World Challenge: Engaging Sophomores in an Intensive, Interdisciplinary Course

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College and university educators seek to increase student engagement in learning content, skills, and applications. To achieve this goal, we used transformative teaching techniques in the design of a World Challenge: a two-week, group-based, reflective course for sophomores leading their own learning in developing creative solutions to the problem of Health, Hunger, and Humanity. Through indirect guidance by faculty members from multiple disciplines, students led their own learning in small groups to research this global problem and develop local solutions. Given the breadth of the course objectives ranging from applying content to teamwork and productivity, we used a variety of assessment tools: pretest/posttest, rubrics, questionnaires, focus groups, peer assessments, and self-reflections. The data documented increases in content knowledge, and provided formative and summative feedback on engagement and satisfaction to the core faculty members. Student comments at the end of the course suggest the intensive experience was indeed transformative.

Faculty in higher education face the challenge of preparing students to address the ensuing complex problems of the 21st century. Part of this challenge is developing new pedagogical approaches that move away from traditional lecture-based formats and engage students through inquiry, group work, and reflection. In traditional lecture-based courses, instructors impart information to students who passively receive the information. This approach falls short of preparing students with essential, transferable skills such as problem-solving, critical thinking, and teamwork (Dalsgaard & Godsk, 2007; Tormey & Henchy, 2008; Wei, 2011). While instructors cling to the perceived importance of covering content and disseminating information for students to memorize, students in fact forget much of the content they memorize (DiCarlo, 2009). Instead, DiCarlo (2009) suggested facilitating a deep interest for lifelong learning that goes farther than covering course content. This is achieved by enabling students to collaborate on gathering evidence, evaluating it, and learning from it. Lujan and DiCarlo (2006) described learning as the ability to use resources to find, evaluate, and apply information, which leads to lifelong skills such as critical thinking, problem solving, and enhanced communication. They recommend teachers reduce the amount of factual information students are expected to memorize, reduce the use of the passive lecture format, and create experiences that enable students to become active and independent learners and problem solvers.

Such experiences may relate to the 2007 Liberal Education and America's Promise (LEAP) report describing "essential learning outcomes" as areas of competence that students should acquire during their college studies in order to be prepared for the challenges of the twenty-first-century (Brownell & Swaner, 2010). In Brownell and Swaner's (2010)

Five High-Impact Practices, Kuh (2008) summarized four categories of essential learning outcomes: (a) knowledge of human cultures and the physical and natural world, (b) intellectual and practical skills (e.g., critical thinking, written and oral communication, teamwork, and quantitative literacy), (c) personal and social responsibility (including civic engagement and ethics), and (d) integrative learning (by addressing a complex interdisciplinary real-world problem).

Because real-world problems occur in a multifaceted and interconnected context, innovative pedagogy should be interdisciplinary in content and in the diversity of students and faculty. While a precise theoretical framework for interprofessional education has not yet been established, the necessity of expanding interdisciplinary training and teamwork is clear. Interdisciplinary teaching and learning include cooperation, collaboration, experiential learning, interdisciplinary inquiry, and reflection (Clark, 2006). In addition, the benefits of interdisciplinary education are apparent. For instance, in a three-credit interdisciplinary learning community for upper-class nutrition, nursing, social work, and child and family studies students, students' self-assessment of cultural competence diminished, perhaps as a result of inflated beliefs about their cultural skills and the perceived need for improvement (Horacek, Brann, Erdman, Middlemiss, & Raj, 2009). Faculty noted that as the course progressed, students used a wider multidisciplinary lens for learning and problem solving.

Minimizing the heavy reliance on lecture-based courses, preparing students for the problems of the 21st century, and building interdisciplinary networks in coursework are steps in the right direction. Pedagogy based on transformative learning also has great potential for moving higher education forward.

Transformative Learning

Transformative learning is described as reflective, problem-based, group-focused work engaging students through inquiry and experience (Burns, 2011). It has been incorporated into courses in sustainability (Burns, 2011), the environment (Rathzel & Uzzell, 2009), ecological social work education (Jones, 2010), and nursing (McAllister, 2005). These courses all share critical theory, the notion that students should reflect on their own assumptions and the assumptions of society, engage in dialogue, and work for social change. Previous researchers have argued the need for less information transmission and more transformational learning. Burns (2011) argued that best practices in adult learning are learning through reflection, inquiry, and experience, in which students develop relationships and engage in dialogue. She further suggested that many students know what to focus on in terms of improving the natural environment, but they often do not know how to effect change. Furthermore, courses built on her transformational learning model result in students knowing how to improve the natural environment (Burns, 2011).

