JOURNAL OF SERVICE-LEARNING IN HIGHER EDUCATION

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Executive Editor
Journal of Service-Learning in Higher Education

Welcome to the 18th edition of *The Journal of Service-Learning in Higher Education.* Like so many of you, I spend much of my day, every day, thinking, arranging, studying scholarship, and actively participating in service efforts. I also am asked the question – just about every week – "What is service-learning?" Clearly described and illustrated by the articles in this edition, there is still so much of service-learning / civic engagement that seems discipline-specific. The definition that I share comes from the **Carnegie Classification of Institutions of Higher Education: The Elective Classification for Community Engagement**

https://carnegieclassifications.acenet.edu/elective-classifications/community-engagement/

Community engagement describes collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity. The purpose of community engagement is the partnership of college and university knowledge and resources with those of the public and private sectors to enrich scholarship, research, and creative activity; enhance curriculum, teaching, and learning; prepare educated, engaged citizens; strengthen democratic values and civic responsibility; address critical societal issues; and contribute to the public good.

Each of our institutions, across the globe, relies on service-learning to enhance our best teaching, produce our best scholarship, and contribute to the public good. This edition of the *JSLHE* highlights elements of the best teaching, scholarship, and service at twenty-five institutions in four countries. They share elements of best practices of e-learning, and share specific successes at the undergraduate, graduate, and professional-academic levels. It is my pleasure to share their work with you.

ABSTRACT

As the way that the world is evolving, higher education is too. This includes online service-learning which in the past has been predominantly delivered in formats off-line or hybrid. This article describes some best practices to make the online service-learning experience beneficial for all who are involved and accessible to more students, including students that previously did not have access to service-learning courses due to the nature of the delivery and/or format of the course. Best practices to overcome some of the limitations that online courses present include high levels of instructor/facilitator involvement, creative collaborations, and communication, and using different varieties of course material delivery methods. Although teaching online takes time, training, and practice, it is an investment to larger gains in student access and to keep up with trends and demands in the real world.

Best Practices of Online Teaching in Service-Learning

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Introduction

As people of the world evolve into a more global society, increasingly diverse time schedules and modes of communication, which is particularly applicable to higher education, become necessary (Faulconer, 2021: Neuwirth et al., 2021; Resch & Schrittesser, 2023). By moving education online, the panorama of students available to participate in higher education exponentially widens. Online education means that students from a variety of experience levels, and various stages of life can learn from one another and benefit from more diverse perspectives than found in a traditional classroom setting (Resch & Schrittesser, 2023; Waldner et al., 2012). In addition, potential learners that are different abled who may not have access to physical travel or can afford to be in specific locations, particularly rural populations, may only be an Internet connection away from participating in this educational exchange (Hamilton, 2023; Waldner et al., 2012). Potential learners due to work or childcare constraints would otherwise not be able to participate in expanded learning experiences. The online educational experience can go beyond typical online lecture format courses and include service-learning courses (Cress et al., 2023), Service-learning combines the experience of applied learning with structured instruction, guided by a purpose beyond learning itself, which is better for the community and the student (Faulconer, 2021). Guided firsthand experience that may include but is not limited to presentations, consultations, needs assessments, grant writing, action plans, website content development and online service delivery (Cress et al., 2023; Guthrie

& McCracken, 2010). Service-learning also places a strong focus on problem solving, creativity, and collaboration. Extreme service-learning is when the delivery of the service-learning course and the application of service-learning are both done in an asynchronous online format (Faulconer, 2021). The focus of this paper is on the best practices in extreme service-learning.

Benefits

There are many benefits to online service-learning. Online service-learning adds new dimension to the growing needs of online courses. With 8.5 million students currently online and with a five-year growth predicted from 2020 to 2025 of 200%, higher education will have to make changes to keep up with demand (Hamilton, 2023; Peck Consulting, 2023). Extreme service-learning, also known as Type IV online instruction, has the potential for exponential learning that creates shift perspectives, increases skills and knowledge beyond course materials that may or may not be utilized or applied by the student post-graduation. (Culcasi & Venegas, 2023; Resch & Schrittesser, 2023; Waldner et al., 2012). Extreme service-learning has service components that are both delivered online designed to cultivate skills including leadership, collaboration, problem-solving and communication, and to prepare students for careers which may be personally rewarding in the process (Culcasi & Venegas, 2023; Waldner et al., 2012). The relationship exists between the community and the student in an environment that is monitored by a facilitator/instructor which ensures quality and meaningful learning exchanges (Waldner et al., 2012). An essential component of service-learning is self-reflection (Lehman & Conceição, 2010; Resch & Schrittesser, 2023) which creates both a deeper understanding of the bigger picture and to expand its meaning. Service-learning requires higher skills which are shared with others for future evaluation of the learning process and experience.

Limitations

Distance learning participation is different from seeing or experiencing the organization or agency in person (Paudel, 2021; Walder et al, 2012). Communication online through message boards and video chat may be less effective. One-way communication can be harder to understand and more likely to create miscommunications. These one-way types of communication in higher education require more details and explanations in order to reach learners at different levels of understanding (Faudi, 2022). Students should have opportunities to discuss the material and ask questions through message boards and direct communication with the instructor/facilitator such as through email or video conferencing. Internet connections must be available and dependable on both ends along with technical support available through the institution. Students, instructors/facilitators, and the community agency will all have to adapt to networking in technological ways (Singh et al., 2022). Upgrading skills may take training and time to implement. However, these skills are more in line with communication that is occurring in today's world and the problem-solving techniques learned through service-learning can transfer to other environments and settings (Culcasi & Venegas, 2023; Waldner et al., 2012).

Research indicates that there are also some concerns with online learning regarding motivation of students, time management, and delay of feedback which have been identified as potential limitations, (Coman et al., 2020; Paudel, 2021).However, these limitations can be addressed by having an instructor that is present and available through responses to students and timely feedback on assignments which also fosters a sense of belongingness (Martin et al., 2019; Zhang et al., 2022). Instructors/facilitators will require plenty of opportunity for students to participate and to be engaged with each other, the material, the service-learning agency, and the instructor/facilitator themselves (Brown et al., 2022).

Best Practices

Accessibility means that different learners and learners at various levels have access to resources such as screen readers, alternative text for images, and a variety of communication styles, such as text, video, and voice (Kim & Fienup, 2022). Materials that are presented within the course need to be in multiple formats to reach these different types of learners in order to promote understanding and measure skills development. In addition, service-learning requires not only learning of course material but also the ability to apply it through demonstration of skills and reflection (Resch & Schrittesser, 2023).

Course activities need to be geared toward the needs demonstrated by the stakeholders and monitored both by the community agency and by the instructor/facilitator (Bringle & Hatcher, 2016). This collaboration requires a strong relationship and huge amount of communication between the stakeholders and the instructor, and the stakeholders and the learners (Bringle & Hatcher, 2016). Research indicates that the amount of instructor involvement makes a big difference to the quality of the involvement of the students and with the greater presence or interaction by the instructor (Kennette & Redd, 2015; Lehman & Conceição, 2010; Zhang et al., 2022). The service-learning collaboration should also include students and organizations that were unable to participate due to time, location, or other limitations. Higher learning needs to be engaging and interactive by exploring resources, having discussions, creating materials such as deliverables to clients, or grant writing where the student is involved in the process. (Arcambault et al., 2022; Waldner et al., 2012) The service-learning collaboration helps the students feel like they are contributing and creates an environment of belongingness (Bringle & Hatcher, 2016). Also, there needs to be strategic continuity of design between materials and service-learning activities and the reflection topics/questions that the students are required to participate in. Instructors need to be trained in communications and course delivery that accommodates the needs of online learners and the difficulties that they may face such as misunderstandings of the material, connection issues, and readability (Hofer et al., 2021; Waldner et al., 2012). Instructors walk a fine line between detailed instructions and written materials and writing too much that might distract from the meaning of the message.

Programs like Quality Matters, EDUCARE, or Online Learning Consortium can help educators develop the skills needed to teach online courses that are more effective, while other models, such as the Context, Input, Process, and Product

Evaluation Model (CIPP) help with course rigor (Baldwin et al., 2018; Zhang et al., 2011). Although these programs and methods have been implemented more with lecture format courses than have been transferred to online. The instructor will need to be well versed in how to create dialogue between the learners and to give feedback on a regular basis and expert input on the service-learning activities (Zhang et al, 2011). Instructors serve as facilitators of the relationship between the stakeholders and the students as well as the students and their learning (Waldner et al., 2012). Needs are ever changing within the community and for the students, so it is necessary for the instructor/facilitator to update the materials in the course on a regular basis. (Martin et al., 2019). Updating may include limiting the numbers of students in the course or numbers per work group so that each student is able to participate giving everyone the opportunity to communicate (Waldner et al., 2012).

There is a direct benefit for all those involved in the service-learning process. Service-learning creates more community bonds for the students and the community organizations. It has been found that service-learning may increase a culture of philanthropy in other extracurricular areas in the community and increase a sense of civic responsibility in the student (Bringle & Hatcher, 2016; Guthrie & McCracken, 2010; Zhang et al, 2011). Additionally, the students and the community organizations may even find future employers/employees and volunteer contacts from service-learning collaborations (Bringle & Hatcher, 2016). Finally, service-learning may also help faculty reach service goals, required by the university promotion and tenure policies, in the process (Bringle & Hatcher, 2016).

