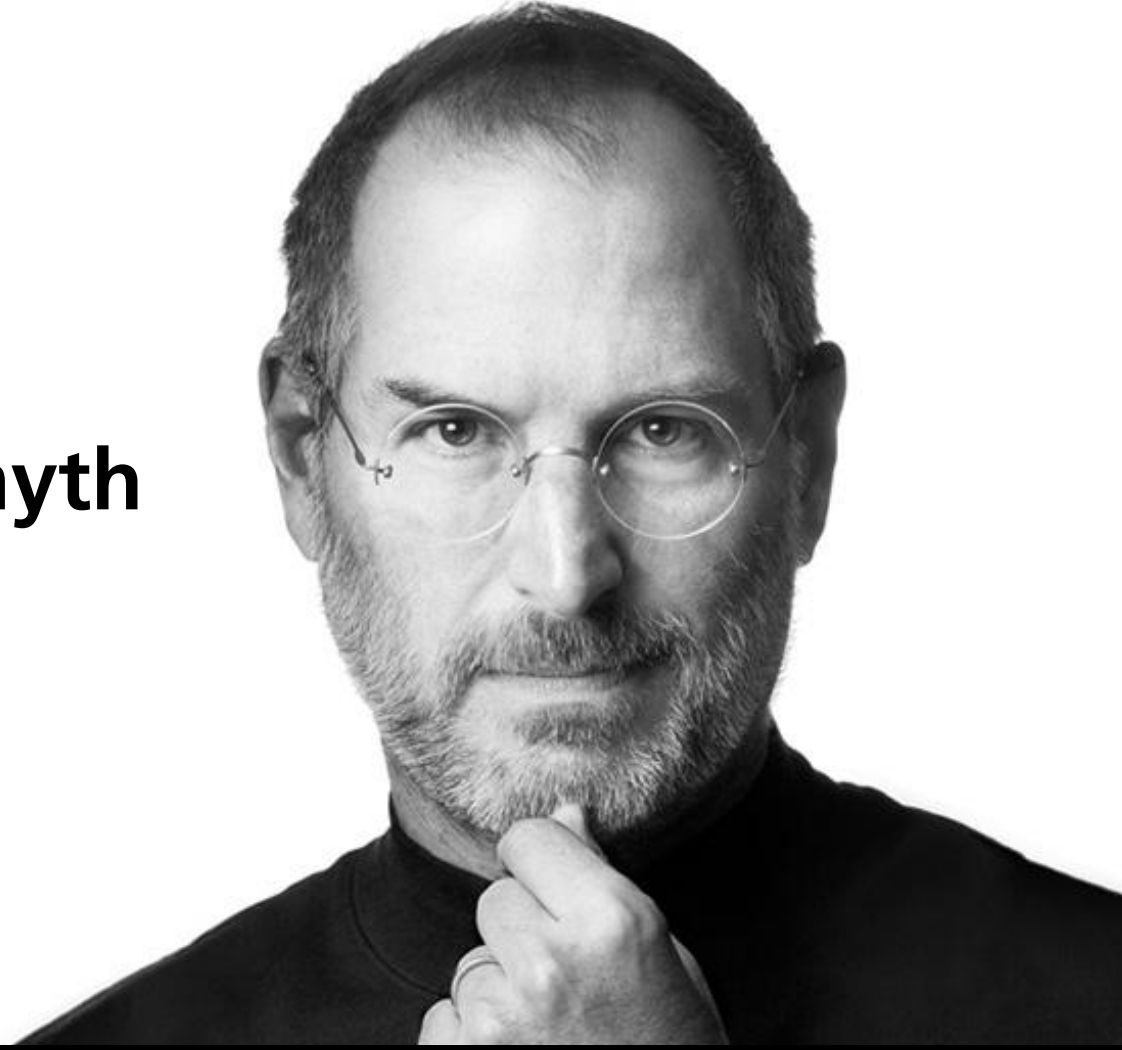
focus on feedback, not ranking

1 purposes

2 problems

3 improvements

objective ranking: a myth