Reflection is a primary component of transformative learning (Mezirow, 2000). One approach to encouraging student reflection is to require regular journaling during a course. Journal writing is an insightful and powerful instructional technology that fosters understanding and application of concepts (Connor-Greene, 2000). It can be used to enhance critical thinking (Hettich, 1990; Hodges, 1996) and improve achievement and attitude (Borasi & Rose, 1989; Boud, 2001; Jurdak, & Zein, 1998). Journal writing can enhance reflective practice by encouraging students to share their perceptions of their development and use of critical skills around self-directed learning; and it can help capture changes in students' perceptions (Dunlap, 2006). With regard to service learning courses, effective and rigorous reflection helps strengthen the power of the service learning experience (Eyler, 2002). In addition, reflections are considered rich sources for documenting student learning in a service learning course (McClam, Diambra, Burton, Fuss, & Fudge, 2008; Sessa, Matos, & Hopkins, 2009), the depth of their learning, and how critically they are thinking about it.

Critical thinking is also enhanced when students are at the center of their learning. Weimer (2002) advocated for reducing the allegiance to covering content, and suggests using course content as a vehicle to develop learning skills by allowing students to apply the course content firsthand. This in turn promotes learner-centered teaching. Weimer (2002) described learner-centered teaching as directing attention to what the student is learning, how they are learning, the conditions under which students learn, the retention and application of learning, and how current learning positions the student for future learning. When instruction is learner-centered, it places the responsibility of learning upon students, while instructors create a classroom environment that facilitates more learning. When teaching is learner-centered, it also creates awareness that an individual is a unique learner. Part of meeting the needs of a unique learner is sharing power with students, which benefits student learning as students take responsibility for coursework they find motivating.

Jones (2009) described motivated students as ones who take on activities that help them learn and achieve in higher education. Thus, empowering students to have control over their learning can motivate and engage students. Jones (2009) offered suggestions for empowering students: provide students with meaningful choices of peers with whom they can work, the materials they can use, and the types of topics they can study. Jones (2009) also suggested giving students control in developing and implementing classroom activities, allowing students to express their opinions and concerns while carefully listening to them, letting students know the instructor cares about their learning, and allowing students to create classroom norms and policies. Another consideration of learner-centered teaching is creating a learner-centered syllabus. Peer and Martin (2005) suggested including students' role and responsibilities, the instructor's role and responsibilities, student learning outcomes, and evaluation standards and procedures. Peer and Martin (2005) stressed establishing open lines of communication from the outset of the course that enthusiastically and explicitly promote student participation, discovery, and the construction of knowledge.

A final consideration for developing new pedagogical approaches is considering innovative, active learning approaches. Based on the teachings of John Dewey, Cohen (2010) designed the course Designing the Sustainable Foodshed to integrate cross-disciplinary teaching and new pedagogical techniques to engage students in solving problems of the world. The course was designed as an active learning experience with small group and project-based learning. Upon completion of the course, students recommended six thoughtful projects that addressed the relevant problems. While students generally reported favorable comments about the course, some students expressed concern about group work. Some of the suggestions Cohen (2010) offered for improving the course included limiting the class size to 16 and facilitating knowledge about group dynamics and project-based teamwork for greater student success. A limitation of this study was student engagement was not evaluated.

In a final example of an innovative course, Lee and Ash (2010) described the work of faculty at a large research university. Instead of imposing precise rules for improving learning, four overarching principles were used as a framework supporting learning in the undergraduate curriculum. These overarching principles included critical thinking, habits of independent inquiry, taking responsibility for one's learning, and intellectual growth and maturity. Examples of these overarching principles as learning outcomes for food science students included:

- Identify, define, and analyze a problem: what generates the problem, what is given, what is unknown, and what the criteria are for viable solutions to the problem.
- Determine what information is appropriate to solving the problem and then find it, assess its authority and validity, and use it effectively.
- Integrate and apply basic science and mathematics as well as food sciences to the solution of problems in food systems.
- Offer a range of potential viable solutions to the problem.
- Evaluate the solutions according to established criteria, choose the most viable solution, and make a convincing case for that solution.

These learning principles make it clear that active, not passive, learning is linked to the evaluation of learning outcomes and learning itself, and supports lifelong learning and the application of knowledge to problems.

Purpose

With the goals of departing from lecture-based teaching, designing high impact practices, creating a multidisciplinary framework, and adopting a transformative learning experience including reflection, learner-centered experiences, and innovative practices, we designed a two-week course for sophomores at a private, women's liberal arts institution. The course was designed to address one of the major challenges facing society today: hunger and the complexities surrounding the production, equitable distribution, sustainability, and wholesomeness of food. Because this World Challenge course exposed students to many new experiences, we used numerous tools to assess the extent of student engagement and learning, and evaluate the effectiveness of this new course on our campus.

