Publications

2012

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Teaching, Learning, and the Net Generation:
Concepts and Tools for Reaching Digital Learners

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Chapter 20

Service–Learning as a Pedagogical Approach for Net Generation Learners:
A Case Study

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ABSTRACT

This chapter focuses on service-learning as a pedagogical approach for Net Generation learners, and presents a case study from a private technological institution in the United States as an example. The chapter covers details of the assignment as a case study, specific considerations in the assignment's design for Net Generation learners, ways in which the assignment followed principles of service-learning assignments, and how service-learning principles correspond with Net Generation learner characteristics. The case study focuses on an assignment for a speech class in which university students developed and delivered presentations on science topics to two audiences: children in an afterschool program and an online audience of teachers and adults. Issues and problems that arose are discussed followed by suggestions and recommendations for this service-learning project.

INTRODUCTION

This chapter explores service-learning as an effective pedagogical approach for teaching Net Generation learners, using a specific assignment as a case study. The assignment was for a speech

course, which was a required general education class. The pedagogical method of service-learning has been incorporated in several sections of the speech class for four years. Data gathered during that period comparing service-learning with other pedagogies indicated students in the service-learning sections showed larger gains in

the areas of content development, delivery, organization, team work, and personal skills (Blomstrom & Tam, 2010; Blomstrom & Tam, 2009). The assignment presented as a case study was a modification that added an online presentation as part of an ongoing service-learning project. The assignment was designed to address the problem of how to more effectively engage students while providing an effective learning experience. This paper suggests service-learning can be a solution to the problem of how to effectively engage Net Generation learners and examines characteristics of Net Generation learners, principles of effective service-learning practice, and how service-learning pedagogy corresponds with Net Generation learner characteristics.

BACKGROUND

The assignment was created for a speech course at Embry-Riddle Aeronautical University (ERAU) on the Prescott, AZ campus, located in the southwestern United States. The course was required of students majoring in engineering, aviation, space physics, and global security and intelligence studies. Speech was usually taken during the first year of study. The course had a defined structure, because the university has two residential campuses and a large worldwide campus and the course was offered through all three campuses. All instructors used a common syllabus, which stated the student learning objectives, and all students developed and delivered informative speeches, persuasive speeches, and team presentations. Instructors created specific assignments in their sections to meet the course objectives. The assignment for this chapter was designed to meet the objectives for the team presentation.

Many students taking the class were Net Generation learners, and the literature suggests those learners do not respond well in traditional classrooms (Howe & Strauss, 2000). In an effort to better address the students service-learning was

selected as the pedagogical approach. Through service-learning students realize many benefits including helping them understand course material better, enjoying learning, liking service, receiving a professional development benefit, and gaining skills, experience, and confidence in their abilities and skills (Isaacson & Saperstein, 2005.) Communication is a practical discipline that can contribute to society through service (Applegate & Morreale, 1999), and the method has increased in popularity in the field of communication (Oster-Aaland, Sellnow, Nelson, & Pearson, 2004). Service-learning has also increased in popularity in engineering studies (Campus Compact, 2008). The engineering industry has a desire for well-rounded individuals equipped to work in a global context (Oakes, 2004). Engineering students who engage in service-learning develop an understanding of the social context and issues related to the problems they are solving, critical thinking skills, ethical standards, communication skills, an understanding of teamwork, and curiosity (Lima & Oakes, 2006).

Service-learning applications vary depending on the content area and the project; however, there are commonalities. Campus Compact (2011) defines service-learning this way: "Service-learning incorporates community work into the curriculum, giving students real-world learning experiences that enhance their academic learning while providing a tangible benefit for the community" (paragraph 1). Learn and Serve America (2011) adds that service-learning, "provides structured time for students to reflect on their service experiences and demonstrate knowledge or skills they have gained" (paragraph 1). Service-learning pedagogy is suited to how people learn (APA Learner-Centered Psychological Principles, 2008). The American Psychological Association (APA) described fourteen psychological principles pertaining to the learner and the learning process. Service-learning aligns particularly well with several of the principles in that it is goal-directed, involves strategic thinking and social influences, and can

increase motivational and emotional influences on learning factors identified by APA. Researchers report service-learning can be beneficial in increasing teamwork skills. Eyler and Giles (1999) found 81% of the students surveyed reported that learning to "work with others" was either the most important or a very important thing they learned from service-learning. The report by the American Association of Community Colleges (Prentice & Robinson, 2010) indicated that in their study service-learning students scored significantly higher on 5 out of 6 institutional student learning outcomes, including communication and career/teamwork skills.

