How Service-Learning Affects Employability Skills, Empathy, and Civic-Mindedness of Computer Science Students

by

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Dissertation Approval

As members of the dissertation committee for Ann Brice, and on behalf of the Doctoral Program at Cardinal Stritch University, we affirm that this report meets the expectations and academic requirements for the Ph.D. degree in Leadership for the Advancement of Learning and Service.

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ABSTRACT

Employers in Information Technology (IT) fields state that students entering the workforce may have solid programming skills, but they lack interpersonal skills, also known as employability skills. One way students may be able to improve their employability skills is to participate in service-learning projects as part of their regular college coursework. This study explored the experiences of IT students who performed service-learning projects. Technical college students majoring in computer science performed a variety of service-learning projects during their first, second, or third trimesters at the college. At the end of the term in which they performed their service-learning project, 13 students answered a series of questions about their participation in their particular project. In addition, five other IT students who had also engaged in service-learning participated in a focus group. The analysis of the one-on-one interview results informed the focus group questions. Participant responses were coded using pre-determined general categories of employability skills, empathy, and civic mindedness, and more specific codes evolved as data were further explored. This study explored three issues: the effect of performing service-learning on students' employability skills, the effect of performing service-learning on students' feelings of empathy, and the effect of performing service-learning on students' feelings of civic mindedness. The majority of participants revealed that they believed their time management skills, communication skills, self-confidence, and team-work had improved as a result of the service-learning experience. Most participants reported increased feelings of empathy and the need to be civically engaged. Findings suggest that performing service-learning has a positive impact on computer science students' employability skills and feelings of social responsibility.

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Statement and History of the Problem

Service-learning is a form of experiential learning in which students practice what they learn in their coursework by providing a related service to a community partner. Studies have shown that service-learning not only helps community partners, but aids students in many different ways. One of the ways service-learning benefits students is by allowing them to practice skills which allow them to become more employable.

Employers across the United States state there is a lack of employability skills in computer science students just graduating from college. John Nitecki, Senior Information Technology Manager of Application Development Services at Kwik Trip, Inc. in La Crosse, WI and member of Western Technical College Advisory Board said:

> We have programmers here who write so badly, they are not allowed to send emails to anyone outside the company. We also have programmers who cry if I ask them to work on a group project. That's not acceptable. We'll get them up to speed on our [programming] platforms when they get here. But please, teach them how to communicate, how to get to work on time, and how to work on a team! (J. Nitecki, personal communication, July 15, 2015)

Many hiring managers state that while "new to workforce" employees may have acceptable technical skills, they lack personal effectiveness and workplace strategies, skills commonly referred to as "soft skills,", "interpersonal skills," or, for the purpose of this study, "employability skills" (Dana, Hancock, & Phillips, 2011; Romirowsky Gajer & Paris, 2017). Employability skills typically include oral and written communication, teamwork, listening skills, empathy, critical thinking, problem solving, and

civicmindedness (Kaplan, Klebanov, & Sorensen, 2012; Wilson, 2011). In addition, in 2017 over 100 hiring managers surveyed identified even more skills that new college graduates need: the agility to adapt to a quickly changing work environment, an attention span long enough to stay focused on learning about their new job, and the humility to realize they have a lot to learn, despite having a college degree (Beaton, 2017).

Students who study computer science may believe they will not have to interact with the public, but in fact, they are important liaisons between companies and their clients (Beaton, 2017). For computer science employees, the lack of employability skills is a "major factor in the failure of many information systems" (Thomas & Schroder, 2002, p. 186). Clients often perceive computer programmers are not listening to them, are arrogant, and are not diplomatic when gathering information or explaining something (Bowers, 2008). New computer programming graduates may think they have strong employability skills, but employers often disagree. For example, according to a 2013 poll of 2,001 United States college students entering the job market and 1,000 hiring managers, "80% of college students believe they are job-ready, only 54% of hiring managers who interviewed recent graduates would agree" (Ortiz, Region-Sebest, & Macdermott, 2016, p. 3).

In another example, the National Association of Colleges and Employment conducted a Job Outlook Survey in 2011, and found that though employers listed verbal communication as a skill they required in new hires, they were only "somewhat satisfied" or "satisfied" with those skills in new college graduates (Driscoll, 2011). Lindsey Pollack, author of *Getting from College to Career: 90 Things to do Before you Join the Real World* says, "It's so rare to find somebody who has that combination of really good

technical skills and really good verbal communication skills. You will be head and shoulders above your colleagues if you can combine those two" (Driscoll, 2011, para. 14).

Even though employers believe people new to the workforce do not have the employability skills needed to succeed, these same employers are forced to hire new graduates in order to meet demand. Specifically, there are not enough graduating computer science students to replace retiring baby boomers. The Wisconsin Taxpayers Alliance used IRS data to show that the net migration loss of workers they forecast in 2013 is actually double what they predicted (Romell, 2016, para. 29). The Wisconsin Manufacturer's and Commerce (WMC) group surveyed Wisconsin CEOs to find out what they thought of the current business climate in Wisconsin, as well as to find out how well employers believed their open positions would be filled. The WMC sent surveys to 1,290 CEOs asking about employers' concerns and hiring forecasts. Of the 306 CEOs who responded, 70% stated they were facing labor shortages, up from 53% in 2014. According to Kurt Bauer, WMC's president, "Wisconsin business leaders are becoming increasingly frustrated with the lack of qualified workers as well as the lack of action by politicians to address the issue" (Adams, 2015, para. 5). In central Wisconsin, the shortage of computer science workers has spurred technical colleges to add IT courses and faculty. Employers near Wausau state that their need for IT employees has reached a "crisis" level (Daley, 2015, para. 2).

The dearth of computer programmers, coupled with new employees' lack of employability skills, make hiring qualified candidates especially difficult for employers. When under-qualified employees are hired, employers must help them develop their

employability skills, costing employers both time and money. In 2012, a study by O'Leonard and Lowe found that United States companies spent over $14 billion on leadership development training which includes employability skills (O'Leonard & Lowe, 2012).

Factors Contributing to Lack of Interpersonal Skills

Several factors may contribute to the lack of interpersonal skills in computer science students. First, computer science students tend to be more introverted than students in fields such as marketing, health care, or sales (Cain, 2013; Charlton & Birkett, 1998; Yagci, 2016). Webster's dictionary defines "introvert" as a person who directs his interest to himself and not to friends or social activities" (Nichols, 1993, p. 91) Of the top ten job fields for introverts, computer science and computer engineering ranked one and two, and management information services ranked seventh (Shatkin, 2011). The myth of the anti-social programmer did not begin with the first computer programmers. In the 1940s, the University of Pennsylvania hired six women to work on ENIAC, one of the first computers. Programming was thought to be menial, clerical work, but as the need for programmers grew, companies hired men in equal numbers to women. According to historian Nathan Ensmenger, "Male computer programmers sought to increase the prestige of their field, through creating professional associations, through erecting educational requirements for programming careers, and through discouraging the hiring of women" (Frink, 2011, para. 8). With the increase in hiring, companies used aptitude and personality tests to screen applicants. Test developers claimed that in order to be successful, computer programmers "displayed 'disinterest in people' and [that] they disliked 'activities involving close personal interaction"' (Frink, 2011, para. 10). This

claim led to the belief that programmers are anti-social (Frink, 2011, para. 10). Therefore, students' inherent personality traits combined with a strong stereotype about the solitude of programming work may draw students with weaker employability skills into the programming field.

The second factor that may hinder computer science students in developing interpersonal skills is time. Because of the intense focus on core programming classes, computer science students at technical colleges often do not have time for extra-curricular activities that may promote interpersonal skill development. Though Western Technical College does offer some extra-curricular activities, computer science students typically take two or three programming languages per term, which creates a heavy work load. Western's computer science student population is also lacking in diversity (85% Caucasian, 20% female), many students (87%) receive some sort of financial aid, and most are working part if not full time (90%) (Institute of Education Sciences, 2018). The combination of inherent personality traits, limited exposure to diversity, and lack of time for extra-curricular activities may leave graduating technical college computer science students without many chances to build their employability skill set while still in school.

Using Service-Learning to Build Employability Skills

Many instructors believe that colleges can use service-learning as an activity to help computer science students gain employability skills without taking away from coursework or out-of-school time. At Western Technical College, for example, 32 programs including computer science incorporate service-learning into their courses in a variety of ways. Students may participate in a one-time group service project, a disciplinary capstone project which allows students to meet a specific community need,

or a multiple discipline project which enables students to combine skill sets to solve an issue. Faculty members at Western report improvement in a variety of employability skills, including teamwork, listening skills, tenacity (S. Berry, personal communication, August 2017; A. Lichliter, personal communication, May 2017, C. Prindle, personal communication, September 2017; S. Ziolkowski, personal communication, February 2018). Faculty members at other institutions also report benefits of service-learning on employability skills. At Marquette University, faculty members state that students learn to make connections in the community and overcome any initial biases they might have towards a certain population (University, 2018).

By performing service-learning projects, students get exposed to opportunities to develop employability skills without adding to their existing coursework.

What is Service-Learning?

Service-learning has its roots in Dewey's theory of experiential education, and is a "form of experiential learning and teaching that achieves course objectives while meeting an identified community need" (Watkins & Braun, 2005, p. 1). Experiential learning is hands-on practical learning that helps students understand the material in their textbooks (Watkins & Braun, 2005, p. 1). Though the term "service-learning" is often used interchangeably with the phrases "volunteerism" and "community service," it is different from volunteerism and community service in several aspects. According to Bringle and Hatcher (1999), service-learning "deliberately integrates community service activities with educational objectives" (Bringle & Hatcher, 1999). In service-learning, students offer their skill sets as a service to a community partner. Students also engage in self-reflection before, during, and after the service-learning project takes place.

In volunteerism, focus is placed on the service offered, not on the learning taking place by the person providing the assistance. Formal time for reflection is not a part of volunteerism (Bringle & Hatcher, 1999). In community service, emphasis is placed again on the service being provided, but does not integrate with the learning objectives of the person completing the work (Furco, 1996). "The students receive some benefits by learning more about how their service makes a difference in the lives of service recipients" but the work is not tied to specific learning objectives (Furco, 1996, p. 13). Service-learning is unlike traditional classroom learning because of its "intention to benefit the provider and the recipient of the service equally, as well as to ensure equal focus on both the service being provided and the learning that is occurring" (Furco, 1996, p. 14). Students use the knowledge they have developed in class to benefit the community (Cress, Collier, & Reitenauer, 2005).

Service-learning projects can range from simple to complex. For example, at some universities, students may participate in a community service project during new student orientation. At other universities, students may spend one or two years taking a series of courses which all have a service-learning component. Most service-learning experiences at colleges and universities fall somewhere in between, in which students take an individual course that includes a service-learning element (Eyler & Giles Jr., 1999, p. 3).

Service-learning prepares students to be active, informed citizens who can successfully navigate a diverse, democratic society (Watkins & Braun, 2005, p. 8). It is considered an asset-based perspective, which encourages discovery of "the gifts, abilities, and resources of each individual, household, association, and institution in the

community" (Watkins & Braun, 2005, p. 92). Students who perform service-learning not only show improvement in retention and persistence (Axsom & Piland, 1999; Yeh, 2010) and course outcomes (Astin, Vogelgesang, Ikeda, & Yee, 2000) but service-learning can also be used to promote a wide variety of employability skills including, but not limited to, communication, empathy, and civic mindedness.

Reflection

Reflection is a critical aspect of service-learning, and essential to transformation. In order for someone to change, she must actively think about her experiences, and challenge her assumptions about the world around her. Reflection enables individuals to ask themselves searching questions and push themselves to grow. This is why students who work with a community partner must reflect on their own role in the project in order to recognize areas for improvement. In a service-learning environment, faculty members are able to guide reflection activities to highlight concepts to which they want students to pay special attention (Maddux & Donnett, 2015). Students should perform written reflection during the service-learning project to capture and examine uncomfortable situations, or as Kolb frames these: "disorienting dilemmas" (Bamber & Hankin, 2011; Kitchenham, 2008). In addition, instructors can assist students by reporting what changes they have seen in the student, and then comparing these observations for parallels (Jenkins & Sheehey, 2006).

The Effect of Service-Learning on Employability Skills

In a study conducted by Hart Research Associates in January 2013, 318 employers responded to an online survey about their priorities for newly hired Associate's degrees or Bachelor's degrees. Respondents were executives at private

sector and non-profit companies with at least 25 employees. Approximately 95% of respondents agreed that skills that would contribute to workplace innovation were essential in a new hire (Associates, 2013). In addition, 93% of respondents agreed that "a candidate's demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than their undergraduate major" (Associates, 2013, p. 2). Nine out of ten respondents stressed the importance of new hires being capable of continued learning, demonstrating cultural competence, and showing ethical judgement and integrity (Associates, 2013). In another study conducted by the National Association of Colleges and Employers, 201 employers listed leadership, ability to work in a team, written and verbal communication skills, and problem-solving skills as the top five skills they want to see on a job seeker's resume (Coffelt, Baker, & Corey, 2016).

Employability skills, also referred to as transferable skills, marketability skills, workplace skills or interpersonal skills, are defined as the abilities employees need to be to be successful at their job. These skills include oral and written communication, public speaking and presenting, and listening (Coffelt et al., 2016). Participating in service-learning has been shown to increase employability skills. For example, in a 2014 study Peterson, Wardwell, Will, and Campana followed undergraduate psychology students at a mid-size private women's liberal arts university in a major metropolitan area. During the time they were studied, the students, who completed a 20-hour service-learning internship and wrote in reflective journals, reported increased communication skills, interpersonal and teamwork skills, and leadership skills (Peterson, Wardwell, Will, & Campana, 2014). While students who participate in service-learning do not consistently show marked improvement in course concept mastery, they consistently report increased

civic responsibility and interpersonal skills (Dallmeyer, 2012; Hebert & Hauf, 2015; Tan & Phillips, 2005) as well as intercultural competence (D'Agostino, 2010; De Leon, 2014).

The Effect of Service-Learning on Empathy and Civic-Mindedness

Webster's dictionary defines empathy as "understanding the feelings of another person" (Nichols, 1993, p. 47). Wilson (2011) compared students participating in service-learning with students not participating in service-learning at a private California college. She found significant differences in expression of perspective, empathy, and self-knowledge between service-learning participants and non-participants (Wilson, 2011). At Miami University in Ohio, Wasburn-Moses, Fry, and Sanders (2014) studied college students who mentored at-risk youth using a triangulated data collection method of surveys, focus groups, and structured writings. The results indicated that not only did the students show increased communication skills, they also showed increased levels of empathy (Wasburn-Moses, Fry, & Sanders, 2014). The positive effects of service-learning on empathy are not unique to college students. Middle and high school students show increases in empathy and caring as well (Billig, Jesse, & Grimley, 2008; Chandler, Buck, & Ferguson, 2011). Because employers state that employees will be more successful if they can empathize with others, it seems logical that students would benefit by engaging in service-learning at some point in their academic career.

A person who is civic-minded or civically engaged views her or himself as part of a larger social fabric (Cole & Zhou, 2014), and "promotes the quality of life in a community, through both political and non-political processes" (Ehrlich, 2000, p. vi). Working for the greater good is part of what service-learning strives to promote.

Participation in service-learning projects has been shown to increase the level of civic-mindedness in those who partake in such projects. Researchers at St. Xavier University in Canada studied 130 undergraduate psychology students to understand what effects service-learning had on civic responsibility, interpersonal skills, and course competencies. The study used a test-retest research design to control for self-selection and for potential differences between service-learning participants and non-participants. After the service-learning project, students reported increased civic responsibility, which included understanding, accepting, and helping others, as well as improved practical skills (Hebert & Hauf, 2015). The positive impact of service-learning on empathy spans age groups, as demonstrated by Smith (2010) who studied millennial students at Ball State University. She found that students who participated in service-learning activities showed significant increases in civic and social awareness (Smith, 2010). Because of the diverse age population in a community college, service-learning would be beneficial to all students, regardless of their generation.

Theoretical Framework for the Study

This study is based on the theoretical framework of six stage lens of service-learning proposed by Cone and Harris (1996). According to Cone and Harris,

> …service-learning needs to consider the personal and intellectual growth of both the student and the community….A model which simply asks students to go into community settings and learn through experience is potentially damaging….A genuine service-learning pedagogy requires careful thought about how people learn experientially and careful attention to the methods educators can use to

> shape and structure the quality of student experiences. (Cone & Harris, 1996, p. 32)

Optimal learning and growth through service-learning is made possible by combining the appropriate service-learning experience with mediated reflection. The theory of Cone and Harris is discussed at length in Chapter Two.

Current Status of the Problem/Need for Further Study

Participating in service-learning impacts college students in numerous ways (Billig et al., 2008; Peterson et al., 2014; Tan & Phillips, 2005). Service-learning has been shown to increase retention, improve workplace or employability skills (sometimes called "soft skills"), and improve civic mindedness (Chandler et al., 2011; Cole & Zhou, 2014; D'Agostino, 2010). Most of these studies have involved four-year college students. A smaller amount of research has been done with two-year technical college students, and an even more limited research has focused on students in the Information Technology fields at two-year colleges (Compact, 2016; Sanderson, 2003). Traditionally, Information Technology programs at two-year colleges are structured so there is limited time for material that is perceived to be unrelated to computer programming (Sanderson, 2003). Service-learning projects provide the chance for Information Technology students to gain community engagement experiences and interpersonal skill development opportunities that are not traditionally available to them in a typical programming coursework sequence. Studies show that students in science-related fields who complete service-learning projects show improvement in problem-solving skills, explaining technical information to non-technical audiences, civic commitment, self-discipline, communication skills, collaboration, and teamwork (Bosman, Chelberg, & Winn, 2017;

Ellerton, Carmona, & Tsimounis, 2016; Keshwani & Adams, 2017; Saviz, Fernandez, & Basha, 2012).

Though service-learning is prevalent in arts and humanities courses, such as philosophy, psychology, fine arts, history, literature, music and language, there is still a dearth of service-learning projects in the computer science field (Sanderson, 2003). In addition, in organizations that promote service-learning on college campuses, computer science is not highly visible. For example, Campus Compact is a coalition of over 1,000 colleges and universities that promote service-learning and community engagement (Compact, 2016). Of the 492 syllabi posted by Compact members who include service-learning in their courses, only three of these syllabi are computer science courses (Compact, 2016). Similarly, the Generator School Network is a group of more than 5,000 members who seek to change the world through service-learning (Council, 2016). Of the 86 service-learning projects listed on their National Service-Learning Clearinghouse website, only two of these projects are related to computer science (Council, 2016).

The studies that do focus on computer science students performing service-learning show students benefit in a wide variety of areas. The STARS (Students and Technology in Academia, Research, and Service) leadership corps is a learning community developed specifically for under-represented (women, minorities, and students with disabilities) computer science students. Students in the corps participated in community engagement work with the goal of increasing their skills in leadership, community building, and civic engagement (Dahlberg, Barnes, Buch, & Bean, 2010). This study revealed that students who participated in the corps showed increases in self-

efficacy, perceived social relevance of computing, grade point average, and commitment to remain in computing when compared to similar students who did not participate in the corps.

Dahlberg, Barnes, Buch, and Bean (2010) used the STARS Leadership Corps (SLC) model to develop a Computer Science Leadership Seminar at the University of North Carolina. The course was developed with the aspirations of attracting a more diverse population of students to the computer science field, to develop students' leadership and team skills, and to increase students' self-efficacy (Dahlberg et al., 2010). Forty-six students worked in teams to develop and implement outreach programs targeted towards a diverse population of students who may not have considered a computer science career. Study participants completed two questionnaires. The first questionnaire was adapted from the LAESE (Longitudinal Assessment of Engineering Self-Efficacy) survey to measure computing efficacy and computing identity. The efficacy questions targeted how well students thought they could succeed in the computer science field while the identity questions targeted how well students felt they belonged in the computer science field. The second questionnaire was developed by the researchers to measure leadership and team skills, and to ascertain general experiences of participants. When results were compared to those of a control group, SLC students computing identity scores were significantly higher than those of non-SLC students, although computing efficacy scores were not significantly different between the two groups. SLC students also reported positive increases in items related to teamwork, which include leadership skills, ability to get along with others, and active listening skills (Dahlberg et al., 2010).

The above study was expanded upon by Payton, Barnes, Buch, Rorrer, and Zuo in 2015. These researchers used the same SLC model to measure students' experiences in a Computer Science Leadership seminar, but they included four years of data from 890 participants in 20 institutions. Because of the additional data, the researchers were able to explore differences between subgroups delimited by gender, ethnicity, and class ranking.

In this study, as in the preliminary study in 2010, participants answered questions about computing efficacy and computing identity both before the course began and after it ended. Participants also answered questions related to computing commitment pre- and post-course. An example of this type of question is, "I am confident that I will keep my computing major." The pre-course survey included demographic items about gender, ethnicity, and class ranking. Finally, students were given a post-only survey to report how they perceived their participation in the SLC impacted them on three levels: personally, professionally, and academically. Results from this study support the findings from the preliminary study, and, as predicted, showed that students who participated in the SLC felt they benefitted from the course. They reported increased collaboration opportunities with peers and faculty, increased confidence in their computing abilities, and increased leadership skills. They also reported a high degree of personal reward (Payton, Barnes, Buch, Rorrer, & Zuo, 2015).

Integrating service-learning into computer programming classes not only affects students, but community members as well. In a study at Hashemite University in Jordan, 35 graduating computer science students participated in a service-learning project. At the end of the project, community members reported being more aware of collaborative opportunities with the university, and expressed higher confidence in the ethical

standards of the students (Al-Khasawneh & Hammad, 2014). In another study, community partners reported the "benefit of access to expertise beyond the capabilities of [our] organizations" (Rinaldo, Davis, & Borunda, 2015, p. 120).

Service-learning benefits all stakeholders involved. Because projects developed for computer science classes are used for real-life situations (e.g., human resources intranet, employee tracking system, nursing home care plan system, website for online sales for small businesses), students are able to gain experience working with real clients. Not only do they learn programming skills, they must also learn to interact with potential employers (Tan & Phillips, 2005).

Due to a lack of research involving computer science students at technical colleges, studying the experiences of computer science students at this type of college may provide impetus for other faculty to include service-learning in their information technology courses.

Purpose of the Study

The purpose of this study was to explore the impact of service-learning on employability skills, empathy, and civic-mindedness of computer science students at Western Technical College in La Crosse, Wisconsin. The overarching research question was: What are the personal and professional experiences of computer science students performing service-learning projects at Western Technical College (Western) in La Crosse, Wisconsin? The study sought to gain an understanding of how service-learning affects a wide variety of skills in computer science students at a technical college, and seeks to inform best practices in structuring service-learning experiences to optimize that skill development.

The related research question(s) were:

- How did participating in a service-learning project affect students' employability skills?
- How did participating in a service-learning project affect students' feelings of empathy?
- How did participating in a service-learning project affect students' feelings of civic-mindedness?

Significance of the Study

This study provides information to technical colleges and instructors about an activity that may be used to help computer science students broaden their repertoire of employability skills. The results of this study may apply to computer science students at technical colleges, to computer programming faculty, and to employers who need to hire highly-qualified computer science graduates. Students who participate in well-structured service-learning experiences that include appropriate reflection may show improvement in the employability skills needed for successful employment. Computer science faculty who use service-learning in their classes may help students gain employment after graduation, and they may also form connections with employers that do not naturally occur in a regular academic setting. Employers may benefit from service-learning by hiring students who have improved their interpersonal skills through an experience that enables them to successfully interact with a community partner. .

Approach of the Study

This was a phenomenological mixed-methods study. A phenomenological study "attempts to understand people's perceptions and perspectives relative to a particular

situation" (Leedy & Ormrod, 2016, p. 255). By studying more than one student, the researcher attempted to make generalizations about what it is like for a computer science student to participate in a service-learning project. Because the researcher collected both quantitative and qualitative data, the study is considered a convergent parallel mixed methods design (Creswell, 2014). The study focused on pre-participation surveys with questions scored on a five-point Likert scale, post-participation interviews, a focus group, and student reflections. The pre-participation surveys and the reflection questions were designed in and delivered in SurveyMonkey. Twelve of the thirteen one-on-one interview participants were current students, and those meetings were conducted on Western's campus by two people not affiliated with the college. One of the thirteen participants had graduated, therefore was interviewed by the researcher in the town in which the participant was employed. This participant's experiences with service-learning were very similar to the 12 participants who were still in school, but she was able to add information about how her service-learning was helping her in her current job. Focus group students were interviewed on campus by the college's Community Engagement Coordinator. Finally, the instructor for the courses was also interviewed on Western's campus by one of the people who conducted the one-on-one meetings with the students. All of these interviews were recorded with a digital voice recorder and were transcribed by http://www.rev.com.

