Using a ‘Flipped Classroom’ to Teach Psychology

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Overview
- What is a ‘flipped classroom’?
- Selection of courses to ‘flip’
- Implementation
- Student reactions
- Results
- Discussion

What is a ‘Flipped Classroom’?

Traditional Classroom
- Information is disseminated in class, primarily through lectures, with varying degrees of discussion
- Students apply the information at home by completing homework assignments

Traditional Classroom -- Problems
- Information is disseminated in class, primarily through lectures, with varying degrees of discussion
- Students typically say they understand and ask few questions
- Struggle on exams
- Students apply the information at home by completing homework assignments
- Answers are often not what we expect
- We don’t know what went wrong because we can’t see the students’ thought processes
**Flipped Classroom**  
(Herreid & Schiller, 2013; Roehl, Reddy, & Shannon, 2013)

- Information is disseminated at home via video lectures
  - Typically 20-30 minutes long
  - Students can pause, go back over more complicated parts, and watch the entire lecture again as an exam approaches
  - Quizzes to ensure that students have watched the videos
- ‘Homework’ is completed during class time
  - Problems require students to apply the information from the videos
  - Students work in groups, with instructor circulating
  - Whole class discusses the problems, working through what went right vs. wrong in the groups

**Selection of Courses to ‘Flip’**

**Scientific Method in Psychology**

- Students often struggle in this course
- After passing, students struggle with methodology in later classes
- Homework answers previous time teaching often left me asking, “What on earth were they thinking when they wrote that?”
- Purpose is NOT for students to memorize information, but to be able to APPLY the information to design and evaluate research studies

**Intro to General Psychology**

- 40 students per section, so many students don’t participate
- Students struggle with conceptual and applied questions on exams, even when they have access to some or all of their course materials
- Flipped one chapter, and plan to flip 1-2 more each semester
  - Learning chapter
  - Problem solving
Implementation

Basic Requirements
- Software to record screencasts for video lectures
- Screencast-O-Matic
- Venue to post videos
- YouTube (via links posted on Blackboard)
- Portable whiteboards and erasers in carrying case
  - 20" x 30"
- Dry erase markers
- Students required to bring

Example Video Lecture Slide
Key Points to Look For:
- Review: Definitions of variable, operational definition, IV, DV, extraneous variable
- Types of independent variables
- Participant characteristics
- What extraneous variables (confounders) do to your results
- Types of dependent variables and characteristics of a good DV
- Noise variables

In class, you will be expected to:
- Begin designing experiments by identifying and operationally defining the different variables relevant to answering a research question

Example Quiz

1. Which of the following is NOT a type of DV?
   a. Emotional
   b. Frequency
   c. Tension
   d. Voice volume

   a. Emotional
   b. Frequency
   c. Tension
   d. Voice volume

2. A good DV for measuring anxiety is ________ and ________.

   a. emotional
   b. frequency
   c. tension
   d. voice volume

   a. emotional
   b. frequency
   c. tension
   d. voice volume

3. In a past experiment, the researcher measured the number of...

   a. participants
   b. participants' characteristics
   c. extraneous variables
   d. data manipulation

   a. participants
   b. participants' characteristics
   c. extraneous variables
   d. data manipulation

4. A variable that increases the probability of one outcome over another, thereby making the results of an experiment less clear and ________ variable.

   a. contingent
   b. random
   c. manipulated
   d. confounded

   a. contingent
   b. random
   c. manipulated
   d. confounded

Example Discussion Questions

Chapter 4 Discussion Questions
1. Come up with two research questions that you think would best be answered by conducting an experiment.
2. Write a research hypothesis for one of the questions.
3. Identify and operationally define the four types of variables.
4. What type of IV did you choose? What type of DV?

