Classroom-based research experience in a non-majors core course: a successful strategy

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Semester-long course-based projects with non-majors: transformative for students, challenging for faculty

Undergraduate research experiences are known to increase student confidence – a critical component to success for underrepresented minority and first-generation college students

3 major challenges for faculty:

1. Large differences in students’ prior preparation/skill sets
2. The need to “cover course material” – course outcomes
3. Project conception, scheduling, directing, assessing
Challenge 1: Differences in prior preparation and getting student “buy-in”

**Strategic solutions**

Day One: set them up for success

1. Clear and high expectations in syllabus and in person
   - give students ownership

2. “Post” your passion
   - introduction exercise
   - your response

Day Two and beyond: Allow students to self-assort in groups by passion – creates camaraderie, group ownership and support network

*Recognize that many students will still earn the grades they would earn if not in a project-based course, but that the experience will be important and retention may be higher*
Challenge 2: The need to cover course material – course outcomes, textbooks, and the like

**Strategic solutions**

1. Schedule course as one day/week
   - allows for both lecture and project work in the same session
   - allows for easier incorporation of outcomes into project work

2. Use your web-based LMS
   - post and receive assignments, communicate, “flip”

3. Take-home exams
   - make students responsible for material you don’t cover
   - allows you to connect project work with course material
   - student feedback indicates good grasp of outcomes

4. Make the textbook a jumping off point for the research
Strategic solutions – sample course schedule

| Day      | Topic                                                                 | Chapter |
|----------|Adam
| Aug 19   | Syllabus  
Intro to Nutrition and the semester | 1       |
| Aug 25   | Healthy Diets  
Project talk | 2       |
| Sept 2   | Digestive System and Digestive Disorders | 3       |
| Sept 9   | Carbohydrates / Nutrition and Diabetes | 4, 5    |
| Sept 16  | The Lipids  
Project field trip | 6       |
| Sept 23  | Lipids in Health and Disease  
American Eaters | 7       |
| Sept 30  | Project Research Day |                  |
| Oct 7    | Protein | 8       |
| Oct 14   | Food for Thought  
Project Field Trip |                  |
| Oct 21   | Plant-Based Diets  
Vegan for a day/week/month/life?? | 9       |
| Oct 28   | Project data/work wrap-up | Chapters 6-9 Exam Due |
| Nov 4    | Energy Balance and Obesity  
Fitness and Sports Nutrition | 15, 16  |
| Nov 11   | Data analysis; putting it all together |                  |
| Nov 18   | Food Safety and Security  
Project finishing touches | 20      |
| Nov 25   | Thanksgiving Holiday – No Class |                  |
| Dec 2    | Chapters 15, 16, 20 Exam Due  
Project Presentation/Service Learning Day |                  |
| Dec 7    | My Food Culture Assignment due |                  |
Challenge 3: Project conception, scheduling, directing, assessing, **completing!**

Identifying healthy whole grain breads in local grocery markets: accessible and affordable

![Image of a presentation slide showing a table and a graph.](image)

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**Abstract**

*Objective:* Eating healthy whole grain breads are recommended for health, but there is conflicting thoughts that whole grain breads are not affordable or accessible. Conflicting advertising and marketing limit the ability for healthy whole grain choices to be recognized by...
Strategic solutions – Topic ideas

**ONLY** choose topics/projects that YOU have interest in; otherwise, it will be a very long semester for you.

- Replicate a study that is referenced in the text or in supplemental materials
- Use research results to create an educational product
- Conduct an original experiment
- Write a grant proposal or enter an academic competition
Strategic solutions – Question/action development and group assignment

Step 1: Class discussion of possible projects and/or focus, faculty led

- Experiment
  - Types of veggies
  - Sun shades
  - Prep experiment

- Sun shades/wind
  - #1
  - #2
  - #3
  - #4

- Value Proposition Design
  - What do people want?
  - Interview/research
  - People in food service
  - Tight budget
  - Time

- What’s out there?
  - Demographics
  - Agencies
  - Food programs

12th of October.
Strategic solutions – Question/action development and group assignment

Step 2: Student assortment into teams – leave the room and let them go

Leaders will arise spontaneously, and groups can form according to passions and majors

Use Discussion Boards in LMS to get groups going and assess participation
Strategic solutions – “How will you assign us a grade?”