Assumptions

The researcher is passionate about social advocacy, and believes in the power of community members working together to create a world where all may live with dignity and freedom. To this end, she uses service-learning in her classroom because she

believes this experience will help students learn about others and about their communities. The researcher assumed that the basic experience of students participating in the service-learning project was generally the same. That is, students met with community partners to understand their needs, and then worked in groups to develop those projects. The researcher also assumed that students, when being interviewed at the end of their experience, were truthful with the interviewer. In addition, this study is based on the premise that everyone can learn, and everyone has the potential to change their beliefs and their subsequent actions based on experience.

Delimitations and Limitations

This study focused on computer science students in their first and second years in college. Traditionally at Western Technical College, service-learning takes place in both the first and second years of the students' coursework. Because of time constraints, this study focused only on students at only a single campus of Wisconsin's 16 technical colleges.

The primary limitation in this study was that bias exists on behalf of the researcher in that the researcher believes service-learning affects students positively. In order to alleviate some of this bias, two external professionals were retained to conduct the interviews. The interviewers had no knowledge of the students before the interview session, nor did either of them have anything more than the most rudimentary knowledge about service-learning. Second, there was only one technical college studied, and the sample size was only about 10% of the computer science majors at the college. Third, service-learning is a required part of the course. In order to earn full points for the class, students had to complete the service-learning portion of the curriculum. If they did not

participate in the service-learning component, they lost 20% of their class points. Therefore, students who chose to be interviewed also chose to complete the service-learning activity. Fourth, students self-selected for study participation. That is, everyone in the selected classes was offered the chance to participate in the study, with no penalty for not participating. But only certain students agreed to participate, which may have introduced some unknown factors involving personality or motivation.

Vocabulary of the Study

For consistency of interpretation, the following terms are defined:

Community partner: For the purpose of this study, a community partner is described as an organization that wished to work with Western's computer science students to build an application which would benefit that organization. In most cases, the community partners in this study were non-profit organizations.

Computer science students: For the purpose of this research, computer science students are defined as students enrolled in one of Western's three information technology tracks: Web and Software Design, Computer Support Specialist, or Network Systems Analyst.

Employability skills: Employability skills encompass a wide variety of characteristics which enable success in the workplace. These skills include aptitude, positive attitude, problem-solving skills, team communication, ability to speak well, project management, and self-management (Deeley, 2013; Jackson, 2015; Ortiz et al., 2016; Wood, 2016). In this paper, employability is a "a set of achievements – skills, understandings, and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, benefitting themselves, the

workforce, the community and the economy" (Yorke & Knight, 2004, p. 2). This definition moves away from merely listing key, core, or specific skills that students need to demonstrate (Dacre Pool & Sewell, 2007; Hillage & Pollard, 1999). The concept of employability is complex, and involves "a mix of personal qualities and beliefs, understandings, skillful practices and the ability to reflect productively on experience" (Yorke, 2017, p. 13).

Service-learning: Service-learning combines community engagement with learning objectives. Service-learning differs from traditional classroom learning because "the focus is placed upon connecting course content with actual experience" (Cress, Collier, & Reitenauer, 2005, p. 9) and from volunteerism because students use the knowledge they have developed in class to benefit the community (Cress et al., 2005).

CHAPTER TWO: LITERATURE REVIEW

Organization of the Review

The purpose of this literature review is to study the relevant research on the effects of service-learning on the employability skills, the feelings of empathy, and civic-mindedness of technical college students in Information Technology (IT) programs. Though many studies have been done in a wide variety of academic programs, there is a dearth of information about technical college students pursuing IT degrees. Therefore, this literature review focused on the effects of service-learning both for technical college students, as well as on four-year university students, with the implication that these effects can be extended to IT students at a technical college. The literature review is divided into five sections. Section one describes the theoretical framework of the study. Section two consists of the review of research on the effects of service-learning on employability skills. Section three is a review of the research about how service-learning affects empathy and civic mindedness. Section four is a review of the research arguing against service-learning. The final section focuses on best practices of service-learning.

Theoretical Framework for the Study

This study is based on the theoretical framework of service-learning by Cone and Harris (1996). Service-learning is based on the principles of several experiential learning theorists as well as on constructs from cognitive psychology, social theory, and the transformational nature of experiential learning (Cone & Harris, 1996). Service-learning can play a critical role in helping to learn interpersonal skills allowing individuals to navigate a wide variety of work experiences. In every career and in any workplace, personal interaction is a must. In order to increase successes in a job, it is vital to understand and accept differences in others. It is imperative to learn to effectively

interact with people who have varied backgrounds, whether these differences be in culture, education, or life experience. Being exposed to a multicultural society does not automatically ensure tolerance (Cone & Harris, 1996). Cone and Harris expanded upon early theories of service-learning to develop a six-stage lens model in order to address weaknesses in earlier theories.

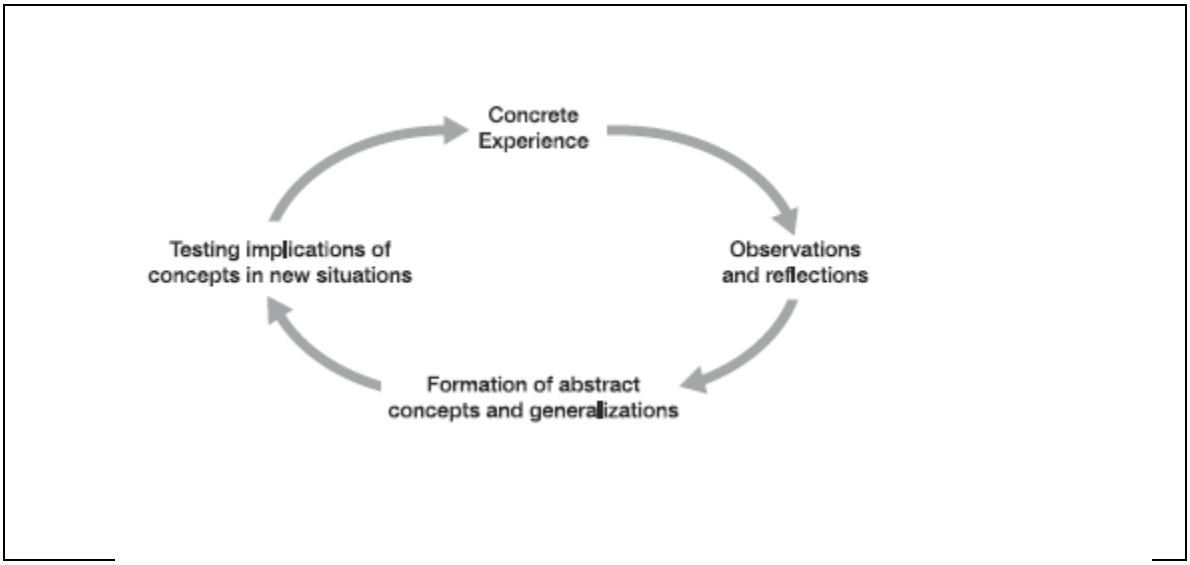
Early Roots of Service-Learning

American philosopher, psychologist, and educational reformer John Dewey was known for his belief that education and civil society are closely connected (Fishman & McCarthy, 2007). Dewey purported that education is the scientific method people use to study the world around them. He believed that "learning occurs through a cycle of action and reflection, not simply through being able to recount what has been learned through reading and lecture" (Watkins & Braun, 2005, p. 7). Dewey went on to state that "knowing and doing cannot be severed" (Watkins & Braun, 2005, p. 8) and he encouraged exploration, experimentation, and discovery, which are all foundations of service-learning. Dewey theorized that "authentic situations generate questions, caring about others generates questions, and important work generates questions" (Eyler & Giles, 1995, p. 85). Dewey formulated a six-step process of inquiry which involved:

1. being confronted with a problem;
2. developing a question to be resolved;
3. garnering information which will be used to derive solutions;
4. formulating hypotheses about solutions;
5. testing hypotheses;
6. drawing conclusions (Cone & Harris, 1996).

Half a century after Dewey formulated his process of inquiry, David Kolb, an American educational theorist, used Dewey's process as a basis for his four-stage experiential learning cycle (Cone & Harris, 1996). Kolb theorized that people are able to develop new concepts as the result of them having new experiences. Kolb stated that "Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 2014, p. 38). Kolb's Experiential Learning Style theory can be represented by a four-stage learning cycle during which a student experiences a concrete event, reflects on the experience, draws conclusions about the experience, and actively experiments with what she has learned (McLeod, 2013). Reflection is a critical aspect of service-learning for without it, transformation cannot take place.

Figure 1
Kolb's Model of Experiential Learning



Transformational learning also contributes to the roots of service-learning. After studying women returning to community colleges in the 1970s, Jack Mezirow of Columbia University developed his model of Transformational Learning and purported that transformation consists of ten phases. The model is an expansion on Kolb's four

stages of experiential learning. First, says Mezirow, the person experiences a "disorienting dilemma." This is analogous to Kolb's initial stage of "encountering a concrete experience." Mezirow states that after the disorienting dilemma, people encounter self-shame, examine their own biases, and recognize that others have had the same reactions when faced with an uncomfortable, unfamiliar experience. This is parallel to Kolb's "reflection stage." After this recognition takes place, people explore options for action, plan their actions, and gather the knowledge they need to carry out their plan. These actions are analogous to Kolb's stages of "drawing conclusions" and "actively experimenting" (Bamber & Hankin, 2011; Kitchenham, 2008).

Though articulated differently, Dewey, Kolb, and Mezirow all emphasize the constructs of having an experience, reflecting on the experience, and acting on the experience as the path to learning and transformation. Finally, many educators who utilize service-learning make reference to Brazilian philosopher Paulo Freire. Freire purported that learning does not occur by people passively "banking" information that is presented to them. Instead, people must conscientiously reflect on their experiences in order to learn. He also points out that every individual comes to a situation with a unique set of experiences (Freire, 2017). Therefore, educators must carefully plan so students are "intellectually challenged and appropriately placed" (Cone & Harris, 1996, p. 33).

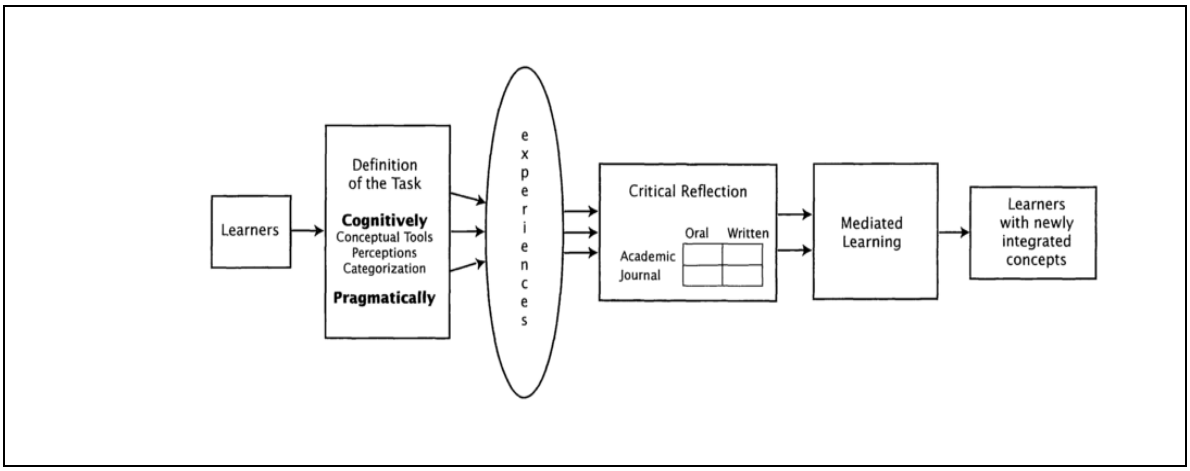
Revised Service-Learning Model

Cone and Harris developed a six-stage lens model of service-learning to address gaps in earlier theorists' models. The framework for this study is based upon this revised model. The first stage of the model focuses on the learner, and recognizes that individual differences play a significant role in the service-learning experience. This gives rise to

the second stage of the model, which concerns the academic and practical issues facing an instructor who implements service-learning into coursework. An instructor must provide students with pre-service training and an introduction to service-learning theoretical concepts, and must strive to challenge students intellectually while making sure they are placed correctly in their service-learning experience.

In the third stage of the model, the service experience itself is examined to ensure that it is distinct from students' everyday experiences. This "agitating" experience ensures that students are challenged to broaden their perspectives. Stage four of the model is reflection following the experience, but Cone and Harris argue that reflection is most effective when guided by the educator. Therefore, stage five of the model focuses on the instructor's role of carefully crafting "academic questions" in which students are asked to "define their terms [regarding their service learning experience], cite their observations, and describe how their observations support or contradict the theories or concepts presented in class" (Cone & Harris, 1996, p. 35). Finally, stage six refocuses on the learner, purporting that the service-learning experience had "potentially profound effects on a student's intellectual and personal growth" (Cone & Harris, 1996, p. 34).

Figure 2
A Lens Model for Service-Learning Educators



Cone and Harris's six-stage lens model attempts to improve upon past service-learning theories. By being aware of students' unique paradigms, striving to match them with appropriate service-learning experiences, and guiding students in mediated reflection, instructors increase the chance that students will learn something about the community they serve instead of simply feeling good about themselves for serving (Cone & Harris, 1996). This study was designed using Cone and Harris's model as its theoretical framework. Because participants in this study all had unique backgrounds, they were allowed to choose a type of service-learning with which they felt most comfortable. Some students had little or no experience working with a community partner, while others had extensive experience before the course began. The instructor worked with the college's Community Engagement director to ensure there was a wide variety of projects from which to choose, as well as to make sure matches between students and community partners was a good fit. Finding a proper match ensured that students were engaging in something different from their everyday experiences. The instructor also had the students reflect on their service-learning experience in a variety of

different ways, helping the students to become aware of how they had transformed as a result of their service-learning episode.

Review of Research on Employability Skills

Employability skills, also referred to as transferable skills, marketability skills, workplace skills or interpersonal skills, are defined as the abilities employees need to be to be successful at their jobs. These skills include oral and written communication, public speaking and presenting, and listening (Coffelt et al., 2016). According to the National Association of Colleges and Employers, 201 employers listed leadership, ability to work in a team, written and verbal communication skills, and problem-solving skills as the top five skills they want to see on a job seeker's resume (Rosenberg, Heimler, & Morote, 2012). Participating in service-learning has been shown to increase these desired employability skills. In a 2014 study Peterson, Wardwell, Will, and Campana followed 12 undergraduate psychology students at a mid-size private women's liberal arts university in a major metropolitan area. During the time they were studied, students completed a 20-hour service-learning internship and wrote in reflective journals. Students reported increased communication skills, interpersonal and teamwork skills, and leadership skills (Peterson et al., 2014). While students who participate in service-learning do not consistently show marked improvement in course concept mastery, they consistently report increased civic responsibility and interpersonal skills (Dallmeyer, 2012; Hebert & Hauf, 2015; Tan & Phillips, 2005) as well as intercultural competence (D'Agostino, 2010; De Leon, 2014).

In a 2010 study at the University of Wollongong, students participated in work-based learning which allowed them to engage with people from industries (Cord &

Clements, 2010). After the semester, students reported development in communication and interpersonal skills as well as in personal insight after spending a semester in a work-based learning program. In this study, students were matched with community partners through online surveys and face-to-face interviews, and work was delineated through formal agreements signed by the organization and the student. The work-based learning program was designed to "prepare students for the workplace by enabling them to develop reflective skills to encourage lifelong learning" (Cord & Clements, 2010, p . 293). The reflection questions that students answered were:

1. Identify specific skills you developed during your placement;
2. Identify what you have learned from a personal perspective, including the possibility of strengths, and areas in need of improvement;
3. Reflect on your overall experience and discuss how this might inform your future university studies or progression into your chosen career (Cord & Clements, 2010, p. 294).

Answers were coded for key terms and expressions, and yielded three main themes: Communication skills, people skills, and personal insights. In addition the researchers identified three aspects related to sense of identity: Self-assurance, self-improvement, and self-awareness (Cord & Clements, 2010, p. 296). Researchers inferred that not only did students develop soft-skills, they took personal insights away from the experience (Cord & Clements, 2010, p. 303).

An increasing number of community colleges are incorporating service-learning into their curriculum. In order to measure the effects of service-learning in community or technical colleges, in 2006 the Learn and Serve America program of the Corporation for

National and Community Service awarded a three-year grant to the American Association of Community Colleges (AACC). “Thirteen colleges participated in AACC’s Community Colleges Broadening Horizons through Service Learning grant project, and AACC measured learning outcomes attainment for students at the Horizons grantee colleges” (Robinson, 2007, p. 1).

To examine the relationship between service-learning and academic learning, AACC developed two separate quantitative instruments – one for students, and one for faculty – as well as conducting five student focus groups and three faculty focus groups during the spring of 2009 (Robinson, 2010). The 24 questions were answered on a six-point Likert scale where “6” was the highest, and “1” was the lowest. The questions focused on six learning outcomes: critical thinking; communication; career and teamwork; civic responsibility; global understanding and citizenship; and academic development and educational success. (Robinson, 2010).

> During the three-year grant, the Horizons colleges collected 2,317 student surveys: 1,687 from service learners, and 630 from nonservice learners. The colleges also collected 68 faculty surveys: 46 from faculty who used service learning in the surveyed courses, and 21 from faculty who did not use service learning in the surveyed courses. (Robinson, 2010, p. 3)

Results of the instrument showed that the GPAs of students who participated in service-learning were significantly higher than those students who did not participate in service-learning. In addition, service-learners scored higher than non-service-learners in five learning outcomes: Career and teamwork, civic responsibility, and academic development and educational success. There was no significant difference between the

two groups in their responses to global understanding and citizenship. Results of the survey questions revealed that students who participated in service-learning felt more involved in their communities, and bettered their understanding of what it meant to be a community member.

Students were not the only ones to report positive impacts of service-learning. Faculty focus group results showed that all responding faculty believed service-learning enhanced student learning. Across the board, faculty reinforced the idea that "service-learning provides students with experiences so varied and unstructured that a single classroom cannot offer them all" (Robinson, 2010, p. 10). Faculty members also stated service-learning helped students "experience the joys and excitement as well as the frustrations and setbacks that are part of any career or work situation" (Robinson, 2010, p. 10). In addition, faculty members discussed three benefits of service learning. First, service-learning can help students develop future academic and career goals; second, service-learning enables students to "identify their biases and to replace those biases with accurate information" (Robinson, 2010, p. 11); and third, service learning helps faculty transfer academic content to real world situations (Robinson, 2010). Therefore, this study showed that service-learning was beneficial to students and faculty on multiple levels.

In a study involving four urban community colleges in New York City, researchers found four items they tested were significantly higher in students who performed service-learning (Group 1) vs. students who did not perform service-learning (Group 2). First, Group 1 students were more likely than Group 2 students to volunteer in the next 12 months (Greenwood, 2015, p. 66); second, Group 1 students reported a

higher desire to be of service to others compared to Group 2 students (Greenwood, 2015, p. 67); third, more Group 1 students than Group 2 students believed class material was relevant to their lives and could apply course content to help solve problems outside of class (Greenwood, 2015, p. 67), and fourth, Group 1 students were more likely than Group 2 students to be aware of opportunities for community involvement, and reported higher comfort levels with public speaking (Greenwood, 2015, p. 69).

No matter what kind of program computer science students produce for a community partner, they can learn about ethical and professional issues and polish their interpersonal skills. Tan and Phillips (2005) describe three projects Mansfield University of Pennsylvania computer science students designed over three years. While two of these projects were for the university and one was for a small arts and crafts business, students were still able to practice their employability skills (Tan & Phillips, 2005).

In this seminal study, computer science students at Queen's University Belfast, during their first year of college, completed a one-year program in which they worked closely with employers to develop employability skills (Hanna, Allen, Kane, Anderson, McGowan, Collins, & Hutchison, 2015). The study proposed that engaging employers right from the start of students' studies increased problem solving skills, decision-making, teamwork, dependency, positivity, and resilience (Hanna et al., 2015, p. 292). The premise of the study was that, to first year students, employment was seen as something far in their futures, so they were not likely to be concerned with developing their skills (Hanna et al., 2015). To address the fact that students thought employment was something in their distant futures, the skills were presented to the students as "professional skills" rather than "employability skills" (Hanna et al., 2015, p. 296).

The university discussed employability skills with a variety of small and medium size companies as well as with multinational companies in order to agree on the types of skills that could be embedded into first year programs. Faculty and employers agreed to focus on three forms of employability skills: Accountability, which includes responsibility, initiative, and self-drive; communication, which includes written, verbal, and technical communication; and teamwork, which includes intrapersonal skills such as commitment and reliability, as well as interpersonal skills such as active listening, knowledge sharing, and flexibility (Hanna et al., 2015, p. 295).

Employers worked with students in multiple ways during their first year. First, they supervised projects the students were doing for the employer; second, they sponsored information events; third, they guest lectured; and fourth, they visited the classroom and demonstrated professional skills. Demonstration of professional skills were not always stated as such to students. Instead, employers visited classrooms as a guest lecturer to talk about a predetermined topic, but were told in advance by the instructor to focus on the need for professionalism in the work place. In addition, employers often chose students who were recent graduates of the university with strong professional skills to be guest lecturers. This was done to provide students with a "meaningful reference model as to how they would be expected to behave in employment" (Hanna et al., 2015, p. 300).

Employers and student teams met every two weeks, and in these meetings, employers coached students on professional dress, posture, and mannerisms, as well as on note-taking and meeting management (Hanna et al., 2015, p. 301). Student attendance at all activities was tracked with RFID key pods which the students had agreed to carry,

and students could see a log of their actual attendance vs. their expected attendance (Hanna et al., 2015, p. 301). Students were supported and encouraged to attend and succeed throughout the semester, and were availed to mentors and counselors (Hanna et al., 2015).

Results showed that students who had gone through the program were more likely to show accountability than students who had not gone through the program ($p<.01$). Program students also authored significantly more professional emails compared to students who had not gone through the program ($p<.01$) (Hanna et al., 2015, p. 305). In addition, there was a significant increase in academic achievement between program and non-program students ($p=.03$), and fewer program students failed the course ($p<=.01$) (Hanna et al., 2015, p. 306).

One unexpected benefit of the employer-college collaboration was that most of the employers who participated were very positive about the course, and have since maintained ongoing collaboration with the school. In addition, employers who did not participate in the original project expressed interest in becoming involved in future collaborations (Hanna et al., 2015, p. 307). Through this program, the college developed strong working relationships with a number of employers.

Review of Research about Empathy and Civic-Mindedness

Empathy is "identification with and understanding of another's situations feelings, and motives" (Dictionaries, 2000, p. 586). There are many studies that demonstrate increased feelings of empathy and increased feelings of civic-mindedness as an outcome of service-learning. The meta-analysis of 62 service-learning studies involving 11,837 students by Celio et al. (2011) reveal that civic engagement behaviors were significantly

higher in students who performed service-learning when compared to students who had not performed service-learning (Celio, Durlak, & Dymnicki, 2011). Celio et al. define civic engagement behaviors as "any measure oriented toward or directly affecting the community, such as altruism, civic responsibility, and current and future voting behaviors" (Celio et al., 2011, p. 170). In another meta-analysis which included 103 studies, Conway, Amel, and Gerwien (2009) found service-learning had a positive effect on academic, citizenship, and social outcomes (Conway, Amel, & Gerwien, 2009).

In a single study, Wilson (2011) compared students participating in service-learning with students not participating in service-learning at a private California college. She found significant differences in expression of perspective, empathy, and self-knowledge between service-learning participants and non-participants (Wilson, 2011). At Miami University in Ohio, Wasburn-Moses, Fry, and Sanders (2014) studied college students who mentored at-risk youth using a triangulated data collection method of surveys, focus groups, and structured writings. The results indicated that not only did the students show increased communication skills, they showed increased levels of empathy (Wasburn-Moses et al., 2014). The positive effects of service-learning on empathy are not unique to college students. Middle and high school students showed increases in empathy and caring as well (Billig et al., 2008; Chandler et al., 2011). Because employers state that employees will be more successful if they can empathize with others, students will benefit by engaging in service-learning at some point in their academic career.

A person who is civic-minded or civically engaged views her or himself as part of a larger social fabric (Cole & Zhou, 2014), and "promotes the quality of life in a

community, through both political and non-political processes" (Ehrlich, 2000, p. vi). Being civic-minded benefits individuals and their social environments, and people must realize that the company for which they work is also a community. Therefore, being civic-minded serves people well in their work environments. Working for the "greater good" is part of what service-learning strives to promote. Several studies have shown that performing service-learning increases feelings of civic engagement in college students (Blankson, Rochester, & Watkins, 2015; Chandler et al., 2011; DePaola, 2014).

Researchers at St. Xavier University in Canada studied 130 undergraduate psychology students to understand what effects service-learning had on civic responsibility, interpersonal skills, and course competencies. The study used a test-retest research design to control for self-selection and for potential differences between service-learning participants and non-participants. After the service-learning project, students reported increased civic responsibility, which included understanding, accepting, and helping others, as well as improved practical skills (Hebert & Hauf, 2015). The positive impact of service-learning on empathy spans age groups, as demonstrated by Smith (2010) who studied millennial students at Ball State University. She found that students who participated in service-learning activities showed significant increases in civic and social awareness (Smith, 2010).