The benefits of service-learning outlined above are as relevant to Net Generational learners as to traditional learners. However, to tailor the assignment for this particular group of Net Generation learners, it is helpful to look at characteristics of those learners. Before doing so it is important to mention that this discussion generalizes about the Net Generation, and generalizations do not hold true in all instances, but can provide some understanding of cohorts. The cohort born between 1980 and 2000 has been referred to as the Net Generation, Generation Y, Generation Next, the Digital Generation, and Millennials (Raines, 2010). Raines (2010) states,

"Net Generation,…students must be actively involved in their classes, not just passive recipients of knowledge imparted by their teachers; they must be academically challenged and motivated enough by what they are learning and how we are teaching to put forth their best effort; they must have a lot of interaction with their teachers; and they must have the support they need to succeed (paragraph #11.)

Howe and Strauss (2000) described Millennials as individuals who, among other things, tend to like group activity, perceive that it is desirable to be smart, are intrigued by new technologies, and are interested in grades. The interest in grades extends to an interest in education. A study conducted by the Pew Research Center (2010) reported that 19% of Millenials have earned a degree; 39% are still in school with 8% in high school or trade school, 26% in college, and 5% in graduate school. Of those not in school, 30% reported they planned to earn a degree. In addition to an educational focus, the Millennials are digitally connected. The Pew study (2010) reported 96% of Millennials in college used the internet. Technology use among these learners apparently continues to increase. Bonamici, Hutto, Smith, and J. Ward (2005) stated the average Net Generation learner by age 21 typically has played 10,000 hours of video games, sent and received 200,000 emails, watched 20,000 hours of TV, spent 10,000 hours on the cell phone, and read less than 5,000 hours. More recently, Jones and Cross (2009) presented findings based on a survey of 596 first year college students' use of mobile phone messaging, instant messaging, participating in online social networks and other items. Their findings pointed to a complex and diverse group, calling into question some of the generalizations made about Net Generation's technological expertise and use. While it appears many people in the Net Generation have developed skills with video games, cell phone applications and their use, others in the Net Generation have not developed those same skills. Similarly some have developed skills with video conferencing, but many have not. Those who have developed skills with video conferencing may be adept at technical applications of the software and hardware, but not understand how to critically think about how to make the experience effective for presenters and for users, or how to implement the strategy. Knowing how to analyze the audience and how to involve the audience makes the experience more effective for all participants.

While many Net Generation learners come into college with well-developed technology skills, Barnes, Marateo, and Ferris (2007) caution that educators must find ways to put to use many of the skills Net Generation learners have developed,

while not conforming to and encouraging the learners to seek instant gratification or to employ shallow thinking. The service-learning assignment discussed here sought to address this issue by providing an effective learning experience while avoiding potential pitfalls. In the next section the assignment will be described followed by a discussion of how the assignment was designed specifically for Net Generation learners and how it aligns with principles of best practice for service-learning projects.

THE ASSIGNMENT

This assignment built on a collaborative effort between Embry-Riddle Aeronautical University (ERAU) and the NASA Educator Resource Center (ERC) involving an ongoing service-learning project that has been offered each semester beginning in the fall of 2007. The students developed and delivered team presentations on science, technology, engineering, and math (STEM) topics to various audiences, primarily K-8 grade students. The project was created to address the problem of low interest and skill level in math and science among students in the state. Most ERAU students have a strong interest in STEM and they conveyed their enthusiasm to audience members.

The assignment described in this paper included sixty-three students enrolled in three sections of the speech course. The assignment involved two STEM presentations. The first presentation was delivered in a face-to-face setting to participants in the fall break program offered by the after-school provider for the local school district. The audience members were between the ages of 5-12. The young students displayed a natural curiosity about the sciences, and university students encouraged that curiosity through their presentations.