Future Directions

One of the possible future directions of teaching service-learning may be through artificial intelligence (AI) simulations as this is already being tested in the related human service social fields of education and counseling with outcomes based on performance during simulated tasks (Ledger et al, 2023; Maurya, 2023). Using AI goes beyond just case studies but may fill in the gap before students are ready for hands-on experiences. Sharing AI experiences also may help students learn from other classmates' successes and failures through insights as these simulations can be reviewed and discussed. Because of the high level of involvement of the instructor/facilitator of extreme service-learning courses, it is important not only that these educators have a background in service-learning but also in online instruction (Waldner et al., 2012). It takes time to develop course documents including course map objectives, materials, activities, and outcomes that have an important impact on these courses. The number of students in these courses should be limited so that appropriate instruction and guidance is available resulting in a high level of interaction and involvement in the course (Brown et al., 2022).

Due to the nature of the course and having outside involvement of a community agency, it is necessary that technology is accessible to all students, instructors/facilitators, and community stakeholders (Martin et al., 2019; Singh et al., 2022). Effective technology includes not only a strong Internet connection and technical support, but also accessibility to tools that might be required such as video conferencing, microphones, and text reader software. Instructors should be trained in

teaching online courses and have knowledge of service-learning (Waldner et al., 2012). Students and community partners may also require online training as well as service-learning training (Waldner et al., 2012).

Over the past several years, there have been calls to action for higher education to dig deeper for more enriched learning experiences and to change the mode of education that works for more students and the broader community (Bringle and Hatcher, 2016; Hofer et al., 2021). This call to action can be addressed with a renewed commitment and effort for universities to be involved with service-learning. In addition, these service-learning opportunities need to be available to all (Boyer, 1994; Bringle & Hatcher, 2016; Boyer, 1994).

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ABSTRACT

Service-learning is a critical component of public health education, especially students of Doctor of Public Health (DrPH), designed for public health professionals. As an evidence-based approach to impactful teaching improving students' learning outcomes, service-learning enables future public health practitioners to engage in the learning and reflective practices developing skills needed to be leaders of social change within their communities. E-service learning has been gaining popularity among faculty and students. This study describes a grant writing course for DrPH students of various concentrations delivered online. We draw attention to the growing need to incorporate service-learning into the public health curriculum to promote social change, address local health disparities, improve students' learning experiences and outcomes, and stay relevant with the educational landscape.

Using Service Learning in an Online Course on Grant Writing for Doctoral Students of Public Health

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"eService-Learning is not just a class – it is a calling." (Strait & Nordyke, Eds., 2015, p. 2)

Introduction

With the expansion of an online academic community coupled with the need to deliver high-impact educational practices, eService-Learning has been gaining popularity among faculty and students (Moloney & Oakley, 2010; Salam, Iskandar, Ibrahim et al., 2019; Strait & Nordyke, Eds., 2015). EService-Learning removes boundaries associated with the more traditional service-learning methods-- a multifaceted teaching and learning process of connecting real-world experiences with academic goals. During such process, the service benefits the community partner, and the learning benefits the student (Strait & Nordyke, 2015). As one of community engagement pedagogies, service-learning is often compared to community-based research, community partnerships, internships, activism,

volunteerism, and community service. Service-learning is one of the five practices emphasized in the 2010 report on high-impact educational practices titled "Five High-Impact Practices: Research on Learning Outcomes, Completion, and Quality," issued by the Association of American Colleges and Universities (Association of American Colleges and Universities, 2022). This pedagogy leads to several gains for participating students, including academic engagement, improved critical thinking and writing skills, improved interaction with faculty and peers and related team-building experience, and an increased sense of civic engagement and reduction in stereotyping (Strait & Nordyke, 2015).

The Institute of Medicine report, *Who Will Keep the Public Healthy? Education Public Health Professionals for the 21st Century* has emphasized public health education promotes excellent citizenship with life-long lasting impact and recommends public health education to be offered to all undergraduates as an integral part of their education regardless of career paths (Hernandez, Rosenstock, & Gebbie,2003). Academic institutions of public health have been challenged to create excellent learning environments that will expose students to experiential, collaborative learning with long-lasting impact (Council on Education for Public Health [CEPH], 2018). While such challenges have been commonly addressed using internships, practice, or field experiences as part of graduation requirements, service-learning projects have been limited. Nevertheless, they emphasize reciprocity and promote a balance between meeting the community's needs and academic partners. Prior research has highlighted the importance of service-learning to the field of public health and suggested ways to incorporate it into public health education (Cashman & Seifer, 2008). Historically rooted in undergraduate education, service-learning has been promoted among undergraduate students of public health as part of introductory public health core courses or electives to enable future public health professionals to ensure conditions in which everyone can be healthy (DeSalvo, Wang, Harris et al., 2017; Mackenzie, Hinchey, & Cornforth, 2019). More recently, service-learning programs integrated into graduate coursework have also gained recognition (Horney, Bamrara, Macik et al., 2016). Service-learning is an evidence-based approach to impactful learning knowing to improve students' learning outcomes (Prentice & Robinson, 2010).

The Doctor of Public Health (DrPH) degree is an "advanced professional practice degree designed to prepare graduate students for careers as senior-level administrators, applied researchers, policymakers, and educators providing leadership to protect and improve public's health" (Lee, Furner, Yager et al., 2009, p. 77). In the 2014 report titled *Framing the Future: DrPH for the 21st Century*, a DrPH graduate has been envisioned as "a transformative leader with expertise in evidence-based public health practice and research who can convene diverse partners and communicate to effect change across a range of sectors and settings" (Association of Schools and Programs of Public Health, 2014). Emphasis on reciprocity between learning and reflective practice makes service-learning an ideal venue to develop skills to effectively work with communities and ultimately achieve social change (Cashman & Seifer, 2008). While the delivery of online DrPH coursework has evolved, innovative development in

the field of civically engaged teaching and learning online has been limited (Strait & Nordyke, 2015).

The current study describes a grant writing course for DrPH students of various concentrations delivered online. We draw attention to the growing need to incorporate service-learning into the public health curriculum to promote social change, address local health disparities, improve students' learning experiences and outcomes, and stay 'relevant' with the educational landscape (Association of Schools and Programs of Public Health [ASPPH], 2014; Bowen, 2014; Rominger, 2018). As the studies includes course description and reflections, the institutional IRB human subjects approval was not sought.

Learning Community

The DrPH program at Jiann-Ping Hsu College of Public Health (JPHCOPH) Georgia Southern University (GS) is a 3-year degree program that prepares full-time or part-time students with the knowledge, skills, and values needed to be an influential effective public health professional. The program offers four concentrations: Biostatistics, Community and Health Behavior and Education, Epidemiology, and Public Health Leadership. The originally created JPHCOPH is located in Statesboro, Bulloch County of Georgia.

The population in of Bulloch County was composed of 66% white, 30% black, 2% Asian, and 2% multiracial residents (OASIS, 2017c). In 2016, 29.9% of Bulloch County's 74,722 residents lived at or below the poverty level, and 19.1% of individuals under age 65 were uninsured (U.S. Census, 2010). According to the 2019 County Health Rankings' profile, 22% of adult residents in Bulloch County smoked, 30% were obese, 24% were physically inactive, and 20% were uninsured (County Health Rankings & Roadmaps, 2019). Accessing quality medical care in Bulloch Country can be challenging for low income, uninsured individuals. While the county is not considered rural because it has a population of more than 35,000 residents, it is surrounded by six rural counties: Screven, Jenkins, Emanuel, Candler, Evans, and Bryan County (GeorgiaGov, n.d). In his report, Nelson (2016) drew attention to the stark contrast between the urban and rural regions of Georgia, referred to as the 'two Georgias': more than 30% of all rural counties experience the worst health outcomes across the state; 8% of them have the lowest quality of life, and in almost 90% of all the rural counties, premature mortality is overwhelmingly higher than the state's average.

The community partner, The Hearts & Hands Clinic (hereinafter, referred to as Clinic), is the only free primary healthcare facility in Bulloch Country; the closest free clinics are an hour's drive away. The Clinic provides free healthcare to Bulloch Country residents aged 18 years or older who are uninsured, ineligible for Medicaid and Medicare, and live at or below 200% of federal poverty guidelines. The patients are cared for by volunteer medical and dental providers. The Clinic employs a part-time Nurse Practitioner (NP) and Registered Nurse (RN) and partners with 23 licensed volunteer medical and dental healthcare providers caring for patients on-site. The clinic has 58 health care provider partnerships in the community, and it provides primary care,

dental, vision, lab draws, prostate screenings, mammogram appointments, and specialty referrals. Given the overwhelming need for affordable healthcare throughout the community, the demand for services continues to grow. In 2014, the Clinic provided 1,715 appointments, and in 2019, the number of patient visits grew to 2,638. Because of the Clinic's evolving partnerships and funding, the number of new patients has also steadily increased. In 2015, 54 individuals became active patients; in 2019, that number increased to 487 active medical and dental patients, 62% female, and 38% male. Over half of patients were non-Hispanic black, 40.7% were non-Hispanic white, and 1.3% were Hispanic. Approximately 85% had diabetes or hypertension, and 35% were diagnosed with both, with nearly all having underlying conditions such as obesity or high cholesterol. In a national study among rural stakeholders, access to health care and diabetes-related services were among the top five priorities in rural areas (Bolin, 2015). Academic-community engagement through practice is an excellent tool to support the health needs of rural communities. Public health practice encompasses translating and applying research, teaching, and service to solve health disparities (Potter et al., 2009).