Community psychology students in Hong Kong had six sessions on social capital, human diversity, and social inequality before they performed their service-learning project (Chan, Ng, & Chan, 2016, p. 26). Students (n=26) worked in groups of four to eight to provide services to elders as well as to youth. During the semester, students engaged in reflective journals, project blogs, and project presentations (Chan, Ng, &

Chan, 2016, p. 27). Data collected through journals and interviews revealed that students felt a sense of mastery, personal empowerment from critical awareness of community issues, and personal empowerment from experiencing community involvement (Chan, Ng, & Chan, 2016. p. 30).

In order to foster a sense of connectedness and feelings of inclusivity for their community with their institution, Benedict College engaged in service-learning activities that enriched their community of Columbia, South Carolina (Greene, 2006). Because local neighborhoods had declined, Benedict College decided to focus their efforts on creating affordable housing in the area as a way of boosting economic and community development (Greene, 2006, p. 55). Between 2000 to 2005, students at Benedict College engaged in street revitalization, purchasing, rehabilitating, and reselling existing substandard housing (Greene, 2006). The service-learning projects were expanded to include "community clean-ups, health awareness, intergenerational therapeutic and recreational activities, historical documentation, community council meetings, and town hall forums, in addition to faith-based and school district tutoring and mentoring programs" (Greene, 2006, p. 58). Because of these activities, the college was able to address the "human element of the local neighborhood" (Greene, 2006, p. 58).

Benedict College developed a list of best practices based on collaborative partnerships (Leiderman, Furco, Zapf, & Goss, 2002) and the merit of inclusivity in creating community (Greene, 2006). All the practices focused on reciprocity and shared vision. The goals were mutually agreed upon before the project began; both partners recognized each other's strengths and experiences, and resources, rewards, and risks were shared among partners and the college (Greene, 2006, p. 60).

Other Student Outcomes of Service-Learning

Though this study focuses on the effects of service-learning on employability skills, feelings of empathy, and feelings of civic-mindedness, it is important to note that service-learning has other student outcomes. Service-learning has been shown to improve student retention (Axsom & Piland, 1999; Yeh, 2010), and academic performance (Astin et al., 2000). In a meta-analysis of the impact of service-learning on students, Celio, Durlak, and Dymnicki (2011) found that students participating in service-learning programs demonstrated significant gains attitudes toward self and attitudes toward school and learning, as well as in academic performance, civic engagement, and social skills (Celio et al., 2011). In addition, Eyler and Giles state that service-learning helps to reduce stereotyping and increase an appreciation of different cultures (Eyler & Giles Jr., 1999). These are just a few examples of service-learning outcomes other than the ones which will be examined in this study.

Arguments Against Service-Learning

Though there are many studies that show service-learning is beneficial to students, there is also literature that purports the opposite. One criticism of service-learning is that if it is done incorrectly, students can form incorrect or incomplete ideas about social problems because of their unique early experiences. They may also form incorrect ideas because their exposure to the community partner and the partner's need is not as thorough as it should be (Eby, 1998; Pearl & Christensen, 2017). In order to alleviate these potential problems, Cronley, Madden, Davis, and Preble (2014) stress the importance of educators using service-learning correctly by developing focus groups of instructors experienced with using service-learning effectively, and then having new

faculty “shadow” an experienced instructor (Cronley, Madden, Davis, & Preble, 2014, p. 163).

Literature also points out that community partners can be negatively affected by service-learning. Eby argues that the work students perform does not change a community’s problem at a “structural level,” and therefore, does not help the community partner (Eby, 1998, p. 3). Strom warns that when performed incorrectly, service-learning can alienate community partners in several ways. First, there is the danger that an educator tells the partner what the partner needs without ever finding out what it is the partner actually needs. Second, if the service-learning project is not carefully designed, the community partner can end up taking on a lot of responsibility for the project (Strom, 2009). Strom suggests that educators and community partners adhere to a carefully outlined contract before proceeding with any work (Strom, 2009). Service-learning can also affect the broader community as Tinkler, Tinkler, Gerstl-Pepin, and Mugisha (2014) point out. When an institution or an educator makes the choice to perform service-learning with a particular community partner, this may create tension in the wider community if there is a perception that this community partner already receives a lot of resources from the community (Tinkler, Tinkler, Gerstl-Pepin, & Mugisha, 2014).

Finally, service-learning can have a negative affect on a faculy member’s chances for promotion and tenure (Cooper, 2014). Cooper states that service-learning activities can be seen as too non-traditional to be counted as academic rigor. He points out that in order for faculty members’ service-learning activities to be validated, it is imporant to have buy-in from one’s institution, and faculty must build a support network among co-faculty but among senior leadership as well (Cooper, 2014).

Best Practices and Future Implications

Community Partners

Having a suitable community partner for students' service-learning work is crucial to positive outcomes. In their book *The Unheard Voices,* Stoecker and Tryon list guidelines that can help optimize the partnership between the learning organization and the community agency. Several suggestions they make are: clearly defining service-learning for the community partner; creating databases that faculty and community partners can consult when arranging matches, running orientations for students and community partners, and keeping in close touch with community partners during the project to make sure everything is proceeding smoothly (Stoecker, Tryon, & Hilgendorf, 2009, pp. 173-175).

In a focus group of 99 community partners, Sandy and Holland (2006) found similar best practices for service-learning including "communication among partners, understanding partner perspectives, personal connections, co-planning, training, and orientation, and accountability and leadership" (Sandy & Holland, 2006, p. 34).

The results of specific studies confirm the best practices proposed by Sandy and Holland and Stoecker and Tryon. One of Benedict College's service-learning best practices is having a shared vision with their community partners (Greene, 2006). Other institutions report service-learning success is tied to relationships with community partners. In order for service-learning to be successful, it is important to assure students are given time to reflect on their experiences (Cord & Clements, 2010; Deeley, 2013; Hancock, Shenk, & George, 2013; Karasik, 2013). McDonald and Dominguez (2015) emphasize that a successful service-learning partnership entails faculty connecting course

objectives to the service being offered by the students (McDonald & Dominguez, 2015). They also emphasize the need for a framework for assessment and reflection (McDonald & Dominguez, 2015).

It is also important to make sure the goals of all parties – community partner, student, and faculty – are aligned. Maddrell (2014) offered a list of design considerations based on a series of interviews with students, faculty, and community partners (Maddrell, 2014). Community partners "must be willing to act as a partner with faculty for student learning, and should recognize the importance and cost of supporting students in their educational experience" (Maddrell, 2014, p. 217). Community partners and faculty must have extended discussions about the partners' needs, the time they are able to commit to the projects, and the abilities of the students. In addition, community partners must be made aware of the restriction of a semester time limit, i.e. partners could not keep adding requirements to the project as the semester went on (Maddrell, 2014, p. 218). Projects can be delayed for any number of reasons, including those as basic as requiring background checks for students or partners (Maddrell, 2014, p. 218). In summary, Maddrell suggests "well-established protocols for communication between partners and students" as well as faculty (Maddrell, 2014, p. 219).

Rinaldo et al. (2015) conducted a qualitative study examining the value of service-learning to community partners (Rinaldo et al., 2015). Researchers surveyed different types of community partners, and multiple instructors in a wide variety of courses in order to achieve an in-depth sample pool (Rinaldo, Davis, & Borunda, 2015, p. 117) . Nine community partners were studied in the same 12-month time frame, and were interviewed face-to-face in a semi-structured format at their own offices. Results of the

interviews revealed that community partners get the most value out of service-learning when there is "shared understanding and reciprocity" between partners and the higher education institution (Rinaldo, Davis, & Borunda, 2015, p. 116). Additionally, instructors and community partners must decide jointly what the service-learning project should entail in order to address classroom learning objectives as well as the needs of the community partner (Rinaldo, Davis, & Borunda, 2015, p. 116).

In another study of community partners, Steimel (2013) found that partners revealed both positive and negative feelings about service-learning (Steimel, 2013). Community partners from unique organizations (N=15) stated in semi-structured interviews that they believed students provided needed and valuable service (Steimel, 2013, p. 244), shared technical skills that partners did not have (Steimel, 2013, p. 245), were made more aware of their community (Steimel, 2013, p. 245), and were able to apply classroom skills in a real-world context (Steimel, 2013, p. 247). On the negative side, community partners believed students either do not know or do not care about learning objectives (Steimel, 2013, p. 248), faculty don't give the students specific enough information (Steimel, 2013, p. 249), they (community partners) have little or no contact with faculty (Steimel, 2013, p. 250), and there is limited opportunity to give feedback about students' performances (Steimel, 2013, p. 250). These issues could be avoided by following the best practice of carefully laying out expectations (Rinaldo et al., 2015).

Morton and Bergbauer (2015), also found that it is important to nurture the partnership between community partners and the institute of higher learning (Morton & Bergbauer, 2015). In this study, researchers followed service-learning activities at

Providence College over an eight-year period. During that time period, Providence College students created four off-campus spaces in which community members could meet and talk and decide on activities that would foster personal growth and community improvement (Morton & Bergbauer, 2015, p. 21). The first project was a weekly recreational night safe space program that focused on intervening in and preventing gang violence (Morton & Bergbauer, 2015, p. 21); the second project was a 1,000 square foot storefront lent by the college to be available for free to community and college members planning collaborative activity (Morton & Bergbauer, 2015, p. 23); the third project was a course that would focus on a different theme about Providence every time it was taught (Morton & Bergbauer, 2015, p. 24); and the fourth project was a Common Grounds Café (Morton & Bergbauer, 2015, p. 25). Results of the study focused on the importance of building relationships with members of local communities in order to ensure the success of service-learning.

Early Intervention

Often, students are not exposed to service-learning until the last semester or year of their college program. In the hopes that their students' interpersonal skills would improve more significantly, the undergraduate physiotherapy program in New South Wales, Australia changed from using their Problem Based Learning (PBL) method only in the final year to using PBL, to utilizing PBL in all four years, starting in the first semester for the students (Skinner, Hyde, McPherson, & Simpson, 2016). Problem based learning (PBL) is another form of experiential education, which allows students to take different roles during the problem-solving process. Students engaged in open and closed questioning, interviewing skills, group work, leadership, role play, and the use of

professional language. Results showed a significant difference in interpersonal skills and confidence, where PBL students scored higher on those constructs (Skinner, Hyde, McPherson, & Simpson, 2016, p. 25). Faculty involved in the PBL noticed that students who increased interpersonal skills were more likely to be engaged with the project, and those students who were disengaged were not as likely to increase their interpersonal skills. This underscores the need to explain to students why they are participating in PBL, and could be a topic for future exploration (Skinner et al., 2016).

In another study, medical students in Taiwan spent at least 14 hours per semester visiting with elderly people who lived alone. Analysis of reflection results showed that early exposure to community engagement increased students' capacity for self-reflection. This study is an argument for early intervention with service-learning (Yang, Shih, Liu, & Chan, 2014). In another study, first-year pharmacy students who participated in service-learning showed increased skill in professional communication and cultural competency, reinforcing the idea that students should start working on employability skills right away in their first year (Kearney, 2013).

Interdisciplinary

One aspect of service-learning project design that appears to improve outcomes is the introduction of cross-disciplinary groups working together on the same project. In an interdisciplinary study in which law students worked with social work students, the interpersonal skills of the law students improved significantly (Boys, Quiring, Harris, & Hagan, 2015). In another study, social work and law students were put together to work on cases at the Indiana University School of Law. At Indiana University, social work students had interpersonal skill development as part of their coursework, but law students

did not. During the semester, the law students (*n*=8) took a course co-taught by a law professor and a social work professor. Half of the course time was spent on team project solving, client-centered practice, interviewing, cultural competence, and empathy (Boys, Quiring, Harris, & Hagan, 2015, p. 418). The law students completed a pre- and post-Interpersonal Communication Inventory, which measures five dimensions of interpersonal learning: Self-disclosure, clarity of expression, ability to cope with angry feelings, listening, and self-concept (Boys, Quiring, Harris, & Hagan, 2015, p. 419). Results showed that law students experienced a significant increase in their interpersonal communication skills after the course was over (Boys, Quiring, Harris, & Hagan, 2015, p. 422).

Research also suggests that interdisciplinary service-learning helps technical people better explain specifics to non-technical people (Keshwani & Adams, 2017, p. 43), and therefore, cross-disciplinary service-learning has been shown to improve communications skills in engineering students (Keshwani & Adams, 2017). At the University of Nebraska, junior year engineering students (*n*=46) and junior year elementary education students (*n*=24) collaborated to develop afterschool science, technology, engineering, and mathematics (STEM) clubs for elementary children. Results showed that engineering students benefitted from the project because they needed to increase their knowledge of the STEM subject in order to explain it to elementary children (Keshwani & Adams, 2017, p. 52). Engineering students also strengthened their communications skills, their cultural competence, and their leadership and teamwork skills.

Researchers at Northwest Missouri State University examined changes in students' interpersonal and professional skills (Shadinger & Toomey, 2014). Undergraduates from five disciplines: Art and graphic design; computer science and interactive digital media; business and marketing; public relations; and journalism and media studies worked together to emulate a professional marketing company (Shadinger & Toomey, 2014). Student reflections showed that participating in the course helped them develop better skills in problem solving, teamwork, interpersonal communications, and professional behavior (Shadinger & Toomey, 2014).

While research overwhelmingly demonstrates a positive link between service-learning and successful employment, some researchers suggest awareness of potential barriers. For example, students are not always enthusiastic about performing service-learning. Criminal justice students (n=231) at a small liberal arts university in the Pacific Northwest were surveyed by both qualitative and quantitative questions about their attitudes towards service-learning. Results showed that students were concerned about time, money, and family obligations (Burke & Bush, 2013). This resulted in the argument that service-learning be done all in class time. Researchers also pointed out that it is important to engage service-learning early in the term so students have time to reflect (Burke & Bush, 2013, p. 66).

Faculty, too, are sometimes reluctant to utilize service-learning because of the uncertain nature of a project's process. They believe if the project does not go according to plan, learning outcomes will be negatively affected (Warner, Glissmeyer, & Gu, 2012). However, studies show that with careful planning and comprehensive post-project analysis, substantial risk can be lessened or even avoided (Larson & Drexler, 2010).

Summary of Findings and Themes within Reviewed Literature

Service-learning theories have evolved to include not just experiential education, but recognition of students' unique backgrounds, the significance of finding the correct match between a student and a service-learning experience, and the importance of educator-mediated reflection. Service-learning has been shown to lead to improved interpersonal skills, as well as increased empathy and civic-awareness in a wide variety of students. This literature review also revealed best practices for optimal service-learning experiences. The theoretical framework of Cone and Harris, as well as concepts from the reviewed literature, will guide the design of this study.

CHAPTER THREE: RESEARCH DESIGN

Research Rationale

Though service-learning has been shown to increase employability skills, empathy, and civic-mindedness in students ranging from middle school to high school to college (Billig et al., 2008; Chandler et al., 2011), there is a dearth of service-learning projects in the computer science field (Compact, 2016; Council, 2016). Therefore, studying the impact of service-learning on students majoring in computer science at a technical college is beneficial.

Research Purpose

The purpose of this study was to explore the impact of service-learning on employability skills, empathy, and civic-mindedness of computer science students at Western Technical College (Western) in La Crosse, Wisconsin. The overarching research question was: What were the personal and professional experiences of computer science students performing service-learning projects at Western?

The related research question(s) were:

1. How did participating in a service-learning project affect students' employability skills?
2. How did participating in a service-learning project affect students' feelings of empathy?
3. How did participating in a service-learning project affect students' feelings of civic-mindedness?

Research Methodology

The proposed study was a mixed methods, phenomenological methodology used to ascertain the experiences of computer science students performing service-learning

projects. A phenomenological study was chosen to obtain the description of "what an experience means to a person…who lived the experience and is able to retell the story of that experience" (Terrell, 2016, p. 146). Both qualitative and quantitative data were collected, and the methods for collecting these data are presented in the next section.

Appropriateness of the Methodology to the Research

The purpose of this study was to find out about students' experiences when they did a service-learning project. A phenomenological study "culminates in the essence of the experiences for several individuals who have all experienced the phenomenon" (Creswell, 2014, p. 14). Because there are few studies examining service-learning projects done by computer science students, a phenomenological study lent itself to exploring important topics, such as students' experiences working in teams, challenges that students faced when trying to complete a project for a community partner, and changes in students' employability skills and feelings of empathy, to name a few (Leedy & Ormrod, 2016). By using interviews to gather data about subjects' experiences, the researcher listened with "deep attentiveness to participants' viewpoints" while "bracketing" or recognizing one's own biases (Bazeley, 2013, p. 27). Bracketing means that phenomenological researchers try to suspend their personal experiences or preconceived ideas which might influence how they interpret the participants' interviews (Leedy & Ormrod, 2016, p. 256). German philosopher Edmond Husserl established the school of phenomenology, and advocated that researchers suspend their own judgements and previous presuppositions while they studied their area of interest. Husserl was also a mathematician, so he called setting aside ideas "bracketing" because it was analogous to setting something in an equation aside in parentheses (Taylor & Francis, 2013).

Overview of the Research Design

Within the research methodology of phenomenological, this study employed the techniques of quantitative and qualitative surveys to generate data relevant to the research questions. The protocol included one-on-one interviews, a survey, a focus group, various types of reflection, and an interview with the instructor of the courses.

Pilot Study

In order to establish validity for the one-on-one interview questions, the researcher conducted a pilot study with her student in an IT Project Analysis class. These students performed service-learning projects as part of their class during the summer of 2017. The researcher asked an instructor in the University of Wisconsin-La Crosse Biology Department (Interviewer One) to conduct interviews with her students. At the beginning of the summer trimester in May 2017, the researcher met with Interviewer One to explain her dissertation research questions. She gave Interviewer One a list of questions to ask the students. The researcher instructed the interviewer to introduce herself, state the student's participation code along with the date and time, and then ask each question on the list. The researcher instructed the interviewer to ask follow up questions if an answer was unclear. During this same time period, the researcher told her students about her dissertation, and asked if any of the students were interested in being interviewed as part of a pilot study. The researcher collected Informed Consent forms from those who wished to participate.

In the middle of August 2017, eight students chose to schedule interview times with Interviewer One. The researcher posted a Doodle poll of times the interviewer was available, and students filled out the poll to secure their time slot. The interviewer had

access to the Doodle poll so she could see which students would be at which time slot. Before each interview, the researcher gave Interviewer One another copy of the question list as well as a digital voice recorder. The researcher reminded the interviewer to introduce herself, state the student's participation code as well as date and time of the interview, and to ask the students follow up questions to elicit more information. The directions the researcher gave the interviewer were derived from the guidelines proposed for planning and conducting interviews in a qualitative study by Leedy and Ormrod. These guidelines include courteously introducing yourself to the participants, restricting each question to a single idea, using simple and clear language, giving a rationale for any item which may seem unclear, and seeking clarifying information when necessary (Leedy & Ormrod, 2016, pp. 147-149). Interviews were conducted in Western's Student Union, and the recordings were then transcribed by rev.com and analyzed using the Nvivo software. After the final interview, the researcher and Interviewer One discussed the process of the interviews. They determined that for the actual study, the researcher would send students the interview questions before the interview so they could think about the questions beforehand. They also decided that the interviewer could rephrase a question if a student didn't understand it, and decided the interviewer could ask for more details after a student's initial response.

Research Protocol

After the pilot study, the researcher collected data from classes occurring in the Fall 2017 trimester. The protocol was as follows. As part of their usual class requirements, IT students at Western are required to participate in a service-learning project of their choice. Students perform their service-learning on various sites,

depending on the project they select via the Ugetconnected website sponsored by Western, UW-La Crosse, Viterbo University, and the Great Rivers United Way.

During the first week of the fall trimester, 54 students in four IT classes were given a definition of service-learning by their instructor and by Western's Community Engagement Coordinator. The researcher then gave a brief overview of her dissertation topic, and handed out consent forms to those students who were interested in participating in any of the data collection activities. Students were told that their participation in the study was voluntary and would not affect their grade, but that if they participated, they would receive a Kwik Trip gift card. Students who returned the signed consent forms were assigned a participation code. This code was comprised of a combination of the course section name as well as a numeric code. Students used this code each time they completed a survey or answered a reflection question in SurveyMonkey, and they were also referred to by this code in their final one-on-one or focus group interviews.

One of the 13 students interviewed was not part of the four classes mentioned above. The researcher chose to include a former student in the data collection because this student had a service-learning experience that was more in-depth than some of the students in the Fall 2017 courses. This computer science student graduated in Spring 2016, and is currently employed in a neighboring city. Because the student would no longer potentially have the researcher as an instructor at the technical college, the researcher conducted the interview herself.

For phenomenological studies, Creswell and Poth recommend five to 25 participants (Creswell & Poth, 2015) , and Morse recommends at least six participants

(Morse, 1994). Patton purports that "there are no guidelines for determining the size of purposeful samples" (Patton, 1987, pp. 58-59). He goes on to state that the sample "should be large enough to be credible for the purpose of the evaluation but small enough to permit adequate depth and detail for each case or unit in the sample" (Patton, 1987, pp. 58-59).

Pre-Service-Learning Assessment

Eight of the students from the one-on-one interviews, and all five of the focus group students completed a pre-service-learning assessment consisting of 39 statements that were answered with a 5-point Likert scale. With the exception of demographic data, these questions were derived from the standard survey developed by Western's Community Engagement Department. The validity of this survey is explained later in this chapter. Questions 1 and 2, shown in Table 1, asked for the student's participation code and asked if the student had ever volunteered before. Questions 3 through 6, shown in Table 1, focused on students' perspectives on the scope and impact of service. Survey questions 7 through 11, shown in Table 2, concerned students' perspectives on how community engagement related to their course. Questions 12 -14, shown in Table 3, focused on how service-learning developed communication skills. Questions 15 through 18, shown in Table 4, focused on critical thinking and reasoning. Questions 19 and 20, shown in Table 5, focused on the relationship between service-learning and community awareness. Questions 21 through 29, shown in Table 6, focused on service-learning and its relationship to personal skill growth and leadership. Data were collected via SurveyMonkey.

Table 1

Pre-Service-Learning Assessment

Section 1: Students' Perspectives on the Scope and Impact of Service

Number	Question
1	What is your Participation Code?
2	Before taking my IT class with Cindy this fall, I had already volunteered in my community (or I am volunteering now).
3	I have a responsibility to serve my community.
4	I can make a difference in my community through service.
5	The service I will do through this course will benefit the community.
6	Most people can make a difference in their community.

Table 2

Pre-Service-Learning Assessment

Section 2: Students' Perspectives on How Community Engagement Related to their Course

Number	Question
7	The service I will do through this course will help me to better understand the materials in this course.
8	I learn course content best when connections to real-life situations are made.
9	I will learn more from this course if more time is spent in the classroom instead of in the community.
10	My interactions with the community partner will enhance my learning in this course.
11	The idea of combining course work with service to the community should be practiced in more courses at this college.

Table 3

Pre-Service-Learning Assessment

Section 3: How Service-learning Developed Communication Skills

Number	Question
12	The service I will perform in this course will help me to improve my speaking skills and communicate effectively with a diverse population.
13	The service experience will improve my listening and conversational skills.
14	The service experience will help me to develop effective communication skills using professional, academic, or reflective writing skills.

Table 4

Pre-Service-Learning Assessment

Section 4: How Service-learning Developed Critical Thinking and Reasoning

Number	Question
15	The service will provide me with experience in a particular issue that will help me to form a viewpoint around that issue and articulate an argument to support my perspective.
16	The service experience will help me to identify problems in the community/with a community organization.
17	The service will provide me with experience to generate alternative solutions to a problem.
18	The service aspect of this course will help me to develop my problem-solving skills.

Table 5

Pre-Service-Learning Assessment

Section 5: The Relationship Between Service-learning and Community Awareness

Number	Question
19	I have a good understanding of the needs and problems facing the community in which I live.
20	The service involved in this course will help me to become more aware of the needs in my community.

Table 6

Pre-Service-Learning Assessment

Section 6: The Relationship of Service-learning to Personal Skill Growth and Leadership

Number	Question
21	The service involved in this course will make me more aware of my own biases and prejudices.
22	Participating in the community will help me enhance my leadership skills.
23	The service experience will help me to develop skills in working with others as a team.
24	The service I will perform in this course will enhance my relationship with my peers.
25	The service will provide me with an opportunity to apply my skills in a "real world" setting.
26	The service I will perform in this course will help me learn how to plan or complete a project.
27	The service in this course will help me clarify my career paths.
28	The service experience will help me to explore different job positions within a specific industry/career field.
29	The work I will accomplish in this course will help to build my resume.
30	This service-learning course will help me become more comfortable working with people who are different from me.
31	The service experience will help me to understand diverse perspectives about community/social issues.

