Flipped Learning: Pathway to Student Success

Erik Christensen

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Sound Familiar?

“My students seem to always come to class unprepared!”

Brain Activity

Active Learning  Passive Learning

crazyforeducation.com
Tell me and I forget.  
Teach me and I remember. 
Involve me and I learn.

~Benjamin Franklin

Virtual Self-Reflection
Ask students to reflect on their learning
Many students have no clue what their grade is. So, I simply ask them two questions:
- What do you think your current grade it?
- What do you need to do to improve?
Great opportunity for virtual counseling

A Solution:
THE FLIPPED CLASSROOM
Flipped Learning: Pathway to Student Success

Seven Principles for Good Practice in Undergraduate Education
Chickering and Gamson (1987)

1. Encourages contact between students and faculty, ✔
2. Develops reciprocity and cooperation among students, ✔
3. Encourages active learning, ✔
4. Gives prompt feedback, ✔
5. Emphasizes time on task, ✔
6. Communicates high expectations, and ✔
7. Respects diverse talents and ways of learning, ✔

Flipped
Changing How Instruction is Delivered

Flipped Learning Pioneers
Aaron Sams  John Bergman
Best use of classroom time?

• **Before Class**
  – First Exposure
  – Self-paced

• **During Class**
  – Deeper understanding
  – Individualized support

• **After Class**
  – Build confidence
  – Extra practice

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Best use of classroom time?

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Best use of classroom time?

• **Before Class**
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• **During Class**
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  – Individualized support

• **After Class**
  – Reflection
  – Build confidence
Why Flip Your Class?
• Students responsible for their own learning
• Students learn more deeply
• Students are more active participants
• Interaction will skyrocket
• More feedback for you and your students
• More fun to teach!

Student Benefits
• Higher quality of student engagement/learning
• Look forward to coming to class, retain more, and are more engaged
• Increased confidence in their knowledge
• Improved mastery and retention of information
• Personalized learning
• Better grades

Who is Flipping Classes?
Stanford
MIT
Harvard
Princeton
Duke
San Jose State University
University of Virginia
Harvey Mudd

Your Institution?
My Inspiration
San Jose State University’s Electrical Engineering Department paired up with online edX material from MIT

*Pass rate increased from 55% to 91%*

So I flipped my classes

- PHY 2048 General Physics w/ Calculus I
- PHY 2049 General Physics w/ Calculus II
- PHY 2053 General Physics I
- PHY 2054 General Physics II
- IDH 2002 Intro to Astrobiology
My Flipped Learning Strategy

<table>
<thead>
<tr>
<th>Before Class</th>
<th>Inquiry</th>
<th>Collaborative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transfer of Knowledge</td>
<td>Individualized</td>
</tr>
<tr>
<td>During Class</td>
<td>Scaffolded Engagement</td>
<td>Collaborative</td>
</tr>
<tr>
<td>After Class</td>
<td>Reflection</td>
<td>Individualized</td>
</tr>
</tbody>
</table>

Student Perceptions

**Before**

**After**

Traditional

Flipped

Failure Rate

<table>
<thead>
<tr>
<th>Flipped</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>22%</td>
</tr>
</tbody>
</table>
Class Average Grade

<table>
<thead>
<tr>
<th></th>
<th>Flipped</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>3.00</td>
<td>2.35</td>
</tr>
</tbody>
</table>

That’s a 28% increase!

Final Grade Distribution
Flipped vs. Traditional (N=42)

The Statistics

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Flipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Mean (out of 1000)</td>
<td>759</td>
<td>819</td>
</tr>
<tr>
<td>Median</td>
<td>809</td>
<td>832</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.466</td>
<td>1.340</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.710</td>
<td>-1.128</td>
</tr>
</tbody>
</table>

p < 0.05 (Mann-Whitney U)
Strategies for the first week
- Explain your expectations
- Be patient but firm
- Solicit student feedback
- Be consistent
- Reward compliance

Issue
How do I get students comfortable asking questions at the start of the term?

Problem: Often students are reluctant to ask questions, especially the first couple days of class
A Solution: Name Tent Plus

Inside of name tent

Name Tent Plus Activity

If your name is Bob, label your tent like this

Issue

How do I get students to understand the requirements of my flipped class?

Problem: They don’t/won’t read the syllabus
A Solution

• List the key requirements and due dates for the course.
• Make them sign and return it electronically.

Issue

How can I minimize excuses from students that they could not access material due to computer/Internet problems?

Backup Plan

• Have students to identify in advance what they will do if either their computer or Internet connections fails.
• Post responses on a Discussion Board for all to see.
**Issue**

How do I reach and engage students who struggle in a text-dominated classroom?

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**Possible Solutions**

For **Aural Learners** – screencast PowerPoints

![Screencastomatic](http://www.screencast-o-matic.com)

For **Visual Learners** – Concept Map

![Concept Map](http://www.screencast-o-matic.com)
20/20 Reflection
Makes students to reflect on what they have just learned
Great way to see if they really understand a difficult concept

*In 20 words or less, summarize a flipped classroom.*

*In 20 words or more, describe your thoughts and concerns about being in a flipped classroom.*
Scaffolded Approach

Before Class

- Read Textbook & Watch Screencast Videos
- Complete Reading Questions & Discussion Board
- Collaborative Problem Solving
- Collaborative Activity
- Challenge Problem & Discussion Board

Before Class

Essential component of the class

Meaningful assignments to build foundational knowledge

Address different learning styles

Require something to be turned in

Online Discussion Board

- Your LMS should have one, but also try...
  - Voicethread.com
  - Popplet.com
  - Padlet.com
  - En.linoit.com
  - Realtimeboard.com
  - Pinboard [http://pinsi.de](http://pinsi.de)
Online Polling

- Polldaddy.com
- Polleverywhere.com
- Socrative.com
- Todaysmeet.com

Astrology is...

