Students' Evaluation of a Communication-Intensive, Service-Learning Project in a Dietetics Course[1]

Denise M. Holston[2] and Carol E. O'Neil[3]
Louisiana State University
Baton Rouge, LA 70803

Abstract

Students' perceptions of a communication-intensive (CI), service-learning (SL) project in a senior-level dietetics course, Medical Nutrition Therapy II, were evaluated. Students were required to develop an interactive, educational module for training Cooperative Extension Service agents on cancer, cardiovascular disease, diabetes, or obesity. Students presented multiple drafts of the modules to the instructors and to professional audiences for review, and wrote partner evaluations and reflection papers about their experiences with the project. Results provide insight on students' perceptions and barriers encountered throughout the multi-component SL, CI group project. Students found the CI/SL course challenging, but rewarding, in terms of cognitive growth, self-efficacy, professional development, and course content; however, we found students need to participate in discipline-specific communication activities earlier in the program because some were unable to perform basic communication tasks, such as locate and assess information found on the Internet or in the peer-reviewed literature. Courses should also include problem-solving exercises to enable students to critically think when difficulties are encountered.

Introduction

For students in Didactic Programs in Dietetics (DPD), the 2002 Commission on Accreditation for Dietetic Education (CADE)'s knowledge and skill mandates places Communication Skills first. There are 16 specific competencies in communication which students must have knowledge of or demonstrate ability in, including: lay and technical writing, educational materials development, the ability to work effectively as a team member, public speaking, and use of current information technologies (Commission on Accreditation for Dietetic Education, 2002). In March 2009, the knowledge and skill mandates will change; however, communication skills, especially lay and technical writing, will continue to be a major element in dietetic education. To help students achieve the CADE mandates, dietetics educators can include a learner-centered pedagogy, such as discipline-specific communication and SL projects in their courses.

Kolb's "Cycle of Learning" can be used when developing learner-centered pedagogies (Kolb et al., 2001). A brief description of the four cycles and course content fulfillment of these cycles is described. Concrete experience is accomplished when students are actively involved. In this course, students were actively involved in the entire module development process. Reflective observation is the second phrase and is accomplished through, as the title suggests, observation and subsequent reflection. Throughout the course and project, students were able to interact with professionals from a variety of disciplines as well as their instructors and peers. Through participation, students were able to observe and write about these observations in the reflection papers. Abstract conceptualization is the third cycle, which is the cycle where students use their experiences and observations to develop into some logical meaning or order. The course was designed to facilitate this process by requiring students to work in teams throughout the semester. As a team, students had to use their knowledge to decide on the appearance, content, length, and design of the module. Active experimentation is the fourth cycle which emphasizes students' ability to problem-solve and make recommendations or decisions. Through use of group work (consisting of large group sizes), oral, technological, and written communication opportunities, students were able to solve problems related to their experiences and observations.

Because of the importance of communication in the professional workforce (Dannels, 2001; Friedland, 2004; Garside, 2001; Kastman and Booker, 1998), universities across the country have implemented Writing or Communication across the Curriculum (CxC) Programs to help prepare society ready students. The CxC initiative promotes communication as a core element of the academic experience throughout all disciplines. The goal of CxC at our university is to improve communication skills of all students and to assist the faculty in developing and revising courses to include assignments that enhance students' written, spoken, visual, and technological

communication skills. Through CxC, courses at Louisiana State University can earn "communication-intensive" (CI) designation if they meet rigorous criteria (Table 1) (Louisiana State University (LSU), 2007).