Course Description

In April 2010, two of the authors representing the departments of Chemistry and Biology attended the National Academy of Engineering (NAE) Boston Grand Challenge Summit convened at Wellesley College. Speakers urged interdisciplinary cooperation to address major problems, and encouraged training experiences that were both deep (expert in their discipline) and broad (conversant in other disciplines) in order to address complex problems requiring multiple viewpoints (Morrison, 1996; Vanderburg, 2006). At the summit, participants in an interdisciplinary, student-led project presented a summary of their investigation conducted between semesters in the January of 2010, focused on The Future of the City. It was clear that these students were genuinely excited about their project experience, and that they felt the process to be quite engaging—and in some cases the overall experience was life-changing. However, some students suggested that more support from, and planning by, the faculty could have resulted in a better final report. After the summit, Simmons College faculty, with support from the administration, developed an intensive, two-week January intersession course that was interdisciplinary and student-led, but with a degree of scaffolding for the students.

Development of the Course

The course was titled, Food for Thought: Health, Hunger, and Humanity. The two core faculty members with expertise in sustainability and public health designed and managed the course using an innovative, learner-centered learning format that emphasized the processes of self-discovery and creativity. While modeled after the NAE's Grand Challenges for Engineering, the course aligned with our college's core purposes and values of: transformative learning, linking passion with lifelong purpose, crossing boundaries to create opportunity, and preparing students for life's work. With financial support and encouragement from our administration, the course was designed as a two-credit course offered during the winter break. The overarching goal was to empower students with the knowledge and skills necessary to understand and tackle the demanding problems of the global food system, while providing local solutions and actions. The topic of the course was selected due to the complex, interconnected, and multifaceted nature intersecting economics, political science, nutrition, social justice, sustainability, business, culture, public health, climate change, food safety, and food security. Furthermore, sustainability issues related to food are a burgeoning interest on campuses nationwide (Bartlett, 2011).

Course Overview

General goals for this course were student engagement, empowerment, and enhancement of

confidence and leadership abilities (see Table 1 for the specific learning objectives). The course was open to sophomores only with the hope that the experience would encourage them to become leaders on campus in their junior and senior years—to more fully develop or execute their proposed solutions after the course had concluded. Additionally, this course was piloted as a possible student retention tool. The course was advertised in the daily campus email announcements in the fall semester. All 14 sophomores who completed a formal application were accepted, and 13 students across 11 majors enrolled (see Table 2 for the majors represented by the students).

Our intention was to empower the students, provide resources, limit the amount of structure but offer enough scaffolding, and "get out of the way." The only formal lectures occurred during two 3-hour introductory sessions before the intersession break in which the course goals, content, schedule, and resources were reviewed. Invited faculty briefly presented on the topics of public health, sustainability, global and national food issues, nutrition, and economics. A featured presenter was an expert and consultant in food systems and policy, collaboration building and negotiation, and economic development. Faculty from the School of Management trained the students in understanding group dynamics and effectively participating in teams. Additionally, supporting faculty presented workshops on library resources, effective teamwork, project management, and self-assessment. Students were responsible for reading and internalizing selected texts, articles, websites, podcasts, and films during their holiday break so they could "hit the ground running" when the course commenced. The students were told that they would consider the global problems surrounding food insecurity, sustainability, and social justice and develop local solutions. The products for the course were a midpoint presentation, a final presentation, a final paper, and another tangible product (e.g., website, documentary video, business plan).

In terms of logistics, the college provided on-campus housing including full access to a kitchen. The students were provided with a credit card for purchasing food ($10.00 per day), and we encouraged them to shop and cook meals together. The students were also given a stipend to absolve working during the holiday break. They were expected to be available for coursework from 9:00 a.m. to 6:00 p.m. daily, and at other times for workshops and course-related activities such as guest speakers. Fieldtrips included touring a state-of-the-art food service facility and an excursion to a large, urban produce venue. We designed the course such that the students would be working under the pressure of producing excellent output in a very short time. The course design sought to balance the stress of

performance with frequent recognition of students' efforts.

Course Implementation

During the course, the two core faculty met with students at the beginning and end of each day for approximately 20 minutes. Other faculty and teaching assistants (TAs) could be called upon by students for assistance. One undergraduate and nine graduate TAs enrolled in programs across the college provided support and perspectives for the students (Table 2). The first day of class was comprised of students sharing knowledge of the assigned readings and materials, followed by a brainstorming session under the auspices of "think global, act local." Students then engaged in a knowledge mapping exercise, delineating the most salient issues, and began selecting working groups. By the end of the second day, students formed four working groups, narrowed their focus to four distinct yet interconnected areas, and entitled the collective project, Campus2Community. That evening, students and faculty prepared and enjoyed a five-course, plant-based meal celebrating and honoring the principles of the sustainability, the integrity of food, culture, and flavor. On the sixth day, the students presented their project concepts and implementation plans to the faculty and other students, who provided critical feedback. Students spent most of their time developing their projects through research, key-informant interviews, website development, documentary videography, and self-reflection. These skills were new to the students, and the students took the initiative to learn how to implement them.

