Promoting Active Learning Through a Flipped Course Design

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Outline

1. What is blended learning?
2. What is flipped learning?
3. Theoretical foundations including PBLT & CTT
4. Advantages & disadvantages
5. Flipped Psychology Statistics Course: A field Experiment
6. Best practices for flipped classroom design
7. Application to other fields: examples & discussion
Distance Learning Courses

* 9.6% increase in online enrollments from 2002 to 2012
* “Digital natives” prefer autonomy
* Faculty perceptions of distance learning courses are positive, but recognize increased work

(Allen & Seaman, 2011; Davis Deil-Amen, Aguilar, & Canche, 2012; Callaway, 2012; Muirhead, 2002; Ocak, 2012)
Blended Learning

- Traditional: face-to-face
- Online: internet delivery
- Hybrid: combines face-to-face with online

Blended learning implies mingling together in ways that lead to a well-balanced combination, uniform, and harmonious mixture.

“At its simplest, blended learning is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences” (p.96).

(Allen & Seaman, 2011; Osguthorpe & Graham, 2003; Garrison & Kanuka, 2004)
Student Centered Blended Learning

Teacher led Instructions
- face to face sessions
- Interactive

Printed Instructions
- traditional study material

Computer Mediated Instructions
- digital
- visual
- e-learning

Web based Assessments
- feedback
- reflection
- outcomes
Flipped Learning

🌟 Utilizes blended learning to reorganize the structure of a typical classroom model

🌟 Using the internet to deliver content

🌟 Motivated by problems with traditional lectures

(Lage et al., 2000; Foertsch, Moses, Strikwerda, & Litzhow, 2002).
Flipped Classroom Made Easy

Traditional Classroom

- Happens FIRST:
  - Lecture
  - Assign Homework

Flipped Classroom

- Happens FIRST:
  - View Instructional videos at home OR
  - Listen to teacher podcasts
  - Complete quick assessments so teachers can gauge understanding before tomorrow’s class

- Happens SECOND:
  - Do schoolwork (what used to be assigned for homework) together with teacher and peers
  - Teachers can offer one-on-one help

Home

- Complete Homework

School
Theoretical Foundation

Project Based Learning Theory (PBLT)

- Student Centered
- Focused on a project that is experienced by the students as a means for instruction
- Intrinsic motivation, collaboration, problem solving, self-directed learning
- Teacher = facilitator
- Flipped Classroom:
  - Time to work collaboratively to solve problems
  - Pharmocotherapy class

(Helle et al., 2006; Adderley, 1975; Hmelo-Silver, 2004; Pierce, Fox, & Dunn, 2012)
Theoretical Foundation
Cognitive Taxonomy Theory (CTT)

* A way to categorize & identify types of cognitive processes
  1. Remembering
  2. Understanding
  3. Applying
  4. Analyzing
  5. Evaluating
  6. Creating

* Flipped classroom:
  * Build strong base outside of class & higher level in-class
  * Application work in class

Bloom, 1956; Anderson & Krathwohl, 2001; Krathwohl, 2002)
<table>
<thead>
<tr>
<th><strong>Pros</strong></th>
<th><strong>Cons</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students no longer struggle with challenging concepts alone outside of class time.</td>
<td>Making sure every student has a computer and Internet access.</td>
</tr>
<tr>
<td>Students can skip parts of the lesson they already understand and re-watch new or challenging ideas.</td>
<td>Students cannot ask questions for clarification during a recorded lesson.</td>
</tr>
<tr>
<td>Applied learning in the classroom.</td>
<td>Technology issues.</td>
</tr>
<tr>
<td>Differentiated instruction.</td>
<td>Designing and grading frequent quizzes.</td>
</tr>
<tr>
<td>Students are given ownership and responsibility for their own learning.</td>
<td>Students have trouble “buying in” to instruction, especially when it is not created by the instructor.</td>
</tr>
<tr>
<td>Students come to class prepped and ready to learn. No down time.</td>
<td>Determining how to handle students who do not complete the homework video.</td>
</tr>
<tr>
<td>Videos include links for deeper thinking and further learning.</td>
<td>Creating or finding quality videos for each lesson.</td>
</tr>
<tr>
<td>Teacher can spend class-time working one-on-one or in small groups with students.</td>
<td></td>
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Flipped Psychology
Statistics
A field Experiment

Objectives
1. Examine students’ perspectives on the new teaching methodology
2. Compare students’ statistical knowledge between the two courses
3. Compare students’ attitudes toward diverse groups between the two courses
Diversity in Stats?! 