Instructors often approach CI courses with trepidation since they fear that teaching communication skills will dilute course content or they feel inadequate to teach a course emphasizing communication skills rather than a course in their academic discipline (Haug, 1996; Tchudi, 1986). However, CI assignments have been integrated successfully into agriculture courses, including animal, dairy and food science, that are not traditional communication courses (Aaron, 1996; Haug, 1996; Kastman and Booker, 1998; Orr, 1996; Reitmeier et al., 2004). Most educators agree that in addition to improving students' communication skills, inclusion of these assignments improves critical thinking, leadership, and management skills (Aaron, 1996; Kastman and Booker, 1998). Participation in discipline-specific communication assignments also enhances student conceptual learning and self-confidence levels (Orr, 1996).

Cleary 2006), although few have investigated student perceptions and evaluation of inclusion of a CI/SL project into a single course, and none has looked at a dietetics course. The purpose of our study was to evaluate students' perception of learning in a multi-component, CI/SL project in a senior level Medical Nutrition Therapy (MNT) course.

Methods

Course Description

Medical Nutrition Therapy II teaches students about *"biochemical and physiological changes that occur in food allergy and immunological disorders, diabetes, cancer, metabolic and neurological, and inherited disease and disorders of the heart or kidney, that require clinical diet modification; nutritional needs during surgery, trauma, and burns"* (LSU, 2006). This course is required for graduation and is limited to senior students. Prerequisites include MNT I, which in turn requires nutrition assessment, nutrition throughout the life-cycle, biochemistry, and physiology.

Table 1. Criteria for "communication-intensive" designation for courses at LSU
Emphases on informal communication for learning and formal communication for sharing ideas publicly
Emphases on at least two of the CxC components: written, spoken, visual, or technological communication
Student/faculty ratio of 35:1 (Graduate teaching assistants can be factored into this ratio)
Genres and audiences appropriate to discipline or profession
Class time spent on communication
Faculty member involvement in evaluation
40% of course grade based on communication
Ethical and professional standards for work

Service-learning is a pedagogy that uses structured community outreach or service activities to facilitate academic learning among students. There are two principal types of SL, one is production of a "deliverable," for example, the computer modules designed in this course, and the other is direct interaction with members of the community, for example tutoring high school students in chemistry. Either is valuable for students and the learning experience should be tailored to individual course needs. Service-learning supports student application and conceptualization of course information (Litke, 2002), improves leadership and writing skills (Vogelgesang and Astin, 2000), and facilitates personal growth. Significantly, SL provides students with an opportunity to apply knowledge and skills to a "real-world setting," which enables them to understand more fully the impact of their profession on society (Bonnette, 2006; Poehlitz et al. 2006).

Past studies have investigated student perceptions of SL projects or CI courses (Ash 2003; Chabot and Holben 2003; Mikolchak 2006; Simons and

Service-learning Component: Cooperative Extension Curriculum Project (CECP)

In 2006, MNT was re-designed as an SL course and was officially recognized as a written and technological CI course by the CxC program, however, visual and oral communication assignments were also included in the course. The course incorporated formal and informal technological, written, and oral communication assignments, and included a comprehensive SL/CI assignment, referred to as the educational module. For the SL component of the course, educational modules were to be designed for use by Cooperative Extension Service (CES) agents in conjunction with the CECP. The goal of CECP is to increase the quality of training for CES agents while using financial resources efficiently. This was accomplished through the development on an online-educational system. Content within each module had to meet core competencies established by CECP for the specific topic (Association of Southern Region Extension Directors, 2006).

Modules will be used to teach Southern CES (LCES) agents about MNT-related nutrition topics. Agents could use knowledge and skills obtained from completion of the modules to train paraprofessionals and educate clientele, which is generally low-income. Modules were developed for four nutrition-related chronic diseases prevalent in this population:

cardiovascular disease, cancer, diabetes, and obesity (Zimmet, 2000).

As part of the SL/CI assignment and to allow for interaction between the students and those who would be utilizing the module, students were required to present the modules at three different times during the semester:

1) Baton Rouge Dietetic Association December meeting. Local dietitians were able to ask questions and provide feedback regarding the content of the module.