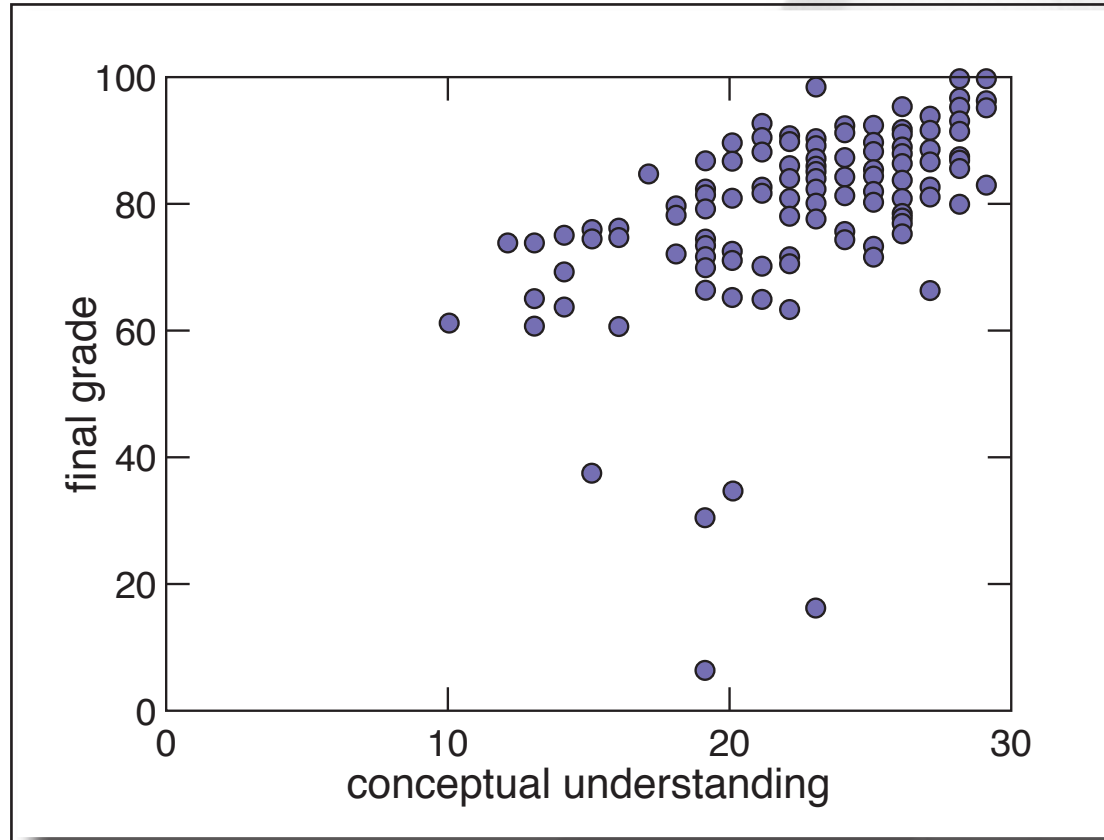


1 purposes

2 problems

3 improvements

2 metrics, 2 results

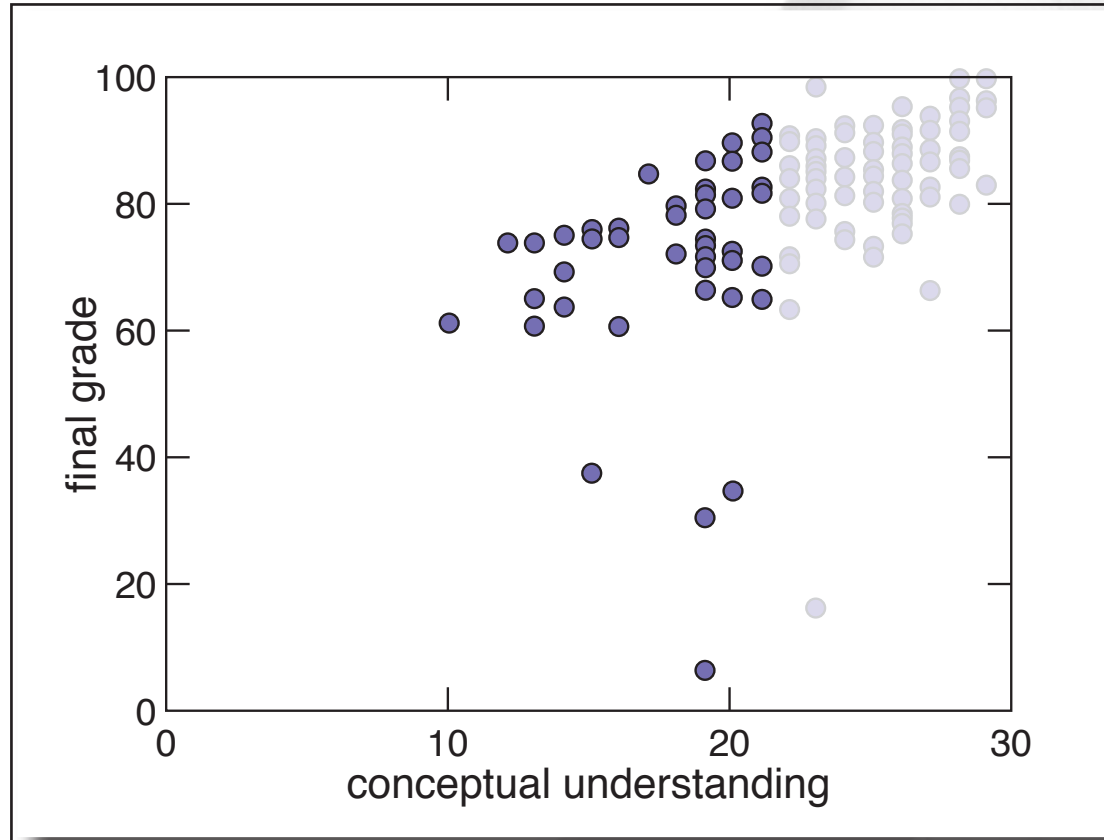