On the 12th and final day of the course, the students presented their group projects and submitted their final papers. The students' Campus2Community solutions to the world challenge of Health, Hunger, and Humanity included improving health; reducing impact on the natural environment; decreasing hunger; and increasing awareness of peaceful, constructive solutions to attaining wholesome, sustainable foods by: (a) creating an on-campus productive food garden and composting site, complete with educational components; (b) producing a documentary film on hunger and homelessness in Boston and calling college students to action and service on vital humanitarian issues; (c) creating a campus Slow Food USA Chapter to reconnect people to the origins and integrity of food; (d) creating a Campus2Community website to increase awareness of local and global issues regarding nutrition, food sustainability, and hunger, as well as to highlight the work of Campus2Community; and (e) installing an on-campus food pantry that would redistribute healthy foods to those in need. After the student presentations, a debriefing session allowed students to share their

Table 1
Course Learning Objectives

Learning outcomes	Assessment tools	
	Formative	Summative
1. Grasp key concepts, principles, and theories relating to the complexities surrounding food.	• Debriefing sessions	• Pretest/posttest • Questionnaire • Final paper rubric
2. Understand the critical social issues such as food insecurity, sustainability, and social justice.	• Group discussion	• Pretest/posttest • Questionnaires • Final paper rubric
3. Understand the critical technical issues such as food safety, production, and distribution.	• Project brainstorming session	• Pretest/posttest • Questionnaires • Final paper rubric
4. Evaluate available information in order to target and define a specific issue.	• Pretest/posttest	• Pretest/posttest • Final paper rubric
5. Address a specific global issue related to food and design and develop a local solution.	• Midpoint presentations rubric	• Final presentation rubric • Final paper rubric
6. Become more empowered to take the lead in learning and become bolder and more comfortable with risk-taking in learning environments.	• Pretest/posttest (essay) • Self-reflection	• Pretest/posttest (essay) • Self-reflection • Final debriefing
7. Produce a daily personal journal and/or blog	• Journal reflection	
8. Worked effectively in a team.	• Daily check-ins • Journal reflection	• TEAMS peer-assessment form

Table 2
Majors and Schools Represented by Students, Faculty, and Teaching Assistants

Students	• Biology • Chemistry • Economics • English • Management • Math/Statistics	• Public Health • Nursing • Nutrition • Physical Therapy • Political Science • Sociology
Faculty	• Biology/Public Health • Chemistry • Economics	• Education • Management • Nutrition
Teaching Assistants	• College of Arts and Sciences • School of Nursing and Health Sciences	• School of Management • School of Social Work

experiences from the multiple facets of the course, and make recommendations for future iterations of the course. The students started this session with *shout-outs*—positive comments about peers and faculty who enhanced their learning experiences during the course.

Method

Given the experimental nature of the course, assessment was an important design feature. A variety of formative and summative assessment tools were used to measure the extent of student engagement and learning (Table 1). In addition to traditional assessment tools (e.g., recalling facts), authentic assessment techniques were employed in which students used their acquired knowledge to address the kinds of problems faced by professionals (Mueller, 2005). We administered four types of assessments to the students, faculty, and TAs to measure the extent to which we accomplished the proposed outcomes of the course: (a)

pretest/posttest; (b) questionnaires; (c) rubrics, peer review, and team-based assessment; and (d) personal reflections and final debriefing. The specific research questions were:

1. Based on experiencing the World Challenge course, to what extent will students increase the content knowledge as measured in a pre and posttest?
2. Based on experiencing the World Challenge course, to what extent will students feel they learned content knowledge as measured by a questionnaire?
3. What will students' opinions be regarding how much they gained by participating in this World Challenge course?

Pretest/Posttest

A pretest/posttest (Table 3) was given to the students on the first and last day of the course to assess learning objectives 1, 2, 3, 4, 6, and 8 (Table 1). Questions 1-7 corresponded to learning objectives 1-3 and were scored out of 18 points. We used a paired t test to determine if the difference in the mean scores between pretest and posttest were statistically significant. In addition, question 8 corresponded to objective 4. To address objective 8, we asked two open-ended questions: one about characteristics students brought to a team; and one about taking initiative, working in groups, taking risks, and producing a high quality local solution to a global problem.

Questionnaires

A second major assessment tool was questionnaires. At the midpoint, we gave students, faculty, and TAs a short questionnaire using a 7-point Likert scale with room for comments to understand their opinions about the progression of the course. At the end of the course, we asked the students to complete an online questionnaire about the usefulness of the introductory sessions; the helpfulness of the professors and TAs; and the location, schedule, and infrastructure of the course content. We inquired about how many hours were spent on the course; the level of satisfaction achieved with journaling; and the feedback received at the midpoint and final presentations. Additionally, the students were asked to rate the field trips, activities, and speakers; and the extent to which they felt they learned about the content-based objectives. Finally, we asked about the living arrangements, potential changes made to lifestyles, and plans for continuing to work on projects after the course. We also used a questionnaire to ask the faculty and TAs about their engagement with the

students; time spent on the course; and if the course changed their approaches to food and teaching.