One-on-One Interviews

Thirteen students participated in one-on-one interviews. Eleven students were interviewed by the faculty member from UW-La Crosse (Interviewer One), and two students were interviewed by a local free-lance writer (Interviewer Two). Before the interviews took place, the researcher met with Interviewer One and Interviewer Two at a local coffee shop to give Interviewer Two an overview of the project, and to have Interviewer One explain the interviewing protocol she used in the pilot study.

Student interviews were conducted in the Union Market, Western's student union. Students were scheduled for interviews this way. Once the student had returned a signed informed consent, the researcher emailed them a list of dates and times from which they could choose an interview slot. When the student emailed the researcher their interview slot choice, the researcher emailed the student the questions which they would be asked, and she informed the interviewer of the schedule. The interviewer arrived on campus about ten minutes before the interview to receive the recorder from the researcher. In order to introduce the student to the interviewer, the researcher waited with the interviewer until the student arrived. Then the researcher left, and the interviewed texted the researcher when she was finished interviewing each student. The interviews lasted about 20 minutes on average. The interviewer retrieved the digital recorder and uploaded the transcript to rev.com for transcription. When the researcher received the transcription back from rev.com, she sent it to the interviewer so the interviewer could send it to the interviewee for member checking. If the student had changes, she or he emailed the interviewer with the changes, and the interviewer sent these back to the researcher. Data

were analyzed first by using a spreadsheet and then by using Nvivo. One-on-one interview questions are listed in Table 7.

Table 7

One-on-One Interview Questions

Number	Question
1	Will you describe the work you did for your community engagement project?
2	What did you learn about yourself after working with your team and your community partner?
3	What did you learn about others during this process? This could be other people on your team, or your community service partner'
4	What did you wish you had known about yourself going in?
5	How did personal stuff outside of school affect you? If you had unexpected personal hardships come up, how did you deal with that?
6	How will this information about yourself and how you handle stress help you later on?
7	How hard was it to be gracious all the time?
8	What roadblocks with your community partner or your team came up that you had to deal with? How did you handle those?
9	How did you see yourself being part of something bigger , i.e. how did your view of your civic responsibility change?
10	How would you improve the service-learning experience – i.e. How could we make it better?

Focus Group

In order to broaden and diversify the amount of data about the service-learning experience, Western's Community Engagement Coordinator conducted a focus group. Students in the IT program who had performed service-learning but had not been interviewed attended a one-hour session in which they were treated to pizza, soda, and dessert. Eight students signed up for the focus group, but only five attended. Two of the students were out ill the day of the focus group session, and one had a work conflict. During the time they were eating, the Community Engagement Coordinator asked them questions about their service-learning experience. The focus group questions were formulated after the one-on-one interviews were analyzed, and are listed in Table 8.

Table 8

Focus Group Questions

Number	Question
1	Will you describe what kind of work you did for your community engagement project?
2	After talking with students one on one, we found that doing community engagement increased teamwork skills, time management skills, and communication skills. How did that mirror your experience? If it didn't, how was your experience different? What other soft skills or employability skills do you think you gained?
3	We found that people liked the feeling of giving back when they did their community engagement work. How is that similar or different to how you felt when you did your community engagement work?
4	How do you think your early experience with volunteering or giving back shaped the experience you had doing community engagement work for your Intro to IT class? For example, were you taught as a child that you should give back, or was that something your family didn't talk about?
5	How did you feel when you learned you had to do Community Engagement work? Were you excited, scared, irritated? Why do you think you felt that way?
6	As you go on job interviews, how will you market your Community Engagement experience? Will you put it on your resume? Talk about it in the interview? List the skills you gained as strengths of yours?
7	How do you view yourself differently after doing your community engagement work?

Reflection Questions

Students were asked by their instructor to reflect in different ways on the service-learning experience. Some students answered journal questions during the trimester. Some students participated in a student showcase, where they had to present their service learning projects to Western's administration members as well as to the community. Some students reflected by answering questions provided by the researcher via a SurveyMonkey link. These questions are listed in Table 9. Students reflected on their experiences in both the one-on-one interviews and the focus group.

Table 9

Reflection Questions

Number	Question
1	Please enter your participation code
2	When you are hired in the IT field, you will be expected to know a lot about IT, but what other skills do you think employers will be looking for when they hire you?
3	Now thinking about those skills you believe employers will require, how confident are you that you have that set of skills? Â What are some areas you'd like to improve?
4	On another subject, how did you feel at the beginning of this term when you learned you would be doing some volunteering, or community engagement work, or service-learning work as part of your class? Â Were you nervous, irritated, excited, worried you didn't have time for it?
5	Finally, what do you hope to gain from your volunteer experience in this class?

Interview with Instructor

Finally, Interviewer One interviewed the instructor at the end of the trimester for additional perceptions of how service-learning may have affected the students. Questions for the instructor were informed by one-on-one interview and focus group results. Questions were also informed by a 2012 study on faculty perspectives on service-learning by Lambright and Alden and from a 2016 study about employability skills by Mansour and Dean (Lambright & Alden, 2012; Mansour & Dean, 2016). These interview questions are listed in Table 10.

Table 10

Questions for the Instructor

Number	Question
1	When you meet your students as they come into your program, what are characteristics they have that might make you think, "This person is going to be great at community engagement, this person is not going to do so great."?
2	For the students who might start off not excited about community engagement work, what would you say is the percentage who really end up enjoying it, and what percentage continue to dislike it?
3	For the students who continue to dislike it, what factors do you think might contribute to that?
4	You indicated that you had students who just didn't do the community engagement part of your class. What factors do you think contribute to their not doing this part of the class?
5	One on one interview results indicated that students' employability skills improved as they did their community engagement work. These skills included communication, teamwork, and time management. Students also indicated that they learned things about themselves that will help them become better employees, like being more assertive, learning how to handle project creep, and learning how to elicit better information from clients. Were you able to see evidence of these changes in students as they progressed during your class?
6	Finally, one on one interviews also indicated that students gained civic awareness and empathy as they did their projects. Same question: Were you able to see these changes in any students during the trimester?

Data Analysis

Data generated by techniques previously described were subsequently interpreted through the qualitative analysis techniques/procedures of coding. According to Leedy and Ormrod, the strategies for organizing and analyzing qualitative data are:

- converting the data into one or more forms that will be easy to organize and analyze;
- organizing the data into a preliminary, superficial way that will enable the researcher to locate items quickly;
- identifying preliminary categories that are likely to be helpful in coding the data;
- dividing the data into meaningful units that will be individually coded;
- applying the initial coding scheme to a subset of the data;
- constructing a final list of codes and subcodes, and define each code and subcode as specifically and concretely as possible;
- considering using two or more raters to code the data independently;
- identifying noteworthy patterns and relationships among the codes;
- being alert for outliers, exceptions, and contraindications within the data set;
- interpreting the data in light of the research problem (Leedy & Ormrod, 2016, pp. 292-297).

Though Leedy and Ormrod suggest considering more than one rater to code the data, Bazeley states that it is not reasonable to expect that two people coming to a sample of data, only for the purpose of coding, will code it using the same categories and in the

same way, unless the second person is drilled in the purpose and framework for the project, and given a tightly defined set of codes to work with, with strict instructions and training in how to apply them (Bazeley, 2013, p. 150).

Therefore, these data were coded only by the researcher. Initially, data were "open coded" to "generate ideas and categories" (Bazeley, 2013, p. 162). These categories were then be used for organization as the researcher explored the data in more detail. Data also were coded to capture context so the researcher could capture types of settings in which students' worked, and types of activities students performed, for example. These contextual codes then served to "provide a basis for comparison when considering more specific aspects of what is occurring" (Bazeley, 2013, p. 160).

Validity/Trustworthiness/Triangulation

According to Creswell (2014), "validity is one of the strengths of qualitative research" (Creswell, 2014, p. 201). Validity is based on determining whether "the findings are accurate from the standpoint of the researcher, the participants, or the readers of the account" (Creswell, 2014, p. 201). There are several strategies that can be used to check the accuracy of the findings. First, the researcher triangulated the results by including pre-experience surveys as well as reflection questions that were given to students the beginning of the study. These questions were developed in order to find out about students' ideas about service-learning and its potential effects on their employability skills. Also, subjects were interviewed by an outside party about their experiences performing service-learning.

The pre-service-learning assessment survey was developed in 2016 by a graduate student at UW-La Crosse in the Student Affairs Administration program who was

performing a two-year graduate assistantship for Western's Community Engagement Department. The graduate assistant was charged with developing survey questions which would help the Community Engagement Department understand:

- a student's perspective of the scope of impact of service;
- a student's perspective of how community engagement connects to the course they are taking;
- how the service experience develops communication skills;
- how service relates to critical thinking and reasoning;
- how community service relates to community awareness;
- the relationship between service and personal growth and leadership;
- the connection between service and career exploration/work readiness;
- the impact service-learning has on cultural competency.

In order to ensure the questions had construct and content validity, the intern performed a literature review of service-learning to familiarize herself with peer-reviewed survey instruments (K. Reyburn, personal communication, November 2017*).* The researcher checked the construct validity of the survey by finding literature that supported each concept. The survey was also reviewed by the Director of Professional Learning of Campus Compact to check for content validity. In order to establish face validity, the researcher distributed the surveys to ten students in each of three different programs at Western: Architecture, Public Health, and Environmental Building Science. Students were asked to read through the survey questions to see if the questions made sense.

Second, the researcher used "rich, thick description" (Creswell, 2014, p. 202) to convey the findings to the reader. The term "thick description" was originally coined by

Gilbert Ryle in 1971 who purported that people's mental processes are demonstrated through their behaviors (Bazeley, 2013). The term was extended upon by Clifford Geertz in 1973, who stated that any action needs "contextual information and an explanation of the cultural significance of the action" in order to be understood (Bazeley, 2013, p. 376). Bazeley chooses to use the phrase "rich description" for three reasons. First, "to imply that description should incorporate a wealth of data-derived 'goodies' within it"; second, to avoid the misappropriation of Geertz's term "thick description," and third, to "avoid any connotation of its simply involving use of a lot of words" (Bazeley, 2013, p. 377).

The data from the interviews do not only include the general shared experiences of the students, but include verbatim quotes in order to give the reader a better understanding of how participating in service-learning affected the students. Third, the researcher identified her biases, recognizing that her interest in the topic of service-learning could inherently skew her interpretation (Creswell, 2014).

Biases

The researcher chose the topic of service-learning because she has an interest in the effects of service learning on students. The researcher chose to examine the experiences of computer science students at a community college because she encounters groups of students meeting this description in her current career as an instructor. The researcher realized the importance of "bracketing" or suspending any preconceived notions that may have influenced how she interprets the data she collected (Leedy & Ormrod, 2016, p. 256). In order to help become aware of notions that may have influenced her interpretation, the researcher presents discrepant information that runs counter to her beliefs about service-learning (Creswell, 2014). She also used peer

debriefing, a process in which people other than the researcher reviewed the study and asked questions about the design and results. This helped the researcher see biases in her interpretation of the data, and added validity to the study (Creswell, 2014).

Limitations

This study had several limitations. First, it is specific to only one technical college with a defined population. Second, even though students are required to participate in service-learning as part of their course, they can choose whether to be interviewed about their experiences. The researcher had no way of knowing why a student chose to participate or not, so this introduced a self-selection bias to the data. Third, in two of the classes, students could choose from a wide variety of service opportunities, whereas in the two other classes, the service opportunities are vetted by the Community Engagement Coordinator. Therefore, the quality, commitment, and level of responsibility of the service-learning opportunities varied greatly. In order to understand this issue better, the researcher asked students to describe their service-learning experiences. Fourth, participants were in one of two computer science programs at Western. Nine students who participated in the one-on-one interviews were in the Web & Software computer science program, and three were in the Computer Support Specialist program. All five of the focus group participants were in the Computer Support Specialist program. Students may be drawn to one or another of these programs because of similar traits, which could have biased the results. Fifth, the sample size, though considered acceptable by qualitative research standards, was small. These limitations will likely warrant further study.

CHAPTER FOUR: FINDINGS OF THE STUDY

Participants and their Projects

Description of Students who Participated in One-on-One Interviews

There were 13 students who participated in the one-on-one interviews. All 13 students except for Students 7 and 10 worked on projects that were directly related to IT. Students 7 and 10, both first trimester IT students, worked at local centers in which community members were given assistance with housing, food, and additional resources. These two students were included in the study because they provided data relating to empathy and civic mindedness.

Student 1 worked as a manager on a student-run help desk. She supervised students who were helping the public with computer issues they brought in to the college.

Student 2 completed two projects. One was teaching senior citizens about smartphones and tablets, and the second was working on a team creating a website for a nonprofit group in the community.

Student 3 worked on a team to install a server for a nonprofit group in the community.

Student 4 taught groups of senior citizens about smartphones and tablets onsite at the technical college.

Student 5 completed two projects. One was working on a team to create a website for a local nonprofit, and the second was volunteering at a fundraising event in the community.

Student 6 worked on a team at the Great Rivers 211 Center, assisting community members as they learned about local resources – housing, food, transportation – that they needed.

Student 7 worked on a team helping community members with projects they needed done in their yards and homes.

Student 8 worked on a team building a website for a neighboring county.

Student 9 worked on a team building a website for a neighboring county.

Student 10 worked with a team at a local food pantry.

Student 11 completed two projects. First he worked on a team at a local computer company, fixing community members' computers, and second, he facilitated a group of community members who wanted to learn about the latest technologies.

Student 12 worked on a team building a website for a local historical society.

Student 13 worked on a team building a website for a local nonprofit organization.

Description of Students who Participated in the Focus Group

Five students participated in a focus group facilitated by the community engagement coordinator. The focus group was conducted in order to explore several concepts that emerged as a result of the one-on-one interviews. During the course of the trimester, each student did at least two community engagement projects. One was specifically dedicated to developing their skills as computer support specialists, and one was to provide service to an underserved population in their community.

Focus group (FG) Student 1 created a training manual for setting up a Raspberry Pi, and then he used the manual while he taught community members how to set up a Pi. He also worked at a local animal shelter, walking dogs, petting cats, and washing pet dishes as well as other clean up as needed.

FG Student 2 taught PC anti-virus workshops which were open to community

members. He indicated that though the class series was open to anyone, the classes consisted entirely of senior citizens. FG Student 2 also worked 20 hours at a local nursing home, helping residents get from one activity to another.

FG Student 3 worked in a team with FG Student 2 to teach the anti-virus workshops. Second, he worked several shifts at a local homeless shelter, helping cook and serve breakfast to the residents.

FG Student 4 taught a class on Windows 10. His class was open to the community, but his group too was comprised entirely of senior citizens. FG Student 4 also volunteered at the Salvation Army.

FG Student 5 did three community engagement projects. She taught a class on Photo Shop and Photo Bucket to community members, she volunteered at a homeless shelter, and she also helped facilitate a Special Olympics bowling tournament.

Pre-Service Learning Community Engagement Survey Results

One-on-one interview students 1, 3, 4, 6, 8, 9, 11, and 12 and FG Students 1 through 5 all completed the Pre-Service Learning Community Engagement Survey. Survey questions 1 and 2 asked for the student's participation code and asked if they had ever volunteered before this course. All but one of the students from the one-on-one interviews volunteered before taking this course. Of the focus group students, two had volunteered before. Questions 3 through 6 of the survey focused on students' perspectives on the scope and impact of service. Twelve of the students (92.3%) strongly agreed or agreed they had a responsibility to serve the community, that they could make a difference in their community, and that their service would benefit their community. The 13th student was unsure about these questions. When asked if they believed most people

can make a difference in their community, 11 students (84.6%) strongly agreed or agreed, while 2 students were unsure. The descriptive statistical information, illustrated in Table 11, provides the mean scores for each statement found in Section 1 of the survey.

Table 11

Pre-Service-Learning Assessment Responses

Section 1: Students' Perspectives on the Scope and Impact of Service

Number	Question		
2	Before taking my IT class with Cindy this fall, I had already volunteered in my community (or I am volunteering now).		
	Answer Choices	Responses	*N*
	True	69.2%	9
	False	30.8%	4
		Answered	13
		Skipped	0
3	I have a responsibility to serve my community.		
	Answer Choices	Responses	*N*
	Strongly agree	46.2%	6
	Agree	46.2%	6
	Not sure	7.7%	1
	Disagree	0.0%	0
	Strongly disagree	0.0%	0
		Answered	13
		Skipped	0
		M	4.4
4	I can make a difference in my community through service.		
	Answer Choices	Responses	*N*
	Strongly agree	69.2%	9
	Agree	23.1%	3
	Not sure	7.7%	1
	Disagree	0.0%	0
	Strongly disagree	0.0%	0
		Answered	13
		Skipped	0
		M	4.6

Table 11 (continued).

5 The service I will do through this course will benefit the community.

Answer Choices	Responses	*N*
Strongly agree	69.2%	9
Agree	23.1%	3
Not sure	7.7%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	13
	Skipped	0
	M	4.6

6 Most people can make a difference in their community.

Answer Choices	Responses	*N*
Strongly agree	61.5%	8
Agree	30.8%	4
Not sure	7.7%	1
Disagree	0.0%	0
Strongly disagree	0.0	0
	Answered	13
	Skipped	0
	M	4.5

Survey questions 7 through 11 concerned students' perspectives on how community engagement related to their course. Again, responses were divided among the Strongly Agree, Agree, and Unsure responses. When students were asked if they thought the service would increase their understanding of course materials, 61.5% (*N*=8) strongly agreed or agreed, and 38.4% (*N*=5) of students were unsure. Students were asked if they learned course content best when connections to real-life situations were made, and 92.3% (*N*=12) of them strongly agreed or agreed with this statement. One student was unsure. When students were asked if they would learn more by being in the classroom than by being in the community, 53.9% (*N*=7) were unsure, 15.9% (*N*=2) strongly agreed or agreed, and 30.8% (*N*=4) disagreed or strongly disagreed. When students were asked if they believed their interactions with their community partner would enhance their learning, 84.6% (*N*=11) of them strongly agreed or agreed, and

15.4% (*N*=2) were unsure. The last question in the learning section asked if students thought combining course work and service-learning should be practiced more at the college. Only one student disagreed with this statement, and 92.3% (*N*=12) strongly agreed or agreed. The descriptive statistical information, illustrated in Table 12, provides the mean scores for each statement found in Section 2 of the survey.

Table 12

Pre-Service-Learning Assessment Responses

Section 2: Students' Perspectives on How Community Engagement Related to their Course

Number	Question

7 The service I will do through this course will help me to better understand the materials in this course.

Answer Choices	Responses	*N*
Strongly agree	38.46%	5
Agree	23.08%	3
Not sure	38.46%	5
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	13
	Skipped	0
	M	4.0

8 I learn course content best when connections to real-life situations are made.

Answer Choices	Responses	*N*
Strongly agree	61.54%	8
Agree	30.77%	4
Not sure	7.69%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	13
	Skipped	0
	M	4.5

Table 12 (continued).

9 I will learn more from this course if more time is spent in the classroom instead of in the community.

Answer Choices	Responses	*N*
Strongly agree	7.69%	1
Agree	7.69%	1
Not sure	53.85%	7
Disagree	23.08%	3
Strongly disagree	7.69%	1
	Answered	13
	Skipped	0
	M	2.8

10 My interactions with the community partner will enhance my learning in this course.

Answer Choices	Responses	*N*
Strongly agree	23.08%	3
Agree	61.54%	8
Not sure	15.38%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	13
	Skipped	0
	M	4.1

11 The idea of combining course work with service to the community should be practiced in more courses at this college.

Answer Choices	Responses	*N*
Strongly agree	46.15%	6
Agree	46.15%	6
Not sure	0.00%	0
Disagree	7.69%	1
Strongly disagree	0.00%	0
	Answered	13
	Skipped	0
	M	4.3

Questions 12 -14 focused on how service-learning developed communication skills. The majority of students strongly agreed or agreed that service-learning would help them improve their speaking skills when communicating with a diverse population (83.3%) (*N*=10), and that their service experience would improve their listening and conversation skills (91.7%, *N*=11). The remaining students were unsure about these two

questions. Question 14 asked students if they believed their communication would improve through the reflective writing requirement of service-learning. Two of the students skipped this question, but 83.3% (*N*=9) of the 11 who answered strongly agreed or agreed, and two students were unsure. The descriptive statistical information, illustrated in Table 13, provides the mean scores for each statement found in Section 3 of the survey.

Table 13

Pre-Service-Learning Assessment Responses

Section 3: How Service-Learning Developed Communication Skills

Number	Question
12	The service I will perform in this course will help me to improve my speaking skills and communicate effectively with a diverse population.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	41.67%	5
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

Number	Question
13	The service experience will improve my listening and conversational skills.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	50.00%	6
Not sure	8.33%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.3

Table 13 (continued).

14 The service experience will help me to develop effective communication skills using professional, academic, or reflective writing skills.

Answer Choices	Responses	*N*
Strongly agree	27.27%	3
Agree	54.55%	6
Not sure	18.18%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	11
	Skipped	2
	M	4.1

Questions 15 through 18 focused on critical thinking and reasoning. Of the 12 students who answered these questions, the majority of students (83.3%, *N*=10) strongly agreed or agreed that being exposed to a particular issue would help them form an opinion around that issue. One of the students was unsure about this statement, and one student disagreed. When asked if service-learning would help students identify problems within a community, 75% (*N*=9) of respondents strongly agreed or agreed, two students were not sure, and one student disagreed. Students were asked if they believed service-learning would help them generate alternative solutions to problems and to develop problem-solving skills and 83.3% (*N*=10) strongly agreed or agreed with this statement, while two students were unsure. The descriptive statistical information, illustrated in Table 14, provides the mean scores for each statement found in Section 4 of the survey.

Table 14

Pre-Service-Learning Assessment Responses

Section 4: How Service-learning Developed Critical Thinking and Reasoning

Number	Question
15	The service will provide me with experience in a particular issue that will help me to form a viewpoint around that issue and articulate an argument to support my perspective.

Answer Choices	Responses	*N*
Strongly agree	25.00%	3
Agree	58.33%	7
Not sure	8.33%	1
Disagree	8.33%	1
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

16 The service experience will help me to identify problems in the community/with a community organization..

Answer Choices	Responses	*N*
Strongly agree	33.33%	4
Agree	41.67%	5
Not sure	16.67%	2
Disagree	8.33%	1
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

17 The service will provide me with experience to generate alternative solutions to a problem.

Answer Choices	Responses	*N*
Strongly agree	25.00%	3
Agree	58.33%	7
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.1

Table 14 (continued).

18 The service aspect of this course will help me to develop my problem-solving skills.

Answer Choices	Responses	*N*
Strongly agree	33.33%	4
Agree	50.00%	6
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.2

Questions 19 and 20 focused on the relationship between service-learning and community awareness. More than half (58.3%, *N*=7) of the 12 students who answered the question strongly agreed or agreed they had a good understanding of the needs and problems facing their community, and 91.7% (*N*=11) of those 12 students strongly agreed or agreed the service experience would help them become more aware of needs in their community. Three of the 12 students were not sure if they had a good understanding of the needs and problems facing their communities, and one disagreed with this statement. One of the 12 students was not sure if the service would help them become more aware of their community's needs. The descriptive statistical information, illustrated in Table 15, provides the mean scores for each statement found in Section 5 of the survey.

Table 15

Pre-Service-Learning Assessment Responses

Section 5: The Relationship Between Service-learning and Community Awareness

Number	Question

19 I have a good understanding of the needs and problems facing the community in which I live.

Answer Choices	Responses	*N*
Strongly agree	8.33%	1
Agree	50.00%	6
Not sure	25.00%	3
Disagree	16.67%	2
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	3.5

20 The service involved in this course will help me to become more aware of the needs in my community.

Answer Choices	Responses	*N*
Strongly agree	25.00%	3
Agree	66.67%	8
Not sure	8.33%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.2

Questions 21 through 29 focused on service-learning and its relationship to personal skill growth and leadership. All 12 of the students who answered believed performing service-learning would help them build their resumes. The majority of students strongly agreed or agreed that performing service-learning would help them become more aware of their biases and prejudices (75%, *N*=9), enhance their leadership skills (83.3%, *N*=10), help them develop skills in working with teams (91.7%, *N*=11), enhance their relationship with their peers (83.3%, *N*=10), and give them the opportunity to apply their skills in a real-world setting (91.7%, *N*=11). More than half the students

strongly agreed or agreed that performing service-learning would help them learn to plan or complete a project (58.3%, *N*=7) and 66.7% (*N*=8) of the students strongly agreed or agreed that performing service-learning would help them explore different job opportunities in the IT industry.

The last two questions focused on the impact of service-learning on cultural competency. Of the 12 students who answered these questions, 83.3% (*N*=10) strongly agreed or agreed that service-learning would help them become more comfortable working with people, and that service-learning would help them to understand diverse perspectives about community/social issues. The descriptive statistical information, illustrated in Table 16, provides the mean scores for each statement found in Section 6 of the survey.

Table 16

Pre-Service-Learning Assessment Responses

Section 6: How Service-learning Developed Critical Thinking and Reasoning

Number	Question
21	The service involved in this course will make me more aware of my own biases and prejudices.