- Application Days 
- Students read guest speakers research articles 
- Class time was spent dissecting the articles research methods and statistics 
- Final course project collecting & analyzing data on a social justice issue of the students choice
Participants

Table 2. Participant Demographics

<table>
<thead>
<tr>
<th></th>
<th>Hybrid (n = 50)</th>
<th>Traditional (n = 59)</th>
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</thead>
<tbody>
<tr>
<td>Mean Age (SD)</td>
<td>19.04 (.90)</td>
<td>19.44 (2.46)</td>
</tr>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>15.3</td>
</tr>
<tr>
<td>Female</td>
<td>84</td>
<td>84.7</td>
</tr>
<tr>
<td>Year in School (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>42</td>
<td>49.2</td>
</tr>
<tr>
<td>Second</td>
<td>36</td>
<td>32.2</td>
</tr>
<tr>
<td>Third</td>
<td>18</td>
<td>11.9</td>
</tr>
<tr>
<td>Fourth</td>
<td>4</td>
<td>6.8</td>
</tr>
<tr>
<td>Race (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Asian</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>Latino/a</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Caucasian</td>
<td>84</td>
<td>94.9</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>1.7</td>
</tr>
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</table>
Materials & Procedures

1. Survey of Attitudes Towards Statistics Scale
   * Affect, cognitive competence, value & difficulty

2. Statistical Content Knowledge
   * MC items
   * Developed by a third party (faculty member)

3. Cultural Sensitivity Scale
   * self-esteem, self-monitoring, open-mindedness, empathy, interaction involvement, & suspending judgment.

(Schau, Stevens, Dauphinee, & DelVecchio 1995, Schau, 1999; Chen & Starosta, 2000).
Results

Statistics Knowledge

Mean Score

Traditional

Flipped

P < .05
Results

Cultural Sensitivity

Mean Score

P < .05

Traditional

Flipped
Results

**Table 2. Mean Scores on Pretest and Posttest Measures for Each Statistics Course**

<table>
<thead>
<tr>
<th></th>
<th>Flipped (n = 50)</th>
<th>Traditional (n = 59)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stat Knowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>9.12</td>
<td>8.22</td>
</tr>
<tr>
<td>Post*</td>
<td>16.04</td>
<td>14.22</td>
</tr>
<tr>
<td><strong>Stat Attitudes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>28.22</td>
<td>26.85</td>
</tr>
<tr>
<td>Post</td>
<td>26.34</td>
<td>26.63</td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>32.30</td>
<td>30.24</td>
</tr>
<tr>
<td>Post</td>
<td>29.80</td>
<td>29.36</td>
</tr>
<tr>
<td>Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>43</td>
<td>43.27</td>
</tr>
<tr>
<td>Post</td>
<td>41.72</td>
<td>40.03</td>
</tr>
<tr>
<td>Difficulty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>29.88</td>
<td>29.07</td>
</tr>
<tr>
<td>Post</td>
<td>28.2</td>
<td>28.32</td>
</tr>
<tr>
<td>Cultural Sensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>77</td>
<td>72.71</td>
</tr>
<tr>
<td>Post</td>
<td>99.68</td>
<td>94.14</td>
</tr>
</tbody>
</table>

*Note. (*) denotes p < .05.*

* 1\textsuperscript{st} & 2\textsuperscript{nd} year students’ attitudes toward statistics became negative.

* 3\textsuperscript{rd} & 4\textsuperscript{th} years’ attitudes became more positive.
Conclusions

 Flipping the class offered more opportunities for active learning as well as infusion of diversity topics. Although this did not significantly affect attitudes toward statistics, students in the hybrid class appear to have retained more information and increased cultural sensitivity.

 The blended & flipped classroom might be best suited for older students
Best Practices in Flipped Classroom Design

1. Determine blend that meet class needs.
2. Audio & visual materials help but both parties have to know how to work the technology.
3. Establish community & expectations
4. Assignments and Learning objectives should match with online or face-to-face portions and should be based on student learning.
5. A high level of faculty involvement necessary.

(Brothen & Wambach, 2007; Gecer & Dag, 2012; Masalela, 2009; Osguthorpe & Graham, 2003; Stacey & Gerbic, 2007; Strayer, 2012; Tao, Fore, & Forbes, 2011).
Application to other courses and fields

• Any course can be flipped!
  • Consider use of new technology such as echo360

• Small group discussion:
  • What are other ways that you could flip the classroom?

• Are there specific technologies within your content domain that could help?
Thank you!

- Additional questions or discussion?

- Chapter copies are available via email upon request.

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