Total points possible = 200

- ~ 50 are graded assignments during the semester

Research Project Assignment – Data Sheet

Due Wednesday, October 16 (10 points)

Good data sheet design is critical for any project requiring data collection. Data sheets are necessary at the start of a project, and can undergo revision; however, a well-thought-through, complete data sheet provides consistency across groups and keeps errors in data collection to a minimum.

Create a data sheet, with columns, for use in data collection in the bread project. You can use the bread bag experiment data sheet to give you ideas on structure. Keys to good data sheets include: readability from left to right, preferably in order of data collection, clear column headings, a place for scientist names, store name, date, and what the sheet is for, at the top, and a place for “notes and observations”.

This can be done in Microsoft Word or Excel. If you need help with fundamentals of Excel, let me know and I’ll walk you through that. The data sheet will be due at the beginning of class next week. It should have the following minimum column headings:

- Brand/Name

Weekly Project Reports (10 pts each) – Due November 5, 12, and 19

Answer the following questions

1) What team are you on? Who else are you working with on that team?
2) What was your assigned task? Completed? Why/why not?
3) What did you do?
4) How did you do it?
5) What did other members of your team do?
6) Any issues or problems arise?
Strategic solutions – “How will you assign us a grade?”

~ 150 points is either research paper or product/productivity
Strategic solutions – “How will you assign us a grade?”

~ 150 points is either research paper or product/productivity

<table>
<thead>
<tr>
<th>First Name</th>
<th>Communication</th>
<th>Follow through</th>
<th>Leadership</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leah</td>
<td>15 Points: Postings on BB; contact with partners; calls to team</td>
<td>14 Points: Talks to home depot mgr., followed up; provided info in a timely manner</td>
<td>30 Points: Responsive to requests; active on BB encouraging other team members</td>
<td>13 Points: Thought in creative ways about partner possibilities</td>
</tr>
<tr>
<td></td>
<td>15 Points: Postings on BB; contact with partners; calls to team; talking to</td>
<td>15 Points: Contacted CP; got signed agreement; provided study design when requested; completed all tasks</td>
<td>30 Points: Actively lead project group; provided feedback to numerous groups; proactive</td>
<td>15 Points: Most active in study design; pushed for new ideas; expressed continual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 Points: Had several meetings with Goodwill; had some trouble “finishing” the work - lack of conclusions</td>
<td>15 Points: Strong - in feasibility discussions - in the beginning of the semester but tapered at the end</td>
<td>10 Points: Started strong, but waned as the semester went on; when idea for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 Points: Faithfully communicated progress, requests, and information to team members</td>
<td>15 Points: Carried out, in a timely fashion, the task; always met deadlines</td>
<td>15 Points: Continually worked to tweak, change, and improve video</td>
</tr>
</tbody>
</table>
Strategic solutions – Completing Examples

Identifying healthy whole grain breads in local grocery markets:

accessible and affordable

1Tulsa Community College, Metro Campus, Honors Nutrition Class, Fall 2013, 909 South Boston Avenue Tulsa, Oklahoma 74119; 2Department of Science and Mathematics, Tulsa Community College, Tulsa, Oklahoma

Abstract

Objective: Eating healthy whole grain breads are recommended for health, but there is conflicting thoughts that whole grain breads are not affordable or accessible. Conflicting advertising and marketing limit the ability for healthy whole grain choices to be recognized by
Completing – and beyond!

Former course-based research students have:

- Gone to conferences to present results
- Student organization president
- Featured TRIO student
- Featured EAC student
- Won a national contest!
“It was the hardest class I took and the best class I took.” Jacob, business major and traditional student

“I want to thank you for this class. It was way out of my comfort zone.” Cindy, first generation college student and active introvert

“I felt like the class could have been more organized and that class discussions should have been more monitored. I was very engaged at the beginning of class but was shut down by other students . . .”

“The project was fun, I learned a lot about being proactive and having to work with a diverse group of people and backgrounds.”

“Same class, different perspectives

“This class has taught me so much about nutrition and life itself. Students were free to speak and ask questions. . .”
It’s always something. . .

What to do about Sequential Learners, Silent Bobs, Sloths, and Snobs?

Post-semester inertia: or, how to keep a project alive?

Can I “spring” a semester-long project on a class, or do they need to know what to expect coming in?

Where to get “seed money” for on-the-spot work?

And?????