Answer Choices	Responses	*N*
Strongly agree	33.33%	4
Agree	41.67%	5
Not sure	25.00%	3
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.1

22 Participating in the community will help me enhance my leadership skills.

Answer Choices	Responses	*N*
Strongly agree	50.00%	6
Agree	33.33%	4
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.3

23 The service experience will help me to develop skills in working with others as a team.

Answer Choices	Responses	*N*
Strongly agree	50.00%	6
Agree	41.67%	5
Not sure	8.33%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.4

Table 16 (continued).

24 The service I will perform in this course will enhance my relationship with my peers.

Answer Choices	Responses	*N*
Strongly agree	33.33%	4
Agree	50.00%	6
Not sure	8.33%	1
Disagree	8.33%	1
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.1

25 The service will provide me with an opportunity to apply my skills in a "real world" setting.

Answer Choices	Responses	*N*
Strongly agree	50.00%	6
Agree	41.67%	5
Not sure	8.33%	1
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.4

26 The service I will perform in this course will help me learn how to plan or complete a project.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	16.67%	2
Not sure	41.67%	5
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

27 The service I will perform in this course will help me clarify my career paths.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	16.67%	2
Not sure	41.67%	5
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

Table 16 (continued).

28 The service experience will help me to explore different job positions within a specific industry/career field.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	25.00%	3
Not sure	33.33%	4
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.1

29 The work I will accomplish in this course will help to build my resume.

Answer Choices	Responses	*N*
Strongly agree	41.67%	5
Agree	25.00%	3
Not sure	25.00%	3
Disagree	8.33%	1
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.0

30 This service-learning course will help me become more comfortable working with people who are different from me.

Answer Choices	Responses	*N*
Strongly agree	50.00%	6
Agree	33.33%	4
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.3

31 The service experience will help me to understand diverse perspectives about community/social issues.

Answer Choices	Responses	*N*
Strongly agree	50.00%	6
Agree	33.33%	4
Not sure	16.67%	2
Disagree	0.00%	0
Strongly disagree	0.00%	0
	Answered	12
	Skipped	1
	M	4.3

Reflection

Students participated in various reflection activities during their service-learning experience. Some students answered journal questions on their Blackboard (learning management software) site. Only the instructor could see these entries. Half way throughout the term, after they had been informed about the service-learning component of their course but before they had completed it, students were given the option to participate in a survey administered through SurveyMonkey. Six students participated in the survey, and answered four open-ended questions about employability skills and their current skill levels. In question one, students were asked what skills besides IT skills employers would require. All six of the students indicated they believed employers would require soft skills, namely those of communication, leadership, responsibility, work ethic, problem-solving, teamwork, organizational, and time management.

In question two, students were asked how confident they thought they were in the skills they listed in question one, and in which areas they would like to improve. All of the students indicated that they were somewhat confident, but they knew they had to improve in various things like organization and time management. One student stated "I understand the most common manners and formalities, but on a deeper level, I believe that I am not yet the suave gentleman I aspire to be." One student stated he would like to be more assertive.

In question three, students were asked how they felt when they found out they had to do service-learning as part of their course. Two of the students felt irritated, and one said, "I was irritated when I found out we were being assigned community service. What I felt mattered little, because in the end I got something out of it, but no less, I was not

enthusiastic at first." Three of the students were worried they wouldn't have time for it, and one student was worried about making a presentation in front of other people, and said, "I felt nervous and dreaded planning and presenting in front of people."

Finally, in question four, students were asked what they hoped to gain from their service-learning experience. One student wanted "full points" but the rest of the students stated that they wanted to be able to help people, get more involved with their community, gain confidence, and build their interpersonal skills.

In another type of reflection, some students participated in a Student Showcase, in which they presented their service-learning projects to community members and to Western's Senior Leadership Team. For this presentation, students were required to prepare a poster showing their project timeline. They were also required to explain their project process and teamwork experience to the audience. They then invited audience members to experiment with the software they had developed.

Figure 3
Western's Programming Student Presents Project

Results related to Employability Skills

Managing Project Creep

Interviews with students revealed improvement in a wide variety of employability skills which varied depending on the projects they completed. One of the common situations that students experienced was "project creep" or in other words, the scenario in which partners kept adding more requirements to their original computer program specifications. Six of the 13 students from the one-on-one interviews reported having to deal with project creep. Students 8, 9 and 12 stated that experiencing project creep in their service-learning project helped prepare them for what a programming job was going to be like – fast-paced with changing criteria. Students managed these continual requests for more functionality by learning to tell their clients that they could complete the

required item, but it would have to be moved to the second phase of the project. Student 8 said she told her client, "Yeah. We can do that, but it might have to be done at a different time. Let's get this done first, and then we can think about adding that." She went on to say, "I think that's fine to say to a client. You just schedule it into a different phase. I mean, you can always shift things around if it's a priority."

Students 8 and 11 stated that part of handling project creep was learning how to impart bad news to clients, as well as learning how to say no to clients. Student 9 explained why he thought project creep occurred: "Sometimes clients get excited and want to tell you all their ideas, but you need to slow them down." He said that clients don't realize all the work that goes into their project, and they don't understand how much something is worth. Student 12 said "This project gave me a hard and fast introduction to programming and made me realize that something will probably change. I learned to write more flexible code because of that."

Communication

Results of the pre-service-learning assessment showed that 91.7% of students surveyed believed their communication skills would improve as a result of service-learning. Every student in the one-on-one interviews mentioned the need for clear communication to ensure project success. Three students discussed issues that they had when communication broke down among group members. Four students had community partners who did not communicate, which caused misunderstandings and project delays. Student 8 learned it was important to have the client "lay out on the table what the wants are for each project." Three students stated they learned to communicate better by watching their peers interact with the public, as well as rehearsing what they were going

to say. Seven students agreed that strong communication helped groups work better together and made working with their community partners easier. Student 7 realized that even if he thought he knew of a better way to do something, it was the client dictating the work (paying for it) and he had to adjust his expectations. He said he needed to communicate clearly to the client why he thought his idea was better, rather than just doing what he thought.

Data from the focus group supported the idea that students' communication skills improved as a result of their service-learning work. Three of the focus group students believed that their communication skills improved as a result of having to speak in front of large groups of people. In addition, data from the interview with the course instructor corroborated the students' beliefs that their communication skills had improved by performing service-learning. She stated:

> At the start of the student run help desk, when a customer walks in the building, I can see hesitancy and reluctance in approaching, greeting, and making eye contact with the customer. It's like everybody is standoffish and waiting for another person to greet the customer. By the end of the student run help desk that does not happen. They greet. They make eye contact. They make the person walking in the door feel welcome.

The instructor also gave an example of increased written communication skills:

> Written communication is also very much improved through the experience as well. We use the SpiceWorks ticketing system, and anytime we update the ticket, there's a public response that goes back to the customer's email so the customer can see everything that we do to update the ticket. The help desk managers,

actually, will review the tickets for the support technicians and provide them with feedback as do I with regard to any suggestions or changes that could be made. We take a look at things like a personal salutation, professional tone, and specific feedback. The written communication is very much an important part to this as well.

Collaboration

All of the one-on-one interview students, except Student 10, reported the importance of having a good team with which to work. Some dreaded teamwork going into the project, but were surprised at how well they did communicating and working well together. All the students except Student 9 were very happy with their teams. Student 3 stated that he was the only LGBT (Lesbian, Gay, Bisexual, Transgender) member of his team. When the team went to install a server for the local LGBT group, he felt very supported by them even though the other team members did not have a lot of experience with the LGBT community.

Students 1 and 12 stated they had issues with children being sick during the trimester, but the other members of their teams stepped up to help. Student 8 stated that "working as a group is definitely hard work, but I've learned that we can all come together as a team, definitely if we keep good communication skills." Student 12 said, "…things absolutely do come up and interfere sometimes, but if you have a strong enough team, it doesn't really hold you down." Student 1 mentioned that getting close with her classmates was a big part of her success in school.

Student 11 stated he used his team to vent, and to practice difficult situations. "…You had the rest of the team to vent a little bit, be like, 'Okay this is going to be pretty

tough, how do I get around this?' And then afterwards you can talk to them and be like 'Man, that person was just really in a bad mood. What can I do next time to improve?' And being able to talk to the rest of the team definitely helped that out."

Student 1 pointed out that it was humbling working with a diverse team, and learning that she didn't know everything, even though she was supposed to be the team leader:

> One of the things that I learned as a manger was how to work with other technicians, and how everybody kind of is at a different level, like even technicians, managers, anybody in IT, they're all kind of on different levels when you're starting out. So there was some things that some of the technicians knew more about than I did. And I was supposed to be their manager, so that was kind of humbling, and I think that's pretty relevant in the real world too, that somebody who may be your manager might know less than you do about a certain topic and they might know more about something else.

Student 12 stated "I did learn that people have different time management skills. Some people need more of a push. Some are more easily self-motivated than others." Student 3 said "Each of us had our own skillsets but bringing them together, it made it really great." Student 13 found out that some people on a team do more than others.

Three out of five students in the focus group also reported they believe their collaboration skills increased as a result of their service-learning experience. FG Student 2 said, "We had to find ways of covering for each other and helping out when one person fell behind on a task." Data from the instructor interview also supported the idea that students showed an increased ability to collaborate as a result of their service-learning

project. She pointed out that sometimes students were reluctant to work in a team, and so they requested that they work alone. But because teamwork is listed as a required competency for this course, the instructor stressed the need for students to collaborate and work on a team. The instructor gave this example:

> A woman dropped off a laptop computer that had an old version of Windows 7 on it, and she wanted everything wiped out and she wanted it upgraded to Windows 10. We had one technician and manager go to do the Windows 10 upgrade, and the machine just went black on them. It stopped upgrading, and there was absolutely no operating system. It just went black screen. The second shift came in and decided to restore Windows 7 on the computer to revert it back to the original operating system. The students then called the customer to let the customer know what was going on and that we needed to hang onto the computer a little bit longer because they wanted to make a second attempt to try to install Windows 10. Now, all this is being communicated through SpiceWorks ticketing system, which also ventures into the area of communication.

The instructor went on to say:

> This was on a Wednesday, and then on a Friday we had a third shift involved in this situation go ahead and install the Windows 10. It was a successful installation of Windows 10. There were no problems. It was upgraded just fine, but they were able to troubleshoot, and they discovered why the first team of people had a situation where the machine crashed and went black. It turns out that when they went to upgrade, they did not pull the USB upgrade media out of the computer, and it crashed.

She continued:

> They actually got back to the first team to let them know exactly what it was that caused the crash in the first place, so we had three teams of people working on one problem within a span of three days. Because of the great teamwork, the researching, and everything else everybody worked on, they were able to get this laptop upgraded for the customer. The customer was so happy, she brought in a bag of chocolates for everybody.

Time Management and Scheduling

While working on teams or working individually, students realized the importance of time management and careful scheduling when working on projects. Students 8, 9, 12, and 13 learned projects were more complicated than they thought, so it was important not to overschedule. At the same time, eight students in the one-on-one interviews reported that they learned how to schedule their own time. Student 3 said, "…now if I'm handed a big project, I know I can tackle it. I know how to plan. I know how to strategize. This is what needs to get done first and prioritize afterwards." Student 8 said she learned how to block off time to get things done and learned how to meet deadlines. Five students stated they realized they are more disorganized than they thought, and they spend a lot of time procrastinating.

Six students stated that even though personal hardships arose during the project, they found ways to stay on track with their work. Student 8 said that in order to balance life and work, she compartmentalized the two. Student 13 summed up his experience by saying, "Just by being tough and realizing that, I guess, life happens but I still have a commitment to my education and my career, so I just had to kind of toughen up and keep

doing my schoolwork anyway. I prioritize my education very highly, so I really didn't let anything impact it." He went on to say, "People might feel bad for you [if you have personal issues come up] but when it comes to business, it's business. You need to get things done."

FG Students 1, 2, and 3 stated that their time management skills improved as a result of their service-learning project because they learned not to procrastinate. Finally, the interview with the instructor supported the idea that students' time management skills improved as a result of the service-learning experience. She said:

> One of our students was acting as a manager, and she knew that she was working with a certain technician the next day. The technician is always prompt and arrives to the help desk before scheduled time. Therefore, the evening before, the manager logged into our SpiceWorks ticketing system, and she assigned the technician to one of the tickets so that when he arrived he could open up the ticket, see that it was assigned to him, and get to work right away on it. Thinking, being proactive, logging in the night before, that is a great example of time management.

Confidence

In contrast to what the literature review revealed about employers thinking students were over-confident (Associates, 2013), all students except for Student 2, stated that their performance on the community engagement project indicated they were better at their skills than they thought. Students stated that having this experience made them more confident to go out into the work environment. Student 9 said:

> It's just kind of taught me to be more of a go-getter, and just to go and try it, because you've got nothing to lose by trying. And because of this, I now have a couple projects under my belt where I can say, "Here's this." This was exciting to me at first because I worked construction and stuff for three years before, and a factory job that I didn't really want to do. Before I did this project, I kind of had a perception in my mind that I needed to know more, needed to know more before I could go out and do something like this.

Students stated they were more capable than they thought, that they had the skills to figure things out, that they were better with helping people, and better than working on a team than they thought. Student 2 was the only student who was over-confident going into the service-learning project. He said that he did not prepare well because he thought he would do fine. During his community presentation, the websites he planned to use would not work, and he learned he should always have a Plan B. He learned he needs to be better prepared. He said, “I was probably a little overconfident about it, which made me kind of not prepared as much as I should be. I was prepared but probably didn’t think things all the way through.” Student 4 said,

> I learned that I handle things under pressure a little better than I thought I did. In my presentation I felt panicked on the inside, but from what people told me, I seemed composed, and I handled it better than I thought.

FG Student 1 also stated that his critical thinking skills increased. He said that during his presentation, he was often confronted with problems about which he had not thought, so he had to find a way to help solve a participant’s issue on the spot. FG Student 3 agreed with that sentiment. He said, “We ran into maybe one or two issues

setting up. We thought everything was going to be smooth and we kind of had to rig things up to get them running smoothly." FG Student 1 said, "I feel more informed. And I think the community training that I did, I think that really helped for me to be a lot more comfortable talking to a group. I think that was one of the biggest things for me as far as community stuff." FG Student 2 said, "Now I'm not afraid to talk."

Personal Growth

Students stated that they were glad to learn things about themselves before they entered the job world. Students 7, 9, and 13 discussed the fact that they realized they did not handle stress well, and throughout their project, they discovered ways of mitigating stress. One of these ways was through exercise, and another one was through meeting with peers to relax. Student 9 stated that he didn't realize he had a habit of avoiding confrontation. When working with his team, he was getting frustrated because some people were not doing their share of the work. He says he should have spoken up right away instead of letting the resentment build up to a point where he snapped at his team members. This student went on to say that he saw a parallel between this situation and one he had with his girlfriend during the time the project was taking place. He avoided breaking up with her because he did not want to confront her. He realized he should not internalize things, and he felt disappointed in himself for not speaking up.

Focus group data revealed that students experienced personal growth as well. FG Student 1 said, "I have a willingness to learn more. I feel more welcoming when someone has a computer issue, like, "Oh let me take a look at it for you." FG Student 3 stated "It takes me a while to warm up to people, to be myself. And I think the community training that I did, I think that really helped me to be comfortable with other

people."

Students also talked about ways the service-learning project would help inform their career paths. Student 2 said, "I liked being put into the instructor position. I very much like leadership positions. I like to share knowledge." Student 11 learned that he did not want to fix computers for a living. Student 10 said, "I felt like it could help me pick what specific career path I want to take as well as communicate with my employer about my strengths and weaknesses so I can get into something that works for me."

Students 1 and 7 discovered that they liked combining their IT skill sets with community engagement work. Student 1 said,

> I really like helping people. So if there is a way I can work in a position that's giving back and something that I enjoy as well, I think it doesn't feel like work. It doesn't feel like a chore. It's just nice, and it's really great when people come back and they're like, 'Hey, you really helped me with this.' Things like that really mean a lot and kind of make you [want to] keep doing that.

Student 8 thought that doing the community engagement work opened her eyes to all the things she could do for other people as well. Student 9 agreed with that sentiment. He said he wanted to do more civic-duty, so he volunteered to create a website for another county in Wisconsin. He said, "This project has opened up a lot of really cool doors for me…. It's just like, 'Wow, I really do have the skills to figure this stuff out and do it.'"

Results Related to Empathy

Webster's dictionary defines empathy as "understanding the feelings of another person" (Nichols, 1993, p. 47). Students who participated in one-on-one interviews and

the focus group shared experiences which demonstrated how they grew in empathy as a result of their interactions during their service-learning projects. In one type of situation, students recognized that their community partners and their team members may not have always had the skills or the time to participate optimally, and instead of being angry, the students expressed understanding. Students 5, 9, and 13 all worked with community partners who did not often respond to them in a timely manner or at all. Students 5 and 13 realized that their partners were not knowledgeable about technology, and so were too embarrassed to contact the student group to clarify information. Student 9 stated he understood that his client was moving their entire office, and said, "They felt bad because they think that [their response to us] is late. And they're having to switch from one building to another in the town that they're in, so they've been really busy with that switch. So, they've had a lot of things going on."

Students also realized that you cannot judge someone without knowing their story. Student 6 said,

> I definitely learned about how you should never really just judge a book by its cover and you should just really understand the story. It kind of reminds me of the whole food stamps process when people get upset when people use food stamps. It kind of makes me upset because they don't know the story. They don't know what's happened with that person, why they're in this situation.

Student 6 also pointed out that by doing this community engagement work, he realized he took things for granted. Several students mentioned they learned about different age groups, and realized how the age difference could have an impact on how

quickly people picked up the technology. Student 12 worked with a client in his 80s, and their project grew bigger in scope every time the client met with their group. She said,

> Oh, I think that's [age] a huge, not necessarily barrier, it was a huge piece though. You have someone who is younger and from a more current generation, they're more knowledgeable about what's out there, what can be used, what can be done. You take someone though that's a little older and from a couple generations back who weren't raised around the computers and the different technology advances, and I think that's kind of what contributed to the project creep.

Figure 4
Western's Programming Students with Their Community Partner.

Student 6 stated that even when people weren't very friendly, he understood that they might not be able to show they were grateful for the help. He said,

> Some people just don't [want to] wanna communicate, cause they may think it's embarrassing for them to have to do this. And I understand that. It depends on

> who you are as a person. And I respect that. Honestly, I knew everyone was grateful for it. It's just some people show it in a different way.

Student 1 said that she became aware of how her attitude could affect a client:

> Again, just trying to be patient even if you were frustrated, because you can make or break somebody's day just by being rude to them because you're annoyed with having to repeat the same questions. So just kind of remembering that they're there to learn. They're asking questions because they don't know and you're supposed to be there as a source for them. So your attitude definitely will affect them moving forward.

She went on to point out that working with a diverse group even helped her when working with her own family members on problems. “A lot of times, before I was going to school for IT, I would get frustrated with my mother and think, ‘how are you not getting this?’ And then I would have to take a step back and understand.” Student 9 also reflected on working with an older student in his group:

> One of the gentleman that I worked with, he's an older guy, and he has trouble understanding some of this stuff. And in my view, he's kind of peaked on his performance level. It's not as easy for him, I think because he's older. He's done something his whole entire life that's very different, you know?

Students consistently made statements that showed they could understand how their client felt. Student 1 said,

> So being patient with people was a big thing because something that might come easy to me wouldn't to somebody else, and I can't just be like, "Oh, it's easy. Just do this." So being careful not to say, "Oh, that's simple. That's easy," 'cause even

> if your intentions are good, they might feel bad about it. Or that might make them kind of second guess their abilities. So instead of saying, "Oh, that's easy, just do this and this," avoid words like that and actually sit down and explain it in a way that they're gonna understand without making them feel dumb.

Student 2 said he realized his clients "were being patient with me, just as I was patient with them." Student 6 said, "If we all just helped each other, the world would be a better place."

Being Gracious

One skill employers are looking for is the ability to be gracious. Therefore, students were asked about how difficult it was to be gracious with their community partners and with their co-students while they were doing the project. Students 3, 5, 8, 9, 11, and 12 all indicated they relied on their team members to help them stay gracious even in difficult situations. Student 11 said that using email or running things by his team before talking to the client helped him get some distance and have time to think. He added, "It's easier to be gracious in emails because you have time to think." Student 9 said, "I had to learn to step back and 'chill' [before I responded]." Student 7 said it was easier to be gracious with people once he had established a rapport with them. Student 9 also said he rehearsed potential difficult scenarios with his team so he would feel more comfortable if things didn't go smoothly. Student 12 she had grown up with her mother saying "be gracious" all the time, so that helped her be patient and explain things to her client in a kind way during difficult situation. Student 9 said that this project helped him learn the social grace to handle all the things that came up with his partner. He realized that people can be rude simply because of their lack of knowledge.

Student 6 had done extensive volunteering in the past. He said,

> One thing I've always learned from doing all my volunteer projects is no matter what happens, you should always keep a smile on your face, and this also goes back to, 'cause you don't know their story again. And as long as you show that you care for that person, I could care less if they show that they care for me, 'cause I'm there to help them. I honestly just want them to be happy. So, if they were rude or didn't say thank you, I just smiled and just let them do their stuff and when they were ready to go, they could go. I'd say, "Thank you and have a nice day," and I'd be gracious.

Other students found being gracious was more challenging when they felt the community partner was not responding to the work they were doing. Students 2 and 4 said it was difficult to be gracious when people didn't stay on task. Student 4 said he learned that part of working with clients is realizing that they have their own schedules, and that he needed to adjust his plan to accommodate them. He said, "A lot of times they needed more help than I anticipated. It would be tough when I wanted to move ahead and they wanted to stay behind on something." On the whole, however, students reported that it was easy to be gracious with their community partners and their teammates.

Finally, the instructor was asked about the changes she saw in empathy and civic mindedness in her students over the course of the term. She said,

> I do see these changes in students. The longer that they are in the program and the more community engagement they experience the greater the awareness. For example, many of the students who work in the Student Run Help Desk will volunteer to carry large and heavy equipment from their car to the second floor of

the Business Education Building. I observe their kindness and compassion to customers who need their assistance in the help desk. They speak in terms that the customers can understand. Many will sit side-by-side at their level to provide guidance. During the community trainings, the students are so patient and take care to answer all questions no matter how trivial the question is. I also see that they are more respectful to each other as well.

Results Related to Civic-Mindedness

Results from the one-on-one interviews yielded several recurring thoughts that students had about civic mindedness.

Belonging to Something Bigger

First, eight of the students in the one-on-one interviews and three of the students in the focus group talked about the importance of belonging to something bigger than themselves, i.e., becoming aware of and belonging to a community. Three of the students in the one-on-one interviews also talked about how they became more aware of opportunities to help their community. This also let them make connections and open doors. They were proud they could help their community. Student 9 worked with a team to create a website for a neighboring county. He stated he had never been part of something so big, and was proud that their work was going to be seen by so many people. Students 1, 3, 5, 6, 8, and 13 also reported that as a result of their work, they became more aware of ways they could use their skills to help the community.

As a result of performing their service-learning projects, five students in the one-on-one interviews and three students from the focus group gained new knowledge about their communities. Student 10 learned about food insecurity through his work at a local

food pantry. After that, he said, he saw the importance of a community working together to help each other. He said, "And I think it was [the instructor's] goal that this would give us a firsthand experience of what servant leadership is all about. And I think it did that successfully."

Six students in the one-on-one interviews talked about meeting community members and making connections with them. Student 11 talked about a facilitating a group of community members who were interested about getting together and talking about technology. "It's super inclusive and inviting for basically anyone in the community who wants to come. I learned that you don't have to be afraid of every person who has a degree behind them, because they're just another person who wants to learn something."

Impact on Community

The second aspect of doing service-learning that students talked about was the impact their work had on others. Student 9 stated he was excited his team's work was going to be seen by so many people. Students 4 and 11 said it was nice to see community members engaging with college students. Student 10 saw the impact of what he was doing. He said, "I know that even though my contribution seemed small, it meant the world to the people I was serving. I learned that I like doing community service where I can see an immediate positive outcome." Student 7, who helped community members with yard projects, said sometimes the person he was helping just wanted to talk. He remembers being worried that he wasn't getting the lawn raked, or the windows washed. Then he said, "But it might have been therapeutic for her just to come out and talk to somebody." Four students talked about how pleased they were that their work had such

an impact on someone else. They echoed Student 7's words when he said, "It didn't seem like a big thing, but it was a big thing to that person." Student 12 who had worked on a team creating an interactive website for a local family's history said, "I thought we were just making a website, but when I saw that family member's face light up when he saw his family tree come to life, I realized how much our work actually meant to him." She said, "We got to learn a lot historical-wise. But it was just amazing how something like that could make such a huge difference to a person and mean so much to someone. You don't always think about it being that big of a deal I guess."

Importance of Giving Back

Third, students reported the importance of giving back. Students 1, 3, 5, 6, and 12 reported wanting to reciprocate with an organization that had helped them. Student 3 installed a network for the local LGBT group as his service project. He said, "I felt like it was really good to give back, especially because of the service that they offer that helped me when I was still coming out. So it was good to return the favor."