1 purposes

2 problems

3 improvements

Aristotelian thinkers

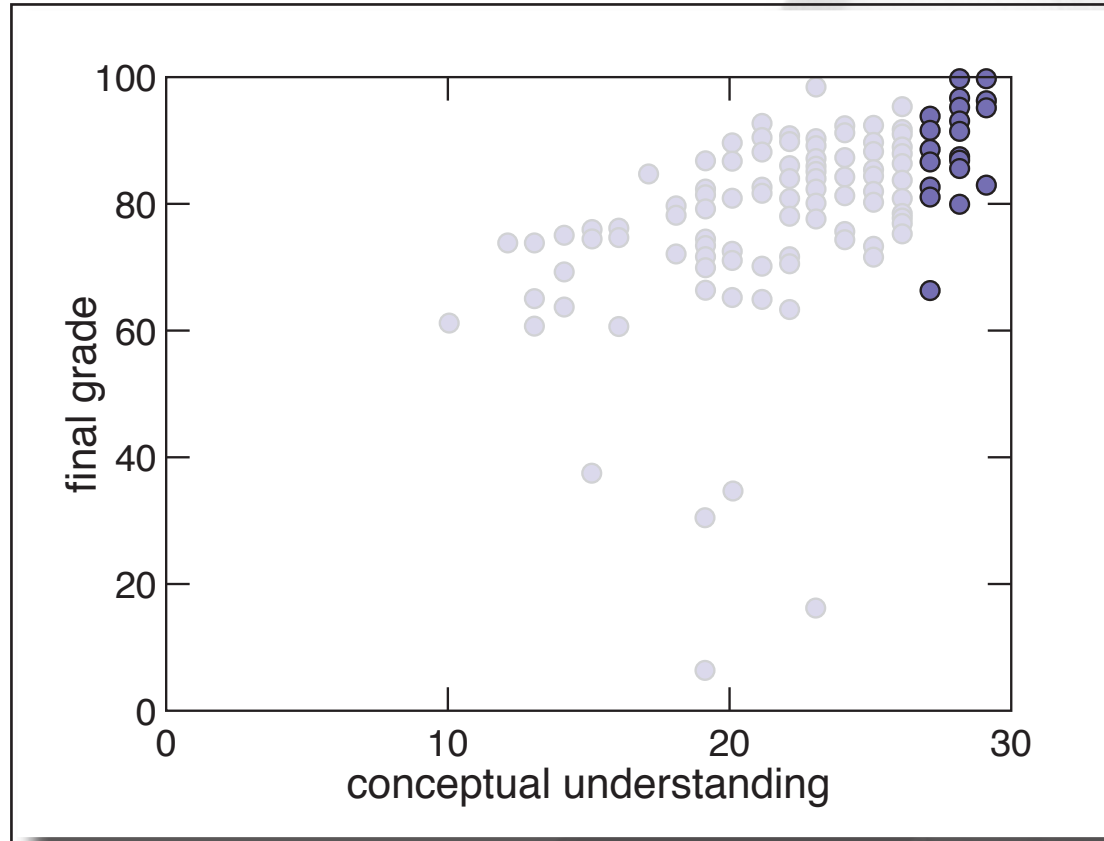


1 purposes

2 problems

3 improvements