EService-Learning

Service-learning (SL) encompasses the three significant areas of practice, and it provides a more vibrant learning environment for students (Bransford, Brown, & Cocking, 1999; Furco, 2002; Klute, & Billig, 2002). Mennen (2006) describes SL as a structured pedagogy and a philosophy that incorporates both teaching and learning in social settings. Moreover, this discipline enhances students' civic engagement (Morgan & Streb, 2001), which exposes them to health disparities in local communities (Buckner, Ndjakani, Banks et al., 2010), and creates opportunities for professional networking relationships (Anderson, Royster, Bailey et al., 2011). This experiential and participatory approach to public health is imperative to foster a practical and engaging generation of public health leaders.

Historically, service-learning has proved effective in a face-to-face traditional classroom setting, where academic institutions engage their students with community partners (Seifer, 1998). Although little research has been done on the effectiveness of e-service-learning, no differences were found when service-learning is delivered entirely online (McGorry, 2012). As academia transitions to a more technological era, such modality can be valuable and impactful in hybrid courses where students are still in between online and face-to-face (e.g., in terms of students' expectations on coursework/assignment burden and self-paced work vs. timed for in-class meetings, developing a sense of helping the community to which students may not relate). E-learning also provides more significant opportunities to increase service-learning because students are constrained to working with communities around their universities; they can do the service with their communities regardless of how far they are from campus. Additionally, Eservice-learning provides an opportunity to foster interdisciplinary and international collaborative work across multiple disciplines and countries (Snyder & Little, 2021). A course on grant-writing is a suitable example for

teaching interdisciplinary and international collaboration. Grant writing is the craftsmanship of a good storyteller with the power to convey all parts of the story, in a cohesive and clear manner (Mennen, K., 2006).

The course on grant-writing is a doctoral-level course, commonly taken by students after completion of their coursework. Most students are adult learners and are already employed in public health. Some of them are already familiar with working as consultants; as they take the course, they are encouraged to think of themselves as such. We also capitalize on different areas of expertise students of various concentrations have to offer as we create groups of students representing each of the five concentrations. For example, biostatistics students take charge of the methods and evaluation section of the grant proposal; community health students lead the subsection on significance and evaluation; leadership students work on the budget-related and logistical sections. The service-learning engagement was integrated into an existing grant writing course through a combination of a one-time group service project which supported meeting the course objectives and a project-related activity that required supported SL activities throughout the course (Bandy, 2019). The service-learning project has been designed prior to the course offering with the input of the community partner and representative from the service-learning office at the university. Implementation strategies and specific activities have been fully stated at the beginning of the semester to ensure students know that the course entails.

This doctoral course has been offered in both hybrid and completely online (e.g., summer 2021 due to Covid) formats. When offered in a hybrid format, students met four times during the semester, while the rest of the course was delivered online using the Folio system. The service-learning project (Assignment 1 Part A & Part B) and critical review of grant applications (Assignment 2) requiring individual and group work constituted the basis of student evaluation. Table 1 describes the service-leaning assignment from the course syllabus.

Table 1. Servile Learning Projects	
Goal	**Help Hearts and Hands Clinic to write and submit 3 grant applications (minimum)**
Description of A Grant-Writing Assignments from the Syllabus	
Assignment 1 Part A	You are strongly encouraged to develop grant proposals in teams/groups. However, if you prefer to work on a grant application alone, please let the instructor know during our first in-class meeting. At the beginning of the course, you will be introduced to the Hearts & Hands Clinic. You will be given several funding announcements and copies of past grant applications of the Clinic. Throughout the course, you will work on the development of new/improved grant applications in groups in communication with the course instructor and a representative from the Hearts & Hands Clinic. Completed and ready-for-submission grant applications are due at the end of course.
Assignment 1 Part B	Prior to that, you will also need to present your applications to other class members, instructors, and representatives from Hearts & Hands Clinic. Your presentation can be delivered as a PowerPoint presentation (ppt) and last 30 minutes with 15 additional minutes for discussion.
	Because this is a service-learning project, you will also need to incorporate lessons learned and challenges related to service-learning in the presentation. You can use this poster presentation to compete in the Eagle Showcase of Service-learning at Georgia Southern University or an outside conference. Following your presentations to the community partner, course mates, and me (your course instructor), you may be given constructive feedback – please make sure to incorporate it in your final version of Assignment 1.
Assignment-related tasks	To guide you through the grant writing process, the instructor will be posting 'to-do' lists. For example, you may be asked to do a quick literature review and gather some background information on Hepatitis C, diabetes, etc. – health conditions that constitute the focus of the grant. Please make sure to review the to-do lists. If you have any questions, please let the instructor know ASAP. Remember, your work in this course, can make a positive impact on the community!

Lessons Learned

At the national level, collaborative efforts are viewed as the best approach to eliminating health disparities (US, HHS, 2018). Service-learning projects provide opportunities for faculty to work collaboratively with the community. However, such projects are still falling short in the classrooms. In their systematic review, Hilliard and Boulton (2012) found the public health sector was still lacking a workforce well immersed in the scholarship of public health practice. Therefore, schools and colleges of public health are being challenged to create excellent learning environments that will expose students to experiential, collaborative learning (Council on Education for Public Health [CEPH], 2018). These priorities highlight the need to increase collaborations between schools and the community to provide learning platforms outside the classrooms.

Incorporating service-learning allows students and faculty to address health disparities and exposes students to impoverished neighborhoods and communities that face real health challenges. From the students' perspective, this experiential learning enhances their leadership skills and allows them to apply solutions to actual problems (Sabo et al., 2015). Similarly, students also report higher levels of personal growth and awareness of local health disparities (Hou, 2009; Upadhyaya, May, & Highfield, 2015). Capitalizing on the richness of service-learning in Georgia, where 108 of 159 counties are rural, is paramount for public health work.

In several of Georgia's higher education settings, service-learning health projects are leading the way in public health practice. For example, various service-learning activities were incorporated into the nursing curriculum at Emory School of Nursing (i.e., needs assessment, health education, health fairs), where students collaborate with agencies to provide services to homeless, teens, farm workers, and special needs individuals. The activities are meant to create a learning environment where students apply their skills in community-based health promotion and prevention and work with diverse rural communities (Kelley, Connor, Kun et al., 2008). Similarly, Morehouse School of Medicine prides itself on achieving a culture of community service by incorporating a service-learning curriculum throughout its medical program. The school understands the importance of generating a healthcare workforce grounded in community health and caring for underserved populations (Buckner, Ndjakani, Banks et al.,2010). Another example can be found at the GS JPHCOPH, where a service-learning project supported weight loss among members of an African American church in Bulloch County (Alfonso, Johnson, Hubeny, & Olivas, 2019). Although service-learning work is being incorporated across some graduate programs, this approach is not free from challenges.

The ASPPH has noted that among some of its faculty members, engagement with community service or faith-based organizations happens at a lower level than national organizations such as the National Institute of Health or the Centers for Disease Control and Prevention (ASPPH, 2018). One of the reasons is that service-learning requires additional time to develop relationships between academia and the

community. The faculty initiates most of these collaborations (Drahota et al., 2016). However, fostering these relationships outside the classroom can be a real challenge (Caron, Ulrich-Schad, & Lafferty, 2015). Conflicting time schedules and priorities of the organization can also affect the timeline of the class projects (Greece, DeJong, Gorenstein et al., 2018). Therefore, investment in cultivating the relationships and advanced planning ahead of the class to develop a timeframe is crucial for a successful service-learning project (Ostrander & Chapin-Hogue, 2011). Despite the preparation time challenge, in her review of the literature of the education of public health professionals, Evashwick, Tao, and Bax (2013) found service-learning had been one of the commonly used methods to teach future public health professionals.

Supportive policies at the institutional level are also necessary to encourage service-learning engagement. An institution environment that includes rewards, adds value to the pedology of service-learning, structures service-learning as part of the curriculum, and supports the development of faculty's skills in community engagement, is necessary to continue this work (Buckner, Ndjakani, Banks et al., 2010; Hartwig, Pham, & Anderson, 2004; Nokes et al., 2013; Smith et al., 2013; Stevens, 2000). For example, the University of North Carolina at Chapel Hill, has fostered their collaborations at the institutional level. They support initiatives that reward faculty engagement through promotion and tenure, integrate engagement into their master planning, and identify creative ways of collaborating with other departments in community engagement projects. Several case studies have demonstrated the ability to design graduate-level courses with tailored service-learning projects that meet the competencies of core requirements (Santella, 2019). As academia becomes more technologically advanced, the instructional learning platform is also changing; more classes online will require creative ways to integrate service-learning into the curriculum.

As of 2015, the community of online or distance learners increased to about four students taking at least one of their courses online (Allen & Seaman, 2016). This new teaching and learning approach presents unique opportunities for integrating service-learning in virtual classrooms. For example, this new platform has allowed graduate students at the Midwifery Institute of Philadelphia University to engage in service-learning projects to increase awareness of health policy advocacy. The student-focused on issues specifically to midwifery, maternal and child, and or women's health allowed them to learn about the legislative process, engage with local politicians, help raise funding to support policy advocacy at the local level, and one even ran for office (Van Hoover, 2015). Moreover, students at the Southern New Hampshire University's College of Online and Continuing Education (SNHU COCE) collaborated with a selected government or nonprofit organization from within their communities. Additionally, they worked with them on a grant proposal that was submitted for funding (Nugent & Thrippleton-Hunter, 2017). Similarly, our class also focused on grant writing to support a local non-profit organization.

