Disclosure

September 7, 2018
Department of Pediatrics Grand Rounds

a. William D. Hendricson has no relationships with commercial companies to disclose.

Learning Objectives

At the end of this presentation the participant will be able to:
1. Explain the "Activity at the Quarters" model for designing large group learning
2. Experience and assess several interactive teaching & learning activities that can be implemented within large groups
3. Describe research on the effectiveness of interactive teaching and learning vs. conventional lecture techniques.

Interactive Teaching & Learning Techniques for Large Groups

Department of Pediatrics Grand Rounds
September 7, 2018

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Today's Agenda

• The case for student activity during large group presentations (classroom lectures)
• Experience interactive learning activities for large groups
• Review research on the effectiveness of interactive teaching and learning

Hendricson Fun Facts: Might Pop Up Later

❖ Worked in health professions educ since 1971; UT Health SA since 1977
❖ Moonlight teaching: middle school, high school, community college, vocational school, prison bootstrap college courses (Joliet State Prison), undergrad, federal service, chiropractic, dental, graduate, HP, medical, nursing, pharmacy, vet med schools
❖ Attended 26 K-12 schools; 4 high schools as senior: Stuttgart, Seattle, Omaha, Fairfax, Virginia
❖ Inspiration for teaching: my grandfather
  - Became HS teacher at 62 (retired at 82)
  - Multi-grade; multi-subject teacher
  - Increased Lowden HS college entry from 10% to 65%

In the preclinical phase of the curriculum, what % of time do health professions students spend sitting in classrooms listening to lectures?

For 800 – 2000 hour foundations (preclinical) curriculum, studies report:

70%

800 hr curriculum = 560 hours
2000 hr curriculum = 1400 hours
What Are We Accomplishing With All This Time in Classrooms?

If HPE students took an exam (unrehearsed) 30 days after completion of a course, what would be their average percentage score?

* Unrehearsed = Spontaneous Recall; a true indicator of learning (Return on Investment; ROI)

Unrehearsed, spontaneously accurate retrieval

- One month: 45 - 50%
- Three months: 35%
- Pre-test: 20 - 25%

Other outcomes: boredom, sporadic attendance, distracted students, unmotivating environment for teachers.

What’s Our Return on Investment (ROI)?

Why Is Information Retention So Low With Conventional (One-Way) Lectures?

- Too Much Information (TMI)
- Cognitive limits: vigilance capacity
- Lack of mental recharge

2. Cognitive Limits

- As long as needed, if truly interested
- 50 minutes
- 30 minutes
- 20 minutes
- 12 minutes

Make it Active

Approximately 4 minutes of cognitive activity, especially with social interaction, recharges mental concentration.
3 X 2 Lecture Model (Activity at the Quarters)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>00-02</td>
<td>2 min Introduction</td>
</tr>
<tr>
<td>03-14</td>
<td>12 min lecture - Objective A</td>
</tr>
<tr>
<td>15-19</td>
<td>5 min application activity</td>
</tr>
<tr>
<td>20-31</td>
<td>12 min lecture - Objective B</td>
</tr>
<tr>
<td>32-35</td>
<td>4 min application activity</td>
</tr>
<tr>
<td>36-47</td>
<td>12 min lecture - Objective C</td>
</tr>
<tr>
<td>48-50</td>
<td>3 min Conclusion</td>
</tr>
</tbody>
</table>

Max hyper-vigilant attentiveness in 60 minute block is 36 min
Absorbing vs. active application: 36 – 9 (4 to 1 ratio)


Student Activity in Classrooms (Activity at Quarters)

- Voting
- ARS (Audience Response Systems)
- Peer Instruction (ConceptTest)
- 3 minute drill
- Swing around
- Add & Delete (Hand-off)
- Speed search
- WWYD?
- Bucket of Balls
- Take the mike (Karaoke)

Voting (Making A Public Decision)

ARS: Audience Response Systems


Voting

Alex is a 3rd year student who is defensive and confrontational when feedback is provided. Instead of discussing the feedback, Alex makes excuses and argues. Last week, Alex got into a loud and hostile conversation with an instructor about “favoritism” while clinic staff and patients watched. Monday, in front of a patient's family, Alex argued with another student who he accused of “showing off” for instructors.

Today, Alex received his mid-rotation evaluation from you (team leader), which included low marks for professionalism and interpersonal skills. Instead of talking to you, he stormed into the office of the clerkship director demanding that the evaluation be changed. Alex angrily stated that he was struggling because of the poor teaching on this clerkship.

Pick two options in sequence:
1. State expectations more clearly; set behavioral goals
2. Ask Alex to self-assess & initiate discussion of personal stressors
3. Repeat the rotation (remediate)
4. Change training location (different clinic site)
5. Increase individualized coaching (guide on the side)
6. Refer for psychosocial & assessment & counseling

2 & 6: 54%
1 & 2: 38%
2 & 5: 23%
4 & 6: 07%
5 & 6: 09%
Peer Instruction (PI)


- Present a ConceptTest question to class
- Students answer individually
- Answers shown without correct response
- Student teams meet to discuss their answers
- Repeat question; students answer again
- Show & discuss correct response

Pre-Post Course Gains
- Trad Lecture: 8-21%
- PI Lecture: 14-33%

Peer Instruction Example

A 69-year old man has a restricted diet that includes no fresh citrus fruits or leafy green vegetables. His teeth are loose and his gums bleed easily. This patient’s disorder most likely results from a defect in collagen synthesis that involves which of the following amino acids?

- (A) Arginine
- (B) Cysteine
- (C) Histidine
- (D) Hydroxyproline
- (E) Leucine

- Organize lecture around 4-5 questions
- Students answer, discuss & answer again
- Learn correct response, discuss why
- Mini-lecture to reinforce concept

Swing Around

What is Emotional Intelligence (EI)?
- Discuss within your team
- Identify 3 concepts that your team knows about EI
- Select a reporter
- Report when your turn

Emotional Intelligence: Ability to recognize and control the emotions of oneself and others

IQ

- Self-awareness
- Social awareness
- Relationship management
- Effective communication
- Adaptability

Add & Delete (Hand-Off)

(Used for topic kick-off or topic review)

- Within your team, write 3 characteristics of “the best teachers we ever had” [1 minute]
- Pass your list clockwise to the next team.
- Receiving team deletes one item from the list they received and adds two new items that do not overlap with existing items [1 minute]
- Pass your edited list clockwise to the next team.
- Repeat process: delete one item & add two new items [1 minute]

WWYD?

- You are carving a Class 2 amalgam
- The marginal ridge broke
- What are all possible reasons?
- What is the most likely cause & why?
- What would you do – right now?
Does Learner Activity in Classrooms Make A Difference?

- Exam scores: 4 - 18% better than conventional lecture; 6.6% ave for 225 studies
- Interactive lecture significantly reduced course failure
- Effect size: .60 - .81; equivalent to one letter grade improvement per student
- Long-term retention: few quality studies, but results dramatically favor interactive

  - Interactive lecture gain score doubled conventional one-way lecture: 47 vs. 23

Best Wishes

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