Rubrics

Faculty and TAs used rubrics outlining quality indicators to assess and give students feedback on their presentations (midpoint and final) and final papers (Table 4). We used an oral presentation rubric (www.readwritethink.org) that rated presentations on a 4-point scale across nonverbal skills (eye contact, body language, poise), verbal skills (enthusiasm, elocution), and content (subject knowledge, organization, mechanics). For the final papers, we also created a 10-part rubric with emphasis on project analysis, timeline factors, alignment with the college's strategic plan, estimated costs, key partners, possible funding sources, anticipated problems, and stakeholders.

Peer Review and Team-Based Assessments

In consultation with two faculty members from the School of Management, the students completed a peer review form at the end of the course. The form had a 5-point scale across six behaviors related to following established team norms for meetings, contributions, punctuality, engagement in decision-making, constructive delivery and receipt of feedback, and positive conflict resolution. We also used a team assessment worksheet asking students to rate and reflect on the quality of their project outcome and the quality of the relationships in the group.

Personal Reflection and Final Debriefing

Reflection is one of the components of transformative learning (Mezirow, 2000). We asked students to reflect daily upon their learning, social, and emotional experiences—and to use this reflection in strengthening their project proposals and developing their final products. The reflections were submitted through the course website and one lead faculty member read and responded to the reflections each evening.

Results

Pretest/Posttest

Results of the paired t test indicated a statistically significant difference in mean scores between pretest and posttest ($p = 0.000$; Table 5). In examining particular test items (Table 3), students gained the most information about how food is related to social justice issues in the US. They also showed robust gains in knowledge about threats to the long-term vitality of the

Table 3
Mean Pretest and Posttest Scores and Deltas of Individual Questions

Questions	Pretest mean	Posttest mean	Delta
What are three specific concepts, principles, or theories related to the complexities surrounding food?	1.539	2.846	1.308
What are three current challenges in addressing food security?	1.301	2.769	1.462
What does oil have to do with food security?	0.462	1.000	0.538
What are the core elements of the food security network?	0.039	0.577	0.538
What are three threats to the long-term vitality of the US food system?	1.000	2.539	1.538
What are three specific ways food is related to social justice issues in the US?	1.077	2.769	1.692
What are three technical issues related to food safety, production, and distribution?	0.692	2.230	1.538
How would you find more information about these topics?	1.000	1.769	0.769

Table 4
Course Grading Rubric

	Assessment tool
Individual participation (30%)	Pre and post self-reflection (5%)
	Journaling (5%)
	Teamwork (10%)
	Team peer review (5%)
	Attendance and punctuality (5%)
Group performance (70%)	Group mid-point presentation (10%)
	Group final presentation (30%)
	Group final paper (30%)

Table 5
Comparison of Post to Pretest Scores

	Mean	SD	p
Pretest	7.115	2.043	
Posttest	15.731	1.666	
Posttest/pretest	8.615	2.033	0.000

US food system and technical issues related to food safety, production, and distribution. The smallest learning gains were about the role of oil in food security and the elements of the food security network.

Questionnaires

On the midpoint evaluation, students responded with a mean of 6.2 on a scale of 7 in terms of the extent to which they agreed the course was going well (with 7 being *strongly agree*). Faculty and TAs responded with a mean of 6.3 on this question. When asked how much they agreed there were problems with the course, students responded with a mean of 2.5 on a scale of 7 (with 7 being *strongly agree*); and faculty responded with a mean of 1.7. The students were generally pleased with the groups and team collaboration, the research process, the progress they made, the bonding they experienced, and the support from the faculty and TAs. Suggested improvements included scheduling, communication amongst the faculty and TAs, and spending less time in evening programs. Faculty commented that strengths of the course were student participation, progress on proposing innovative solutions, and providing a rigorous and fun learning environment. Faculty suggestions for improvements included more time to work on details of plans, a clearer communication process between students and faculty, and more support for the students.