Every student in the one-on-one interviews except Students 2 and 4 reported that they felt great being able to help others, and three students stated that the more they did, the more they wanted to do. Student 6 said,

> My personal motto is to always help people. Doing this work always just motivates me to do more. It's those smiles and when people are thankful, even if they don't tell you, you know they're thankful. It's what really motivates you and makes you want to keep doing it – working in my community and all across the country. That's why I love doing it.

Student 7 said, "You should always be helping people, volunteering."

Student 5 said, “It’s cool to give back. It’s not really to get recognition for it.” Student 10 said “I learned that once you start volunteering, you feel an incentive to come back…because after going there a couple times, I would really feel motivated to go back because of a calling.” Student 6 summed up his community engagement work like this:

> People sometimes don't wanna [want to volunteer] because you're not getting paid cash. It's 'cause you're working for free basically. Well, you still get paid. And you get paid in good deeds and like you're impressed with yourself, and you're happy with yourself. And you go home that day and sometimes you just go lay down and you think about what happened that day and you're like, "Wow. I may not have done a lot, but I still made a big impact on someone today." And that's the best part, you helped someone.

Students 1, 2, and 12 all talked about how important it was to impart the spirit of community service to their children. Student 1 said after doing the community engagement project, she asked herself, “Now how do I involve my child in this?” She decided to take her daughter to work at the community garden on a regular basis.

Data from the focus group supported that students felt the importance of giving back to the community. FG Student 3 said,

> When I was volunteering it really opened my eyes to being there and seeing what a lot of these homeless people are going through.... I was like, "Holy cow, there's a lot of bad stuff out there." … it felt good to help out these people that, it was very apparent that they needed help. So after I went home after volunteering those days I felt good about it. I felt really good about it.

FG Student 1 agreed with that sentiment but also added that he felt bad he couldn't do more at the shelter at which he volunteered. But he said his daughter wants to volunteer there now too, and he was proud that she wanted to help as well. FG Student 5 felt good about giving back at all of her community engagement sites. She had not had volunteering experience before this trimester, and she said,

> With the Special Olympics, the hours that I spent there, my impression was that I was supposed to be keeping an eye on things. But it turned out really I think that it wasn't so much that they wanted people to do stuff, except to be a companion to so many of the Special Olympics athletes. It wasn't really a job, it was a be a friend, make their experience rewarding for them. It wasn't work, it was make sure they were having a good time, even if they were losing. Which, some of them were. I didn't really realize why they had so many people volunteering. There were a lot of people in their little white shirts out there. And it just seems like we were taking up a whole lot of room that could have been better used by the families of the people that were there. Until I realized, "Oh that's why we are here!" It was just kind of like a light bulb went on, this is what's going on. Because I could see some of the volunteers, maybe they had done some volunteering before and they understood their role is to keep things happy.

FG Student 2's experience was similar to FG Student 5's experience. He said,

> It was just kind of fun just to help people. I was on helper's high. It was fun in the sense that you are instilling knowledge into someone else. You are kind of transferring what you know into someone else, it's kind of neat when it takes. It's really satisfying to see when they are able to basically retain what you told them.

FG Student 3 added to that, “It was nice at the end of that when we had all these little ladies coming up to us saying, ‘Oh I learned something new today.’ That was pretty cool.” FG Student 4 echoed that sentiment: “I did feel better about myself, helping others and just giving back to the elderly people that I trained. When they came up to me and they told me they learned something new today, it made me feel good.”

Unexpected Findings

Interviews with students revealed several issues that, while not directly related to the research questions, could help better inform the service-learning experience, especially in the computer science field. For example, Student 9 was frustrated during his project because his community partner was not responsive. He said that several of his instructors had told him people don’t appreciate what they are not paying for, and he found this to be true. He stated “People need to pay for things to value things. And when they don’t pay for it, they don’t value it. And with research that I’ve done, I’ve heard that story repeated, that they say the worst clients are the free ones.” This experience could be shared as a caution when an instructor is helping computer science students prepare for a service-learning experience.

Making Connections with Employers

Besides strengthening their teamwork, communication, and time management skills, students also made valuable connections with potential employers. Students 3, 8, 9, 11, and 13 were all offered part–time employment while they were still in school, with a promise of full-time employment when they graduated. When Student 12 went on her first interview after graduation, her potential employer spent 30 minutes of the interview going over the service-learning project she had done for the historical society. He offered

her a programming job on the spot, and she has been with the company for the past two years.

Student 7 said that as part of his current job, he looks over a lot of resumes. He said that after doing his own community engagement work, he is more aware of candidates' skills that may be enhanced by their own community engagement work. He stated that now he has more interest in potential employees who do more service work than others.

Referencing Community Engagement on a Job Interview or Resume

Focus group students were asked if they had included their community engagement work on a resume, or talked about it on a job interview. All five of the FG students indicated that they had wondered if they should include it because doing the service might be seen as bragging (FG Student 3) or the service might not relate directly to IT (FG Students 1, 2, 4, and 5). After some cross discussion, FG Student 3 said, "It built character though." Students said they would definitely reference their community engagement work if it related to IT. FG Student 4 then said, "I would use it [non-IT related] as an advantage in an interview and I would just elaborate on characteristics that I have improved with it. Just to show them what kind of person I am." As a result of the data that came from this discussion, Western's Community Engagement Coordinator will encourage students to include their service-learning experience on their resumes.

Student Suggestions for Improving the Service-Learning Experience

Students suggested a variety of ways the instructor and the college could improve the service-learning experience. Students 8 and 12 stated that the instructor should let students know that web development projects will be a big time commitment. Student 12

said, “Don’t bite off more than you can chew, even if it sounds like a really good idea.” Student 8 said, “Don’t overschedule yourself because it was more work than we thought.” She also said “As a team, we should have said no a little more.”

Student 9 was frustrated because he felt taken advantage of by his groups’ community partner because they continued to add requests to their original project. Even though this was a chance to learn about project creep, Student 9 pointed out that the instructor should have stood up more for the students, and been more clear with the client about the students’ limitations. He said,

> …and talking with another instructor before that even happened, where I was just getting their advice on freelancing and stuff, he said that one of the big things is just learning to say no, because he’s seen students get kind of swindled into more than they can accomplish, because they don’t know how to say no, and they’re eager to do it.

Student 13 also expressed irritation with the way Western had vetted the community partners. He suggested when the pairings were made, community partners and student groups should meet right away to establish norms and set the project timeline. Student 13’s partner was nonresponsive for a good part of the trimester, which caused anxiety for Student 13 and his group members. He said:

> I almost felt cheated because we’re trying to invest all this time into doing something and then [our community partner was] not trying at all [to respond to us]…. we made pretty hefty efforts to get ahold of him for a long time and could not. Mostly I kind of felt a little bit insulted that [the community partner] might have just been totally blowing us off.

Student 9 thought some of the difficulties with community partners could have been alleviated by more course structure. His class was given the option to meet off campus to work. "If we could have met once every two weeks [in the classroom] or something, and just kind of been like, 'Where's everybody at?', it would have helped." He thought the instructor should have given clearer guidelines on project expectations. Students 2 and 4 thought they could have done better on their projects if they had practiced their presentation skills on each other more in class, and challenged each other with difficult scenarios.

Early Experiences with Volunteering

Focus group questions were informed by data from the one-on-one interviews. One topic the researcher decided to explore was how early experiences with volunteering may have affected students' perceptions of service-learning. Focus group students were asked to think back to their childhoods and any early exposure to community engagement or volunteering. They were asked to discuss how those early experiences may have affected how they viewed the community engagement they did for their classes. FG Student 1 said he was told "Mind your own business." FG Student 2 said he was told the same thing as a child. He said,

> I was the exact same way too. Because when I was growing up my dad was always telling me, because you always see that stuff on the news where people were helping out someone, and they get sued right away. And he's like, "That's what happens when you be nice, mind your own business."

FG Student 1 had also been leery of volunteering, but for different reasons:

> I'm from Milwaukee, and a lot of time you kind of have to mind your own business because you never know what's going to happen. There have been many-a-times where you might pass someone that may be homeless or asking for change, which happens every time I go back home, and you have no idea what their intentions are…. In Milwaukee, it's like, "Are you going to rob me or what?" You know being a brother [African American] from the big city is very different than say La Crosse or Tomah. In Tomah, you kind of trust people.

FG Student 1 said that in a smaller city (like La Crosse or Tomah), he is more likely to trust people, and be willing to help someone in need. FG Student 3 said, “It’s a little less likely that you’re going to get robbed if you pull out some money.” FG Student 2 added “Yeah, it's a farm town around here, there's not a lot of thugs around here versus the city. The worst thing that probably happens is what? Your tractor gets stolen?”

FG Student 5 talked about why her attitude towards volunteering and giving back has changed.

> When I was younger, in my teens or whatever, we didn't do a whole lot of community stuff, my parents were busy working or doing stuff. But, as I got to be a little bit older there were some people I knew, who the only thing they looked forward to in life was their next high or fix or whatever. And they would work just long enough to get enough money to buy what they wanted. And then they would go to the free food store and they would take whatever possible and you just knew they were going to grow up to be the kind of people who were going to have some excuse to be on disability. So when it comes helping out the homeless, I envision them usually as some kind of people who, they are just too

> damn lazy to work. They don't want to work. I can understand that there are going to be situations where people are going to end up there through bad luck. But with the people that I used to know it was laziness. And now that I'm getting older and I've done some volunteering I can see that helping out is not necessarily because somebody is just too damn lazy. So I think my attitude has improved on that a lot over the years. [When you're] helping out, I think other things besides good feelings can come back to you, meaning it'll be your turn to be helped out. Over the years I've had neighbors save my bacon basically because they had the ability to do so and they asked for nothing in return. And if I helped anybody out without even really thinking about it, hopefully I have given back to others as a payment for when other have helped me out.

FG Student 3 said he had never been exposed to giving back, but that as a result of this work, he would teach his children about volunteering. He said, "I'm going to teach my children that it does feel good to help out somebody or volunteer here or there. I think I'm going to do that different for my kids. Because I never really volunteered for anything before that."

Making Service-Learning Mandatory

Six students from the one-on-one interviews thought community engagement work should be mandatory because it helped them grow so much. Student 6 said, "Get out and help, no matter who you are, how old you are. You get paid in good deeds and you're impressed with yourself and happy with yourself." Student 5 thought "for a project to mean something, it has to be something the students care about." Student 1 said,

> I just think that it's great to continue to kind of push students to be involved in things like that, 'cause I don't know that I would've actively been doing it myself, 'cause life and everything's so busy that you don't think about, or stop to think this won't actually take that much time and this will be really rewarding not only for myself but for other people. So, I think it's really important and great that Western really makes that a part of each program for all students and actively engaging them in community service.

None of the students in the focus group had been exposed to community service and it colored their response to having to do it. FG Student 3 remembered being excited and nervous when he learned he would have to do community engagement work. FG Students 1 and 2 were irritated and annoyed that they were going to have to do community engagement work because it was something outside of school. FG Student 2 said at the time he heard about the assignment, he didn't get the point of volunteering at something that wasn't IT related. FG Student 1 said, "That's one of the things that I like about college. That's something that I learned. They've been preparing us, we are getting a well-rounded education. And we are learning not just about IT but how to deal with people." FG Student 3 added, "And be professional." FG Student 1 said, "Yeah, be professional, deal with different people, different backgrounds, different situations, even if we don't want to do it."

FG Student 5 said, "My first thought when I heard that we had to do this was, 'Oh for Christ's sake, I don't have time for this crap. How am I going to set this up and get my assignments done and what is the point?' Of course my eyes are just changed since then." FG Student 4 said he was initially nervous but after having had the experience, he said if

someone asked him if they should do community engagement work, he'd say, "Do it." FG Students 1, 2, and 3 echoed that sentiment.

The instructor was asked about characteristics that she thought would help her predict who would be successful working with community members. She stated "I go into it thinking that they will all be as passionate as I am about servant leadership and community engagement." She stated that students who come into the class with some sort of community engagement experience "are more accepting, understanding, and enthusiastic of the concept than those who have never experience it." This statement reflects comments made by focus group students who had never volunteered for anything before. They were not enthusiastic about participating in service-learning, but at the end of the course, they were glad that they had the experience. The instructor stated that because she goes through all their reflections, she knows that all their comments about the experience are positive. She said she also has face-to-face meetings with them about their service-learning experience, and hears the positive comments firsthand. The instructor stated that in her four years of teaching, she has had students who found the service-learning an inconvenience because of the time commitment, but that all of them see the value in the experience. This statement corresponds with answers from the one-on-one interviews and the focus group.

Data from one-on-one interviews, the focus group, and the interview with the course instructor indicate that students believed they improved in the employability skills of managing project creep, communication, collaboration, time management and scheduling, and confidence. Data also indicate that students experienced personal growth which would help them in their employment. Most students shared insights that infer

they increased their levels of empathy and feelings of civic-mindedness. Pre-assessment survey data showed that the majority of students who answered believed they could make a difference in their communities, and that performing service-learning would give them an opportunity to do this. The interview with the instructor supported the theory that students could improve in their employability skills, their feelings of empathy, and their feelings of civic-mindedness by performing service-learning. In congruence with Cone and Harris's model of service-learning, students reported different levels of transformation based on their unique early experiences. Interview data also revealed several unexpected findings which can be used to inform future service learning experiences as well as for future research.

CHAPTER FIVE: SUMMARY AND CONCLUSIONS

Review of Study

This study investigated the experiences of computer science students at a Wisconsin technical college who performed service-learning. Students engaged in various service-learning projects, and shared their experiences through a pre-service-learning survey, one-on-one interviews, and a focus group. Their instructor was also interviewed to determine how her observations corroborated or disputed data gathered from student interviews.

Purpose of the Study

The study sought to gain an understanding of how service-learning affects employability skills, feelings of empathy, and feelings of civic-mindedness in computer science students at a technical college.

Review of Research Questions

The overarching research question was: What are the personal and professional experiences of computer science students performing service-learning projects at Western Technical College (Western) in La Crosse, Wisconsin?

The related research questions were:

1. How did participating in a service-learning project affect students' employability skills?
2. How did participating in a service-learning project affect students' feelings of empathy?
3. How did participating in a service-learning project affect students' feelings of civic-mindedness? `

The study focused upon three sets of data collected from computer science students who had performed service-learning. The first set of data consisted of answers from a 39-question survey designed to elicit students' pre-conceived notions about service-learning. The second set of data consisted of the results of 13 students' one-on-one interviews after they had completed their service-learning. The third set of data consisted of the results of five students who participated in a focus group facilitated by Western's Community Engagement Coordinator after they had completed their service-learning experience. In addition, the study also included an interview with the instructor who facilitated the service-learning courses. The study was intended to evaluate the extent to which students were affected by their service-learning experience. In this chapter, the findings will be summarized for each of the research questions. The interpretation of these findings will be supported with evidence from the survey data, one-on-one interviews, the focus group, and the interview with the instructor. The interpretations will be related to the literature and any limitations of the results will be articulated. In addition, examination of the data also yielded several concepts which may inform best practices for service-learning in technical college computer science courses. The study also yielded several unexpected findings and several concepts which may warrant future exploration. This chapter will use the unexpected findings to inform a discussion about making service-learning mandatory by incorporating best practices into the course design.

Discussion of Conclusions

Conclusions Related to Theoretical Framework

Any research results must first be examined through the lens of the study's theoretical framework. This study is based on the six-stage lens model of service-learning by Cone and Harris, which are:

1. recognizing that individual differences play a significant role in the service-learning experience;
2. recognizing that instructor must provide students with pre-service training and an introduction to service-learning theoretical concepts, and must strive to challenge students intellectually while making sure they are placed correctly in their service-learning experience;
3. examining the service experience to make sure it is different from the student's everyday life;
4. requiring students to reflect on their experience;
5. requiring the instructor to formulate proper reflection questions;
6. re-focusing on the learner to understand the effects of service-learning on the individual.

In concordance with the first stage of the model, results showed that students' individual differences played a role in their service-learning experience. For example, none of the focus group students had ever volunteered or performed community engagement work before, so they all reported apprehension about doing service-learning. Three of the focus group students had negative associations with volunteering: two were told by their fathers not to interfere with other people, and one thought people who

needed help were lazy. In contrast, students who had volunteered before stated how much they were looking forward to it. One of those students said about giving back to the community, "It's my favorite thing to do."

Second, the model states that an instructor needs to frame the service-learning project correctly through pre-service learning training and imparting service-learning theory to the students. This was done at the beginning of the trimester, when the instructor and the Community Engagement coordinator spoke to the students about service-learning. The instructor also needs to make the coursework intellectually challenging as well as making sure the students are correctly placed. Several students from the one-on-one interviews indicated that they were overly challenged by their projects and that the instructor should have done a better job securing an appropriate community partner. Most of the students, however, stated that they were satisfied with their service-learning projects. The third stage of the model states that the service-learning project should be "agitating" and be different from students' daily lives. The majority of students indicated that they were nervous going into their projects, mostly because they lacked confidence about their abilities. As a result of this agitation, they learned new skills and gained confidence as a result of being in a new situation.

Stages four and five of the model focus on reflection. Cone and Harris purport that post-experience reflection is critical (stage four) but that the reflection is best guided by the instructor (stage five). As part of their service-learning experience, students performed various reflection exercises, ranging from journal questions posted on their learning management system, to answering questions on SurveyMonkey, to giving capstone presentations in class about their experience, to participating in a student

showcase where they presented their service-learning experiences to Western's administration and the community. Finally, stage six of the model states that the learner was transformed in some way. Student interviews revealed that students believed they had improved the employability skills of managing project creep, communication, collaboration, time management and scheduling, and confidence. They also indicated that students believed they were more empathetic and more civic-minded after completing their projects.

Conclusions Related to Research Purpose

Conclusions About the Effects of Service-Learning on Employability Skills

One of the hypotheses of this study was that performing service-learning improves a variety of employability skills in students. Beaton, Bowers, Thomas and Schroder all state that computer science students often lack employability skills (Beaton, 2017; Bowers, 2008; Thomas & Schroder, 2002). The results of this study support the findings that service-learning improves employability skills. A recent study revealed that when computer science students work with real clients, they learn valuable lessons about what it is really like to be a programmer (Lee, Wilder, & Yu, 2018). This was the case for the students in this study. Lessons about working in a programming environment will help students when they secure a job after graduation. For example, four of the 13 students interviewed worked on service-learning projects that experienced significant "scope creep," sometimes referred to as "project creep." "Scope creep" or "project creep" is defined as "the process by which projects with very general scope definitions expand gradually, without specific authorization" (Rosenblatt, 2014, p. 68). One of these students stated that at the interview for her current job, she was able to talk about her

experience with scope creep, and explained to the interviewer that her experience would make her a better programmer.

The pre-service-learning survey revealed that over 80% (*N*=10) of students believed performing service-learning would improve communication, teamwork, and leadership skills. Of all the employability skills students discussed in their interviews, they mentioned communication most often. Eight of the 13 students interviewed and three of the five focus group participants all stated that they thought their communication skills had improved as a result of their project. Collaboration was another concept that students agreed was augmented by their service learning projects. All 13 of the one-on-one students interviewed mentioned the importance of their team to the success of their project. One student felt he was dragged down by his team, while the rest of the students relied heavily on their teams and saw the importance of teamwork in the workplace. All five of the focus group students stated that they felt their communication and teamwork skills had improved by doing their service-learning project. The interview with the instructor supported these findings. She stated "At first teams fail miserably. They then realize how important it is to communicate. By about week three, teamwork and communication turn around. They realize that they perform at a higher level when they work in sync towards the same goals. They begin to trust their teammates."

The pre-service-learning survey revealed that while 58.3% (*N*=7) of students thought performing service-learning would improve their project management skills, 41.7% (*N*=5) of students were unsure about this. However, one-on-one interviews revealed that project management and personal time management were two related skills in which students reported improvement. Students learned to let clients know that their

entire project could be completed, but some of the projects facets would have to be moved to a Phase Two section of the project timeline. Several students pointed out how important this concept is in a computer programming environment. Students also learned to better manage their own schedules so they could get everything done and not be stressed. The interview with the instructor supported these findings. She said that when students were required to track their time with a spreadsheet, they were shocked to find out how much time they were wasting on gaming and social media. Strong project management and personal time management are two skills that support the "agility to adapt to a quickly changing work environment" that Beaton states is so important in an employee (Beaton, 2017).

In contrast to the literature that said employers stated students are over-confident when they start a job (Ortiz et al., 2016), 92% (*N*=12) of the 13 students interviewed did not feel confident about their skills. Of that group, 62% (*N*=7) of those students stated that as a result of doing their project, they developed more confidence about their skills. In the focus group, 80% (*N*=4) of the students stated that they were not confident about their IT skills or their communication skills going into their service-learning projects, but and all of them felt more confident in their skills after they completed their projects.

Conclusions about the Effects of Service-Learning on Empathy

Service-learning has been shown to positively affect students' levels of empathy (Lundy, 2007; Prentice, 2011), and data from this study support those findings. The pre-service-learning survey revealed that 83.3% of students believed performing service-learning would help them become more comfortable working with people who were different from them. The survey also revealed that 83.3% of students believed that doing

service-learning would help them understand diverse perspectives about social issues. One-on-one interviews and the focus group results supported the idea that students increased their feelings of empathy as a result of service-learning.

Data from the one-on-one interviews also revealed that students learned the importance of being gracious. Students reported they learned that it was important to remember people are often struggling with hidden barriers that can affect their interactions and performance. For example, three of the students pointed out that their community partner may have been of an older, less technologically minded generation. Other students talked about interacting with team members who have different skill levels. One student described working with community members that needed services, but did not seem to be grateful. He said he understood that people may not show gratitude because they are embarrassed.

The instructor interview supports the idea that students grew in empathy through their service learning experience. The instructor stated she could see changes in her students during the trimester – they helped clients carry heavy equipment, made sure every client's questions were answered respectfully and patiently, and showed kindness and compassion to each customer who visited or called the help desk. Using an empathy scale in future studies would be beneficial to test for qualitative changes.

Conclusions about the Effects of Service-Learning on Civic Mindedness

Service-learning has been shown to increase students' civic-mindedness (Mitchell, 2015; Prentice, 2011). Results from this study supported these findings. The pre-service-learning survey data revealed that 92.3% of students surveyed believed they had a responsibility to serve their community, and that their service could benefit their

community. Interview data revealed that participating in service-learning impacted students' civic mindedness in three facets. First, students reported a feeling of belonging to something bigger than themselves. For example, Students 8 and 9 both reported that by performing service-learning, they become more knowledgeable about their community, and the role they played in that community. Second, students stated that doing their service-learning projects enabled them to realize the impact they could have on their community. The pre-service-learning survey showed that 41.7% (*N*=5) of students were not sure if they knew about the needs of their communities. Post-service-learning interviews revealed that students learned about populations in their communities about which they knew nothing. The focus group students performed service-learning specific to computer skills, but also spent time volunteering at community service sites. They all expressed surprise about the number of people who utilized services like homeless shelters, the Salvation Army, nursing homes, and Special Olympics.

Third, as a result of doing just one service-learning project, students realized the importance of giving back to their communities. Interview data also revealed that many students enjoyed participating in their service-learning experience simply because it felt good to give back to the community. Two students shared examples of wanting to give back to community groups that had helped them through difficult times. Several students in the focus group discussed the "helper's high" they felt when working with community members and stated that this gave them incentive to continue serving the community.

Making Service-Learning Mandatory – Challenges and Suggestions

Western is in the process of requiring that all students experience some type of service-learning as part of their degree. Ostensibly, making service-learning mandatory would eliminate self-selection bias if students' experiences were studied in the future. However, despite an activity being a mandatory part of a course, students can still choose not to complete an assignment. They may lose points, or they may fail the class outright, but in fact, the choice still remains with the student as to if she or he is going to participate in the service-learning activity.

Lessons learned from the unexpected findings of this study may inform more effective service-learning experiences so that reluctant computer science students would be eager to participate. Though three of the students in this study thought that Western should make service-learning mandatory because of all the positive benefits, (and even suggested using social media to get more students excited about service-learning), there are always students who choose not to participate.

First, data revealed that students were able to make connections with employers that they would not normally be able to make during regular coursework. Second, data revealed that students did not realize they could or should reference service-learning on their resumes. When introducing the idea of service-learning to their students, instructors should make sure students realize the powerful impact service-learning can have on a computer science career.

Third, data revealed that service-learning could be improved upon in various ways. Most of the ideas related to the second stage of Cone and Harris's service-learning model, which is that the service-learning instructor must give students an appropriately

challenging experience. One caveat to this idea is that students who were inexperienced with performing community engagement may not have realized that their service-project was appropriate to their skill set.

Several students complained about community partners who were over-involved in their projects and wanted too much programming completed. Other students were frustrated with community partners who were under-involved and would not communicate with the students in a timely fashion. So in the future, both the Community Engagement coordinator and the instructor should work more closely with the community partners, delineating responsibilities and expectations. Before beginning any work, the college and the community partner should sign an agreement which outlines the scope of the project.