2) LSU AgCenter Family and Consumer Sciences Spring Conference. Louisiana Cooperative Extension Agents attended a "round robin" session of the conference. During this session, agents in groups of 5-8, provided feedback on content of the modules with respect to their personal educational needs.

3) LSU School of Human Ecology MNT seminar and reception. Students presented to faculty members at LSU to receive further feedback on the entire project. Students also received input from faculty members during the reception following the seminar.

CI/SL Assignment

The project objectives were to: 1) foster a learner-centered educational environment for students to acquire a comprehensive understanding of the risk factors, pathophysiology and treatment of chronic diseases, and the challenges their future clients would face, 2) provide students with the opportunity to foster professional development and civic engagement, 3) enhance students' communication skills (written, technological, visual, and oral) through discipline-specific assignments, and 4) enhance students' ability to read, interpret, and evaluate peer-reviewed articles and information on the Internet. The educational module's components ensured a comprehensive learning experience (Table 2). A grading rubric for each component was provided to students at the beginning of the semester.

Students were divided into four groups (n=6 to 11 per group), each of which was responsible for a module on a separate disease. While group sizes were large, it is typical in the dietetics profession (Ellingson, 2002). Four students were selected as group leaders based on demonstrated leadership ability in the Student Dietetic Association and previous courses taught by the instructor and coauthor of this paper. Group leaders were approached prior to the semester and given the opportunity to choose the module upon which they wanted to work. The remaining students were strategically assigned to work groups to ensure the

Table 2. Description of components of the education module assignment, targeted knowledge and skills, and corresponding project objectives

Component	Communication knowledge and skills	Description	Project Objective
Educational module	Technology	The module was required to have interactive and multi-media components: • Microsoft Producer allowed students to import, synchronize, and publish audio, video, slides and images. • Video technology was required because each module had competencies which called for a demonstration.	2) provide students with the opportunity to foster professional development and civic engagement 3) enhance students' communication skills (written, technological, visual, and oral) through discipline-specific assignments,
	Technology	Students searched the literature and Internet and assessed the accuracy of the information.	1) foster a learner-centered educational environment for students to acquire a comprehensive understanding of the risk factors, pathophysiology and treatment of chronic diseases, and the challenges their future clients would face 2) provide students with the opportunity to foster professional development and civic engagement 3) enhance students' communication skills through discipline-specific assignments 4) enhance students' ability to read, interpret, and evaluate peer-reviewed articles and information on the Internet.
Oral presentations	Oral	Students presented drafts of the module at three times throughout the semester to professional and peer audiences. Professional audiences were: Cooperative Extension agents, members of the Baton Rouge Dietetic Association, and faculty members from the Louisiana State University School of Human Ecology and Department of English.	3) enhance students' communication skills through discipline-specific assignments
	Technology	Students designed a PowerPoint presentation.	3) enhance students' communication skills through discipline-specific assignments
Reflective essay	Written	Students reflected on their experience with the course and the module project.	2) provide students with the opportunity to foster professional development and civic engagement 3) enhance students' communication skills through discipline-specific assignments
Partner evaluation	Written	Students described their responsibilities and those of other group members for the project and the relative contribution of all group members.	3) enhance students' communication skills through discipline-specific assignments,

separation of students with known friendships and comparable cognitive styles, based on observations made in previous courses taught by the instructor. This was done in an effort to prevent uneven groups in terms of workload and skill and allow students to experience diversity which is common among team members in the healthcare setting. Because effective communication is crucial to the team's ability to accomplish goals, we strategically placed students in groups with individuals with whom they might not normally have the opportunity to work. We felt that this approach would give students the insight onto future team work with health care practitioners.

Outside of class, the group leader, often with a self-selected secondary leader, initiated the development process by establishing a plan of action, which outlined each group members' responsibilities, and timeline for completion. Further, construction of the module was accomplished through an iterative process. Thus, each team was required to submit drafts of the module throughout the semester to the course instructor and teaching graduate assistants so they could receive additional feedback to improve the module. This iterative process is a key element of CI courses.