The end-of-course online questionnaire provided rich information on the extent to which students felt they learned content-based knowledge, as well as how much they were satisfied with different aspects of the course (Figure 1). In terms of content, we asked

Figure 1
The Extent to Which Students Felt They Learned About Particular Topics in the Course
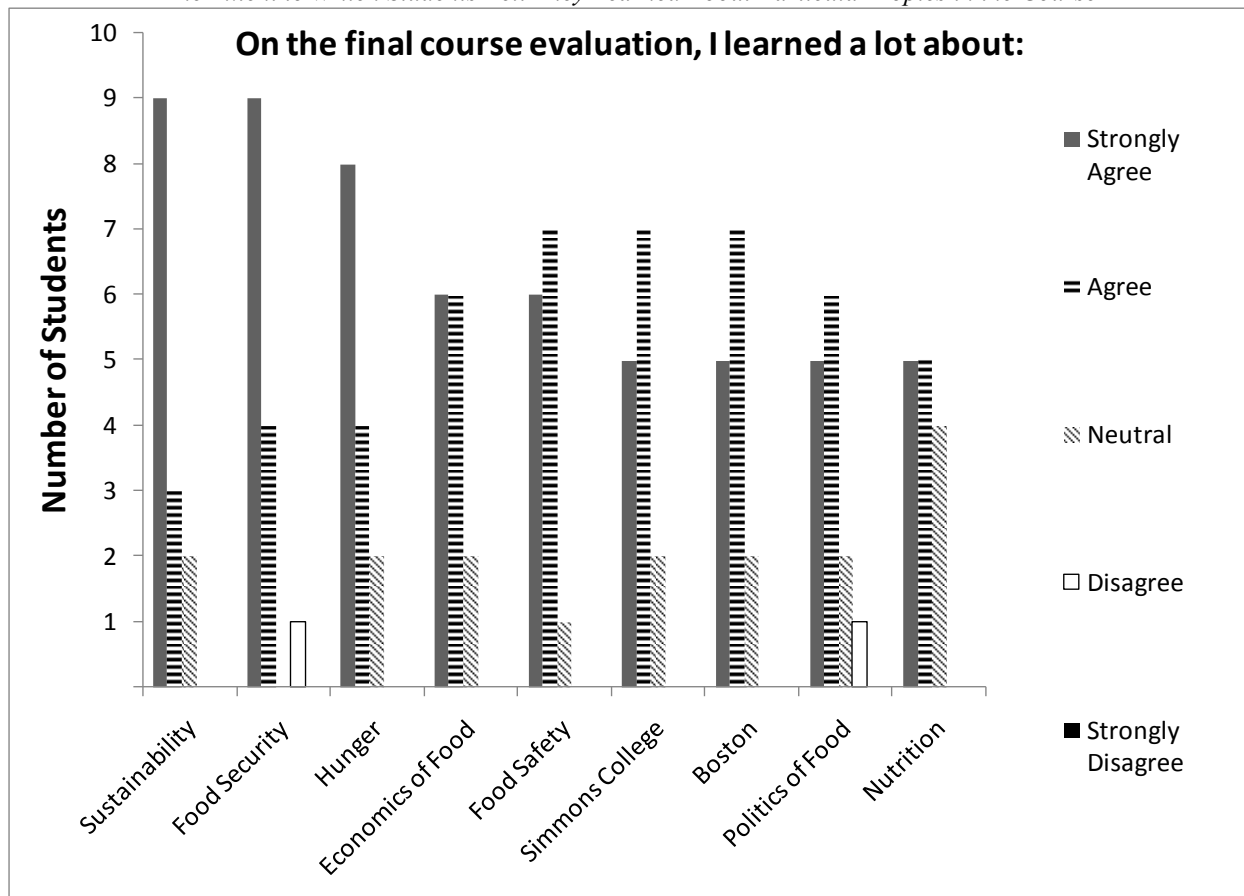
students to rate, on a 5-point scale from *strongly agree* to *strongly disagree*, how much they learned about food security, sustainability, food safety, nutrition, the politics of food, the economics of food, hunger, our college, and our city. Students felt they learned the most about sustainability, food security, and hunger; followed by economics of food, food safety, our college, and our city; and finally the politics of food and nutrition.

We asked the students to estimate the amount of time they spent on the course per day. Eight students reported spending between 11 and 15 hours, and the other six reported spending 6-10 hours. In addition, when asked how many hours they estimated spending on the course during the two weeks in January, two reported 60 hours, six reported 100 hours, four reported 140 hours, and two reported 180 hours. The students were generally pleased with the faculty and TAs and liked working in the library, but had mixed reviews of the entire group meetings. There were also mixed reviews of the journaling: some students enjoyed it while others found it to be tedious. Most students were

pleased with the midpoint and final presentations, as well as with the trips, activities, and speakers. Overall, nine of the 14 students strongly agreed they were satisfied with the course. Interestingly, all 13 students strongly agreed with, "The classes stimulated me to engage intellectually with the course material." Most faculty were engaged with and satisfied with the course. Some commented on how they plan to incorporate more problem-based, student-centered learning into their courses.