The innovation for this assignment was to add a second presentation on the same topic. Eight of the teams presented to an online audience and four teams presented face-to-face to an 8th-grade science class. The online audience members were invited by the NASA ERC and by students in the class. The online audience was composed primarily of teachers and other adults. The eight teams delivering their second presentation online used webinar software, which is a format the university students are likely to use in their career communication. The webinar platform provided a format in which students could use audio or a combination of audio and webcam video to accompany static slides. One team incorporated a video made during the first presentation, and several students included video clips to illustrate concepts. The topics were the same for both presentations, but students modified the content from their first presentations to better suit the online audience or the 8th grade science class.

Topics for the presentations were selected by our partner, the NASA ERC director. Students chose the topic they wanted to investigate from that list. Two teams from a given section worked on each topic. The titles for two of the teams under the NASA Missions topic illustrate how the students developed topics according to their interests (Table 1).

One indication that students were engaged was the observation that participants, audience members and students, appeared to enjoy the experience and to have fun, which was consistent with Shumer's (1997) observation that participants in successful service-learning programs had fun, and in addition to learning, their attitudes toward learning and group behavior were more positive. For college students the service-learning experiences provided a novel setting breaking the monotony of regular classes.

This assignment was designed for Net Generation learners and it also addressed the principles of effective service-learning suggested by the National Youth Leadership Council. In order to be effective, the basic foundation of the assignment needed to be strong. Table 2 illustrates how the assignment was structured with Net Generation

Table 1. Assigned topics and samples of team-developed topics for presentations

General Topic	Presentation Descriptions or Titles
Force and Motion on Land	Learn how Newton's Laws of Motion apply to cars, bikes, and other vehicles
Force and Motion in Water	Learn how velocity and Newton's 1st Law of Motion is demonstrated by a boat
Force and Motion in Air	Learn how mass, force, and acceleration apply to the Space Shuttle, helicopters, and jets
Force and Motion in Space	Learn how the Space Shuttle travels to and from the International Space Station.
NASA Aeronautics Missions	Unmanned Aerial Vehicles
	NASA Aeronautics Projects
NASA Aerospace Missions	Our Solar System … and Beyond!
	To Infinity and Beyond: Space Exploration's Past, Present and Future!

learners in mind. The table maps characteristics and attributes of the Net Generation, as noted by Oblinger and Oblinger (2005), with specific aspects of the assignment..

To look at the rigor and quality of the basic assignment, the eight principles of effective practice for K-12 service-learning projects from the National Youth Leadership Council were applied (Weah, 2007). The descriptions for the principles, which appear in quotes, are taken from the Learn and Serve America website (2011). While this assignment is a college-level assignment, the principles were deemed appropriate because the audience consisted primarily of K-12 students and teachers. In Table 3 each principle is listed followed by a description of how this assignment applied including references to the literature.

Service-learning assignments that meet these principles can be a good fit for Net Generation learners. Several of the principles of effective service-learning projects are listed with corresponding characteristics of Net Generation learners. Table 4 restates the characteristics of Net Generation learners and the principles of effective service-learning practice. Net Generation learners want to study things that matter and service-learning involves meaningful service. Net Generation learners like the social component and service-learning involves partnerships formed with community members and organizations providing interactions for students with people outside of their educational environment. Net Generation learners like immediate experiences and service-learning offers immediate and practical experience; furthermore students have a voice in determining what those experiences involve. Net Generation learners like experiential activities and service-learning is one form of experiential learning. An important element of service-learning is that the projects have sufficient duration and intensity to be meaningful and instructive. While Net Generation learners like to be connected, for learning to take place it is important that they not just be connected, but that connections are linked to the curriculum. Net Generation learners like to work in teams, and often service-learning projects incorporate teamwork. In addition service-learning projects often provide opportunities to gain appreciation for diversity, which is a benefit realized through teamwork. The structure preferred by Net Generation learners can be addressed by the progress monitoring in service-learning. While Net Generation learners like engagement and experience, service-learning theorists and practitioners have found that reflection is a critical part of relating the engagement and experience to learning.