Before Class

Padlet.com

Before Class

Transfer of Knowledge

Replacement for traditional lecture

A series of structured assignments

- Video lectures (15 min maximum)
- Pair with an online engagement activity
- Podcasts
- Reading Assignment

Before Class
Adding Videos

- Simple and free
- Students are already there!
- Any digital camera or smartphone will do
- I use Camtasia to edit
- The shorter the better (6 minutes maximum)

Podcast

- Audioboom.com
- Soundcloud.com
- Vocaroo.com
- Audacity.com

*Sometimes all you need is a little audio*

Cornell Notes

- Reduce for recall
- Record
- Reflect

(Hulet, 2011)
Nothing New!

Leonardo da Vinci may have used a form of focused notetaking!

Reading Assignments

Cornell Notes

Answer 5 Key Questions
Write 3 Questions
Summarize & Reflect

During Class
During Class

**Scaffolded Approach**

**During Class**

- Challenge Problem & Discussion Board
- Collaborative Problem Solving
- Collaborative Activity
- Complete Reading Questions & Discussion Board
- Read textbook & watch videos

**During Class**

The *most* important part of the course

Goal is to make it...

- Engaging
- Enjoyable
- Effective

**During Class**

Scaffolded approach

Peer/Instructor Support

Low stress but performance-driven

Require *something* to be turned in
Guided Inquiry Activity

A few simple activities
Quantitative
Qualitative

During Class

Jigsaw Activity

During Class

Gallery Walk

During Class
Matching Exercise

Great way to review new vocabulary

During Class

58

5-Word Exercise

Explain image in 5 words
Discuss with partner

Have a partner write an explanation for each of your words

During Class

59

In-Class Polling

Polleverywhere.com
Polldaddy.com
Padlet.com
Todaysmeet.com
Titanpad.com
Primarywall.com
Clickers

During Class

60
Carousel Activity

During Class

Exam Review 3x5

During Class

Exam Wrapper

During Class

I still don’t understand...

Have students define what they want to review before each exam

Exam Wrapper

After the exam, ask students to reflect on their performance and answer...

- What should I stop doing?
- What should I continue doing?
- What should I start doing?
After Class

Scaffolded Approach

Challenge Problem & Discussion Board
Collaborative Problem Solving
Collaborative Activity
Complete Reading Questions & Discussion Board
Read Textbook & Watch Videos

After Class

Reflection
Confidence building
Require something to be turned in
Challenge Problem

• Opportunity to apply what they learned in class without assistance
• Can be as simple as...
  • End of the chapter problem
  • Old quiz problem

Post-Class Discussion Board
Extend the engagement and learning beyond the class period.

1. Explain...
2. What is still unclear from today’s class?
   Must post before seeing others

Exam Essay Questions
Online Discussion Board

- Your LMS should have one, but also try...
  - Voicethread.com
  - Popplet.com
  - Padlet.com
  - En.linoit.com
  - Realtimeboard.com
  - Pinboard [http://pinsi.de](http://pinsi.de)

After Class

PhotoVoice

- **PhotoVoice = Photo + Paragraph**
- Students will constantly think about your course
- Take a photo of something related to the current chapter we are studying
- Write one paragraph explaining one concept and discuss how your photo relates
- Post on Discussion Board for all to see
The Flipped Classroom is Gaining Momentum in Higher Education

So How About YOU?

NMC Horizon Report 2015 Higher Education Edition

Implementation

Recommendations

Start Slow

“Test the water first”

- Just one lesson
- Just one chapter
- Just occasionally

Eventually...every class period!
Be Flexible

Be ready to change things based on how they are received by students.

*If it isn’t broken, don’t fix it*

**but**

*If it’s not working, change it*

High Tech / Low Tech

**High Tech**
- Videos
- Online materials
- Clickers

**Low Tech**
- Group discussions
- Live presentations
- Classroom discussions
- Written exercises

Integrate Technology

**Explore ways** to integrate them in your class.
- Use blogs, discussion boards, drop boxes, online assignments, and videos ...

Use technology **where it makes sense** but not just for the sake of integrating technology.
Students Don’t Do Optional
• Give points (even just a few) for any pre-class assignment and completion rates will soar.
• I use a simple 3-point scoring system and check more for effort than accuracy.

Have fun!
Be ready for increased student engagement
• student-to-instructor
• student-to-student
• both in class and out of class.

Quick Start Guide
• Define what you want to do in class
• Put material online to support (before & after)
• Use technology where it helps
  • Videos, online discussions, online homework
• Decide what you will do with “extra” time
  • Pacing will be faster than traditional
What if students come to a flipped class unprepared?

- Don’t accommodate them by lecturing!
- Let them struggle in class while others are being productive
- Can be minimized by collecting and grading assignments

Try it, you’ll like it! (and so will your students)

Questions
Online Resources

http://padlet.com/erikatSFSC/flipped

Thank You!

Erik Christensen
erik.christensen@southflorida.edu
863.784.7424