Is the Lecture Dead? Lecturing for Deeper Learning

Effective, Efficient, Research-based Strategies

An Invited Talk at the 4th Annual CTE Celebration of Teaching Excellence

1:30-3:00 PM on Monday 13 January 2014
Some Questions We *Might* Consider Together

1. Is the lecture dead?
2. What are lectures actually good for? [And what not?]
3. What key constraints affect learning from lectures?
4. How can lectures best promote deep, meaningful learning?
5. How can teachers more efficiently prepare effective lectures?
6. How can teachers help students use their lecture preparation time more efficiently and effectively?
7. How can we efficiently assess lecture effectiveness?
8. Your questions?
Some Questions We * Might* Consider Together

Circle the 3 below which most interest you.

1. Is the lecture dead?
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Some Questions We *Might* Consider Together

Cornell participants gave the highest number of “votes” to:

4. How can lectures best promote deep, meaningful learning?
5. How can teachers more efficiently prepare effective lectures?
6. How can teachers help *students* use their lecture preparation time more efficiently and effectively?
Some Questions We *Might* Consider Together

Cornell participants gave the highest number of “votes” to:

4. How can lectures best promote deep, meaningful learning?
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6. How can teachers help students use their lecture preparation time more efficiently and effectively?
1st “Balcony” Question

If you participated actively:
Are you more interested in finding out the answers to these questions now than you were 5 minutes ago?

[Note: About 80% of those present indicated that the exercise increased their interest.]
Assessing Student Interests

A simple, quick way to assess students’ interests/goals and provide some choice – at least re: start points.

Why bother?
Because choice enhances motivation.
And motivation enhances persistence.
Applications Card

Ideas/Techniques    Possible Applications

Note: Participants were encouraged at several points to pause, reflect, and jot down on this page possible applications of strategies and techniques being demonstrated in the session to their work.
Some Questions We *Might* Consider Together

Q2. What are lectures actually good for? [And what not?]

Lectures can be effective for . . .

• Motivating
• Persuading
• Prioritizing, organizing and focusing attention
• Demonstrating ways of thinking/problem-solving
• Modeling

Lectures are *not* very effective means for teaching content, developing higher-order thinking, or improving communication skills.
Some Questions We *Might* Consider Together

Q3. What key constraints affect learning from lectures?

- Limited human attention span
- Memory constraints
- Lack of intrinsic interest
- Lack of relevant preparation/prior knowledge
- Distractions
- Note-taking
- Cognitive load
- Unhelpful preconceptions
- [Add at least 3 more]
Q4: How can teachers make lectures more effective in promoting deep learning?

Use lectures only for what they do well.

Recognize and manage inherent constraints.

- Limited human attention span
- Memory constraints
- Lack of intrinsic interest
- Lack of relevant preparation/prior knowledge
- Distractions
- Note-taking
- Cognitive load
- Unhelpful learner preconceptions
The Balcony
and
The Dance Floor

Note: This is simply a metaphor for the relationship between “cognition” (the dance floor) and “metacognition” (the balcony from which we can watch ourselves on the dance floor). My contention is that higher education requires – or should require – that students employ metacognition (self-direction and self-assessment) effectively if they are to succeed.
“It’s not what we do, but what students do that’s the important thing.”

Background Knowledge Probe

Please answer each question regarding the USA, Canada and Mexico. 

Guessing is encouraged!

Note: Participants then reviewed the questions on page 2 to determine which were lower-level and which higher-level in relation to Bloom’s Taxonomy – and in relation to the uncertainty of potential answers.
Bloom’s Taxonomy (revised)
Anderson & Krathwohl, 2001

Remember
Understand
Apply
Analyse
Evaluate
Create
Background Knowledge Probe

A simple, quick way to assess students’ prior knowledge before we begin teaching – to better fit teaching to learning and to provide feedback to students.
Students’ prior knowledge and beliefs are among the most powerful influences on their learning.

Consequently, assessing that prior knowledge can provide powerful leverage.
Some Key Terms and Concepts

Surface, strategic and deep learning approaches
Prior knowledge
Bus Test, Parrot Test, Parking Lot Test
Interactive lectures
Attention span
Cognitive load
Wait time
Metacognition
Deliberative practice
The Dance Floor and the Balcony
Novice-Expert differences
The 80/20 Rule (aka, the Pareto Principle)

Threshold and core concepts
Some Key Terms and Concepts

Please mark each item on the list with a plus sign, minus sign, or question mark

• Use the plus (+) if you know the term
• Use the minus (−) if you do not know it
• Use the question mark (?) if you’re unsure

Note: This was another example of a simple diagnostic, formative assessment one could use before (on LMS) or during a lecture to promote metacognition.

Tom Angelo – 13 January 2014 – thomas.a.angelo@gmail.com
Formative Assessment & Feedback for Deep Learning –

A Gap-Analysis Approach

Find the Gaps
Mind the Gaps
Close the Gaps
Seven Levers for Deeper Learning

1. Prior knowledge and beliefs
2. High expectations and clear goals
3. Metacognition – Learning tools
4. Standards, assessment and feedback
5. Connections – Transfer and application
6. Collaboration toward shared goals
7. Time invested in engaged, active learning
Seven Levers for Deeper Learning

Note: These “levers” are the research-based guidelines on which I’ve built this presentation – and which I use to guide my own teaching.
“It’s not what we do, but what students do that’s the important thing.”