top performers, broad grade distribution

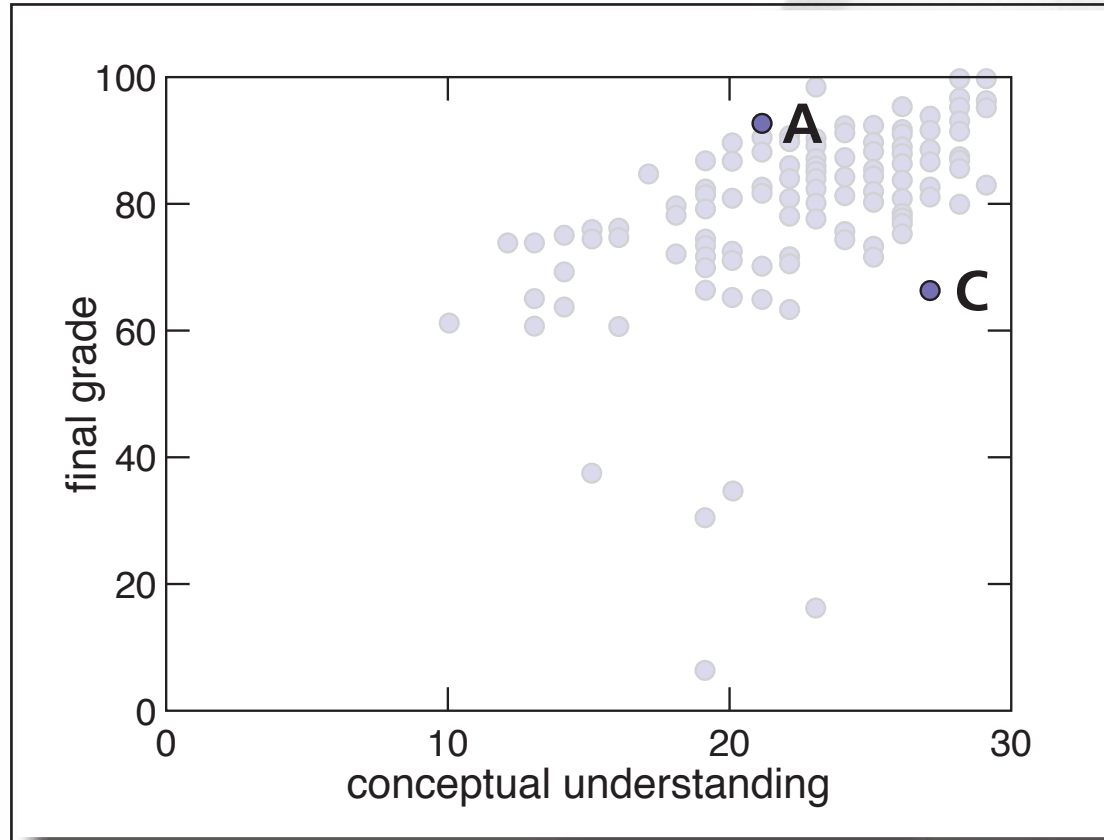


1 purposes

2 problems

3 improvements

objectivity or injustice?