According to Waldner, Widener, and McGorry (2012), E-learning provides students with expanded opportunities to work with organizations that serve the interest

of their community, not restricted to the physical geographical location of the academic institution. Online service-learning can take many forms. For example, it can be structured as a hybrid course, incorporating full online instruction and activities carried out at a physical site, or vice versa; or both the instruction and the service-learning activities done virtually (Waldner, Widener, & McGorry, 2012). Additionally, the students can also engage in the community as consultants who immerse themselves in a particular issue concerning the partner agency or "client," and both work collaboratively to develop a solution for the matter (Bandy, 2019). Lastly, critical steps for developing courses and syllabi applicable in e-learning settings have been developed (Nordyke, 2015). The faculty needs to decide how the course will be structured; the goals and objectives for the service-learning project must be clear; the community partners and their needs must be identified, and the number of hours needed for the project must be stated. Other things include knowing the geographical location of partners and students, knowing how to manage the online tools used for the class, assessment, and evaluation of the project, consent forms and confidentially, and a comprehensive review of materials to ensure academic rigor (Nordyke, 2015).

Furthermore, this reciprocal practice also generates positive rewards for the communities engaged in the process. Some community partners see great value in the skill sets that students bring to their workplaces and have benefited from students' support to enhance their strategic planning and reshape their vision, mission, and objectives (Birkhead et al., 2014; Comeau, 2918).

Conclusion

The grant-writing course is one example of how to capitalize on the benefits of service learning for students, community, and faculty. As our reflections coupled with findings from prior studies demonstrate, the potential of e-service-learning is endless as a collaborative and multidisciplinary approach to decrease health disparities. Thus, the academic body must work through the various mechanism to decrease the challenges of implementing service-learning in the classrooms or virtual platforms (Buckner, Ndjakani, Banks et al., 2010; Hartwig, Pham, & Anderson, 2004; Nokes et al., 2013; Smith et al., 2013; Stevens, 2000).

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Acknowledgments

ABSTRACT

This article discusses how a new APRS service-learning model was implemented in a new service-learning project in the traditional Chinese medicine (TCM) orthopedics curriculums at three Hong Kong institutions. The APRS model adopting flipped learning approach consists of four cyclic stages, including Application, Practice, Reflection and Self-regulated learning. Qualitative and quantitative findings in this study reveal that TCM students gained confidence in applying discipline knowledge/skills and improved in various areas, including cross-cultural competence, communication, problem-solving and collaboration. Drawing evidence from this study, possible factors contributing to positive impacts on student learning in the APRS model are the *strong connectivity* (including clear alignment with programme, profession, institutional missions and traditional Chinese philosophy *xiushen*), *reinforced motivation* (student autonomy and buy in) and *structured organisation* (strong network among participating parties and use of a centralised electronic platform). The APRS service-learning model is a culture-based approach helping students reconnect Confucian *xiushen* to the discipline knowledge and the real-life application in the Hong Kong context. This model may also be applicable to other Asian contexts where the Confucian culture prevails.

Cross-Institutional Service-Learning in Orthopedics Curriculum in Traditional Chinese Medicine Education: APRS Service-Learning Model

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Background of the project

This study is based on to an interinstitutional collaborative teaching and learning project, *Enhancing Orthopedics Curriculums in Chinese Medicine Education by Bringing Theory to Practice.* It involves the schools of Chinese Medicine at three Hong Kong institutions: Hong Kong Baptist University (HKBU), The University of Hong Kong (HKU). The project was supported by the Hong Kong University Grants Committee, under the Funding Scheme for Teaching and Learning Related Proposals.

To implement service-learning in the traditional Chinese medicine (TCM) orthopedics

curriculums at the participating institutions, the TCM students, professionals, community centers, and social workers jointly established a Chinese Medicine Service-Learning Network to provide professional services to elderly orthopedic patients, aiming to relief the currently overladed health care system in Hong Kong and the increasing health care needs in the community (Schoeb, 2016). Throughout the project, students gained the meaningful opportunities to practice essential clinical skills in orthopedics, such as assessing/analyzing medical conditions, preparing health records, designing recovery plans and exercises, and organizing health care activities for the community.

Based on the study, this article discusses the implementation of a unique service-learning model in TCM education in the Hong Kong context, with a particular focus on the TCM orthopedics profession that consists of practical techniques of acupuncture, acupressure, and Tuina massage therapies. This article also analyzes how the student participants perceived the implementation and how it enhanced student learning.

Overview of TCM Education in Hong Kong

Pedagogical Design

Following the problem-based learning (PBL) adoption in McMaster University Medical School in 1969 (Lee & Kwan, 1997), Hong Kong also introduced PBL to medical education (including medicine, nursing, pharmacy, etc.) in 1990s. In medical education, PBL is a student-centred pedagogical approach which makes use of realistic and open-ended medical problems as triggering materials at the start of the learning process (Servant-Miklos, 2019). The problem serves as a vehicle for students to develop problem solving skills and acquire new knowledge (Barrows, 1996). PBL is proved to promote the motivation to learn and the enhancement of academic performance to students (Araz & Sungur, 2007; Finch, 1999; Lee & Kwan, 1997). Thus, it has become one of the core pedagogies in Hong Kong since then (Nandi, et al., 2000).

TCM education in Hong Kong has, instead, adopted a slightly different teaching and learning pedagogy: case-based learning (CBL). In TCM, it is a goal-oriented, faculty-resource intensive teaching method (Rosenbaum, Lobas & Ferguson, 2005) that highlights the training of semi-practical advanced medical knowledge (McLean, 2016), including diagnosis, herbal medicine, acupuncture, and pathology (Chen et al., 2013).

Both pedagogies had been proved effective to motivate TCM students and strengthen their diagnosing skills (Chen et al., 2013; Nandi et al., 2000). However, in the orthopedic course, the medical cases are usually designed to only address a single orthopedic issue (such as joint dislocation or pain), and students are given all the essential information to analyze the clinical cases for the single and correct answers. Since there is a lack of practicing opportunity for students to obtain extra information from real patients, other important attributes of TCM professionals, such as communication skills and empathy which are necessary for building a positive physician-patient relationship, are somehow underdeveloped in the current curriculum.

Constraints in Offering Practicing Opportunities

In view of the knowledge-intensive nature of the TCM subjects, the TCM curriculum at local universities, in general, had been designed in a traditional way, e.g. five years of pre-clinical study and one year of clinical practicum (5+1). Orthopedics, like many other subjects in TCM curriculum, requires students to apply their clinical knowledge. However, in the curriculum design, authentic practices (with real patients) are only available in the clinical practicum year. Thus, there is a lack of authentic practice opportunity integrated in the course level.

Although TCM has been legally accepted in the Hong Kong health care system since the 90s (Chinese Medicine Council of Hong Kong, 2007), a public TCM hospital is yet to be established to provide training/practicum opportunities. The training practice for TCM students has primarily relied on physician shadowing (observing the physician at work) in local TCM clinics, where TCM students' clinical practices are strictly prohibited, and the compulsory clinical clerkship at the hospitals in Mainland China during the clinical years (Su et al., 2015).

Physician shadowing, though provides opportunities for observing the physician-patient interaction and getting involved in daily operations of the clinics, does not offer any hands-on experience for students to apply clinical treatments on patients. The compulsory clinical clerkship in Mainland China hospital that intends to boost students' practical skills is also not effective. This could be due to two major reasons: different professional standard and language barrier. TCM professionals in Mainland China are legally authorized to prescribe and utilize both Chinese and Western medicine, while this is highly prohibited in Hong Kong (Su et al., 2015). Also, only few Hong Kong TCM students are fluent in Putonghua and so may not always fully understand what they are learning. The lack of first-hand experience with real patients in a familiar medical system also leads to student anxiety about the clinical practicum because of the sense of uncertainty about the clinical situation (Moscaritolo, 2009; Sun et al., 2016).

Bringing Theory to Practice through Service-Learning

Service-learning

Service-learning seems to be able to bridge this gap. Also called reciprocal learning (Sigmon, 1979), service-learning is an effective pedagogy approach in which students work with the community to tackle real problems (or emerging issues) by applying what they learn in the classroom. It is distinguished from other experiential learning approaches by the aim of bringing equally positive impacts on both student participants and the community (Furco, 1996) – a win-win situation for all participants (Salam et al., 2019). In other words, service-learning only occurs when there is a balanced emphasis on both student learning goals and community service outcomes.

Stewart and Wubbena (2015) find service-learning effective in supporting students' hands-on experiences by improving student's performance in three aspects: 1) interpersonal skills; 2) academic and professional knowledge; 3) civic engagement and social responsibility. This constructs a mental schema for future learning in medical education. Research conducted by Lingnan University in Hong Kong also shows an upsurge in subject-related knowledge, communication skills, organization skills and

problem-solving skills after a university-wide service-learning program (Chan et al., 2006).

A meta-analysis of the studies on service-learning from 1970 to 2008 conducted by Celio, Durlak, and Dymnicki (2011) reveals that the integration of community service into curriculum enhance student learning outcomes significantly. They reveal that if adequately integrated in the curriculum, community service can positively enhance five areas of outcomes such as attitudes toward self, institution, civic engagement, social skills, and academic performance (Celio et al., 2011). Chan et al. (2006) also identify that service-learning raises HK students' global awareness and develops their intercultural effectiveness and global citizenship.

