**Education 2011: Pedagogy, Assessment, and Technology**

**National Postdoctoral Association Meeting**
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**Pedagogy in 20 Minutes**

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**Learning Objectives**

1. Understand the differences between pedagogical techniques.
2. Gain insight into the use of cooperative learning techniques in the classroom.
3. Experience cooperative learning methods.

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**What is Pedagogy?**

1. Lecture
2. Seminar
3. Cooperative Learning

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**Introduction to Cooperative Learning: Think-Pair-Share**

- Take a minute to reflect on your experiences with PowerPoint, lecture, and seminar.
- Now turn to a partner near you and share your knowledge.
- Do you have anything to share with the group?
What is Pedagogy?

1. Lecture
2. Seminar
3. Cooperative or Active Learning

Cooperative Learning Strategies

- Think-Pair-Share
- Peer Led Team Learning
- Focused Listing/Brainstorming
- Two Minute Papers
- Case Study

Cooperative Learning Increases Retention

Why Use Cooperative Learning?

- Positive Interdependence
- Face-to-Face Interaction
- Individual & Group Accountability
- Interpersonal & Small-Group Skills
- Group Processing

3. Experience a Cooperative Learning Technique: Case Study

Using a case study:
1. Design learning objectives.
2. Create or select a case to highlight learning objectives. Use Resources such as the National Center for Case Study Teaching in Science.
3. Allow enough time for students to thoughtfully complete the case study. A case can last several minutes up to several weeks.

A Sample Case Study on Drugs of Abuse for an Undergraduate Psychology Course

- You and your friends decided to go out dancing on Saturday night. You arrive at the club and see another classmate from your Brain & Behavior class. You go over and say hello to her and to see what she thought of the first exam, but she seems to be acting very strange. She starts describing fantastic colors the lights in the club are making and how the dance floor is a beautiful sea of diamonds. You turn around to take a look and realize the lights are nothing special, while the floor is definitely made of wood. You take another look at your classmate; her pupils are dilated and she says she’s a bit chilly. You ask her how long she’s been there and she says hours. You know, however, that the club has only been open an hour.
- What drug is your classmate on?
A Sample Case Study: Original Instructions for Students

1) Determine what drug the individual in your case has been using.
2) Why do you think it is that drug?
3) Determine what the subjective effects of the drug are (i.e., how does the person feel after using the drug).
4) Determine what receptors, transporters, or neurotransmitters are known to be involved and how the drug affects these receptors, transporters, or neurotransmitters.
5) Create 1 PowerPoint slide describing your findings.
6) You may use your textbook, and at least 1 more source. List this at the bottom of your assignment sheet.

Educational Assessment

Staying on the Right Track

Learning Objectives

- Define assessment in the context of education research.
- Determine the basic tools and steps in completing a successful assessment.


- What is assessment and how does assessment differ from traditional assignments in the classroom?
- Why do we assess and how can we get better?
- How does assessment help instructors, faculty & administrators?

Assessment: How to get Started?

- Identify a question/problem
- Who is your target population?
- Design an instrument
- Get needed approvals
- Institutional Review Board (IRB)
- Give your instrument to your target population
- Data Analysis
- Apply analysis to question/problem
Defining Your Study: A Good Question Makes All the Difference

- Question: Do students learn better with multiple choice or essay questions?
- Who is your population?
- What will be measured?
- What is success?
- Revised Question: Do students in my BIO310 show the retention of 3 key concepts about bacterial growth using multiple choice or essay questions on a mid-term exam?

Practice Makes Perfect: Instrument Design

- Research Question: Does a brief introduction in pedagogy techniques result in implementation of specific pedagogy techniques at home institutions by post-docs and/or faculty members?
- In groups of 3-4 design 3 instrument questions which would help you answer the question above.