Rubrics, Peer Review, and Team-Based Assessments

We found the presentation rubrics to be helpful in providing feedback to the students at both the midpoint and final points in the course. The midpoint presentation feedback was particularly helpful as the students responded to the feedback in their final presentations. For example, based on feedback from the midpoint presentations, the students made better eye contact, read less, had stronger enthusiasm, and were less fidgety in the final presentations. On the peer

reviews, we found the students generally rated their teammates favorably (i.e., 4 and 5 on a scale of 5) and commented on their contributions. They provided constructive feedback, such as with "being punctual" and "staying focused." On the team-based assessments, the students rated themselves favorably (i.e., 7 on a scale of 7), and thoughtfully reflected on their own participation and lessons they learned.

Journaling and Final Debriefing

Daily journaling served two purposes: one was an opportunity for student self-reflection and the contextualization of new experiences. Journaling also provided a vehicle for ongoing faculty-student communication, since at least one faculty member responded to each student every night. Journaling not only allowed faculty to anticipate potential problems,

but also to share in the process of discovery that students recounted in their writings. The final debriefing session with the students, faculty, and one TA provided the most evidence that the course was transformative. For instance, "I loved the interdisciplinary nature of this course. I don't think I've learned as much in a course as I have in these 2 weeks—about nutrition, economics, and other food-related topics." See Table 6 for more samples of the students' comments.

Discussion

This World Challenge course proved to be engaging, enriching, and transformative for students, faculty, and TAs. Pretests, posttests, and questionnaires indicated the students gained content-level knowledge, even with little direct instruction. The course was

Table 6
Representative Comments from Students During Final Debriefing Session

- "This course was a true liberal arts experiment that I will remember forever. Although it was stressful and often difficult work, I am extremely proud of the finished product—not only the physical work, but also the intangible learning."
- "I enjoyed the trust we were given to go on our own and do what we need to do. Because I was given that trust, I didn't want to violate it. Because I spent a large amount of time on the work, it had to be good."
- "I loved the interdisciplinary nature of this course. I don't think I've learned as much in a course as I have in these 2 weeks—about nutrition, economics, and other food-related topics."
- "I liked this course because of all the faculty members involved. It made me aware of how diverse and well-rounded they were and all their connections. Sure, I can Google info, but it's not the same as a professor/expert helping me and helping me come up with solutions."
- "What freaked me out in the beginning was there was no structure. Now looking back, because we were able to make our own projects, we pushed ourselves farther than we would have. We pushed each other at the midpoint presentations. Another group said, 'We made a website.' This motivated us to produce, too."
- "I really like school, I always have, it's kind of geeky, and I take a lot of classes. I don't think I've been as stimulated or engaged; one or two classes come close. Having that stimulation and being challenged to go one step further, like making documentary—having that stimulation to go further made it sweeter at the end."
- "Usually I do all the work, but we split up equally. It was an amazing group experience and I have restored faith in group work."
- "I was planning on transferring to a university because Simmons didn't have a campus feel, but I got a job and I got into this class. I found myself saying, 'Yeah, we'll work together after class; let's have groups go to movies and go out after.' I stopped applying to other schools."
- "These are friends I'm going to have for next two years."
- "I don't think there's a student in the room who can't say they didn't grow in the last two weeks: emotionally, intellectually, and socially. Thank you for helping us grow."
- "We were eat-sleep-breathing this program."
- "I'm trying to figure out why I learned more in this class than others: there was a passion level—we were interested and passionate about this topic. Maybe class time (in other courses) is a waste of time sometimes. Often there is one group taking up time with their own problems while others want to just go and do it."
- "This course makes me want to volunteer more. I've been making excuses and now I'm actually going to do it. My communications major can go anywhere now. I was put to the test and I can do it."
- "At first I thought I knew everything in this course: food, science, homeless people, volunteering, health, hunger, and humanity. But with Larry talking about food security in other countries—I know nothing about it. This course surpassed my expectations. And I realized there is so much more."

designed to be short and intense, and evidence of the intensity was how much time the students reported spending on the course: up to 15 hours per day; and 100, and as much as 180, hours during the 2 weeks. The students gained effective presentation skills, as demonstrated through presentation rubrics. The arrangement of peer reviews encouraged students to be cognizant of expectations of group work (e.g., making contributions, completing assignments on time, giving and receiving feedback constructively). The course was successful in that the students gained new academic and career-focused skills, such as interviewing, video editing, documentary-making, website development, and business plan writing. Faculty and TAs were changed by reporting the incorporation of student-led learning into their other courses. For example, one of the course instructors (Berger) subsequently modified his introductory chemistry laboratory course to include student-led group independent projects developed by the students themselves.