1 purposes

2 problems

3 improvements



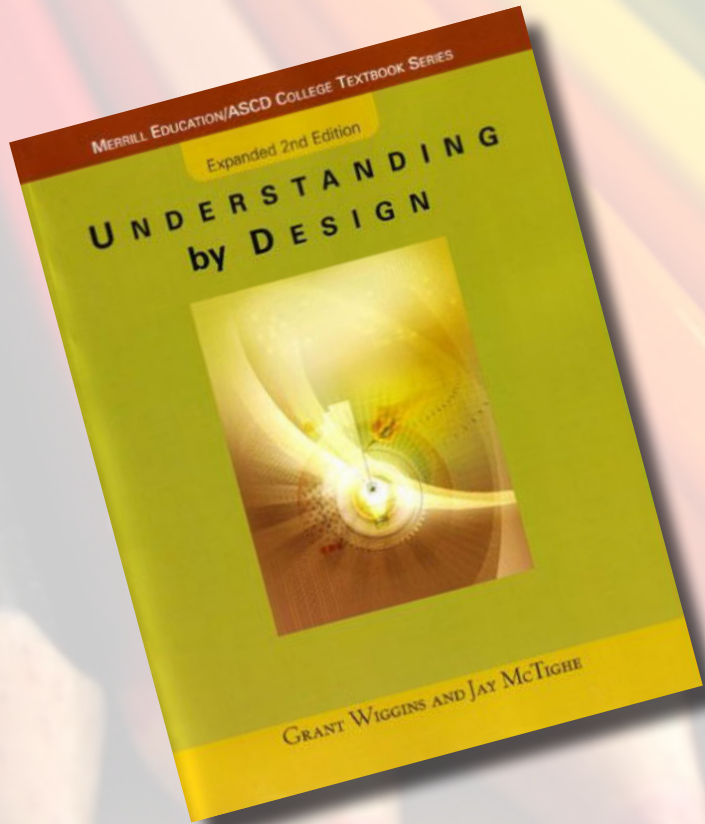
3

focus on skills, not content

1 purposes

2 problems

3 improvements



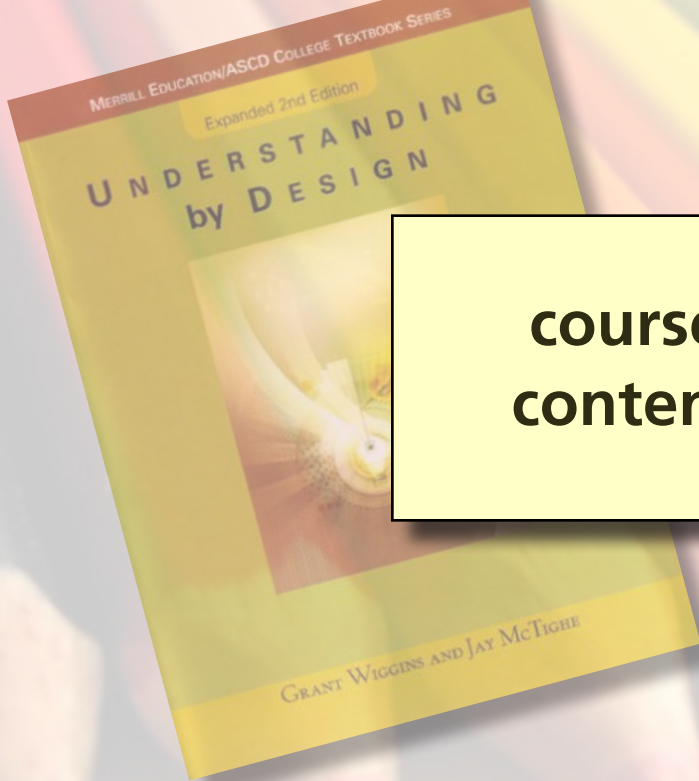
Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