Students also pointed out that the instructor should have been clearer about the amount of work that was going to be required. When interviewed, the instructor stated that the only reason she believes students do not want to participate in service-learning is because of the time commitment. This supports findings reported by Burke and Bush (2013). Here is another instance where carefully vetting community partners and projects would be beneficial. Students could be more accurately matched with a project timeline that fit their own schedule.

Several students expressed irritation with group members who did not have similar abilities or work ethics. The students stated that the instructor should have required the teams to have weekly check-ins during which students would self-report on their progress. Though the instructor had the students make a time line for their project progress, students stated she should have been stricter on enforcing deadlines to help

students who were not self-motivated. Creating the project management schedule as a class would have helped the students better understand the framework and timeline of the project.

Expanding Service-Learning in a Technical College Computer Science Course

There are many ways a technical college could expand upon the service-learning experience for computer science students. First of all, students indicated that working with diverse community partners contributed to improvements in their employability skills, their feelings of empathy, and their feelings of civic-mindedness. The service-learning experience could be expanded upon by using an interdisciplinary approach in which students from multiple programs at the technical college work together to solve a community issue. Research shows that when cross-disciplinary groups work together on the same project, students show improvement in the areas of employability skills and empathy (Boys et al., 2015; Keshwani & Adams, 2017; Shadinger & Toomey, 2014). This multidisciplinary approach could be undertaken at Western in a variety of ways. For example, currently students in the Entrepreneur program at Western conduct a drive for gently-used business clothes, shoes, and accessories. The business wear is then sorted and displayed in a store-type setting on campus. Any Western student can come and select an outfit for job interviews. This project could be expanded so multiple programs could participate. For example, Marketing students could create promotional materials, Web & Software students could create a website for tracking donations and appointments, Architecture students could design a retail space for the event, and Culinary Management students could provide light meals for students after they select their outfits. Western would need to help instructors learn ways of synchronizing a

trimester of classes so that the multiple discipline project could fit into each program's schedule and meet the required course objectives.

The second way the service-learning experience could be enhanced is by utilizing the correct community partner along with allowing the student a greater connection with that partner. Both the study's theoretical framework and the research suggest that the right community partner is essential for positive service-learning outcomes (Cone & Harris, 1996; Maddrell, 2014; Rinaldo et al., 2015). Research also suggests that an early introduction to service-learning (Skinner et al., 2016), as well as involving students' families in the service-learning experience (Seider, 2013), improve outcomes. In the future, the technical college could consider a community engagement day for new students and their families, during which time they would be exposed to a variety of community partners. This would expose students to service-learning from their first day on campus, would help students in their later selection of a service-learning project, and would create a connection between family members and the college. The college could also invite students' families and friends to the end of trimester Student Showcase event, where students present their service-learning projects.

One other connection that could be made is between college alumni and incoming students. Research shows that when compared with alumni who did not participate in service-learning, alumni who performed service-learning at a four-year college were significantly more likely to engage in behaviors which "reflect social change activism such as social movement organization membership and participation in protests" (Winston, 2015). When alumni return to speak with current students, they impart the importance of making connections to the institution and the community (Hanna et al.,

2015). Therefore, inviting alumni who have completed service-learning in to speak with computer science students may increase students' awareness of the important of service-learning.

Finally, there are several ways more data could be collected in order to support the findings of this study. First, while students indicated they improved in employability skills, feelings of empathy, and feelings of civic-mindedness, there were no qualitative data to measure change. There are a wide variety of scales available to measure these concepts, and in future studies, any of them could be used to gather qualitative data so that changes in students could be tested for significance. Second, even though audience members at the end of trimester student presentation voted on the best project, there were no formal interviews with community partners about student performance during their service-learning project. In future studies, community partners could be interviewed to get their perceptions about how service-learning affected the students, as well as how they saw employability skills in action in the students' performances. In addition, the college could follow graduates from programs that incorporate service-learning and interview their employers at six months and one year after hire. This would give the college information about employers' perceptions of students' employability skills.

Implications for Leadership

There are many styles of leadership, and a career in computer programming may require that employees take on different styles at different stages in their careers. Data from this study show that service-learning helps students become better at communicating, working in teams, managing projects and their own time. Data also show that students developed empathy with their community partners and each other, and

they also become more aware of the needs of their community. All of these skills contribute to exceling as a leader, no matter what the style of leadership is warranted in their particular role.

Implications for Learning

By including service-learning along with their regular classroom coursework, course concepts are reinforced in a real-world setting. Students get to see how their skills will be used in the concrete, rather than in the abstract. This is especially important in the computer programming field, because of the concept of "scope creep." Scoop creep happens when clients ask programmers to continually add additional functionality to a project, and those functions are outside the original agreement between the programmer and the client (Rosenblatt, 2014). Students in this study learned about project creep, and learned ways to tell their client "no" in a professional, respectful manner.

Implications for Service

It is important to ensure that students who perform service-learning do not simply see the impact of their actions or feel good about themselves after the project is over and not find deeper meaning. Instead, service-learning should be framed as a way for students to build capacity to be servants to their community and setting an orientation for helping the community to grow for the benefit of themselves and others. Instructors can help frame the service-learning experience by carefully matching students and community partners as well as requiring students to engage in focused reflection (Cone & Harris, 1996).

Implications for a Technical College Computer Science Program

In conclusion, results of this study indicate that service-learning is a valuable activity for helping computer science students at a technical college improve employability skills, feelings of empathy, and feelings of civic-mindedness. There are many opportunities to explore these findings in order to inform better practices. This study's interviews contained concepts that could be explored further in order to refine the service-learning experience for maximum results. For example, one of the questions on the pre-service-learning assessment asked students to what extent they understood the needs of their communities. This topic could be explored more deeply with students and the results could be used to create more meaningful matches with community partners as well as to increase students' feelings of connection with their communities. In another example, three of the students who answered the pre-service assessment were not sure if service-learning would help them identify their own biases and prejudices. Helping students to examine their biases before beginning their projects may help them have a more meaningful, transformational service-learning experience. Additionally, this study indicates that early experiences with volunteering affect students' willingness to participate in service-learning. In summary, the results of this study indicate that using service-learning in a computer science curriculum is a way to help technical college students develop not just as programmers, but as community members.

Bibliography

Adams, B. (2015, June 13). Employers worry about labor shortages. *Wisconsin State Journal*. Madison. Retrieved from http://host.madison.com/wsj/business/employers-worry-about-labor-shortages/article_c7ddca7f-218f-509b-a69e-bc0469fa571f.html

Al-Khasawneh, A., & Hammad, B. K. (2014). Implementation of service learning and civic engagement for computer information systems students through a course project at the Hashemite University. *Education for Information*, *30*(3–4), 191–203. https://doi.org/10.3233/EFI-140944

Associates, H. R. (2013). It takes more than a major: Employer priorities for college learning and student success. Retrieved from https://www.aacu.org/publications-research/periodicals/it-takes-more-major-employer-priorities-college-learning-and

Astin, A. W., Vogelgesang, L., Ikeda, E., & Yee, J. (2000). How service learning affects students. *Higher Education Research Institute*. Retrieved from http://heri.ucla.edu/pdfs/hslas/hslas.pdf

Axsom, T., & Piland, W. (1999). Effects of service learning on student retention and success. *NSSE Quarterly*, *24*, 15–19.

Bamber, P., & Hankin, L. (2011). Transformative learning through service-learning: no passport required. *Education + Training*, *53*(2/3), 190–206. https://doi.org/10.1108/00400911111115726

Bazeley, P. (2013). *Qualitative data analysis: Practical strategies*. London: Sage Publications Ltd.

Beaton, C. (2017). Top employers say millennials need these 4 skills in 2017. *Forbes*. Retrieved from https://www.forbes.com/sites/carolinebeaton/2017/01/06/top-

employers-say-millennials-need-these-4-skills-in-2017/#5f5f7ce87fe4

Billig, S. H., Jesse, D., & Grimley, M. (2008). Using service learning to promote character education in a large urban district. *Journal of Research in Character Education*, *6*(1), 21–34. https://doi.org/10.1080/03057240902792686

Blankson, A. N., Rochester, S. E., & Watkins, A. F. (2015). Service-learning and civic responsibility in a sample of african american college students. *Journal of College Student Development*, *56*(7), 723–734. https://doi.org/10.1353/csd.2015.0078

Bosman, L., Chelberg, K., & Winn, R. (2017). How does service learning increase and sustain interest in engineering education for underrepresented pre-Engineering college students ? *Journal of STEM Education*, (June), 5–10.

Bowers, T. (2008, October). The 7 most important communication skills an IT leader should have. *TechRepublic*. Retrieved from http://www.techrepublic.com/blog/tech-decision-maker/the-7-most-important-communication-skills-an-it-leader-should-have/

Boys, S. K., Quiring, S. Q., Harris, E., & Hagan, C. A. (2015). Social work and law interdisciplinary service learning: Increasing future lawyers' interpersonal skills. *Journal of Teaching in Social Work*, *35*(4), 410–424. https://doi.org/10.1080/08841233.2015.1063569

Bringle, R. G., & Hatcher, J. A. (1999). Reflection in service learning: Making meaning of experience. In *Introduction to Service-Learning Toolkit* (pp. 113–119).

Burke, A. S., & Bush, M. D. (2013). Service learning and criminal justice: an exploratory study of student perceptions. *Educational Review*, *65*(1), 56–69. https://doi.org/10.1080/00131911.2011.638138

Cain, S. (2013). *Quiet: the power of introverts in a world that can't stop talking*. New York: Crown Publishers.

Celio, C. I., Durlak, J., & Dymnicki, A. (2011). A Meta-analysis of the impact of service-learning on students. *Journal of Experiential Education*, *34*(2), 164–181.

Chan, K., Ng, E., & Chan, C. C. (2016). Empowering students through service-learning in a community psychology course: A case in Hong Kong. *Journal of Higher Education Outreach and Engagement*, *20*(4), 25–35.

Chandler, P. T., Buck, K., & Ferguson, D. (2011). Reclaiming the common good in education: Teaching social responsibility through service learning. *Current Issues in Middle Level Education*, *16*(1), 1–5.

Charlton, J. P., & Birkett, P. E. (1998). Psychological characteristics of students taking programming-oriented and applications-oriented computing courses. *Journal of Educational Computing Research*, *18*(2), 163–182.

Coffelt, T. A., Baker, M. J., & Corey, R. C. (2016). Business communication practices from employers' perspectives. *Business and Professional Communication Quarterly*, 2329490616644014-. https://doi.org/10.1177/2329490616644014

Cole, D., & Zhou, J. (2014). Do diversity experiences help college students become more civically minded? Applying Banks' multicultural education framework. *Innovative Higher Education*, *39*, 109–121. https://doi.org/10.1007/s10755-013-9268-x

Compact, C. (2016). Campus Compact. Retrieved from http://compact.org/

Cone, D., & Harris, S. (1996). Service-learning practice: developing a theoretical framework. *Michigan Journal of Community Service Learning*, *Fall*, 31–43.

Conway, J. M., Amel, E. L., & Gerwien, D. P. (2009). Teaching and learning in the social

context : A meta-analysis of service learning ’ s effects on academic , personal , social , and citizenship outcomes. *Teaching of Psychology*, *36*, 233–245. https://doi.org/10.1080/00986280903172969

Cooper, J. R. (2014). Ten years in the trenches: Faculty perspectives on sustaining service-learning. *Journal of Experiential Education*, *37*(4), 415–428. https://doi.org/10.1177/1053825913513721

Cord, B., & Clements, M. (2010). Pathway for student self-development: A learning orientated internship approach. *Australian Journal of Adult Learning*, *50*(2), 297–307.

Council, N. Y. L. (2016). 21st century skills. Retrieved from https://gsn.nylc.org/home

Cress, C. M., Collier, P. J., & Reitenauer, V. L. (2005). *Learning through serving: A student guidebook for service-learning across the disciplines*. (S. Publishing, Ed.).

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th Editio). Thousand Oaks: Sage Publications Ltd.

Creswell, J. W., & Poth, C. N. (2015). *Qualitative inquiry and research design: Choosing among five approaches* (Fourth Edi). Thousand Oaks: Sage Publications Ltd.

Cronley, C., Madden, E., Davis, J., & Preble, K. (2014). Factors influencing service-learning utilization in social work: Results from an online survey of faculty. *Journal of Teaching in Social Work*, *34*(2), 147–166. https://doi.org/10.1080/08841233.2014.890692

D’Agostino, M. J. (2010). Measuring social capital as an outcome of service learning. *Innovative Higher Education*, *35*(5), 313–328. https://doi.org/10.1007/s10755-010-9149-5

Dacre Pool, L., & Sewell, P. (2007). The key to employability: developing a practical model of graduate employability. *Education + Training*, *49*(4), 277–289. https://doi.org/10.1108/00400910710754435

Dahlberg, T., Barnes, T., Buch, K., & Bean, K. (2010). Applying service learning to computer science: Attracting and engaging under-represented students. *Computer Science Education*, *20*(November), 169–180. https://doi.org/10.1080/08993408.2010.492164

Daley, D. (2015, July 15). IT worker shortage in central Wisconsin near "crisis." *WPRI*. Retrieved from http://www.wpri.org/WPRI/Commentary/IT-worker-shortage-in-central-Wisconsin-near-crisis.htm

Dallmeyer, M. A. (2012). Utilizing on-campus foodservice facilities as a laboratory. *Journal of Family and Consumer Sciences*, *104*(2), 50–52.

Dana, H., Hancock, C., & Phillips, J. (2011). A research proposal to evaluate the merits of writing across the curriculum. *American Journal of Business Education*, *4*(5), 15–20.

De Leon, N. (2014). Developing intercultural competence by participating in intensive intercultural service-learning. *Michigan Journal of Community Service Learning*, *21*(1), 17–30.

Deeley, S. J. (2013). Summative co-assessment: A deep learning approach to enhancing employability skills and attributes. *Active Learning in Higher Education*, *15*(1), 39–51. https://doi.org/10.1177/1469787413514649

DePaola, T. (2014). Collaborating for social justice through service learning. *New Directions for Community Colleges [H.W.Wilson - EDUC]*, *165*(Spring), 37–47.

https://doi.org/10.1002/cc

Dictionaries, E. of the A. H. (2000). *The American heritage dictionary of English language* (Fourth Edi). Boston: Houghton Mifflin Company.

Driscoll, E. (2011). Um, like, whatever: College grads lack verbal skills. *Fox Business*. Retrieved from http://www.foxbusiness.com/features/2011/03/03/um-like-college-grads-lack-verbal-skills.html

Eby, J. W. (1998). Why service-learning is bad. *Learning*, (March), 1–10. Retrieved from http://glennblalock.org/~gblalock/glennblalock/wiki/uploads/ACSM1110f09/whySLbad.pdf

Ehrlich, T. (2000). *Civic responsibility and higher education*. (R. & L. Publishers, Ed.).

Ellerton, S., Carmona, N., & Tsimounis, A. (2016). Two-year community: Increasing science knowledge among high-risk student populations through a community college honors/service-learning program. *Journal of College Science Teaching*, *46*(2), 11–16. Retrieved from http://proxy.library.vcu.edu/login?url=http://search.proquest.com/docview/1871573760?accountid=14780%5Cnhttp://vcu-alma-primo.hosted.exlibrisgroup.com/openurl/VCU/vcu_services_page?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article

Eyler, J., & Giles Jr., D. E. (1999). *Where's the learning in service-learning?* (1st ed.). Jossey-Bass.

Fishman, S. M., & McCarthy, L. (2007). *John Dewey and the philosophy and practice of hope*. Chicago: University of Illinois Press.

Freire, P. (2017). *Pedagogy of the oppressed: 30th anniversary edition*.

Frink, B. (2011, June). Researcher reveals how “Computer Geeks” replaced “Computer Girls.” *Gender News*. Retrieved from http://gender.stanford.edu/news/2011/researcher-reveals-how-“computer-geeks”-replaced-“computergirls”

Furco, A. (1996). Service-learning: A balanced approach to experiential education. In *Introduction to Service-Learning Toolkit* (pp. 11–14).

Greene, G. R. (2006). Cultivating reciprocity: The guiding framework for Benedict College in partnership with the community to garner economic and community growth. *Journal of Higher Education Outreach and Engagement*, *11*(3), 53–64.

Greenwood, D. A. (2015). Outcomes of an academic service-learning project on four urban community colleges. *Journal of Education and Training Studies*, *3*(3), 61–71. https://doi.org/10.11114/jets.v3i3.663

Hancock, C. R., Shenk, D., & George, J. (2013). Balancing structure and choice in intergenerational service-learning. *Gerontol Geriatr Educ*, *34*(2), 115–134. https://doi.org/10.1080/02701960.2012.679371

Hanna, P., Allen, A., Kane, R., Anderson, N., McGowan, A., Collins, M., & Hutchison, M. (2015). Building professionalism and employability skills: embedding employer engagement within first-year computing modules. *Computer Science Education*, *25*(3), 292–310. https://doi.org/10.1080/08993408.2015.1085626

Hebert, A., & Hauf, P. (2015). Student learning through service learning: Effects on academic development, civic responsibility, interpersonal skills and practical skills. *Active Learning in Higher Education*, *16*(1), 37–49. https://doi.org/10.1177/1469787415573357

Hillage, J., & Pollard, E. (1999). *Employability: developing a framework for policy analysis*. London. Retrieved from https://www.education.gov.uk/publications/eOrderingDownload/RB85.pdf

Institute of Education Sciences. (2018). National center for education statistics. Retrieved from https://nces.ed.gov/

Jackson, D. (2015). Employability skill development in work integrated learning Barriers and best practice(1), *40*(2), 350–367.

Jenkins, A., & Sheehey, P. (2006). A checklist for implementing service-learning in higher education. *Journal of Community Engagement and Scholarship*, *4*(2), 52–61.

Kaplan, S. N., Klebanov, M. M., & Sorensen, M. (2012). Which CEO characteristics and abilities matter? *Journal of Finance*. https://doi.org/10.1111/j.1540-6261.2012.01739.x

Karasik, R. J. (2013). Reflecting on reflection: capitalizing on the learning in intergenerational service-learning. *Gerontology & Geriatrics Education*, *34*(1), 78–98. https://doi.org/10.1080/02701960.2013.749252

Kearney, K. R. (2013). Impact of a service-learning course on first-year pharmacy students' learning outcomes. *American Journal of Pharmaceutical Education*, *77*(2), 34. https://doi.org/10.5688/ajpe77234

Keshwani, J., & Adams, K. (2017). Cross-disciplinary service-learning to enhance engineering identity and improve communication skills. *International Journal for Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship*, *12*(1), 41–61.

Kitchenham, A. (2008). The evolution of John Mezirow' s transformative learning

theory. *Journal of Transformative Education*, *6*(2), 104–123. https://doi.org/10.1177/1541344608322678

Kolb, D. A. (2014). *Experience as the source of learning and development*. Pearson FT Press. https://doi.org/10.1002/job.4030080408

Lambright, K. T., & Alden, A. F. (2012). Voices from the trenches: Faculty perspectives on support for sustaining service-learning. *Journal of Higher Education Outreach and Engagement*, *16*(2), 9–45.

Larson, E., & Drexler, J. A. (2010). Project management in real time: A service-learning project. *Journal of Management Education*, *34*(4), 551–573. https://doi.org/10.1177/1052562909335860

Lee, S. J., Wilder, C., & Yu, C. (2018). Exploring students' perceptions of service-learning experiences in an undergraduate web eesign course. *Teaching in Higher Education*, *23*(2), 212–226.

Leedy, P. D., & Ormrod, J. E. (2016). *Practical research planning and design* (Eleventh E). Boston: Pearson.

Leiderman, S., Furco, A., Zapf, J., & Goss, M. (2002). Building partnerships with college campuses: Community perspectives. *Council of Independent Colleges*.

Lundy, B. L. (2007). Service learning in life-span developmental psychology: Higher exam scores and increased empathy. *Teaching of Psychology*, *34*(1), 23–27. https://doi.org/10.1080/00986280709336644

Maddrell, J. (2014). Service-learning instructional design considerations. *Journal of Computing in Higher Education*, *26*(3), 213–226. https://doi.org/10.1007/s12528-014-9085-y

Maddux, H. C., & Donnett, D. (2015). John Dewey ’s pragmatism: Implications for reflection in service-Learning. *Michigan Journal of Community Service Learning*, *Spring*, 64–73. https://doi.org/10.14434/josotl.v15i4.13432

Mansour, B. El, & Dean, J. C. (2016). Employability skills as perceived by employers and university faculty in the fields of human resource development (HRD) for entry level graduate jobs. *Journal of Human Resource and Sustainability Studies*, *4*(March), 39–49.

McDonald, J., & Dominguez, L. A. (2015). Developing university and community partnerships: A critical piece of successful service learning. *Journal of College Science Teaching*, 52–56.

McLeod, J. (2013). *An introduction to research in counselling and psychotherapy (Practical skills for counselors)* (1st Editio). Sage Publications Ltd.

Mitchell, T. D. (2015). Using a critical service-learning approach to facilitate civic identity development. *Theory into Practice*, *54*(1), 20–28. https://doi.org/10.1080/00405841.2015.977657

Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220–235). Thousand Oaks: Sage Publications Ltd.

Morton, K., & Bergbauer, S. (2015). A case for community : Starting with relationships and prioritizing community as method in service-learning. *Michigan Journal of Community Service Learning*, (Fall 2015), 18–31.

Nichols, V. (1993). *Webster’s dictionary plus thesaurus*. Nickel Press.

O’Leonard, K., & Lowe, L. (2012). *Leadership development factbook 2012: Benchmarks*

and trends in U.S. leadership development. Retrieved from http://www.bersin.com/Store/details.aspx?docid=15587

Ortiz, L. A., Region-Sebest, M., & Macdermott, C. (2016). Employer perceptions of oral communication competencies most valued in new hires as a factor in company success. *Business and Professional Communication Quarterly*, *79*(3), 317–330. https://doi.org/10.1177/2329490615624108

Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. Newberry Park, CA: Sage Publications Ltd.

Payton, J., Barnes, T., Buch, K., Rorrer, A., & Zuo, H. (2015). The effects of integrating service learning into computer science: an inter-institutional longitudinal study. *Computer Science Education*, *25*(3), 311–324. https://doi.org/10.1080/08993408.2015.1086536

Pearl, A. J., & Christensen, R. K. (2017). First-year student motivations for service-learning: An exploratory investigation of minority student perceptions. *Journal of Higher Education Outreach and Engagement*, *21*(4), 117–137. Retrieved from https://content.ebscohost.com/ContentServer.asp?T=P&P=AN&K=126760516&S=R&D=eue&EbscoContent=dGJyMMvl7ESep684yOvsOLCmr1Cep7RSs6%2B4TbeWxWXS&ContentCustomer=dGJyMPGss0q1qK5IuePfgeyx43zz2bAA

Peterson, J. J., Wardwell, C., Will, K., & Campana, K. L. (2014). Pursuing a purpose. *Teaching of Psychology*, *41*(4), 354–359. https://doi.org/10.1177/0098628314549712

Prentice, M. (2011). Civic engagement among community college students through service learning. *Community College Journal of Research and Practice*, *35*(11),

842–854. https://doi.org/10.1080/10668920802205014

Rinaldo, S. B., Davis, D. F., & Borunda, J. (2015). Delivering value to community partners in service-learning projects. *Journal of Community Engagement and Scholarship*, *8*(1), 115–125.

Robinson, G. (2010). Community colleges broadening horizons through service learning, 2006-2009, 8.

Romell, R. (2016). Where will Wisconsin find enough workers? *Milwaukee Wisconsin Journal Sentinel*. Retrieved from http://www.jsonline.com/story/money/business/2016/09/03/where-wisconsin-find-enough-workers/89783022/

Romirowsky Gajer, L., & Paris, D. (2017, June). Temple experts: Why MBA grads need much more than technical skills. *Philadelphia Business Journal*. Retrieved from http://www.bizjournals.com.csu.ezproxy.switchinc.org/philadelphia/news/2017/06/22/temple-experts-why-mba-grads-need-much-more-than.html

Rosenberg, S., Heimler, R., & Morote, E. (2012). Basic employability skills: a triangular design approach. *Education + Training*, *54*(1), 7–20. https://doi.org/10.1108/00400911211198869

Rosenblatt, H. J. (2014). *Systems analysis and design* (Tenth). Boston: Course Technology, Cengage Learning.

Sanderson, P. (2003). Where's (the) computer science in service-learning? *Journal of Computing Sciences in Colleges*, *19*(1), 83–89.

Sandy, M., & Holland, B. A. (2006). Different worlds and common ground: Community partner perspectives on campus-community partnerships. *Michigan Journal of*

Community Service Learning, *13*(1), 30–43.