These learning themes were also captured and emphasized in the final debriefing session. "We were eat-sleep-breathing this course," and comments on the course being stressful suggested its intensity. Students commented on the trust they were given, which spoke to the student-led nature of the course; we believe this student-led nature is what made it so moving and engaging. Student-centeredness and intensity were discussed as features that helped motivate students to excel. Students appreciated the uniqueness of the interdisciplinary features of the course, including how they were able to directly interact with faculty members from around the college. The benefits of, and "renewed faith" in, group work spoke to an essential feature of the course, and what also contributed to the transformative nature. Some comments indicated the course helped retain students at the college; and students indicated being more socially comfortable as a function of the course, an important variable in retention (Lang, 2002). Finally, the course propelled the students into volunteer work and exploration of related coursework. These debriefing comments were direct evidence of the positive impact this course had on the students.

In the final questionnaire, students indicated they learned the most about sustainability and food security. Food security was an explicit focus of the course and its consideration was required in the students' projects. Students were required to address the sustainability of their local action project in their final report. Sustainability was also achieved through the work the students did after the course was completed. This included applying for a grant to fund the implementation of their projects. The students presented their projects at the college's annual undergraduate conference. Perhaps the greatest impact on the college was the initiation of a Slow Food club on campus whose mission is to discuss and create ways to eat in healthy, meaningful ways.

Appropriate scaffolding (Wass, Harland, & Mercer, 2011) was an important consideration in the design of the course. Scaffolding included foundational lectures before the course; detailed rubrics for presentations and reports; daily feedback on journal entries; twice daily group meetings; and availability of faculty, the library, and TAs. For the most part, students took advantage of this structure; however, some commented that as the course developed, the daily group meetings distracted them from their detailed project work. We recommend that in future courses the daily group meetings be reduced during the project.

Student engagement can be increased through activities that demand high-quality work under the pressure of real time, that provide a congenial atmosphere with public feedback, faculty-student interactions, and peer evaluation (Brownell & Swaner, 2010; Kuh, 2008). In addition to undergraduate research, learning communities, service-learning, and capstone projects are examples of high impact practices that increase student engagement. Students in Food for Thought exemplified student engagement by being involved in all aspects of research: literature searches, data collection, data presentation, and data analysis. Food for Thought provided intense learning communities, which can be defined as an "integrated, comprehensive program in which transformational learning takes place through a community process as students develop professional, civic, and ethical responsibility" (Brower & Dettinger, 1998, p. 21). The action projects designed by the student teams reach out into the community, and certainly lend to service-learning, another high impact practice. "Service learning is a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities designed to promote student learning and development" (Jacoby, 1996). The students' final presentations and papers represent another high impact practice, the capstone project, where students integrate their learning and apply it to real world situations.

This World Challenge Course, Food for Thought, is a good example of project-based learning. Ahlfeldt, Mehta, and Sellnow (2005) described the merits of loosely-structured situations designed to create an environment that allows students to explore and learn; the importance of group-based teaching with small teams of students working together; an emphasis on process rather than product; student-centeredness; and the learning of skills for life-long learning based on critical thinking, collaboration, self-direction, reflection, and evaluations by self, peers, and teachers. All of the above characteristics were incorporated into

the course design. In addition, the National Survey of Student Engagement (NSSE, 2005) found that educators encouraging deep learning are associated with students with better grades, longer retention of information, and a more satisfying learning experience. Among the recommendations in their annual report, the NSSE urged educators to involve students in unstructured problems that address real world complexities through experiential learning (Kuh et al., 2001). Food for Thought was designed to incorporate these recommendations.

Recommendations for Research and Practice

There are many areas for future research with this work. We conducted preliminary data collection, and more studies could use similar metrics to compare this type of transformative learning course with more common approaches. There are numerous studies that could be designed, such as examining the best length of the course, the number of students, the staff-to-student ratios, and so on. Colleges would benefit from data on how to bring a World Challenge-type course to scale within their respective college.

Given the profound impact the course had on students, faculty, and TAs, we recommend other colleges employ the design and implementation of the World Challenge course. It certainly requires strong support from a dean and other administrators. There can be a call for proposals from faculty for ideas on topics that advance the college's mission or that appeal to faculty initiatives and research interests, thereby encouraging administration support and faculty participation. For example the second World Challenge course at Simmons, At the Edge of Poverty: Empowering Women to Change their lives and their World, supported the college's mission to "provide transformative learning that links passion with lifelong pursuit." This challenge was led by four interdisciplinary faculty members and engaged 34 students. Schools should decide on the credit structure and stipend possibilities. Applications should be sent to students months in advance of the course, especially to select students with genuine interest in the subject of the challenge. Involving faculty from the entire university was an important feature of our course, and we recommend this interdisciplinary approach. The student-led and group-based nature of the course allowed students to gain skills absent in other courses, and afforded them positions of leadership. It also gave students a sense of pride to propose and implement their solutions. We feel this course represents a timely, innovative, and inspiring experience for students and faculty alike—and we hope more schools adopt the practice. Finally, the structure of these courses must allow for organic growth and spontaneity in order for

the World Challenge to be a valuable and exciting experience for both students and faculty.

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