Instructor and Student Reflections of a Flipped Class Model in a Sensory Evaluation of Foods Laboratory Course

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Presentation Overview

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- Presenter
- Sensory Evaluation of Foods
- Flipped Classroom

Motivation & Execution
- Why we did it
- How we did it

Reflections
- Student

Lessons Learned
- Instructor
- Findings Summary
Presenters

- Joseph (Joey) Donald Donovan
  - Ph.D. candidate in Food Science and Human Nutrition
  - Teaching and Research Assistant

- Soo-Yeun (Soo) Lee, Ph.D.
  - Associate Professor
  - Associate Head for Academic Programs
Sensory Evaluation of Foods

Food Science and Human Nutrition Sensory Evaluation of Foods (FSHN 302) students are...

- Juniors & seniors (about 50 students total)
- Food Science and Human Nutrition majors or minors
- Have taken a basic statistics course
- Attend lab once a week (2 hours) and lecture twice (1 hour each)

“To understand and apply the knowledge of sensory evaluation as a discipline in the field of food science”
# The Flipped Classroom

Taking traditional lecture based assignments out of the classroom and bringing them online.

## Traditional Lectures

<table>
<thead>
<tr>
<th>Delivered in class</th>
<th>Brief comments on material</th>
<th>Worked on outside class</th>
<th>Assigned for homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>Discussions</td>
<td>Group Projects</td>
<td>Example Problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Watched online before class</th>
<th>Extended exploration of material</th>
<th>Completed during class</th>
<th>Worked on during class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flipped Class</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Baker 2000; Lange and others 2000; Zappe and others 2009; Walter-Perez and Dong 2012; Meyer 2003
Why we did it- Structure vs. Goals

• Was this structure meeting our goals?
  • Were students actively engaging lecture material in the laboratory?
  • Are students confident in their knowledge?
  • Were students learning how to become sensory scientists?
  • Were students working as a team?
Why we did it - Performance

• Laboratory quality scores
  • 2011: 4.7/5
  • 2012: 4.7/5

• Excellent average grades
• Student comments

“Make better use of lab time”
“Lab is a waste of time”
“The group project is disjointed”
“The lab could get repetitive”

“The course material is relevant to my major”
“The lab was very useful”
“To improve, connect lecture concepts to lab”

“The course is pretty good as is”

“Provide more examples”
How we did it

- **Instructor Lead**
  - Defined Problem Sets
  - Defined Exercises

- **Student Lead**
  - Group Project Focus of Lab
  - Student Designed Exercises

- **Active Discussion**
  - Defined Activities

- **Open Activities**
  - Group Project Outside Class
How we did it- Group Project Focus

• Group Project Focus of Lab
  • The project becomes the class and lab
  • A semester long project where students are
    • Assigned a product category and scenario
  • Design, Execute, and Analyze three types of sensory tests
How we did it-

- Open Laboratory Activities
  - Daily objectives set the stage
  - Activities progress project goals

Discrimination Testing 1: Test Design and Prep

Objective:
The main objective of this laboratory is to design and prepare the discrimination testing that will take place in the following week.

Procedure:

1. Testing Design
   A. You have been given a scenario and products that you will use to guide you through the sensory tests you will run during this course.
   B. In order to conduct a discrimination test, the design of the experiment and many logistical details must be carefully thought out and planned beforehand. As a group, please answer the questions included in your Group Project Assignment Questionnaires under “Difference Testing” to get a basic view of how you will conduct your test.

2. Rinse Protocol: The complexity of your sample will dictate the most appropriate rinse for your test. You may need to use combinations and multiple rinses. As a guideline, your final rinse should always be at room temperature. In order to determine which rinse to use, try the following rinses with your samples and see which works best. At the end of trying the various rinses, decide how many rinses you will use and the order below:

   1. Room Temperature Water: _____________________________

   ___________________________________________________________________

   2. Warm Water: _____________________________

   ___________________________________________________________________

   3. Carbonated Water: _____________________________

   ___________________________________________________________________
How we did it- Exercises and Discussion

• **Student Designed Exercises**
  • Students design their own tests
    • What questions to ask?
    • How much sample is needed?
    • How many participants?
  • Connecting online and in-class discussion material to make decisions

• **Active Discussion**
  • Group members collectively made decisions
  • Discussed problems/ideas between groups
  • TA acts more as a “facilitator”
Student Surveys

- Optional online survey
- 15 minutes in length
- 50 participants
- Results analyzed/interpreted with
  - Microsoft Excel
  - Wordle.net for word clouds

Reflections

Student
Student Reflections - Survey

Pre-Flipped Comments

“To improve class, connect lecture concepts to lab”

“The group project is disjointed”

“How much do you agree with the statement: the material covered in lab directly reflects what is taught in lecture”

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Strongly Disagree or Disagree</th>
<th>Neither agree or disagree</th>
<th>Strongly Agree or Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>1</td>
<td>45</td>
</tr>
</tbody>
</table>
Student Reflections- Survey

Pre-Flipped Comments

“Make better use of lab time”

“What percentage of the group project is completed during lecture and laboratory sessions”

Number of Responses

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-80%</td>
<td>10</td>
</tr>
<tr>
<td>79-60%</td>
<td>19</td>
</tr>
<tr>
<td>59-40%</td>
<td>14</td>
</tr>
<tr>
<td>39-20%</td>
<td>7</td>
</tr>
<tr>
<td>20-0%</td>
<td>0</td>
</tr>
</tbody>
</table>
Student Reflections- Survey

Pre-Flipped Comments

“Please provide general feedback in relation to the laboratory”

“The course is pretty good as is”

“The lab was very useful”
Student Reflections- Survey

“Please provide general feedback in relation to the laboratory”

Academic Year | Course Quality Score
--- | ---
Fall 2011 | 4.7/5
Fall 2012 | 4.7/5
Fall 2013 | 4.7/5
Instructor Reflections

• Activity Planning
  • Restructure activity distribution

• Flipped Class Model
  • Student unfamiliarity
  • Education to ease apprehension

• Group Considerations
  • Long term motivation
  • Section-long or rotating groups

+ Structure
+ Education
+ Groups
Findings Summary

Connect lecture material to the laboratory

Help avoid common group work troubles

Increased student confidence in learned material

Consider group structure and activity time commitment

The Flipped Laboratory
Questions?

THANK YOU FOR YOUR ATTENTION

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