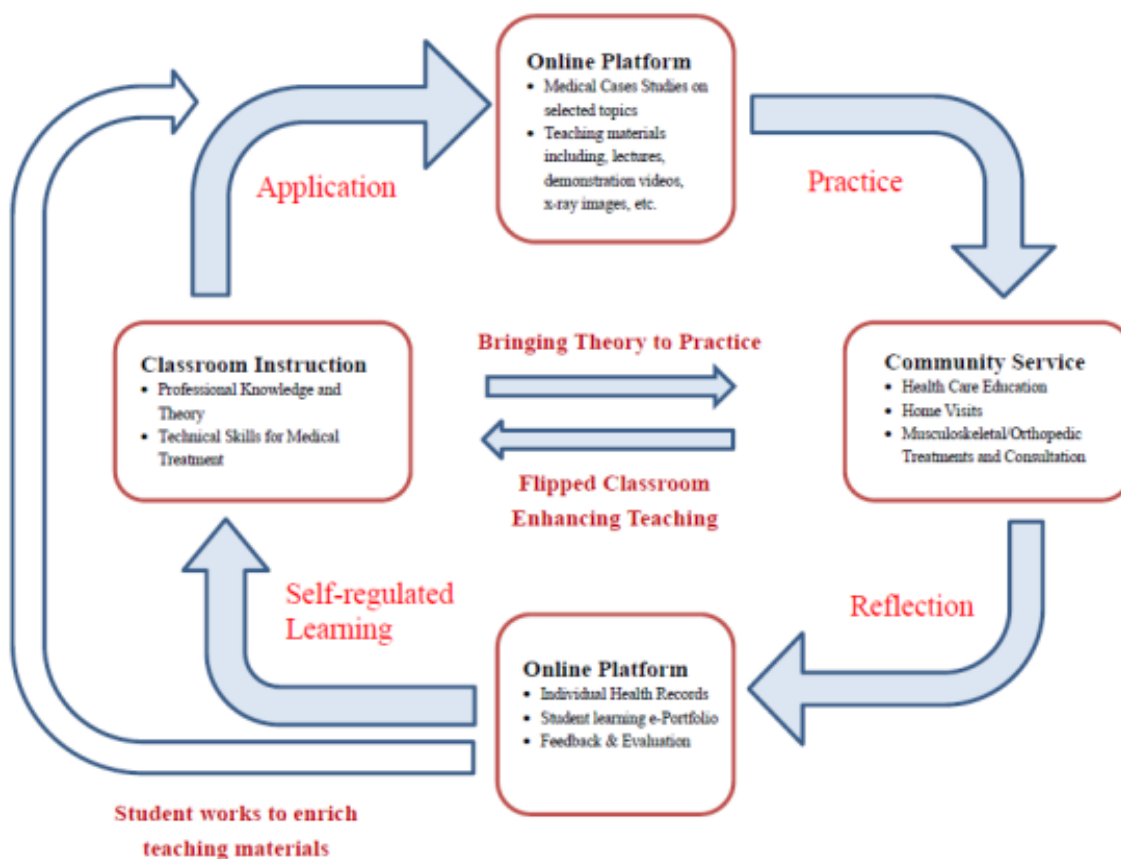*Service-learning Model: PARE Model*

The PARE (Preparation, Action, Reflection and Evaluation) Model, originated from the University of Maryland (Commuter Affairs and Community Service, University of Maryland, 1999) is a widely recognized operational tool for designing service-learning experience in various disciplines. To integrate disciplinary knowledge/skills with practices, the PARE Model embraces the reflective learning stages described by Kolb (1984): concrete experience (Action), reflective observation (Reflection), abstract conceptualization (Evaluation), and active experimentation (Preparation and Action).

A Modified Model for TCM Education: APRE Model

To overcome the constraints in offering first-hand experience opportunities for students in Hong Kong's TCM education, service-learning was trialed in the orthopedics curriculum using a modified service-learning model, APRS, which is developed based on the four-stage structure of the PARE Model and an inspiration from flipped learning.

The APRS is a cyclic model including four stages throughout the service-learning activities: *Application*, *Practice*, *Reflection* and *Self-regulated Learning* (or *Self-regulation*) (See Figure 1).

Figure 1. The APRS model

Online Platform
- Medical Cases Studies on selected topics
- Teaching materials including, lectures, demonstration videos, x-ray images, etc.

Application

Practice

Bringing Theory to Practice

Classroom Instruction
- Professional Knowledge and Theory
- Technical Skills for Medical Treatment

Community Service
- Health Care Education
- Home Visits
- Musculoskeletal/Orthopedic Treatments and Consultation

Flipped Classroom Enhancing Teaching

Self-regulated Learning

Reflection

Online Platform
- Individual Health Records
- Student learning e-Portfolio
- Feedback & Evaluation

Student works to enrich teaching materials

At the *Application* stage, after learning some basic knowledge and theory in class, student groups (4-5 students each) were tasked to relate their classroom learning to design community services. For example, they arranged health assessment and delivered general health care seminars as a start to understand the needs of the target groups. Based on the interactions with some individual patients in the seminars, students summarized the common issues or needs of the target groups (first-hand observation).

At the *Practice* stage, students were guided to relate their observation with the medical case studies in the online platform (a mobile app, *Orthopedics and Traumatology of Chinese Medicine*) to formulate services plans, including home visits, consultation, health care education. The student groups were paired up with 4 patients, each of whom were visited 3-4 times during the lesson time throughout the semester. With reference to the demonstration videos and medical cases in the mobile app,

students practiced their clinical skills during the service under the supervision of TCM professionals.

At the *Reflection* stage, the TCM professionals provided feedback to the student groups and facilitated reflection in an ePortfolio on Google Site. To reinforce their learning, students were also required to revisit the materials through the mobile app to identify any misconceptions or misunderstanding of the theories in the Practice stage. Two peer review sessions were also conducted to guide students to modify their ePortfolios based on peer feedback, before finalizing the ePortfolio for submission.

Students presented their ePortfolios in the class monthly at the *Self-regulated Learning* stage. They engaged in regular evaluations of their service quality and reviewed their professional knowledge/skills through the ePortfolio development. As student groups visited the patients and provided services 3-4 times, the APRS cycle was supposed to repeat a few times. Finally, upon the consent of students and patients, anonymous ePortfolios and patient cases were selected to enrich the teaching materials in the online platform to enhance student learning in the subsequent cohorts.

In this APRS model, the online platform plays a bridging role to connect traditional classroom learning (theory) with community service (practice). Rather than traditionally attending lectures (a group learning space) and doing projects or solving problems at home (an individual learning space), flipped learning inspires teachers to reconsider alternative arrangements for group and individual learning activities and spaces, resulting in active learning (FLN, 2014). In this model, teachers created opportunities for application (e.g., service/practice) in the classroom and moved out the information transfer (e.g., lecture) from the class routine as a result to encourage students to study the materials on their own before class. This arrangement freed part of the class time for social learning (Bandura, 1977) through the interactive activities and immediate peer feedback, which created a group learning space. To further promote active learning in the orthopedics courses, new online teaching materials (including clinical cases, demonstration videos, short lecture videos and short quizzes) were developed as supplementary resources to classroom instruction. These were integrated into a newly developed mobile app which provided students with an individual learning space to study and plan their service. The ePortfolios (on Google Site) also engaged students to consolidate knowledge in an individual learning space.

To conceptualize this APRS model based on the PARE model, there were three major considerations. The first is to minimize teacher's influence on the service activity design and maximize the application and practicing opportunities for students in the service-learning activities by introducing online materials and flipped learning. Thus, the *Application* and *Practice* stages were introduced. Secondly, the *Self-regulated Learning* stage was arranged as the last stage of the cycle to engage students in developing regular practice of evaluating the service outcomes and reviewing their professional knowledge/skills (through the development of ePortfolio). The students self-monitored their classroom learning with the help of the mobile app and then modified plan for the next services. Thirdly, the traditional Chinese philosophy, Confucian *xiushen* (self-cultivation or individual formation) (Yang, 2022), was integrated as a guiding principle for participants to continuously self-regulate throughout the community service (see Discussion).

Methodology and Data Analysis

This project adopts the mixed-method approach to analyze students' perception on their learning experience in service-learning in the orthopedics curriculum. For triangulation, the team produced standardized direct and indirect assessment methods to evaluate students' performance and improvement in different aspects of the service-learning (Wolcott, 1988).

Participants of the Study

A total of 87 pre-clinical Year 4 TCM students who were taking Orthopaedics classes from three local universities participated in the project. All of them were local students. Eighteen TCM teachers from the three local institutions and 40 registered professional TCM practitioners from four local TCM associations participated in the project to provide on-site guidance to the students. The teachers also assessed the students' analysis in students' ePortfolios. Social Workers from seven local non-government organisations (NGOs) and community centres helped with the logistics supports and patient recruitment. They were responsible for assessing students' social responsibility and attitude towards the patients in the service.

Assessment of Students' ePortfolios (direct assessment)

All the participating students submitted an ePortfolio which consists of the patients' health records, details of treatment, self-reflection upon the service and development of practitioner-and-patient relationship. A few rounds of individual presentations on the ePortfolio were held to facilitate peer evaluation. Students were required to raise challenging questions regarding the presentation and provide constructive criticisms to help one another to revise and update the ePortfolios.