Example Exam Questions
8. Research shows that married people who have sex at least once a week tend to be happier in their relationships than those who do not. You are interested in exploring why. Design a study to investigate one possible explanation for this relation.
   a. What research method would you use? (1 point)
   b. What is your general hypothesis? (1 point)
   c. What is your research hypothesis? (1 point)
   d. What is your IV? Operationally define it. (2 points)
   e. What is your DV? Operationally define it. (2 points)
   f. Identify two extraneous/nuisance variables. How would you control each one? (3 points)
   g. How would you assign participants to these groups? (1 point)
   h. If your results show differences in the outcomes for the different groups, what would you be able to conclude? (1 point)

12. You are researching people’s opinions of three different movies: Nighthawks on Elm Street, Fear Willis, and Harry Potter, so you have people come to your laboratory movie theater and watch three movies, back to back. Which of the following is an example of a carryover effect?
   a. After a few hours, participants just get bored with watching movies.
   b. When participants fall asleep in the theater, the movie score's intensity decreases but after a while, they get used to it and no longer bother them.
   c. After the first movie, participants feel it is exciting to stay and watch another.
   d. After watching Nighthawks on Elm Street, participants can’t shake the bad movie.
Student Reactions

Scientific Method

- Lots of griping because they felt like they didn’t know what to expect on the quizzes or exams or how to prepare
- Slides added to lectures guiding students toward key points
- The exams were VERY similar to what they did in class
- I held in-class exam reviews with practice exam questions
- Students acknowledged later in semester that the exams never asked them to do anything they hadn’t done in class
- Complaints that they ‘weren’t getting credit for their class work’ and didn’t like that exams counted so heavily
- The class work prepared them to earn credit on exams
- Succeed in class by demonstrating that they’ve learned the material via exams - Necessary for next course in sequence
- There was extra credit awarded for attendance and participation
- Demonstrated in class that they were learning how to design research studies

Intro Psych (1 Chapter)

- Students’ opinions about the flipped classroom experience were overwhelmingly positive
- They thought they learned better this way
- Everyone in class was engaged and the students were able to help each other through their difficulties. They seemed to understand better than students in previous semesters
- Flipped chapter was right around Thanksgiving, so there was a lot of absenteeism

Results

Intro Psych (1 Chapter Flipped)

- Participants
  - Excluded students with attendance <80%
  - 3 sections with flipped chapter Fall 2015 (n=52)
  - 2 control sections Spring 2015 (n=53)
- Measures from Final Exams (all reported as percentages)
  - Questions on flipped chapter material
    - 4 Q’s that were identical for both groups (Flip Matched)
    - 11 Q’s total for each group (Flip All)
  - Control questions from other chapters
    - 3 Q’s that were identical for both groups (Non-Flip Matched)
    - 20 (flip) and 25 (control) Q’s total (Non-Flip All)
  - Overall exam scores for each group (Exam Total)
Scientific Method

- Participants
  - One outlier excluded from Control group (scored ~20% higher than next highest score, more than 2 SD from mean)
  - One section with flipped classroom Fall 2015 (n=17)
  - One control section Fall 2014 (n=10)
- Compared overall Final Exam scores as percentages
  - The exams were entirely different, as the textbooks were very different and the flipped classroom exams were specifically designed to test questions similar to those solved in class
  - Many of the concepts being tested were similar
  - Both exams a mixture of open ended and multiple choice Q's

Discussion

Summary of Findings

- Student opinions did not match up with quantitative results
- No quantitative evidence that the flip was effective in Intro Psych
- Scientific method students earned significantly higher final exam grades with the flipped format than the traditional format

Discussion

- Although there is some evidence that the flipped classroom was successful for teaching Psychology, must interpret with caution
  - Lots of absenteeism in Intro Psych
  - Changed textbooks for both courses
  - Poor writing skills may hinder students on open-ended test questions
- Subjectively, I think my students learned better in the flipped classroom
- As Dr. Lloyd pointed out in his flipped classroom workshop, when first semester Biology is flipped, the results become evident in the second semester course, not the first
  - True test may come when Scientific Method students take Experimental Psychology

Questions?