

## 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.

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## 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

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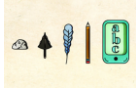
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## Literature

- 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>




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## What We Did

Chose Content

Built Modules

Technology Used

- Flip Camera
- Video Storage
- Audio Lecture

Deployed modules

Surveyed for Student Perception

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## 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.

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## Content Included

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

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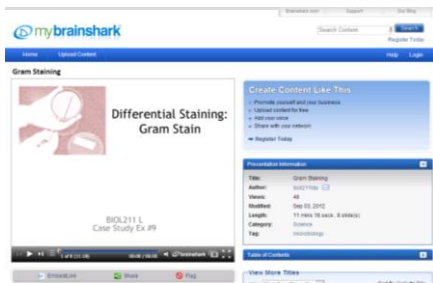
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## Example PowerPoint



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## Example Video



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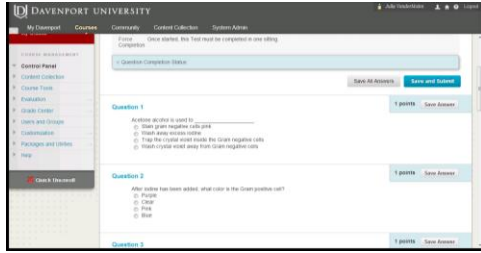
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## Example Quiz




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## 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.

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## 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%

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### 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

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### 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

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### 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

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### 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

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### 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

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### 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

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### 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

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### 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

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### 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

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### Should You Flip?

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

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### Flipping Tips

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

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### Setting Up the Technology

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

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## Questions and Comments

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## 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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