Table 2. Description of how the assignment was designed to address characteristics and attributes of net generation learners identified byOblinger & Oblinger (2005)

Characteristic or Attribute of Net Generation Learner	Details of Assignment Design
Digitally Literate "Having grown up with widespread access to technology, the Net Gen is able to intuitively use a variety of IT devices and navigate the Internet. Although they are comfortable using technology without an instruction manual, their understanding of the technology or source quality may be shallow." (p. 16)	This service-learning assignment, even before the addition of the online component, was popular with students and evidence suggested it offered an effective way for students to learn the course content. Adding an online component fit well with the student population and it incorporated a skill the students were likely to use in the future. While students were digitally literate, the level of skills required for this assignment varied considerably between students with some demonstrating shallow knowledge and others incorporating features and functions beyond the basics.
Connected "While highly mobile, moving from work to classes to recreational activities, the Net Gen is always connected." (p. 16)	Having observed students frequently connected through laptops or cell phones, the thinking was that they would enjoy being connected to others for a class assignment. The commonly observed connections were likely with friends and family. The online audience they were connecting with consisted mostly of strangers, and the unknown aspect was anxiety producing for some students. Several other students responded quite favorably to the online audience. More investigation is needed to determine which students are more likely to experience anxiety, and then structure the assignment to reduce the anxiety.
Immediate "Whether it is the immediacy with which a response is expected or the speed at which they are used to receiving information, the Net Gen is fast." (p. 17)	Students like quick response times and they had to adapt during their online presentations. In some cases, their plan to show clips from YouTube failed because audience members in schools could not view the clips through the software links, nor could they access them independently through the internet when given the links. This was due to internet restrictions at the school. Consequently the students had to verbally describe what was being shown in the clips. The quick adaptations were handled better by some speakers than by others.
Experiential "Most Net Gen learners prefer to learn by doing rather by being told what to do." (p. 17)	Many students like to learn by doing. One challenge is to provide them sufficient information to carry out the tasks successfully. Moving ahead on an assignment without getting the details, resulted at times in false starts. Fortunately, at least one person from each team made sure to have all of the information before going ahead with an assignment. For example, all students were instructed to create PowerPoint presentations without animations because animations would be lost. One group member incorporated a number of animations in the slides. Only one group had that experience. Others either recalled the instruction or learned by observing that slides could not be animated.
Social "They seek to interact with others, whether in their personal lives, their online presence, or in class." (p. 17)	Students display a liking for social interaction. This assignment incorporated a social dimension online because of the availability of the text chat feature. Few people used the feature, but for those who did it was an effective means of communicating and connecting. For example, one teacher couldn't hear the audio and sent a text. Immediately the message was read and adjustments were made. The text chat feature was also used to send messages between audience members.
Teams "The Net Gen often prefers to learn and work in teams. A peer-to-peer approach is common, as well, where students help each other." (p. 18)	This assignment was the first major speech assignment of the term. Because the speech was a team presentation, the fear of public speaking appeared to be reduced. Moreover, in the reflective comments several students said they were more confident in giving a public speech after the assignment. A number of students wrote about how successfully their team performed. In the past many of them had dreaded team assignments, because one individual took on the work of the team, but in this assignment, the work was more equally distributed and the end result, according to students, was better than individual efforts would have been.