TCM teachers and NGO partners assessed the ePortfolios by using two different sets of rubrics, one focusing on clinical knowledge, case analysis and professional skills, and another one focusing on generic skills development including multicultural awareness, citizenship and social justice. The standardized generic rubrics were developed based on HKBU's Graduate Attributes rubrics on Social Responsibility and Problem-solving Skills (https://chtl.hkbu.edu.hk/teachers/obtl/GA-Rubrics.html).

Thematic analysis was adopted to analyse the data collected in the e-Portfolios to identify patterns. The comments provided by the assessors (the social workers and TCM teachers) were also included in data analysis to help explain student learning experience in the project.

Pre- & Post-service Surveys (indirect assessment)

All students completed surveys on their learning experience before and after participating the service. Each survey consisted of 44 items. The first eight items related to the learning outcomes, requiring students to indicate their perception on the importance of and their confidence level in applying the professional knowledge/skills/attitude in orthopaedic diagnosis by giving a rate from 1 to 5 (with 1 being the least important or low confidence and 5 being the most important or high

confidence). These items include knowledge of orthopaedics symptoms and signs, medical skills of orthopaedics treatments, caring attitudes and communication skills. The other 36 items adopted the Common Outcome Measurement for Service-Learning (COM) framework which was developed by the Higher Education Service-Learning Network (HESLN) in 2012 and had been widely embraced in the Asian context (Ma, Chan & Tse, 2019). The measurement adopted the cognition-attitude-behaviour model to create nine domains for evaluating the impacts on their whole-person development attributes in general, including (1) self-confidence; (2) general communication; (3) problem-solving; (4) social responsibility or civic engagement; (5) collaboration, (6) self-reflection; (7) knowledge application; (8) empathy or caring attitude; and (9) cross-cultural competence. According to Ma et al. (2019), there are 4 questions in each domain and students were required to give rating on a scale from 1 to 10 (with 1 being strongly disagree and 10 being strongly agree).

Focus Groups (indirect assessment)

Two focus group interviews were arranged with a total of 16 voluntary students to collect more in-depth data to supplement the pre- and post-service questionnaires. The focus group interviews covered areas of (1) students' views of their experience and learning in service-learning; (2) how service-learning supports or impedes students' learning; (3) areas for enhancement of service-learning teaching and *arrangement.*

Findings

Direct assessment on student eportfolios – TCM teachers

TCM teachers in general were impressed by the student ePortfolios. The average score was 85.4 out of 100 (ranged from 68 to 95) which indicated that the majority achieved the learning outcomes of the orthopedics course well. Teacher A commented that "the patient case records and analyses were very detailed and organized. Photos and videos records in the ePortfolios also provided supplementary information about the patients' recovery progress". Through multi-media, the students visualized their thoughts to demonstrate their clinical skills and how they reached a diagnosis. "The reporting quality was even higher than the traditional oral presentations" Teacher B added. Findings from the teachers' comments also suggested that teachers were able to articulate how the students overcame the struggles when they tried to communicate the diagnosis or health care concepts to the elderly who were relatively less educated.

In response to the students' reflections, the TCM teachers gave many positive feedback to acknowledge the professional skills/values students demonstrated. For example, "Your indiscriminate love to patients will guide you to become a pain specialist in Chinese Medicine…", "The actions you took in this atypical case proved that you had learned well and integrated the skills to other TCM subjects…". Another comment "You raised so many questions at a time to challenge yourself after the first service. Take it easy, don't push too harsh…", also indicated that students were eager to improve their performance in the following service.

The teachers' comments also indicated that service-learning experience provided a lot of inspirations to the students. In the overall comments to student ePortfolios, Teacher C highlighted that when students drafted their personal statements in the ePortfolio, they referred to the service-learning experience and "re-considered their current roles as TCM students and then formulated goals for future professional development". Students not just demonstrated professional images as TCM students, but also conveyed their caring attitude toward the patients.

After reviewing the student ePortfolios, all the TCM teachers felt satisfied with the mentorship arrangement in the project. They all identified that students appreciated the mentor roles played by the TCM professionals and expressed their eagerness to work with them again because they realized the needs to follow role models for a long-term development (life-long learning).

Direct assessment on student eportfolios – NGO partners or social workers

NGO partners or social workers graded ePortfolios with the focuses on students' development in Social Responsibility (assessment criteria include multicultural awareness, citizenship, social justice) and Problem-solving Skills (assessment criteria include defining problem, analysing problem, research, applying knowledge, developing solution, implementing plan and evaluating outcomes). These criteria were standardized and adopted at HKBU.

As indicated in Table 1, students in general showed higher achievement in Problem-solving Skills (average score is 3.14 out of 4) while Social Responsibility was still good (3.01). As for Problem-solving Skills, the students did well in applying knowledge (3.32) and other six criteria (range from 3.07 to 3.14). The results suggested that students were able to apply knowledge they had learned previously from different sources (such as lectures, online materials/cases, peer discussion on ePortfolio, etc.)

In Social Responsibility, the average score of the multicultural awareness criteria was 2.96 (which was also the lowest score among the ten assessment criteria). It suggested that students generally needed more exposure to real patients with different cultural or educational background. The assessors observed that students tended to act based on their preconception about the elderly and hence took longer time to establish mutual trust. Although some students were very attentive to the patients' needs in health care, the accessors suggested that students should pay more attention to two-way communication; for example, they should spend time understanding the patients' daily routines or medical history and inviting them to share their views on the diagnosis and treatment.

Table 1: Student ePortfolio assessment graded by NGO partners or social workers

Assessment rubrics and criteria	Average score (rate from 1 to 4)
Social Responsibility	**3.01**
Multicultural Awareness	2.96
Citizenship & Civic Engagement	3.04
Social Justice	3.04
Problem-solving Skills	**3.14**
Defining Problem	3.11
Analysing Problem	3.11
Research	3.11
Applying Knowledge	3.32
Developing Plan/Solution	3.11
Implementing Plan/Solution	3.07
Evaluating Outcome	3.14

Overall, both TCM teachers and the assessors acknowledged students' achievement in service learning and appreciated their efforts to reflect deeply. A major finding here is that ePortfolios, as a direct assessment measure, did not just provide opportunities for students to showcase their learning achievement (including professional knowledge and skills), but was also an integrated platform to demonstrate how student personal values and thoughts developed and how their professional identities were established in the four stages: Application, Practice, Reflection and Self-regulated learning. The strategy of engaging TCM students in the regular reflective practice throughout the service-learning project also facilitated a cyclic learning pathway for students to get across the four-stage APRS model.

Indirect measurement: student surveys and focus groups

Table 2 summarizes the results of the pre-/post-service student surveys (indirect measurement). Positive differences were identified in students perceived confidence and competence (including communication, problem-solving, social responsibility, collaboration, reflection, knowledge application, empathy and cross-cultural competence) after participating in the service-learning project.

The original design of the research was to perform a paired t-test to examine any statistical significance. However, because some identifiers of individual participants were lost in the data collection, it was impossible to perform a paired-test. Though the survey findings below were limited to the discussion around positive or negative differences, these findings were consistent with the relevant quotes and findings in the focus groups and student ePortfolios.

Table 2: Results of the pre-/post-service student surveys

Item no.	Item descriptions	Pre	Post	Diff
1. Importance of discipline knowledge/skills/attitudes (1=least important to 5=most important)				
1.1	Knowledge of orthopedics symptoms and signs	4.6	4.6	0.0
1.2	Medical skills of orthopedics treatments	4.6	4.5	-0.1
1.3	Attitudes of caring patients	4.5	4.4	-0.1
1.4	Communication skills with patients	4.5	4.5	0.1
1.1 to 1.4	**Average of importance of discipline knowledge/skills/attitude**	**4.6**	**4.5**	**-0.1**
2. Confidence in using discipline knowledge/skills/attitudes (1=least confident to 5=highly confident)				
2.1	Knowledge of orthopedics symptoms and signs	2.9	3.5	0.6
2.2	Medical skills of orthopedics treatments	2.8	3.4	0.6
2.3	Attitudes of caring patients	3.7	4.2	0.5
2.4	Communication skills with patients	3.4	4.0	0.6
2.1 to 2.4	**Average of confidence in using discipline knowledge/skills/ attitude**	**3.2**	**3.8**	**0.6**
3. Agreement of the experience, action and opinion (1=strongly disagree to 10=strongly agree)				
3.1	I am aware of my personal strengths and weaknesses	7.1	7.6	0.5
3.2	I am open to new experiences and willing to take risks and accept challenges	7.7	7.7	0.0
3.3	I often seek out challenging opportunities that test my skills and abilities	6.8	7.5	0.7
3.4	I am confident in my abilities	6.0	6.7	0.8
3.1 to 3.4	**Average of self-confidence**	**6.9**	**7.4**	**0.5**
3.5	I feel comfortable to present my ideas in front of others	6.3	7.1	0.8
3.6	I know how to communicate my ideas in situation that is new to me	6.4	7.2	0.8
3.7	I understand the importance of participating in group discussion with others	7.5	7.7	0.2
3.8	I feel confident in communicating ideas precisely with people	6.4	7.3	0.8
3.5 to 3.8	**Average of general communication**	**6.7**	**7.3**	**0.7**
3.9	I feel confident in identifying a problem	6.6	7.1	0.5
3.10	I feel confident in tackling problem	6.5	7.0	0.4
3.11	Before I solve a problem, I gather as many facts about the problem as I can	6.8	7.5	0.7
3.12	I go through the problem-solving process again when my first option fails	7.0	7.6	0.7
3.9 to 3.12	**Average of problem-solving**	**6.9**	**7.2**	**0.3**
3.13	I am aware of the important needs in the community	6.7	7.5	0.8
3.14	I am or plan to become actively involved in issues that positively affect the community	6.6	7.3	0.7
3.15	I feel a personal obligation to contribute in some way to the community	6.8	7.5	0.6
3.16	It is my responsibility to help improve the community	7.3	7.4	0.1
3.13 to 3.16	**Average of social responsibility**	**6.9**	**7.4**	**0.6**
3.17	I am able to remain calm and reasonable even when conflict among group arises	7.2	7.5	0.2
3.18	I cooperate successfully with other students in a variety of situations	7.2	7.6	0.4
3.19	I notice and compliment accomplishments of others	7.2	7.6	0.4
3.20	I participate effectively in group discussions and activities	7.0	7.5	0.5
3.17 to 3.20	**Average of collaboration**	**7.2**	**7.6**	**0.4**
3.21	I am assertive and independent	7.0	7.4	0.4
3.22	I am motivated to learn, participate and achieve in school	7.1	7.7	0.6
3.23	I believe self reflection can improve myself	7.5	8.0	0.5
3.24	I will evaluate myself after completing a task	7.2	7.7	0.4
3.21 to 3.24	**Average of self-reflection**	**7.2**	**7.7**	**0.5**