Saviz, C. M., Fernandez, A. A., & Basha, E. A. (2012). Formal service learning opportunities: Engineering internships in social entrepreneurship organizations. *International Journal for Service Learning in Engineering*, *7*(1), 40–52. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=82689033&site=ehost-live

Seider, S. (2013). Two key strategies for enhancing community service learning. *Journal of College and Character*, *14*(1), 79–84. https://doi.org/10.1515/jcc-2013-0011

Shadinger, D., & Toomey, D. (2014). Knacktive: Answering a call for more interdisciplinary, collaborative, educational experiences. *College Teaching*, *62*(January 2015), 55–61. https://doi.org/10.1080/87567555.2014.885875

Shatkin, L. (2011). *10 Best college majors for personality* (Second). St. Paul: JIST Career Solutions.

Skinner, K. L., Hyde, S. J., McPherson, K. B. A., & Simpson, M. D. . (2016). Improving students ’ interpersonal skills through experiential small group learning. *Journal of Learning Design*, *9*(1), 21–36.

Smith, K. L. (2010). *The effects of service-learning on millenial students*. Ball State University.

Steimel, S. J. (2013). Community partners’ assessment of service learning in an interpersonal and small group communication course. *Communication Teacher*, *27*(February), 241–255. https://doi.org/10.1080/17404622.2013.798017

Stoecker, R., Tryon, E. A., & Hilgendorf, A. (2009). *The unheard voices: Community*

organizations and service learning. Temple University.

Strom, S. (2009). Does service-learning really help? Retrieved July 3, 2018, from https://www.nytimes.com/2010/01/03/education/edlife/03service-t.html

Tan, J., & Phillips, J. (2005). Incorporating service learning into computer science programs. *The Journal of Computing Sciences in Colleges*, *20*(4), 57–62. Retrieved from http://proxyau.wrlc.org/login?url=http://search.proquest.com/docview/62225405?accountid=8285%5Cnhttp://vg5ly4ql7e.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/ProQ:ericshell&rft_val_fmt=info:ofi/fmt:kev:mtx:j

Taylor, B., & Francis, K. (2013). *Qualitative research in the health sciences: Methodologies, methods, and processes*. New York: Routledge.

Terrell, S. R. (2016). *Writing a proposal for your dissertation: Guidelines and examples*. New York: The Guilford Press.

Thomas, T., & Schroder, C. (2002). Developing the interpersonal and communication skills necessary for effective requirements engineering. *Austrailian Workshop on Requirements Engineering*, 185–197.

Tinkler, A., Tinkler, B., Gerstl-Pepin, C., & Mugisha, V. M. (2014). The promise of a community-based, participatory approach to service-learning in teacher education. *Journal of Higher Education Outreach and Engagement*, *18*(3), 209–232. Retrieved from http://libaccess.mcmaster.ca/login?url=http://search.proquest.com/docview/1651835658?accountid=12347

University, M. (2018). Service-learning projects and stories. Retrieved from http://www.marquette.edu/servicelearning/ProjectsandStories.shtml

Warner, J., Glissmeyer, M., & Gu, Q. (2012). Are real world projects worth the risk ? Evidence from service learning projects. *Journal of Instructional Pedagogies*, *7*, 1–10.

Wasburn-Moses, L., Fry, J., & Sanders, K. (2014). The impact of a service-learning experience in mentoring at-risk youth. *Journal on Excellence in College Teaching*, *25*(1), 71–94. Retrieved from http://celt.muohio.edu/ject/issue.php?v=25&n=1%5Cnhttp://ezproxy.library.usyd.edu.au/login?url=http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=eric3&AN=EJ1026167%5Cnhttp://dd8gh5yx7k.search.serialssolutions.com/?sid=OVID:ericdb&id=pmi

Watkins, M., & Braun, L. (2005). *Service learning: From classroom to community to career*. JIST Works.

Wilson, J. C. (2011). Service-learning and the development of empathy in US college students. *Education + Training*, *53*(2/3), 207–217. https://doi.org/10.1108/00400911111115735

Winston, F. (2015). Reflections Upon Community Engagement: Service-Learning and Its Effect on Political Participation After College. *Journal of Higher Education Outreach and Engagement*, *19*(1), 79–104.

Wood, G. (2016). Voices from the field: Developing employability skills for archaeological students using a project based learning approach. *Journal of Problem Based Learning*, *4*(1), 100–108.

Yagci, M. (2016). Blended learning experience in a programming language course and the effect of the thinking styles of the students on success and motivation. *Turkish Online Journal of Educational Technology - TOJET*, *15*(4), 32–45. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1117633&site=ehost-live

Yang, S.-H., Shih, C.-K., Liu, C.-H., & Chan, W. P. (2014). Service learning for medical students: Program development and students' reflections. *TOJET*, *13*(1), 193–198.

Yeh, T. L. T. (2010). Service-Learning and persistence of low-income, first-generation college students: An exploratory study. *Michigan Journal of Community Service Learning*, (Spring), 50–65. Retrieved from http://www.freepatentsonline.com/article/Michigan-Journal-Community-Service-Learning/255178770.html

Yorke, M. (2017). Employability in higher education: what it is - what it is not. *The Higher Education Academy*, (January 2006).

Yorke, M., & Knight, P. T. (2004). Embedding employability into the curriculum. *Learning and Employability*, *Series 3*, 1–28. https://doi.org/10.1108/17561391111106016

Appendix A

Sample of One-on-One Interview Transcript

Sample One-on-One Interview Transcript

Student 12: I learned that I am much more capable of working with the team than I thought I would be. A lot of times doing projects, sometimes it's easier if you're doing it on your own, because you know your ideals, you know where you're wanting to go with it. And then when you introduce that team aspect though, it's a collaboration of everybody's ideas and finding a way to meld them all together to get the project done and in the best way possible.

Interviewer: And you had a challenging team. You had a project that kind of got out of control.

Student 12: Yeah, project [creep 00:00:49]. Yeah, the project started out with just, it was supposed to just be like this little screen of some history and some pictures. And it blew up into a complete data base, multiple screens. We ended up integrating different ideas and where they could do a slide show, or it was kind of like a map idea where you could walk around to these different buildings that were on these farms and stuff.

Interviewer: How do you think the client's age affected your project? Was that a barrier?

Student 12: Oh, I think that's a huge, not necessarily barrier, it was a huge piece though. You have someone who is younger and from a more current generation, they're more knowledgeable about what's out there, what can be used, what can be done. You take someone though that's a little older and from a couple generations back who weren't raised around the computers and the different technology advances, and I think that's kind of what contributed to the project creep was it was a case of the client didn't know these things were possible. We opened the door to show him this is some stuff we can do and it grew from there if we can do this, well can we do this? And it just kept going.

Interviewer: Okay, thanks. What did you learn about others during this process, like people on your team or you talked a little bit about the community service partner?

Student 12: As far as people on the team, I worked with a really great team. We were able to work together really well and mesh our ideas up together really well. I did learn that people have different time management skills. Some people need more of a push. Some are self-motivated I guess is the word I'm looking for. Some people have that more easily than others do. Others take a little nudge and push sometimes.

Interviewer: Were you the motivator?

Student 12: I was one of actually ... Matt was a huge motivator. He was really good. Once we noticed there was, sometimes things were getting put off when they shouldn't have been with other team members, Matt was a really good one. Even on my part sometimes. He was really good about looking at the project and saying, "You know, we should be here by

Appendix B

Sample of Focus Group Discussion Transcript

Sample Focus Group Transcript

Moderator: Yeah, so in the one on one interviews we found that community engagement, or the service learning projects increased teamwork skills, time management skills and communication skills. Did that mirror your experience as well?

FG Student 2: I think so. Yeah, I think I got, after teaching to a room of people and trying to teach stuff I think I got a lot more at ease with communicating to people. That was something that I had to get over and that helped me out a lot. So definitely communication, yes.

Moderator: How about others?

FG Student 5: I didn't really see that it did anything for my time management skills, I mean they still stink. The teamwork, yes and communication.

Moderator: And why do you say yes? Can you elaborate more on-

FG Student 5: The teamwork and communication? Well for the one project it was, for making the tree cookies as they called them. We actually worked together in an assembly line, one person do this and one person do that. If somebody would also get behind then you'd stop what you were doing and go help them out. So I think that may have helped some, although, actually I kind of knew that anyway. But it reinforces it maybe?

Communication as far as, it turns out there was an easier way to do it, by communicating that to each other, we'd find a better way then tell them about it. It would make it a lot easier to do the job.

Moderator: Great. What others? Do you think these experiences improved your teamwork skills, time management skills and communication skills?

FG Student 1: I do feel that it has increased it. When I did my project with the Raspberry Pi, I got over problems speaking to people, but the time management thing. I knew what I wanted to do and I knew a lot about what I wanted to present so it was just a matter of putting everything together how I wanted to do it and not procrastinating. It went well for me I think. I would say

that if you can get something done earlier then definitely take advantage of that.

Appendix C

Sample One-on-One Interview Analysis

Coding Summary By Node

SL Interviews

4/13/2018 1:50 PM

Aggregate	Classification	Coverage	Number Of Coding References	Reference Number	Coded By Initials	Modified On

Node

Nodes\\always have a plan B.

Document

Internals\\Interview With Student 2

No		0.0025	1			
				1	AB	3/5/2018 5:20 PM

always have a plan B.

Nodes\\Civic Responsibility

Document

Internals\\Student 9

No		0.0107	2			
				1	AB	3/5/2018

"It was cool doing something for the county."

				2	AB	3/5/2018

Student had never been part of something that big. (church but not a county)

Internals\\Interview With Student 2

No		0.0135	1

1	AB	3/5/2018

enjoyed the community engagement training. I think it was very useful and I think it helped me grow a little bit

Aggregate	Classification	Coverage	Number Of Coding References	Reference Number	Coded By Initials	Modified On

Internals\\InterviewWithStudent1

No		0.0027	1

1	AB	3/2/2018

how do I involve my child in this

Internals\\InterviewWithStudent 2

No		0.0323	1

1	AB	3/2/2018

I really enjoyed it, because I feel like I helped a lot, especially with it being in the LGBT community. I felt like I had an impact within our community in La Crosse. I felt like it was really good to give back, especially some of the services that they offer that helped me when I was still coming out. So it was good to give my ... basically return the favor.

Internals\\InterviewWithStudent5

No		0.0154	2

1	AB	3/1/2018

it was nice to help them out and it was cool to give back. It felt nice to me to give back to them as an organization for what they've offered me in the past.

2	AB	3/1/2018

It's not really to get recognition for it.

Internals\\InterviewWithStudent6

No		0.0245	3

1	AB	3/1/2018

You should always be helping people, volunteering.

2	AB	3/1/2018

So one thing I've always done with my life and one thing I've always been, kind of like a personal motto, is always to help people. Honestly doing this work always just motivates me more and more to the next day to do something.

3	AB	3/1/2018 3:39 PM

It's those smiles and when people are thankful and you know, even if they don't tell you, you know. It's what really motivates you and makes you wanna keep doing it and working in community and outside of the community, all around the country. That's why I love doing it.

Internals\\InterviewWithStudent8

No		0.0180	2

1	AB	3/1/2018

Just different things like that, wondering how I could do things to make tasks easier for other people as well.

Appendix D

Sample Focus Group Analysis

4/13/2018 2:08 PM

Aggregate	Classification	Coverage	Number Of Coding References	Reference Number	Coded By Initials
Node					
Nodes\\FG Projects					
Document					
Internals\\FocusGroup3152018					
No		0.0254	5		
				1	AB
we were teaching basically older folks, senior citizens how to utilize program.					
				2	AB
it was like basic PC operation and then he had some software he wanted gone, as far as cleaning your PC and keep things running smooth.					
				3	AB
I did mine about Windows 10, basically it was utilizing the interface, and moving taskbar buttons around, personalizing your desktop, like your background photos or setting different colors, your theme and all that					
				4	AB
My project, I did a Photo Shop, a Photobucket presentation to teach people how to create and work with a Photobucket account.					
				5	AB
I created a training manual for two of Cindy's first year computer support students. The training manual was how to turn your Raspberry Pi which is a very small computer, wallet					

Appendix E

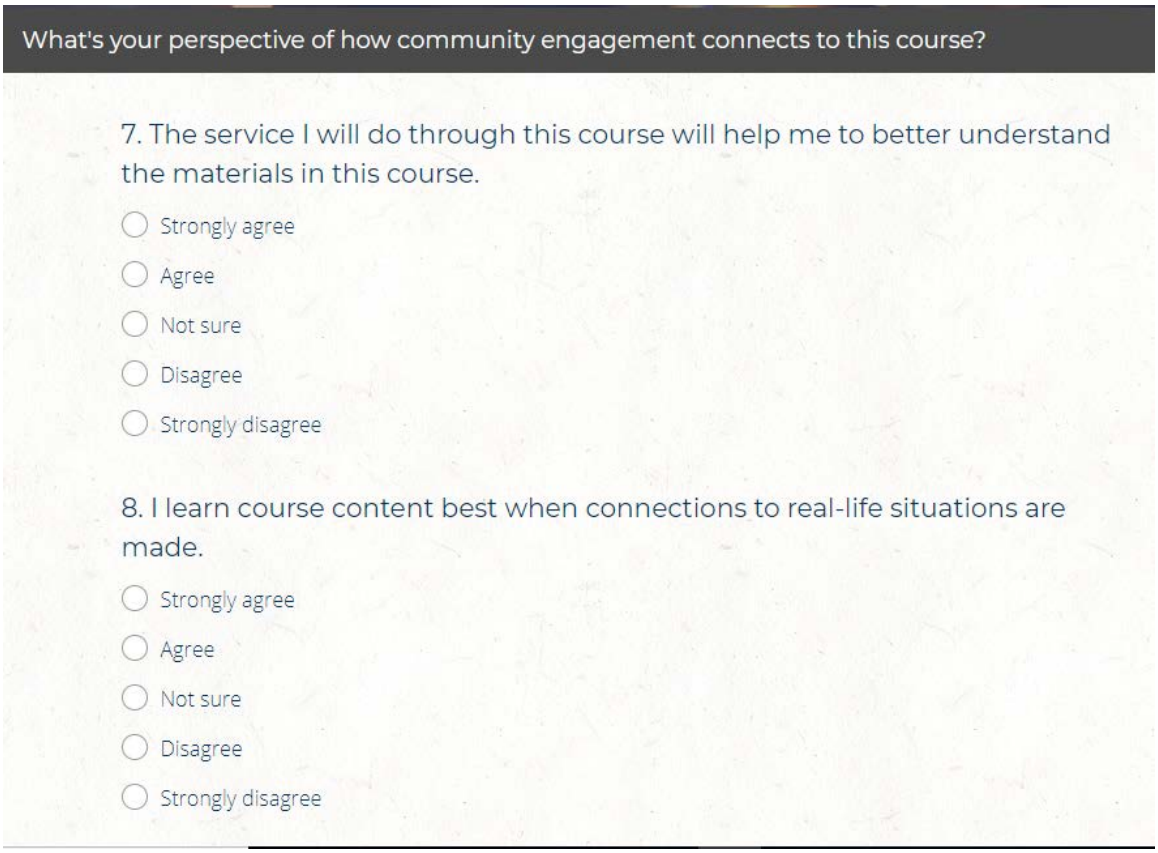
Pre-Service-Learning Assessment Survey Section One Sample

Appendix F

Pre-Service-Learning Assessment Survey Section Two Sample

Appendix G

Pre-Service-Learning Assessment Survey Section Three Sample

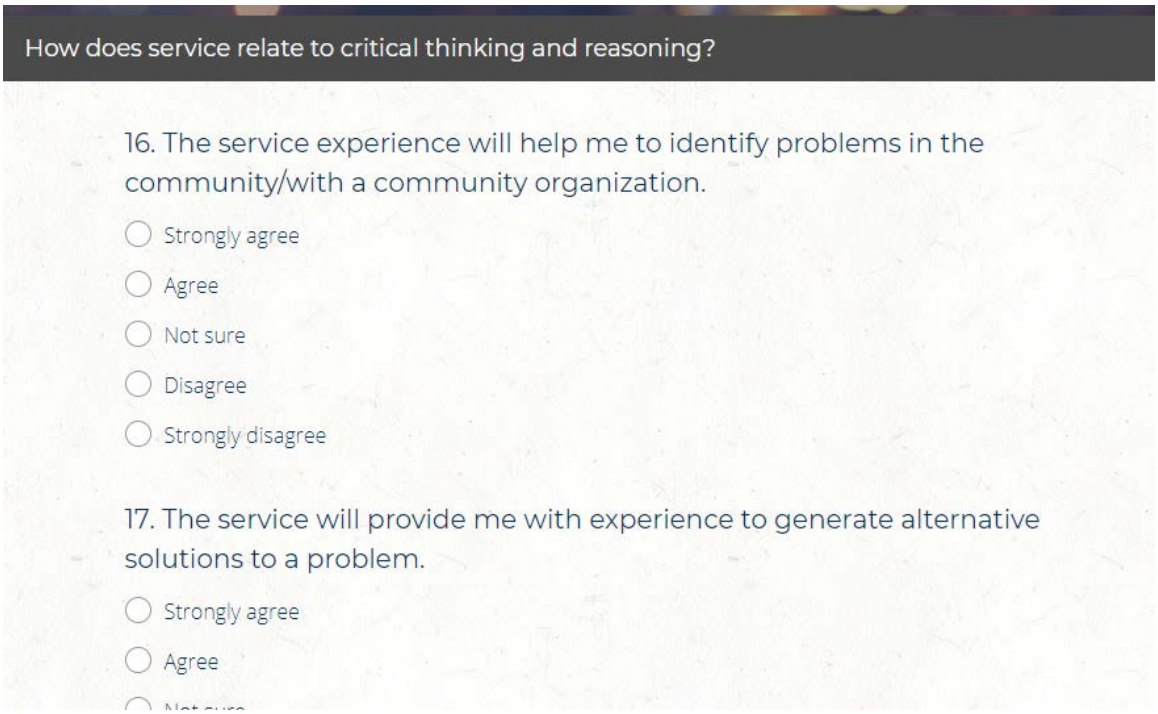


Appendix H

Pre-Service-Learning Assessment Survey Section Four Sample

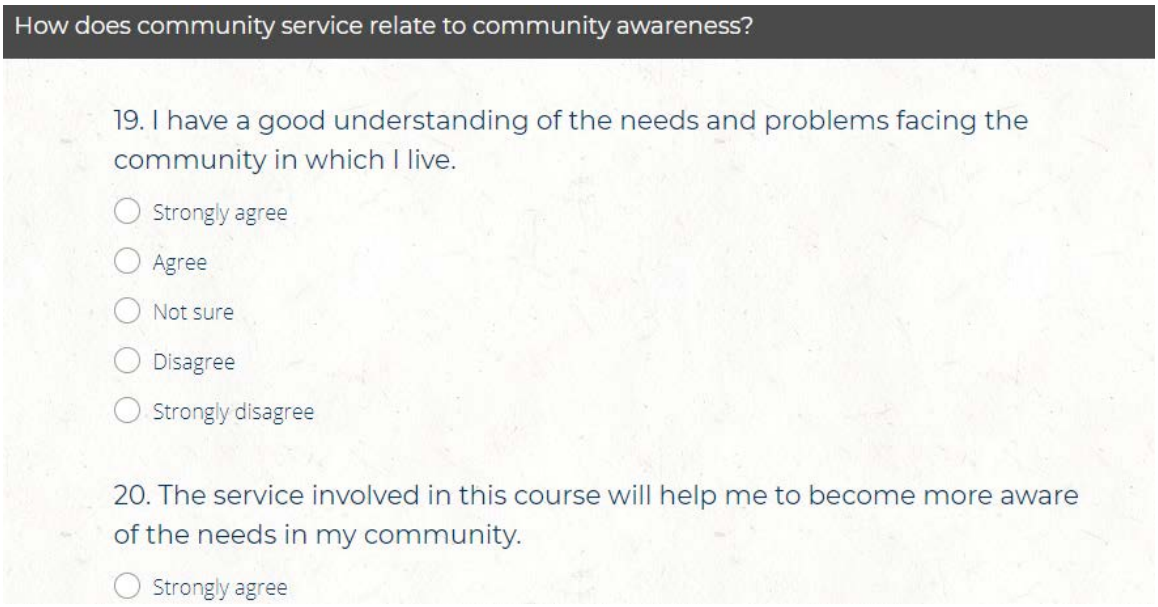
Appendix I

Pre-Service-Learning Assessment Survey Section Five Sample



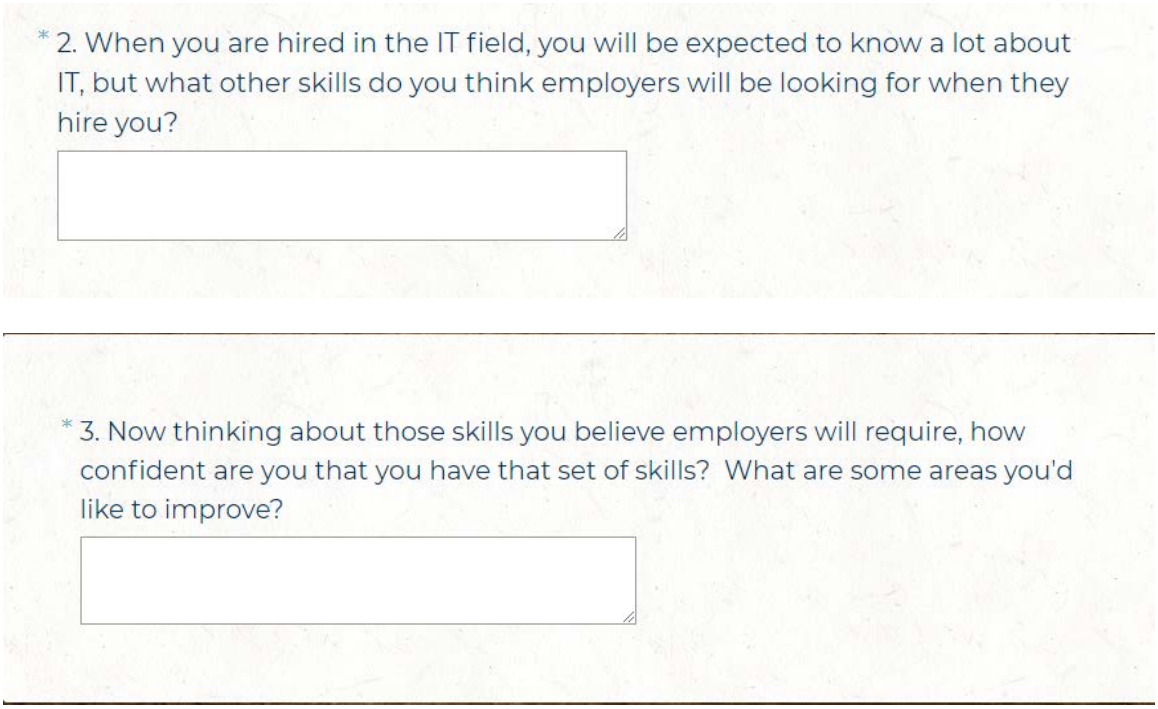
Appendix J

Pre-Service-Learning Assessment Survey Section Six Sample



Appendix K

Reflection Question Survey Sample



Appendix L

Informed Consent Form

EXPERIENCES OF WORKING WITH COMMUNITY PARTNERS

January 1, 2018

Dear Students:

I am an instructor in the Web & Software program at Western Technical College. I am conducting a research study to understand the experiences of IT students working with a community partner. This research is part of the dissertation I am writing to fulfill the requirements for a Ph.D. in Leadership, Learning, and Service through Cardinal Stritch University, Milwaukee, Wisconsin.

I am requesting your participation, which will involve answering a pre- and post-survey regarding your thoughts about community engagement. You will also reflect upon your experiences through structured writing. In addition, you will be interviewed about your experiences. This interview will be conducted on Western's campus, and will take 20-30 minutes. It will be conducted by a faculty member from University of Wisconsin-La Crosse. The interviews will be recorded, and the recordings will be transcribed. I will not hear your voices on any recordings, and therefore, your answers will be anonymous. After being transcribed, the recordings will be kept by me in a locked filing cabinet. Only I will have access to these recordings, and they will destroyed by January 2019.

Your participation in these surveys is voluntary. If you choose not to participate or to withdraw from the survey at any time, it will not affect your grade. If at any time you discontinue the survey, your results will be discarded. The results of the research study may be published, but your name will not be used.

If you choose to participate in the study, upon completion you will receive a $50 gift card to your choice of one of three places: Kwik Trip, People's Food Coop, or the Western Union Market.

The potential benefits of the study include improving opportunities for students to connect with employers, as well as to inform future community engagement work.

If you have any questions concerning the research study, please e-mail me at bricea@westerntc.edu.

This research has been approved by the Western Technical College Institutional Review Board. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact Mr. Kemah

Celestine, the Chair of the Human Subjects Committee Institutional Review Board at 608-785-9199 or kemahc@westerntc.edu

You must be 18 or older to participate. A signed copy of this letter returned to me will be considered your consent to participate. Thank you.

Sincerely,

Ann Brice

bricea@westerntc.edu

Print Name_____ Sign Name_____

Advisor
Peter M. Jonas, Ph.D.
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