Table 2. Continued

Characteristic or Attribute of Net Generation Learner	Details of Assignment Design
Structure "The Net Gen is very achievement oriented. "They want parameters, rules, priorities, and procedures.…" (p. 18)	Students want to know what is required to achieve a goal. This assignment was involved and required many skills, so the instructions and parameters were given in chunks. The first day a 1½ page sheet was distributed. Several exemplars were displayed and discussed so students know what was expected of them and they could also identify high quality work. The evaluation sheet was included with the other documents for the assignment. A sample of the written work was also included. Later additional information such as software instructions were presented in class. That was followed with independent sessions using the software. Later still were instructions for the day of the presentation. This method seemed to work fairly well; however, a single written document or more likely, a more comprehensive collection of documents providing more details, may be generated for future assignments.
Engagement and Experience "The Net Gen is oriented toward inductive discovery or making observations, formulating hypotheses, and figuring out the rules." (p. 18)	The students appeared to be engaged and this was supported through their thoughtful reflective papers. The depth of thought presented in their writing was somewhat of a surprise, because the papers were graded pass/fail. The extra effort invested by students gave glimpses into their appreciation of the project and into what they learned.
Visual and Kinesthetic "The Net Gen is more comfortable in image-rich environments than with text." (p. 18)	Students have well-developed skills for presenting material visually. For this assignment with two audiences, those skills were put to use to create presentations for the different audiences so audience members could visually appreciate and enjoy the presentation. For example, the presentations on NASA Missions included many photos. When students were instructed on the software, one short component of the training was showing them how to use the laser pointer on slides. Within minutes students were using the pointer to draw attention to areas of their slides, focusing the attention of the audience.
Things that Matter "Given a choice, they seem to prefer working on things that matter, such as addressing an environmental concern or a community problem." (p. 18)	The Net Generation participates in community activities. For this assignment, students displayed respect for the community partners and the audiences through their dress and their respectful behavior. They answered questions clearly and respectfully and went beyond what was expected. Yet we sensed the students didn't see how the assignment fit within a larger context. We informed the students of the results of science scores for the state and talked explicitly about how their contributions could help. Students could reach more people (and possibly have a larger effect) through the online presentations. Students were asked to be more involved in reaching out to the education community to invite them to listen to their online presentations. The additional discussion of the larger community issue and how the students could make a difference may have resulted in a stronger connection during the online presentations. Overall, the students seemed very interested in the assignment and in their reflections they suggested the assignment be incorporated in future classes.

The revised assignment with an online component met the criteria for an effective service-learning project, and it seemed to appeal to most of the students. They worked in teams, had a lot of social interaction including several opportunities for feedback. They incorporated technology and they were addressing a real-world community problem. The addition of the online component is likely to become a regular part of the assignment, because the technology enables a broader outreach, which could provide a better, more robust solution to the problem motivating the service-learning project. In the face-to-face presentations, the younger students especially those who attended multiple sessions benefited in observable ways. They were more likely to answer questions during discussion. Their comments showed they grasped the material and that they had thought about the content presented. If similar experiences can be created for online audience members using webinar software, more people could be reached and perhaps more progress can be made toward addressing the problem of low interest in STEM.

Table 3. Description of how the assignment addresses principles of effective practice for service-learning projects (Learn and Serve America, 2011)

Principle	Details of Assignment Design
Duration and Intensity "Service-learning has sufficient duration and intensity to address community needs and meet specified outcomes." (p. 4)	Service-learning experiences that involved longer duration and more intensity resulted in higher perceived value of the project and higher likelihood of committing to further service (Eyler & Giles, 1997). Kraft and Krug (1994) reported the desired outcomes were found when students participated in 6 to 8 weeks of experience in service-learning with field work once a week. The service-learning project mentioned here took place over a 6-week period with students spending two hours presenting to the audiences and they had several meetings with the community partner.
Link to Curriculum "Service-learning is intentionally used as an instructional strategy to meet learning goals and/or content standards." (p. 4)	According to Eyler and Giles (1999), service and learning should have equal weight and enhance each other. This project involves university students applying the communication concepts and skills they were learning in their speech course in a service project. Through the project they learned audience analysis, content development, delivery skills, organizational skills, team skills, and personal skills. Data collected over the three-year period indicated that students in service-learning sections made significant gains in each of those five areas. The assignment also related to each of the five student learning outcomes specified for the course. The results from this project are consistent with the findings of evaluators who studied CalServe and reported that academic effects were related to clarity of goals and activities through focused reflection, which is an integral part of service learning (Ammon, Furco, Chi, & Middaugh, 2002).
Partnerships "Service-learning partnerships are collaborative, mutually beneficial, and address community needs." (p. 4)	Billig (2002) noted that a key factor for sustainability of service-learning projects was a reciprocal relationship with mutual high regard. These characteristics were achieved with all three partners in this project: the NASA ERC, Kids & Company, the after-school program for the local school district, and the 8th-grade science teacher. These partnerships enabled all parties to benefit from the project. Survey responses from the online audience members indicated they were interested in future presentations.
Meaningful Service "Service-learning actively engages participants in meaningful and personally relevant service activities." (p. 5)	The societal problem addressed in this project was the low interest and achievement in science for K-8 students in the state. The project was designed to try to increase STEM interest in the audiences. The extent of the problem was evidenced in the rankings on science scores for students in the state reported in The Nation's Report Card made available by the National Center for Education Statistics (2011). Based on test scores of eighth-graders in Arizona who took the 2009 test, 46% had test scores below the basic level, 32% had test scores at the basic level, 21% had test scores indicating a proficient level and 1% had test scores at the advanced Level. Only two states in the U. S. reported lower overall test scores. Because of the specialized nature of the majors and curriculum offered at ERAU, the students are in a unique position to speak about science-related topics. They engaged in meaningful service by communicating with younger students in public speaking settings, teaching them about science. They also shared their career goals, which seemed to interest the younger audience members.
Youth Voice "Service-learning provides youth with a strong voice in planning, implementing, and evaluating service-learning experiences with guidance from adults." (p. 5)	Fredericks, Kaplan, and Zeisler (2001, p. 1) defined youth voice as "the inclusion of young people as a meaningful part of the creation and implementation of service opportunities." The university students were given a project overview, a topic, expectations in terms of length of presentations and a list of equipment that would be available. Students developed the content of their presentations on their own. They received feedback along the way, yet the presentations and accompanying activities and demonstrations were created by the students. They were asked for their feedback and suggestions at the conclusion of the project.
Diversity "Service-learning promotes understanding of diversity and mutual respect among all participants." (p. 5)	Weah, Simmons, and McClellan (2000) commented that in service-learning students can move beyond their personal views to learn the perspectives of others. The university students worked in teams composed of students from different majors, ages, and experience so they learned from each other. The audience members were diverse in terms of race, educational expectations, and their interest in the topics. Young audience members enjoyed the international students and the diversity of the university students.