3.25	I am aware of the importance of evaluation and outcome with knowledge learned in class	7.3	7.6	0.3
3.26	I feel confident in applying knowledge in my areas of study	6.8	7.2	0.4
3.27	I understand the needs to adapt my theoretical knowledge in various real-life situations	7.5	7.6	0.2
3.28	I learn course content better when connections to real-life situations are made	7.7	7.9	0.2
3.25 to 3.28	**Average of knowledge application**	**7.3**	**7.6**	**0.3**
3.29	I am aware of the thoughts and feelings of other people	7.7	7.9	0.2
3.30	I believe that the world would be a better place if prejudices no longer exist	7.5	8.1	0.6
3.31	I feel comfortable building relationship with people from different background	7.2	7.7	0.6
3.32	I believe that taking care of people who are in need is everyone's responsibility	7.3	7.8	0.5
3.29 to 3.32	**Average of empathy**	**7.4**	**7.9**	**0.5**
3.33	I am keen to learn more about people from other cultures	7.6	7.7	0.2
3.34	When I interact with people from other cultures, I try to understand their behaviours, perceptions or feelings in the context of their cultures	7.4	7.8	0.5
3.35	I believe that paying attention to the body language of those from other cultures would allow me to understand more about them	7.5	8.0	0.5
3.36	I am interested in making friends with people of different cultural background	6.6	6.9	0.3
3.33 to 3.36	**Average of cross-cultural competence**	**7.3**	**7.6**	**0.3**

Self-confidence and application of discipline knowledge, skills and attitude

Large positive differences in the items 2.1 to 2.4 seemed to suggest that students felt quite confident in using the discipline knowledge/skills/attitude in the service. Especially for the knowledge of orthopedical symptoms and signs (item 2.1), the average confidence level increased from 2.9 to 3.5 with 1 representing "least confident" and 5 representing "highly confident". Similar observations were also found in students' ePortfolios in which many students reported that they were able to identify relevant symptoms and signs for diagnosis based on the knowledge learned from class lectures and the mobile app. The results of other competence domains in the survey, including Self-confidence (items 3.1 to 3.4) and Knowledge application (items 3.25 to 3.28), were also consistent with this observation.

Student A reported a relevant experience in the focus group: "the year-long service learning has enhanced my diagnostic skills in orthopaedics…; for example, I examine patients' condition by different approaches, rather than only rely on the symptoms they reported. That helped me develop various practical skills to do diagnosis". He further elaborated that the service-learning provided a good opportunity for students to extend learning from the book knowledge to clinical practice and "more importantly it helps me transit from learning in discrete subjects to an integrated and authentic application".

Communication with peers and TCM professional

While students gave high scores to all the items in General communication skills (items 3.5 to 3.8), they perceived larger differences in the items regarding presentation, communicating ideas in new situation and conveying ideas with layman people (items 3.5, 3.6 and 3.8). Student B in focus group also explained that "while we were able to communicate with peers/mentors with the technical terms, we were also aware of the needs to translate these terms into the language that patients could understand… We made extra efforts (using different analogies) to ensure that the elderly understood our explanation and instruction."

Student C further related the communication skills with empathy. "We learned some communication strategies from the TCM professionals when they demonstrated how to talk with the patients… Good communication skill doesn't only help us collect extra information for diagnosis, but also shows our caring attitude [empathy] and build trust with them."

Social responsibility

Students had high ratings for the Social Responsibility items, especially items 3.13, 3.14 and 3.15. The analysis of the focus group transcript suggested that students also recognized the first-handed expectations on TCM students from the elderly and realized the responsibilities a TCM practitioner should bear.

There is an interesting view from Student C who mentioned that "As TCM students, I feel that there is very little we can do to improve the health care system now, because TCM is currently less popular compared with the western one… However, we need to work in the reality though it is not an ideal situation". In fact, increasing studies reveal that TCM provides effective recovery solutions for the COVID patients in the mainland China. In view of the limitations of the existing Hong Kong public health care systems (e.g., prolonged waiting time for non-emergency patients who need health care), students felt strongly that TCM could offer alternative choices to relief the overwhelming health care needs. "I believe that TCM has strengths in long-term health care service, which might be a solution to this challenge in the system" (Student C).

Problem-solving and collaboration skills, and self-reflection

Student reflected that the service-learning activities offered them the opportunities to develop their problem-solving and collaboration skills. Student D recalled the experience that "we took turns to take different roles: observer, recorder, doing diagnosis and giving peer feedback at various stages of the activities". This arrangement encouraged students to have meaningful conversations or discussions throughout the service. The presence of the TCM professionals, in addition, allows students to seek immediate support/enquiry in the service. Student E explained, "this arrangement created a faster pace of individual learning cycle (self-reflection). My struggle was directed to my peers or teachers immediately onsite and I could consolidate the learning in the later individual reflective exercise… I could remember the knowledge better".

Student E reflected that "I used to be a person who usually omitted the proper steps to analyse a situation and jumped to conclusion. In this service, I was frequently and nicely reminded of the proper procedure through different means, such as the surveys, peer feedback, assessment… That really helped me develop a more systematic thinking habit."

Empathy and cross-cultural competence

In the post survey, students generally gave higher average scores to the items regarding Empathy (7.9) and Cross-cultural Competence (7.6), compared to other items. Student F explained in the focus group that "I realized that in my first visit, I put too much emphasis on the chronic pain they were suffering… too much focus on producing recovery advice to the patients without considering the feasibility in their living environment… because I did not spend enough time to understand their feeling, interests or even emotional needs".

She continued, "in fact, reading their body language and even observing the setup in the living room give us a lot of clues to understand their perception and beliefs… In some cases (such as the elderly living alone), what they needed was simply fundamental: someone who are willing to listen to their stories and to recognize the achievement in their early life… Respect and acknowledgement are probably the very first medicine/treatment for them in this service."

Students developed empathy and cross-cultural competence throughout the reflection on the interaction with the patients. It suggested that this service-learning did not just enhance professional skills/knowledge, it also helped students to develop appropriate beliefs/values in the TCM profession.

Discussion

The above findings in the indirect measures (pre-/post-service student surveys and focus group) echoed those findings in the direct assessment on student ePortfolios by TCM teachers and NGO partners mentioned earlier. Students gained confidence in applying discipline knowledge/skills and improved in various areas, including cross-cultural competence, communication, problem-solving and collaboration. And through self-reflection, they also developed greater sense of social responsibility and empathy. These findings are consistent with the meta-analysis of service learning's effect on student learning (academic, personal, social and citizenship outcomes) by Conway et al. (2009) and Celio et al. (2011).

Based on this study, it is suggested that connectivity, motivation and organisation are the three key factors contributing to student success in the suggested APRS service-learning model.

Strong connectivity

Apart from the fundamental connection with the community, the service-learning activities in this study also connected with the students in four different dimensions: 1) *curriculum and programme*: integrating to academic curriculum structure and content (Furco, 1996), 2) *professional skills and values*: allowing students to practice and reflect

on the discipline skills and values (Bringle & Hatcher, 1999; Huda et al., 2018), 3) *institutional mission*: aligning with the university's commitment to the community (Bringle & Hatcher, 2000), and 4) the traditional Chinese philosophy, Confucian *xiushen*: expanding self-cultivation to the society (Yang, 2022).

In traditional China, *xiushen* represents "the way of being human" (Tu 1979, p. 238), striving to be a good person. This notion of individual formation is developed in terms of the Confucian anthropocosmic worldview (Lu & Jover, 2018; Tu 2013), representing the intention to expand cultivation from individual boundary to *family* (including teachers and peers), society, state and eventually to *tianxia* (the world below heaven) for a "Great Harmony" (Yang, 2022, p. 1165). It views the world as a harmonized whole while individuals and society are parts of the whole.

With a strong alignment with the *xiushen* philosophy, the APRS model offers students the opportunities, in the Reflection and Self-regulation stages, to internalize professional values (developing individual cultivation). As they share their portfolios for teacher/peer feedback in these stages, they are helped to formulate and cultivate professional identifies with their teachers/peers (expanding to *family*). After the first-cycle Reflection, the second learning cycle begins, and students further apply and practice professional knowledge/skills in the community in the Application and Practice stages (expanding to society).

