Assessment: The Silent Killer of Learning

Cardiff University
27 January 2020
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kosten
1. die Kosten (pl.)
2. kostbar

krank
1. die Krankheit, —, en

cow

das Kind, —, —
1. kindisch
2. kindlich

kennen
1. kennen-gekannt
2. kennenlernen
3. erkennen
4. bekennen

magnificent
glorious

splendid

think of

428

430
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
purposes

problems
purposes
problems
improvements
how many different purposes of assessment can you think of?
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
purposes

problems
inauthentic tests
what is the meaning/definition of...?
inauthentic problem solving

1 purposes
2 problems
problem

1 purposes

2 problems
1 purposes
2 problems
1 purposes
2 problems
1 purposes
2 problems

problem solution outcome

UNKNOWN KNOWN

EDUCACION
1 purposes
2 problems
1 purposes
2 problems
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?
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How long do you have to wait before someone frees up a space?

Requires:
Assumptions
Developing a model
Applying that model
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Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

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Assumptions
Developing a model
Applying that model
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\[ t_{\text{wait}} = \frac{T_{\text{shop}}}{N_{\text{spaces}}} \]
computers can do this!
purposes

problems
REAL problem solving

1 purposes
2 problems
grading incompatible with real problem solving
isolation

1 purposes
2 problems
We will use spherical coordinates:

$$0 \leq \phi \leq \frac{\pi}{4}, \quad 0 \leq \theta \leq 2\pi, \quad \leq \rho \leq \rho_0$$

The integral is thus:

$$\int_{\phi=0}^{\frac{\pi}{4}} \int_{\theta=0}^{2\pi} \int_{\rho=0}^{\rho_0} f(\rho, \theta, \phi) \rho^2 \sin(\theta) \, d\rho \, d\theta \, d\phi$$

$$= \left\{ \int_{\rho=0}^{\rho_0} \rho^2 \, d\rho \right\} \left\{ \int_{\theta=0}^{2\pi} \sin(\theta) \, d\theta \right\} \left\{ \int_{\phi=0}^{\frac{\pi}{4}} f(\rho, \theta, \phi) \, d\phi \right\} = 0$$
high-stakes examinations promote cramming
information stored in short-term memory
1. purposes
2. problems

Information stored in short-term memory

No retention
No transfer
grades: measure of standing relative to others

1 assessment  2 problems
grades: measure of standing relative to others
feedback: reflection on what has been learnt

1   assessment
2   problems
assessment produces a conflict
assessment produces a conflict

cCoach or judge?
conflict resolved by:

objectivity (fairness, reliability)
... but ...

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

- Equilibrium
- Kinetics (Key Ch: 2)
- Modem dynamics (Dalton's Law)

...
REMEMBERING
UNDERSTANDING
APPLYING
ANALYZING
EVALUATING
CREATING

1 purposes
2 problems
only lowest order thinking skills can be judged objectively
and then there is...

• grade inflation

• cheating
1 purposes
2 problems
3 improvements
mimic real life
open-book exam

1. purposes
2. problems
3. improvements
1 purposes  
2 problems  
3 improvements
purposes  problems  improvements
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focus on feedback, not ranking
objective ranking: a myth
2 metrics, 2 results
Aristotelian thinkers
top performers, broad grade distribution

![Graph showing conceptual understanding vs. final grade distribution.]

1 purposes
2 problems
3 improvements
objectivity or injustice?

1. purposes
2. problems
3. improvements
focus on skills, not content
Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)
Traditional approach to course planning

1 purposes

2 problems

3 improvements

course content
Traditional approach to course planning

1. purposes
2. problems
3. improvements

- course content
- assessment
Traditional approach to course planning

- course content
- assessment

Course determined by content
Backward design

1. purposes
2. problems
3. improvements

desired outcomes
Backward design

1. purposes
2. problems
3. improvements

acceptable evidence \(\rightarrow\) desired outcomes
Backward design

1 purposes
2 problems
3 improvements

instructional approach -> acceptable evidence -> desired outcomes
Backward design

1. purposes
2. problems
3. improvements

course defined by outcomes

instructional approach
acceptable evidence
desired outcomes
Backward design

1. purposes
2. problems
3. improvements

course defined by outcomes

instructional approach
acceptable evidence
desired outcomes
4 resolve coach/judge conflict
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
rethink
assessment
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