Table 3. Continued

Principle	Details of Assignment Design
Reflection "Service-learning incorporates multiple challenging reflection activities that are ongoing and that prompt deep thinking and analysis about oneself and one's relationship to society." (p. 5)	The reflection component of service-learning is critical. Eyler & Giles (1999) report that reflection helps students gain a deeper understanding of what they learned. In the present project students wrote a minimum of two reflective papers. Throughout the process students were encouraged to ask questions and to comment on the process, the project, and their progress. Reflective comments written after the online presentation included, "What I liked about the online presentation is that I got to experience technology in online video, which is where a lot of business corporations are turning...," "Going into the speech I felt that I would be fairly comfortable presenting in a webinar however when I put the headset on, I really didn't like it. I did not like the fact that I couldn't see my audience. I couldn't tell if I was putting them to sleep like so many webinars do to me."
Progress Monitoring "Service-learning engages participants in an ongoing process to assess the quality of implementation and progress toward meeting specified goals, and uses results for improvement and sustainability." (p. 6)	The process of progress monitoring is to provide constructive feedback to participants. University students were given timelines and expectations, which included a dress rehearsal one week before the face-to-face presentations. Feedback was given to the students at the time of the dress rehearsals. Students provided feedback to the instructor on their efforts and those of their teammates. Students received immediate feedback from the audiences and additional feedback from the community partners. This project has undergone several modifications based on what was learned from data analysis and feedback. The data collection, analysis and feedback will continue. Data is gathered from the university students, students in the audience, the community partners, and online participants.

Table 4. Comparison of Net Generation learner characteristics and service-learning principles

Characteristics and Attributes of Net Generation Learners (Oblinger & Oblinger, 2005)	Principles of Effective Practice for K-12 Service-Learning Projects (Learn and Serve America 2011)
Things that Matter	Meaningful Service
Social	Partnerships
Immediate	Youth Voice
Experiential	Duration and Intensity
Connected	Link to Curriculum
Teams	Diversity
Structure	Progress Monitoring
Engagement and Experience	Reflection
Visual and Kinesthetic	
Digitally literate	

The service-learning project was well received by the community partners including the NASA ERC director, the director of the afterschool program and parents of the participants, the 8th grade science teacher, and the online participants. While considerable work remains to be done, the outcomes appear to be worth the effort and resources. Requests were made from the director of the afterschool program, the 8-th grade science teacher, and members of the online audience to continue the project in the future.