Evaluation

This study was approved by the LSU AgCenter Institutional Review Board. Students (n=37) also provided written consent to have samples of their work used for educational purposes and to participate in a research project. Student reflective essays were used to obtain information on their perceptions, beliefs, and attitudes regarding the SL/CI project. Student responses were classified into three principal themes: academic achievement, professional development, and societal impact.

Results and Discussion

Self-reflection is a key component to effective SL projects because it fosters: 1) critical thinking skills, 2) the link between the service and their future career, and 3) communication of feelings about the educational and emotional aspect of the project (Ash, 2003; Bonnette, 2006). Results from student reflection papers are presented as they relate to student perceptions of academic achievement, professional development, and societal impact.

Academic Achievement

Participation in SL enhances student comprehension and application of course content (Simons and Clearly, 2006; Vogelgesang and Astin, 2000). The majority of our students (86%) felt that the project increased their knowledge and skills related to the pathophysiology and nutritional treatment of chronic diseases. Students also indicated that they were able to apply this knowledge and translate it into information for use by audiences of different educational and professional backgrounds. One

student supported others' perceptions by saying, *"It [the module] forced students to take theory from the whole dietetics program and merge that into a concise, valid, understandable, and teachable package."*

To produce the module, students had to develop or use technology skills by including a video inset into their PowerPoint presentation and use the Internet to identify and locate scientifically-based information related to their assigned chronic disease. Additionally, the final module was converted from Microsoft PowerPoint to Microsoft Producer for inclusion in the CECP online database (Microsoft Office PowerPoint, 2003). Almost half (46%) the students believed that their technology skills improved as a result this project. The most commonly reported barrier was difficulty using the software. Most students were proficient in PowerPoint; however, 12 students indicated that using Microsoft Producer was very time consuming since they had little exposure to the software. Online tutorials and workshops were available on campus to assist students. We intentionally had the student covert the module to Microsoft Producer because it is an add-on to Microsoft PowerPoint. The students in this discipline will frequently use PowerPoint in any practice venue. For example, students or professionals can use a PowerPoint add-on (i.e. Producer) to make educational videos and training modules for their patients, clients, employees. Use of the videos and modules are particularly important when working with low-literacy clients, which is common in our discipline. Based on student recommendations, collaboration with other disciplines, specifically information technology, will be included in future course projects.

Most students (59%) believed that the project enabled them to read, interpret, and evaluate peer-reviewed articles and information on the Internet better. One student stated, *"I also developed the skill of finding accurate and reliable information on the web. This is something that should be included in every program throughout the university. Most students, I was formally one of them, do not have the ability to read through a web page or journal article and determine its usefulness and reliability."*

Oral communication assignments enable students to learn more about their discipline and future societal contributions as professionals (Reitmeier et al., 2004). Students (41%) felt that after making the oral presentation to professional audiences and peers, they improved their oral communication skills. Because of class schedules, not all students actually presented at all three occasions, thus, there may be some students who did not fully benefit from this aspect of the project, which may explain why the percentage of students who perceived improved oral communication skills was relatively low. Some students (30%) felt that feedback from audience members could have been more constructive as opposed to "good job." Oral presenta-

tions and submission of drafts of the module were included in this project for students to obtain constructive feedback from a professional audience. While some students were disappointed by audience comments, input may have been improved if students had taken the initiative to ask audience members specific questions regarding strengths and weaknesses of the module. Unfortunately, some professionals feel that the best way to encourage students is not to criticize their work. This will addressed in future courses by requiring students to develop a list of questions to ask the audience.

Some senior-level students indicated that the project exposed them to new communication techniques. We felt that some of basic skills should have been acquired in previous courses. This raised an important question: Are other courses in the undergraduate program enabling students to establish communication skills which are essential to the dietetics profession? Overall, students perceived that the project further improved their MNT knowledge and communication skills but we did not objectively measure an actual increase in knowledge or skills. Other studies have shown that students' belief about their capabilities is strongly correlated to academic performance (House, 1994; Lane et al. 2004).