Navigating the Numbers: Survey Coding

- What is survey coding?
- Coding a survey allows you to turn text-based survey responses into numerical data to be used by statistical software packages
- Keeping a Code Book

Making Sense of It All: Data Analysis

- Common Analysis Techniques
  - Descriptive Statistics
  - Frequency Table
  - Histogram
  - Pie Diagram
  - Cross-tabulations
  - Statistical Analysis
  - Why use statistics?
## Descriptive Statistics – Cross-tabulations

### Cross Tabulation of Find Position & Degree From

<table>
<thead>
<tr>
<th>How did you Open</th>
<th>Response Count</th>
<th>% within</th>
<th>% within</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment</td>
<td>USA</td>
<td>9</td>
<td>39.1%</td>
</tr>
<tr>
<td>Recruitment</td>
<td>Other Country</td>
<td>14</td>
<td>60.9%</td>
</tr>
<tr>
<td>Find Position</td>
<td>Degree From</td>
<td>23</td>
<td>100.0%</td>
</tr>
<tr>
<td>Word of Mouth</td>
<td>Response Count</td>
<td>19</td>
<td>65.5%</td>
</tr>
<tr>
<td>Find Position</td>
<td>% within</td>
<td>10</td>
<td>34.5%</td>
</tr>
<tr>
<td>Degree From</td>
<td>% within</td>
<td>29</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

## Making Sense of It All: Data Analysis

- **Common Analysis Techniques**
  - Descriptive Statistics
  - Frequency Table
  - Histogram
  - Pie Diagram
  - Cross-tabulations
  - Statistical Analysis
  - Why use statistics?

## Wrapping it Up

- **Why is assessment important?**
- **How can assessment help make your job easier?**
- **What makes a good assessment?**
  - A thoughtful research question
  - A well-planned and targeted instrument(s)
  - Clear presentation of assessment results

http://www.physiology.emory.edu/FIRST/NPA/NPAIndex.html

## Education Technology

- **Bloom’s Taxonomy and Technology**
  - Higher Order Thinking Skills
    - Evaluation
    - Synthesis
    - Analysis
    - Application
    - Comprehension
    - Knowledge
  - Lower Order Thinking Skills
  - Higher Order Thinking Skills
    - Creating
    - Evaluating
    - Analysing
    - Applying
    - Understanding
    - Remembering
  - Lower Order Thinking Skills

Bloom's Digital Taxonomy

http://www.physiology.emory.edu/FIRST/NPA/NPAIndex.html
Why technology?

- iTunes U
- Blogger
- Skype
- Google Docs

Understanding
- Creating
- Evaluating
- Analyzing
- Applying
- Understanding
- Remembering

Higher Order Thinking Skills

How to Introduce Technology

- Start with a learning objective or a classroom problem
- Pick a technology
- Strategies to implement technology into classroom

Start with a Learning Objective or Classroom Problem

- Promote an active classroom
- Increase participation
- Encourage collaboration and group work
- Get frequent feedback on teaching
- Improve student writing
- Supplemental Course Material
- Address a difficult topic
- Simplify Grading/Evaluation
- Reduce plagiarism
- Large classroom grading, assessment, and attendance

Pick a Technology

- Clickers
- Skype/ooVoo
- Google Docs (collaborative documents)
- Websites
- Blogs
- YouTube/TeacherTube

- Wikis
- Podcasting
- Audio
- Enhanced (with slides or pictures)
- Video
- Digital Story Telling
- Diigo (annotating websites)

- Turn-it-in (plagiarism tool)
- Guided Inquiry labs
- On-line quizzes
- Adaptive Quizzing
- Survey Monkey

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Clickers

Juana Mendenhall
Assistant Professor
Morehouse College
Chemistry Department

Promote an active classroom

Why Use Clickers?

ARS: Audience Response Systems

Skype or ooVoo

What are the advantages and disadvantages of using Skype to bring in speakers to talk during class?

Collaborative Documents

Advantages
- Free
- Fosters team work
- Real time collaborative writing
- Revision history for grading
- Commenting

Requirements:
- Internet
- Google account
- Other Options instead of Google Docs
- MindMeister

Implementation

Pick only 1 NEW technology per semester
SELL IT!!!
Have a back-up plan

To avoid:
- Being overwhelmed
- Frustration for you and your students
- To reduce amount of time
Implementation

- Pick only 1 NEW technology per semester
- SELL IT!!
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Explaining why you are implementing technology will increase buy in.

How to Sell:
- Show data
- Talk about how it will improve grades
- How relates to job or life

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Workshop Website

http://www.physiology.emory.edu/FIRST/NPA/NPAIndex.html

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Question or Comments