

Flipped Classroom for the Sciences



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Disclosure Statements

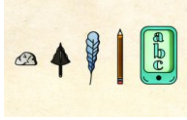
- The planner and presenter do not have any financial arrangements or affiliations with any commercial entities whose products, research or services may be discussed in this activity.
- No commercial funding has been accepted for this presentation.

Objectives

- Participants will learn the basic concepts of a flipped classroom concept
- Presenters will provide participants with examples and student perception regarding the flipped classroom model and how it enhanced the learning experience
- Participants will learn the basic technology used to implement a flipped classroom

Literature

- Flipped Classroom Infographic
<http://www.knewton.com/flipped-classroom/>
- Flip Your Classroom by Bergmann and Sam
<http://www.iste.org/store/product?ID=2285>
- Teacher Use Technology to Flip Their Classroom
<http://www.techsmith.com/flipped-classroom.html>



What We Did

Chose Content

Built Modules

Technology Used

- Flip Camera
- Video Storage
- Audio Lecture

Deployed modules

Surveyed for Student Perception

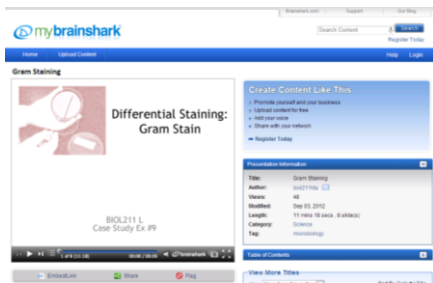
Choosing Content

- Limited in microbiology lab due to 50 minute time constraint.
- Chose lab techniques which were time-consuming to explain and demonstrate.
- Decided on 6 topics: aseptic technique, streak plating, simple staining, Gram staining, Spore staining and Acid-fast staining.

Content Included

- Each module included:
 - PowerPoint explaining topic
 - Video demonstrating technique
 - Online quizzes to assess the information within each PowerPoint and Video.

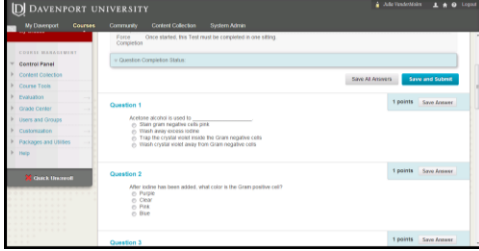
Example PowerPoint



Example Video



Example Quiz



Surveying for Student Perception

- The survey consisted of 10 questions:
 - 4 pertained to student learning
 - 3 pertained to student preparedness
 - 2 pertained to the use of technology
 - 1 pertained to time spent out of class
- Of the 22 students in the microbiology class, 16 completed the survey.

What We Found Out

Table 1. Quality of Flipped Learning Experience

Success Level	Number of Student responses	Percentage
Very Successful	9	56%
Mostly Successful	6	38%
Neutral	0	0%
Mostly Unsuccessful	1	6%
Very Unsuccessful	0	0%

What We Found Out

Table 2. Being able to watch the video demonstrations increased my abilities to achieve the learning objectives

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	14	88
Agreed	2	13
Neutral	0	0
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 3. By completing the video demonstrations outside of the classroom, the time we spend in class was more relevant to my own learning.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	10	63
Agreed	5	31
Neutral	1	6
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 4. By being able to watch a video of the lab technique prior to performing the technique, my time was optimized to enhance my understanding of the lab outcomes.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	12	75
Agreed	3	19
Neutral	1	6
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 5: By being able to watch a video of the lab technique prior to performing the technique, I felt prepared for the lab experience.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	9	56
Agreed	7	44
Neutral	0	0
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 6: By being able to watch a video of the lab techniques prior to performing the technique, my confidence in performing the technique was high.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	6	38
Agreed	9	56
Neutral	1	6
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 7: My lab experience was enhanced by being able to watch a video of the lab techniques prior to performing the technique.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	9	56
Agreed	6	38
Neutral	1	6
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 8: The instructor used technology to support my learning.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	13	81
Agreed	3	19
Neutral	0	0
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 9: The amount of technology used in this class was manageable.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	10	63
Agreed	6	38
Neutral	0	0
Disagreed	0	0
Strongly Disagreed	0	0

What We Found Out

Table 10: I spent more time on out-of-class assignments in this class than I would in a traditional lecture class.

Agreed/Disagreed	Number of Student responses	Percentage
Strongly Agreed	3	19
Agreed	4	25
Neutral	4	25
Disagreed	5	31
Strongly Disagreed	0	0

Should You Flip?

- Pedagogical Tool
- Areas to consider flipping
 - Technique or procedure
 - Review
 - Content to build upon

Flipping Tips

- Determine objective(s)
- Start small!
- Time limits
- Completion of an assessment
- Expansion upon flipped content

Setting Up the Technology

- Technology Tools Needed or Recommended
- Hardware
 - Flip Camera
 - Tripod
 - Computer
- Software
 - PowerPoint
 - BrainShark
 - Video hosting site

Questions and Comments

References

- Hertz, M. (2012, July 10). The flipped classroom: pro and con *Edutopia | K-12 Education & Learning Innovations with Proven Strategies that Work*. Retrieved March 11, 2013, from <http://www.edutopia.org/blog/flipped-classroom-pro-and-con-mary-beth-hertz>
- Namahoe, K. (2012, October 1). Bill Nye 'The Science Guy' Talks Flipped Classrooms -- THE Journal. *THE Journal: Technological Horizons in Education -- THE Journal*. Retrieved March 11, 2013, from <http://thejournal.com/articles/2012/10/01/bill-nye-the-science-guy-talks-flipped-classrooms.aspx>

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