1 purposes

2 problems

3 improvements

Traditional approach to course planning



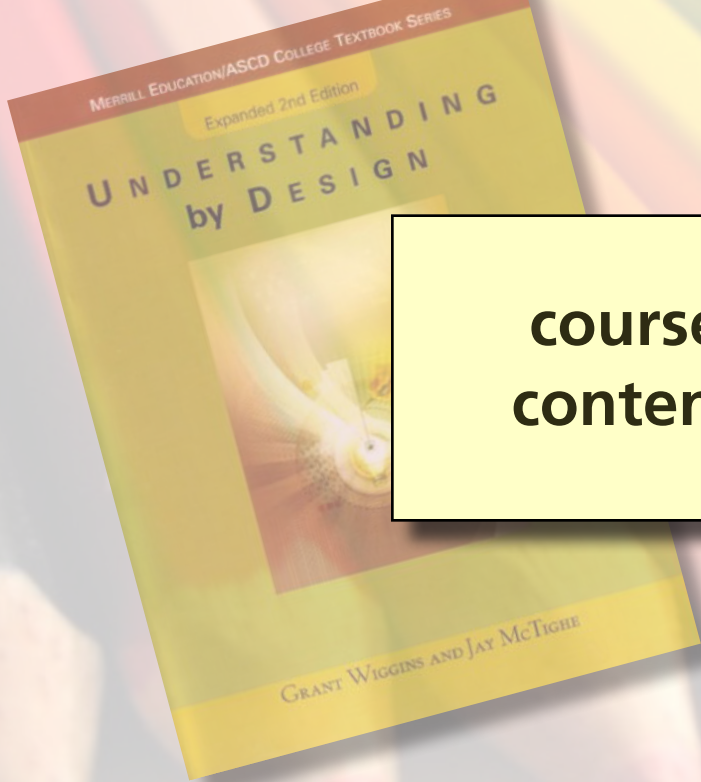
**course
content**

1 purposes

2 problems

3 improvements

Traditional approach to course planning



**course
content**



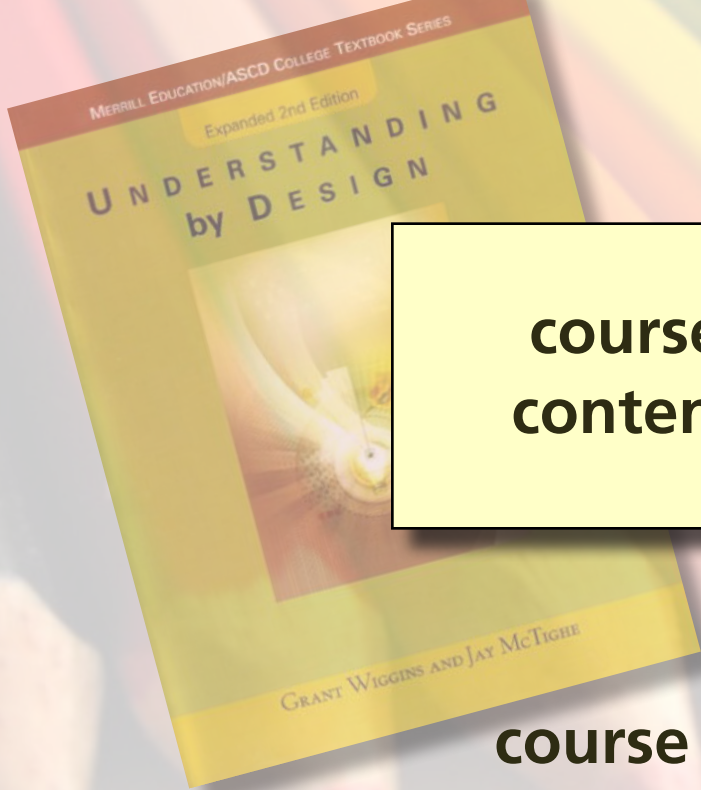
assessment

1 purposes

2 problems

3 improvements

Traditional approach to course planning



**course
content**



assessment

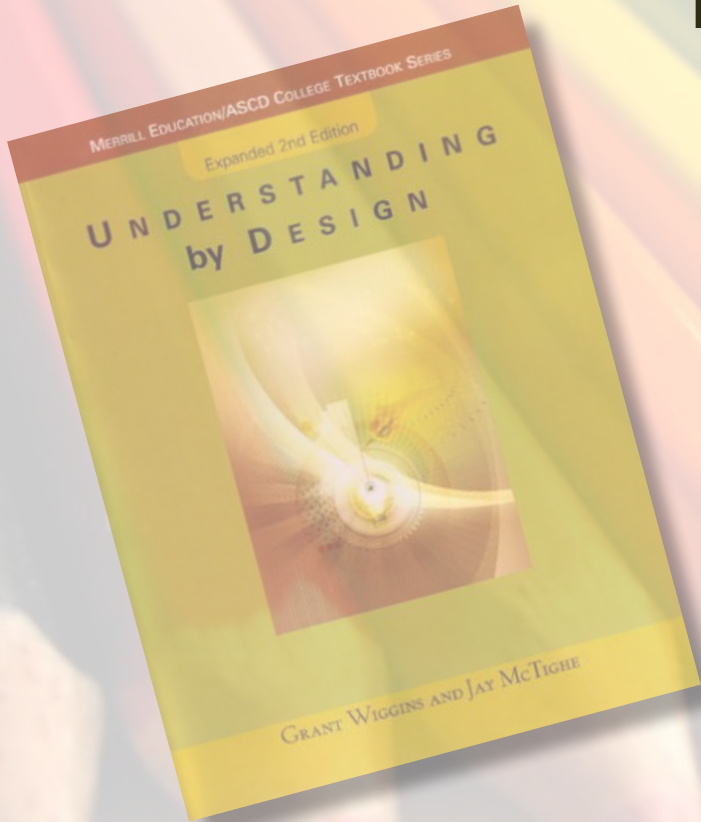
course determined by content

1 purposes

2 problems