Professional Development

The majority of students (81%) felt that the project promoted professional development through cognitive and personal growth. As one student said, *"The assignment was one of the most practical applications of the information I've learned as a dietetics student. I feel that this project will be a great addition to my resume and I am very proud of this accomplishment."* These findings and others suggest that application of course material and professional development are enhanced with SL (Chabot and Holben, 2003; Simons and Cleary, 2006) and discipline-specific communication opportunities (Litke, 2002; Steinfatt, 1986).

More than half the students believed that the module project improved their ability to work in teams. Many students (59%) felt that groups were too large, which hindered their ability to meet due to conflicting schedules. Scheduling conflicts with group projects has been reported by others (Hansen, 2006). Seven students further added that the large group size made it difficult to feel "like a team" and compile information because of different writing styles. This has been reported as a problem with group projects (Hansen, 2006) and could be a result of students' attitudes about their own ability to respond to group issues such as team development, accountability, and dynamics (Feichtner and Davis, 1984). At the clinical level, physicians, therapists, nurses, and other healthcare professionals work together as a team to create a plan of care and monitor the patients' outcome. Further, the healthcare team can consist of a number of members from several different healthcare disciplines. Groups consisting of ten or more individuals are also common in nutrition (Ellingson, 2002). Surprisingly, only seven students suggested use of smaller groups in the future. Further, the perceived group size barrier forced students to use innovative techniques to communicate. For example, one group developed a website to communicate and other students frequently corresponded via e-mail and "met" using Blackboard.

Societal Impact

The majority of students (78%) also recognized the societal impact of the project. Statements included, *"I think the module will be a great help to people in low-income populations who do not have a clear understanding of what cancer is and how it can be prevented"* and *"This was the ultimate project for integrating every aspect of the disease process to provide users with a tool of hope."* Thus, this CI/SL project enabled students to have a better appreciation and understanding of the impact of their prospective careers on society (Bonnette, 2006; Cyphert, 2002; Reitmeier et al., 2004).

Service-learning has been shown to enhance students' ability to work with diverse audiences (Chabot and Holben, 2003). For this project, we strategically constructed the groups to ensure the separation of students with known friendships and comparable cognitive styles. This was done because students with differing personalities, abilities and cognitive styles will gain experience in working in multi-disciplinary groups and with diverse audiences, which is common in the professional workforce (Vega and Tayler, 2005).

Summary

The CI/SL, MNT course was a rewarding experience for the students, as well as the instructors. Reflections suggested that students felt the project was rewarding because they were able develop and apply knowledge and skills while serving the community in which they will practice. Although students recommended the project's continuation, some changes are needed. The CI/SL project will be modified to include: availability of more class time for group meetings, collaboration with other disciplines to enhance development of skills, and development of a formal review for audience use to foster more constructive feedback. Although students found it difficult to meet due to differing school and work schedules; they used new methods of communication and gained experience with the professional workforce.

Reflection is a critical component of SL. Student reflections were equally beneficial to the faculty because they provided insight on students' perception of the project and barriers they encountered throughout the module development process, which was especially important since the course was redesigned as SL/CI. We did feel that some students had difficulty

expressing their feelings or thoughts. For example, one student stated, "It is hard for me to put into words." In the future, students will be required to address questions within their essays, in addition to free-form writing, to allow generation of more specific and detailed information.

The impact of this project on learning was summed up by one student in saying, *"Developing this module was a learning experience for me. I developed technological skills and better researching skills. I felt myself grow as a leader and saw improvements in how I communicated with others. I worked harder than I have ever worked on a project before, and I proved to myself that I can do more than I thought I could. This project has helped me grow."*

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