Lecturing for Deeper Learning
Effective, Efficient, Research-based Strategies

An Invited Session at the 4th Annual
Celebration of Teaching Excellence at Cornell
1:30-3:00 PM on Monday 13 January 2014

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and Professor of Higher Education
Queens University of Charlotte

Some Questions We Might Consider Together

1. Is the lecture dead?
2. What are lectures good for? [And what not?]
3. What key physical, psychological, and cognitive constraints affect how well students typically learn from lectures?
4. How can teachers make lectures more effective in promoting 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. [Is there a question(s) you’d like to raise?]
Tri-national Background Knowledge Probe

Please answer each question below for the following three countries: the United States (USA), Canada (CAN), and Mexico (MEX). Guessing is encouraged and expected!

<table>
<thead>
<tr>
<th>Question</th>
<th>USA</th>
<th>CAN</th>
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<tbody>
<tr>
<td>1. Population?</td>
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<td>2. Area in sq. kms.?</td>
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<td>3. Capital city?</td>
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<td>4. Name of current head of national gov’t?</td>
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<td>5. Name of most likely next head of gov’t?</td>
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<td>6. % Indigenous?</td>
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<td>7. Corruption ranking?</td>
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<td>8. Obesity ranking?</td>
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<td>9. Per capita income?</td>
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<td>10. Inequality ranking?</td>
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Q1: ___________________________________________________________

Q2: ___________________________________________________________

Q3: ___________________________________________________________
Some key terms and concepts that *might* be of use

- Surface, strategic, and deep learning approaches
- Prior knowledge
- Bus Test, Parrot Test, Parking Lot Test
- Interactive lectures (or Punctuated 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

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Seven Levers for Deeper Learning
Research-based Guidelines for Effective Teaching and Learning

*Overall, research suggests that virtually all students can learn more – and more deeply – when we provide well-designed curricula, teaching, and academic support to ensure that they . . .*

1. Become explicitly aware of their own relevant prior knowledge, beliefs, preconceptions, and values – and to be willing to unlearn, as needed
2. Set and maintain realistically high and personally meaningful learning goals and expectations for academic success
3. Learn how to learn effectively – given their own individual histories, skills, and goals – so they become increasingly self-directed and independent learners
4. Invest sufficient time and high-quality effort into deliberate practice against clear standards of performance.
5. Understand the criteria, standards, and methods used in assessing and evaluating their learning and get useful, timely feedback on performance against those standards
6. Seek and find connections to and real-world applications of the concepts and skills they are learning in class
7. Collaborate regularly and effectively with other learners and with teachers to achieve meaningful, shared learning goals
**ConcepTest**

Liquid hazardous waste is disposed of by pumping it down injection wells. Which well location would be the most suitable to use for an injection well? Why?

![Diagram of injection wells and water table]

Thanks to Dr. David McConnell, of NCSU, for the Geology ConcepTest above.

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Stats for Everyday Life – Spring 2004 - Angelo

**First Concept Review**

Circle the variable in each pair that you would expect to have the larger standard deviation:

1.1 adult humans’ heights
1.2 domestic dogs’ weights
1.3 language skills of 12-year-olds
1.4 hours students spend in this classroom

adult humans’ weights
domestic cats’ weights
math skills of 12-year-olds
hours students spend studying for this class
Lecture Design and Preparation Questions

1. What are your intended learning objectives/outcomes for this lecture?  
   [Will you/How will you communicate them?]
2. What prior course work leads in/connects to this lecture?
3. How will you and the students prepare for it?
4. How will you get, manage, and 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 understanding and achievement of learning objectives/outcomes?
8. What will the lecture lead/connect to? Next steps?

Preparing Effective Lectures Efficiently

To make lecture preparation time more effective and more efficient:

- Set limits to your preparation time
- Remember the “80/20 rule”
- Contextualize and connect (connect, connect) the lecture
- Start with the end – intended learning outcomes – and design your lecture “backwards”
- Identify and prioritize no more than 5-7 key points
- Build in “interactive” opportunities for learning
- Privilege the beginning and the end
- Manage attention span and cognitive load
- Prepare to be, or at least to act enthusiastic
- Have Plan B ready, just in case

Remember: It’s what the learners do that matters most.
**APPLICATIONS CARD**

**DIRECTIONS:** Please take a moment to recall the ideas, techniques, and strategies we've discussed—and those you've thought up—to this point in the session. Quickly list as many possible applications as you can. Don't censor yourself! These are merely possibilities. You can always re-evaluate them later.

<table>
<thead>
<tr>
<th>Interesting IDEAS/TECHNIQUES from this session</th>
<th>Some possible APPLICATIONS of those ideas/techniques to my work</th>
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A Few Key Print References on Improving Teaching & Learning – with a Focus on Effective, Efficient Lecturing


A Few Potentially Useful Websites

The Carl Weiman Science Education Initiative at the University of British Columbia. http://www.cwsei.ubc.ca


Session Mini-Evaluation Form

**Overall Feedback** – Please circle the rating for each item which best represents your evaluation of this session.

1. Overall, the **value** of what I learned in this session is

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2. Overall, the **quality** of this session is

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3. Overall, I rate this presenter's **effectiveness** as

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**Comments on this session**

4. Which two or three specific aspects of this session were **most useful/helpful**?

5. Which specific aspects could have been improved?

6. What kind of CTE follow up, if any, might be helpful to you/your colleagues?