3 improvements

Backward design



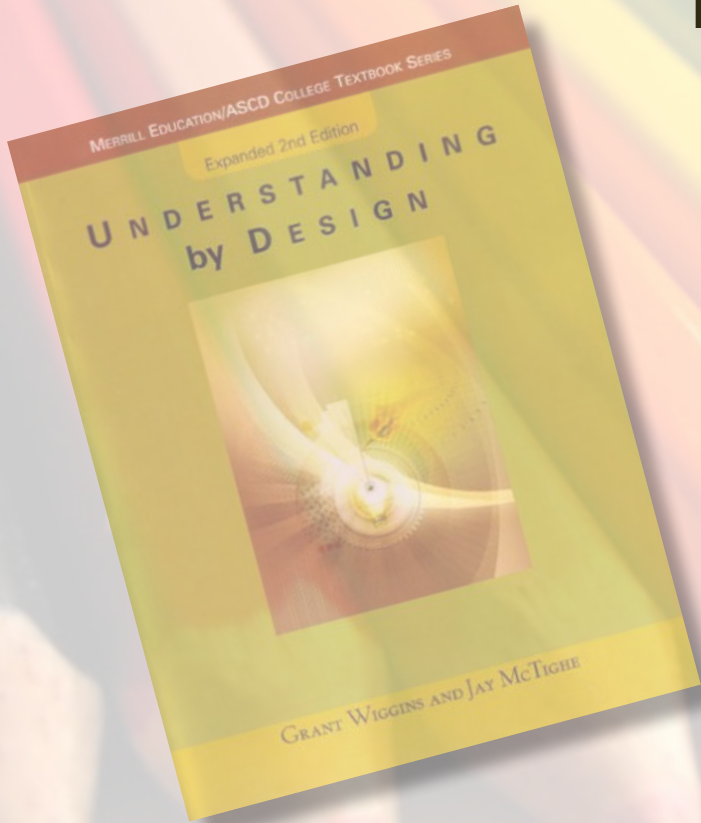
**desired
outcomes**

1 purposes

2 problems

3 improvements

Backward design



acceptable
evidence



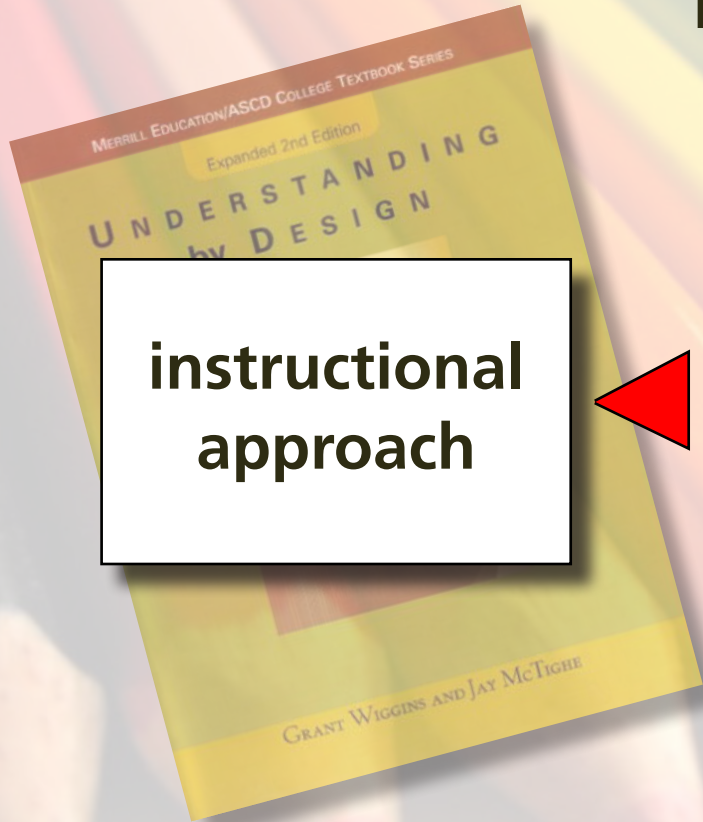
desired
outcomes

1 purposes

2 problems

3 improvements

Backward design



**instructional
approach**



**acceptable
evidence**



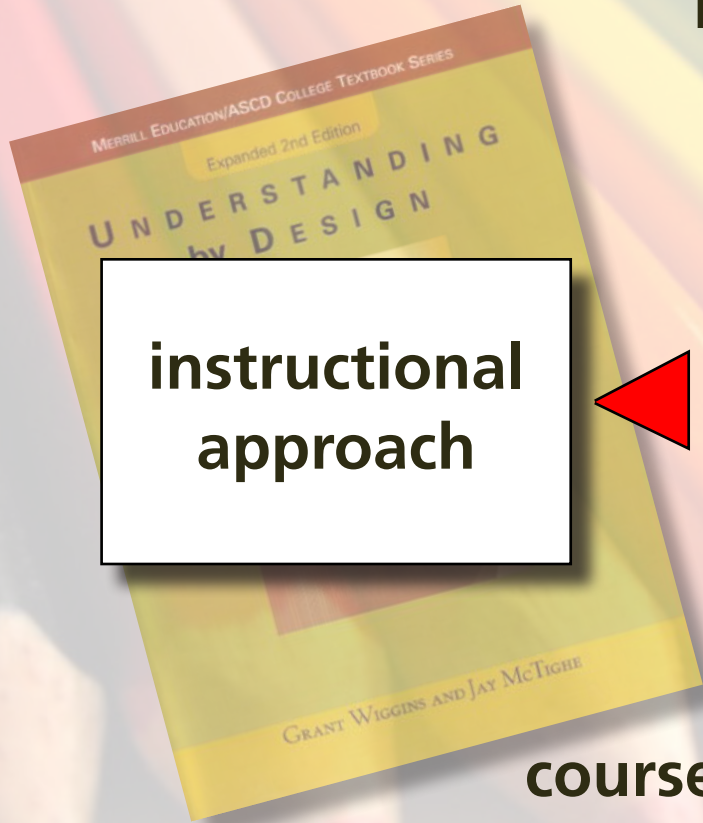
**desired
outcomes**

1 purposes

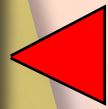
2 problems

3 improvements

Backward design