ISSUES, CONTROVERSIES, PROBLEMS

Several issues or challenges face anyone considering service-learning, and in particular, this assignment.

1. Faculty teaching Net Generation learners face decisions about how to best utilize their resources. Service-learning is a resource intensive teaching strategy leaving faculty who choose service-learning with less time to pursue other options. Net Generation learners have articulated their expectations for faculty, and these expectations require time for training and for skill development. Although the sample size in the study reported was small (25 students at the

University of Pittsburgh) the findings may be representative of a broader segment of the population. Students said they expect and value faculty who are knowledgeable in their fields. They rated the professor's experience and expertise as 8 on a 10 point scale of importance. The respondents rated "The professor's ability to professionally convey lecture points using contemporary software" as 7.68 out of 10 and they rated "The professor's ability to customize the class using the current technology available" as 7.64 out of 10 (Roberts, 2005 paragraph 11). To stay current in one's field takes time. If faculty teaching Net Generation learners must also be proficient in using technologies for their courses, that may leave little time for developing and implementing service-learning opportunities. Successful service-learning projects require partnerships and coordination of logistics. Establishing and building relationships with partners requires time, as does project coordination. As faculty choose among competing demands for their time, each person must ascertain how to invest their time as an instructor. Service-learning is highly rewarding, but the time commitment is considerable.

2. A problem worth mentioning is that not all students like working in teams. Regardless of the general description of Net Generation learners preferring social interaction and working in teams, some students are poor team members. The reasons gave for not wanting to work in teams were that some individuals had poor experiences on team projects in the past, some said their team experiences in the past seemed to just be repetitions of each other because they never learned about group dynamics or how to be effective, others required high grade point averages for scholarships and they did not want their grades negatively affected by poor performances of others in the group. The resistance expressed by students for work-ing in teams was mitigated by grading each student individually, rather than assigning a group grade.

3. Some of the students said they experienced a higher level of anxiety presenting to an online audience than when presenting to a face-to-face audience, due to unknown factors of the audience and of the software. Several students commented that feedback from a face-to-face audience was important to them. This was somewhat surprising given the technological skills of the students and their frequent mediated communication, which was probably typical of Net Generation learners.

4. Delivery is an important part of public speaking. Several students used expressions such as "um" and "ah" (non-fluencies) which were distracting for the online audience more than they would be in a face-to-face situation because with fewer nonverbal cues available to the online audience the "ahs" and "ums" stood out. The non-fluency rate was probably higher due to increased anxiety of giving a speech and delivering it in a new venue. Net Generation learners are likely to use video conferencing or webinar formats to deliver presentations in their careers so practice can help them develop skills they will use in the future.

5. Some technically proficient students appeared anxious about using software to deliver a presentation. While Net Generation students have well-developed technical skills generally, those skills did not necessarily translate to the particular software application in this situation. This was consistent with Jones & Cross (2009) who found varying levels of confidence and skills among current college students in using tools and software, with 60% reporting no or minimal skills with video and audio software.

SOLUTIONS AND RECOMMENDATIONS

Solutions and recommendations for the problems identified are listed according to corresponding numbers of the problems.

1. A recommendation for determining how to best invest resources is to assess the outcomes and results through data collection and analysis. Assessment evidence gathered from students who participated in service-learning over several semesters at our institution indicated that service-learning was effective for student learning. Nearly all of the students were Net Generation learners. For students who participated in service-learning activities, gains were larger than for students in sections that did not incorporate service-learning. Final course evaluations for the service-learning sections were also reviewed. At our institution the evidence of larger gains on desired skills for students in service-learning sections coupled with the alignment of service-learning with our institution's mission statement, justify the investment of resources.

2. To address the problem of some students being poor team members a recommendation is to provide instruction in team dynamics and time management for teams. Tasks to complete the team project can be identified and discussed during class and placed on a timeline. Responsibility for each task can be assigned. Additionally teams can submit PowerPoint slides and team outlines in advance of the presentations as partial completion of the final project using the software to give them additional experience loading files. Students could be asked to give status reports to the instructor using the webinar software to gain experience using the software to deliver short status reports. For both the online and face-to-race presentations

    rehearsals should be mandatory, which helps with time management and which provide students with useful feedback.