Three Preconditions for Deep Learning

• Shared TRUST
• Shared GOALS
• Shared LANGUAGE & CONCEPTS

Note: The interactive pair- and triad exercises demonstrated to this point in the session were intended to demonstrate learning-focused strategies to engage students in self-assessment and metacognition and get feedback on their learning – as well as to build a shared sense of trust, shared goals/expectations, among the students, and commonly understood terms and concepts.
Collaborative Learning Techniques

Think-Pair-Share & Buzz Groups

These are “Low-Threshold Applications”

- Low complexity – easy to use
- Low cost – in time and effort
- Low risk – to teachers or learners
- Relatively high ROI (Return on Investment)
- Potentially worth adapting?

Tom Angelo – 16 Nov. 2012 – thomas.a.angelo@gmail.com
Two Concept Tests

Thanks to Dr. David McConnell of NCSU for the Geology example.
Two Concept Tests

Threshold and Core Concepts are necessary foundations for disciplinary mastery.

Given that, it makes sense to prioritize such concepts in our assessment and feedback.
Some Questions We *Might* Consider Together

Note: The following two slides – “Lecture Design & Prep Questions” and “An Interactive Lecture Recipe” are responses to Question 5 below – one of the three questions to which Cornell participants gave the highest number of interest “votes.”

5. How can teachers more efficiently prepare effective lectures?
Lecture Design & Prep Questions

1. What are your learning outcomes?
2. What prior work leads in/connects?
3. How will you and students prepare?
4. How will you get, manage, sustain attention?
5. How will you help students manage cognitive load?
6. What work will students do during the lecture?
7. How will you assess achievement of lecture ILOs?
8. What will the lecture connect to – next steps?
An Interactive Lecture Recipe

1. Assign pre-lecture reading/problems/etc.
2. Provide a pre-lecture quiz over the key concepts
3. Give an in-class quiz at start of session
4. Assign quick discussion (pairs or triads)
5. Review the correct answer
6. Assign another, similar problem/question for in-class groupwork
7. Elicit responses
8. Provide directed feedback at conceptual level
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Some Questions We * Might * Consider Together

6. How can teachers help * students * use their lecture preparation time more efficiently and effectively?

Note: The first three steps in the previous slide are strategies for helping students prepare to make the best use of lectures. If the lecture is the first time the students have encountered the material, it is unlikely to result in much learning. If, on the other hand, students come to the lecture having already thought about, struggled with and answered questions about the material, they are more likely to benefit from the presentation and discussion. To ensure that students are motivated to do this preparation work, it’s critical that they see the relationship between preparing and getting better grades, and that they get useful, timely feedback on their preparation in class.

1. Assign pre-lecture reading/problems/etc.
2. Provide a pre-lecture quiz over the key concepts
3. Give an in-class quiz at start of session
The Wrap Up – Part 1

To make your lecture preparation time more effective and more efficient:

• Set limits to your preparation time
• Remember the “80/20 rule” [In essence, don’t over prepare. You are likely to get about 80% of the lecture prepared in the first 20% of the time you could spend on it. And that may be enough preparation. Spending additional time may not add much value – and it may take time away from other priorities.]
• Contextualize and connect
• Start with the end and design backwards
• Prioritize no more than 5-7 big points
The Wrap Up - Part 2

To make your lecture preparation time more effective and more efficient:

• Build in “interactive” opportunities
• Privilege the beginning and end
• Manage attention span & cognitive load
• Prepare to be, or at least to act enthusiastic
• Have Plan B ready, just in case
The Parking Lot Test

Note: The “Parking Lot Test” is a simple way of assessing what and how students can recall what happened during a lecture soon after it has finished. I ask students to imagine they are heading across the parking lot to their cars when they meet a classmate who did not attend the lecture. When that classmate asks, “What did I miss in class today?”, what will those who did attend say?
Applications Card

Ideas/Techniques    Possible Applications

Note: At the end of the workshop, participants were asked how many potential applications they had written down. The great majority indicated they had generated at least two. They were then asked to choose and circle one application which seemed most promising/interesting at that moment.
What, Why and How

Choose one of your possible applications.

Prepare to answer the three questions below about that specific application:

• **What** is it?

• **Why** do you think it might be useful?

• **How** do you think you might use it?

Note: Participants were then asked to form groups of 3-4 and, in 20-30 seconds each, share their answers to What, Why and How. (In preparation for the Parking Lot Test.) The point of this exercise is that it can help students recall the lecture better and make it more likely they will apply what they have learned.
Please complete the session evaluation on page 9.

Feel free to send further questions, comments, critiques and suggestions to thomas.a.angelo@gmail.com
2nd “Balcony” Question

If you participated actively:

What differences do you note between the “teaching objectives” and the “intended learning outcomes”?

(How consequential are those differences?)