instructional approach



acceptable evidence



desired outcomes

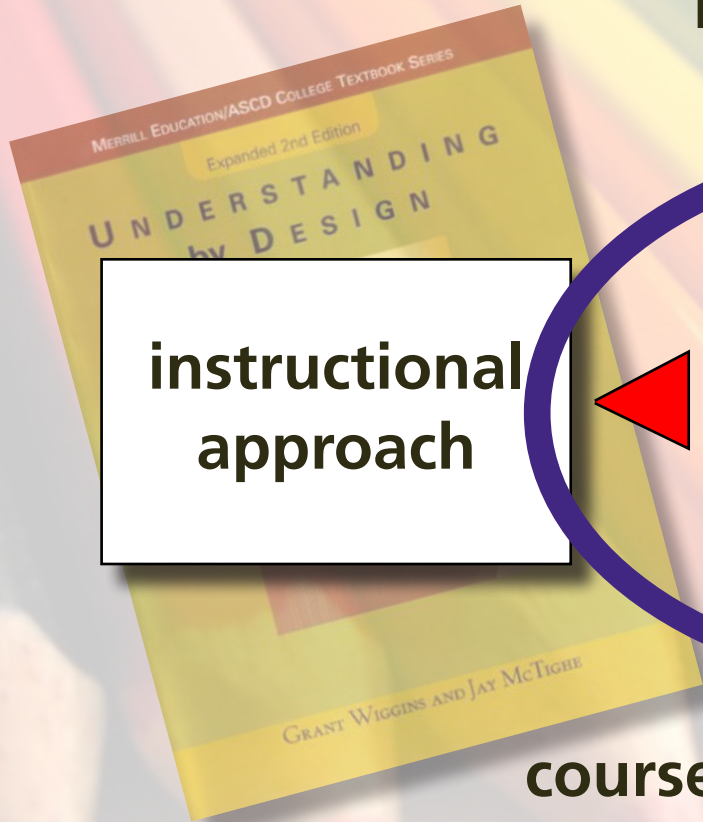
course defined by outcomes

1 purposes

2 problems

3 improvements

Backward design



instructional approach

acceptable evidence

desired outcomes



course defined by outcomes

- 1 purposes**
- 2 problems**
- 3 improvements**



4

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**



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ericmazor.com

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