3. To increase audience involvement which would likely decrease the anxiety experienced by students when presenting to an online audience, students need to have opportunities to practice using online features including the text function and the survey tool to ask questions of the audience. A recommendation is to have students observe more examples of how to involve the audience using these software features and have them practice to incorporate using the tools.

4. A recommendation to reduce non-fluencies is to have students prepare and use a manuscript for online presentations. Sounding natural when reading can be accomplished through practice. The combination of reading a manuscript and practicing deliver more would likely reduce non-fluencies. Using an extemporaneous delivery style in the face-to-face setting would provide students an opportunity to compare the two styles. A further recommendation is to have the manuscript delivery take place a week or two before the extemporaneous delivery. This would encourage students to be prepared in advance and would make the rehearsal time transitioning from manuscript to extemporaneous delivery more effective.

5. Spending more time using the software would allow students to respond more effectively and should reduce anxiety levels. A recommendation is to incorporate several practice sessions using the software. Awarding partial credit by asking that materials be submitted in advance through the software and by giving status reports at the time the materials are submitted would also increase familiarity with the program.

FUTURE RESEARCH DIRECTIONS

Several interesting questions arose when looking at this service-learning project with the online component. Would students gain the same benefits from the online presentation as from the face-to-face presentations? If not, in what area would differences become evident? How could the assignment be best structured for the students to maximize their learning and benefits? How do the presentations for the online audiences need to be structured? How much instruction do audience members need? How can the online presentations be structured to be most effective for the audience members? How much software instruction is the best amount of instruction for the university students and how should it be implemented? How can webinar exemplars best be included in instruction? Should the students develop portions of their online presentations in advance and test them?

Future research could focus on how to improve the process and outcomes for the students, for the community partners, and for the audience members. Research questions could address each of those groups. This project plans to collect quantitative and qualitative data to investigate those questions. Quantitative data will be gathered at ERAU through a skill survey completed by students at the beginning and the end of the semester. The skill survey has been used for four years, allowing comparisons to be made across semesters and across conditions. Quantitative data in the form of faculty evaluations of speeches can be used to identify areas of strength and areas needing improvement in future assignments. Quantitative data will be gathered from online audience members, who respond to questions at the end of the presentations. Qualitative data can also be gathered through reflective comments written by students and through interviews with the community partners. Additional reflective questions will be posed to students in the future. In-depth interviews will be conducted with the community partners to improve these relationships and thereby improve the quality of the experience for all involved. While this research will be case specific, the findings can have broader implications.

CONCLUSION

This chapter explored service-learning as a pedagogical method for instructing Net Generation learners, presenting an assignment as a case study. The service-learning assignment of students delivering similar presentations to a face-to-face audience and later to an online audience addressed several aspects of Net Generation learning preferences. Students worked in teams, had immediate experiences on a project that mattered, and incorporated digital elements. The assignment met with positive responses from students and from community partners, yet problems and issues were apparent. Solutions and recommendations were offered to address those problems. Additional research is recommended. More data, both quantitative and qualitative, needs to be gathered and analyzed to continue the process of improving instruction.

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KEY TERMS AND DEFINITIONS

Audience: The listeners who hear and respond to presentations.

Community Partners: Organizations and their representatives within the community who had an identified need the service-learning project addressed. In this case the problem was the need for increased interest in science with the hope of achieving higher science scores on state tests. The community partners provided important knowledge about the need and, importantly, the audience for the project.

Net Generation: Individuals born roughly between 1980 and 2000, who vary in important ways, but who generally want to be actively engaged in learning, who like to work in teams, who have technological skills, and who are interested in grades and learning.

Service-Learning: A method of teaching and learning that integrates academic content directly with meaningful community service and reflection to achieve curricular objectives.

Speech: The ability to effectively express thoughts, ideas, and emotions through oral communication, usually to an audience. The speech can be delivered face-to-face or it can be delivered using technology such as online webinars or television or radio.

STEM: Science, technology, engineering and math.

Technology: Refers to the use of video conferencing and use of PowerPoint and other file types within that structure.

Webinar: A workshop or lecture delivered over the web. In this case the audience members were invited to give feedback through the chat feature and through a survey at the end of the presentation.