Reinforced motivation

Students as Partners

In this study, the TCM students were considered as partners, rather than only learners. Student as Partners (SaP) in teaching in higher education, is a pedagogical approach that challenges the traditional power relationship between students and teachers, suggesting that students could work with teachers, to improve teaching and learning experiences because student voices are equally important (Felten et al., 2014; Mercer-Mapstone et al., 2017). In such a partnership, student partners were empowered to take control of their learning. They could make significant decisions like what specific activities (home visit, consultation, or health care education) to hold, how to carry them out and when to do them. This arrangement allows student participants to develop a greater sense of control of their learning process. This flexible arrangement created a positive learning environment that reinforced Autonomous Motivation (Hagger et al., 2014). The detailed arrangements of the service in this study were self-determined by the TCM students.

Student buy-in

The pre-survey results showed that TCM students generally experienced low confidence in using discipline knowledge/skills (mean score: 3.2 out of 5) because of the lack of practicum opportunities in the curriculum in the Hong Kong context. They need authentic experience of working with TCM professionals and communicating with the local social workers and patients. Thus, when the students were informed that they could have this additional exposure, they were excited in participating.

The project team gained student buy-in by emphasising the "serving to learn" and "learning to serve" attributes. It basically went through four stages: Exposure, Persuasion, Identification and Commitment (Cavanagh, et al., 2016). Students were encouraged to participate in small groups so that the new exposure and workload were considered manageable for them (initial exposure). TCM professionals and teachers debriefing sessions also helped students to relate the lived experience with the course materials and persuaded them by identifying the benefits to student learning (persuasion). Students reflected and identified the small changes they had brought to the patients or community in their ePortfolios (identification). Finally, students were given opportunities to tailor follow-up services and develop health records for the patients (commitment). This arrangement allows students to truly buy in the civic education (Battistoni, 2001; Westheimer & Kahne, 2003). In this case, students joined the Chinese Medicine Service-Learning Network and contributed to developing solutions to an emerging issue in Hong Kong, i.e., offering health care services to the non-emergency elderly patients who have been waiting for years in the public health care system.

Structured organisation

Chinese Medicine Service-Learning Network

In view of the challenges in organising inter-institutional service-learning activities for TCM curriculum, the project team first established the Chinese Medicine Service-Learning Network to operate and support the service-learning activities. The Network gained wide support and hence consisted of the Chairperson of Hong Kong Registered Chinese Medicine Practitioners Association, curriculum directors from the TCM schools at the three participating institutions, representatives from NGOs, and student representatives. The Network provided a discussion platform for the orthopedics course directors to re-align the curriculum assessment, course schedule and prerequisites among the institutions, with input from other stakeholders. Furthermore, the orthopedics course directors at HKBU and HKU considered this implementation an opportunity to review the assessment design. Official approvals of the service-learning implementation in the TCM curricula were obtained afterward. In addition, the Network provided an effective operation platform for the NGOs to facilitate the logistic arrangement to maximize the benefits to the communities. By the end of the project, over 1,300 sessions of services were provided to the elderly in five districts in Hong Kong.

Use of a centralised electronic platform to facilitate flipped learning

The development of a mobile app and the adoption of ePortfolios assisted teachers/students to transition from a traditional classroom learning to a flipped learning approach (service-learning APRS model) by sharing course materials, student reflection and peer/teacher feedback effectively. The mobile app also played a significant role in motivating students to learn new knowledge (video recordings), review medical cases (case studies) and self-evaluate learning progress (formative tests). The ePortfolio, instead, provides a one-stop platform for students to nurture their professional identity via reflection and develop anonymous health care records to create additional course

materials. Feedback from peers and teachers were also easily captured and utilized. It is believed that the establishment of a centralized operation Network and the use of an electronic platform were crucial to the success of this project study.

Conclusion

The findings in this study reveals that TCM students gained confidence in applying discipline knowledge/skills and improved in various aspects, including cross-cultural competence, communication, problem-solving and collaboration. Through self-reflection, they also developed a greater sense of social responsibility and empathy which are essential for TCM students to develop their professional identities. The suggested APRS model, adopting a flipped learning approach, could be effective for Chinese Medicine education in the Hong Kong higher education context. Evidences from this study show that possible factors contributing to both student success and positive impacts on student learning in the APRS model include the *strong connectivity* (including clear alignment with programme, profession, institutional missions and traditional Chines e philosophy *xiushen*), *reinforced motivation* (student autonomy and buy in) and *structured organisation* (strong network among parties and use of etools).

The concept of Confucian *xiushen* had been included in Hong Kong secondary school Chinese Culture curriculum for decades. However, it was only addressed in a theorical way and eventually disconnected from the modern society. This study suggests that service-learning through the APRS model is a reasonable way to help students reconnect the Confucian concept *xiushen* to the discipline knowledge and real-life application in Hong Kong context. This model may also be applicable in other Asian contexts where the Confucian tradition plays a role in education. Further study on its implementation in other disciplines could be a way forward.

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ABSTRACT

Community outreach and service-learning are common components of medical and health profession programs. Outreach programs can provide diverse service-learning opportunities for students to work collaboratively with their communities. Many educational accrediting bodies require service-learning activities for students. The discipline of anatomy is uniquely suited for outreach as it engages students with the community and provides relevant, health-related educational materials and information. Anatomy is often a general interest to many and can aid in the promotion of students pursuing health professions careers. The objective of this work is to describe three unique anatomical outreach programs that integrate components of community service, service-learning, and/or pathway program initiatives in innovative ways. These programs are presented to inspire and/or be adapted in other medical or health professions programs. Variety in these programs range from duration, target audience age, resource and financial requirements, and necessary collaborations. The authors provide tips for success and potential pitfalls to consider. These three examples serve as successful, contemporary, and diverse approaches to anatomical outreach that can be implemented into medical or health professions education programs.

Anatomical Outreach is Within Reach: Contemporary and Diverse Approaches

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INTRODUCTION

The accrediting body for medical education programs across the United States and Canada, Liaison Committee on Medical Education (LCME), stipulates in Standard 6.6 "*Service-Learning/Community Service: The faculty of a medical school ensure that the medical education program provides sufficient opportunities for, encourages, and supports medical student participation in service-learning and/or community service activities.*" Outreach is often used as an umbrella term to broadly encompass closely related educational service opportunities such as service-learning, community service, and pathway programs. However, there are nuanced differences between these important opportunities. The LCME further defines service-learning as educational opportunities that allow students to address concerns identified by their communities, require student preparation, and provide reflection regarding relationships among their participation in the activity, their medical school curriculum, and their roles as citizens and medical professionals. A pathway program, which is also sometimes referred to as a "pipeline" program, has an objective endpoint to help underserved and underrepresented minority students reach matriculation in a health sciences career. An outreach program can therefore be defined as any program that accomplishes the requirements of service-learning but is missing one or two of the other components [Figure 1].
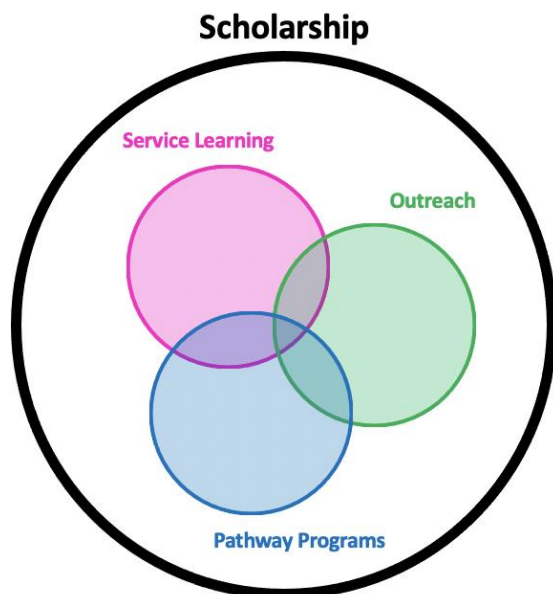

Figure 1. The intersection of service learning, outreach, and pathway programs.

Outreach programs can provide abundant and diverse opportunities for medical education institutions to collaborate with their communities. The discipline of gross anatomy is ideally suited to be utilized as a medical education outreach topic to help

students engage with the community and provide relevant and health-related educational materials and topics. Many educational outreach programs that target younger learners can provide unique educational experiences that encourage the pursuit of careers in healthcare (Cregler, 1993; Zhang et al, 2016), promote professionalism and scholarship at a young age, or minimize harmful or unhealthy behaviors (Block & Block, 1980; Burns, 2002). Programs that also involve teachers in learning experiences alongside or concurrently with their students allow new resources and lasting skill sets to be brought into classrooms and learning environments across the community (Burns, 2012). Medical students who participate as educators in these service-learning opportunities gain valuable experience working with diverse and medically underserved populations (Bennard et al, 2004, Meah, et al, 2009; Theoret et al, 2021).

These types of important learning opportunities can also provide unique ways to promote diversity, equity, and inclusion (DEI) initiatives both within the medical education institution and across the broader communities in which they reside. Outreach programs that focus on creating service-learning opportunities with demographics that pre-professional and professional students may be less routinely exposed to can promote professional, and even personal, identify formation crucial to serving diverse patient populations; indeed, developing empathy with more inclusive and culturally sensitive ethical standards, can prepare students to practice medicine in various communities. Outreach or clinical rotations programs aimed to create service-interactions between medical students and protected or underserved groups such as those experiencing homelessness (Batra et al, 2009), persons with disabilities (Theoret, 2021), the incarcerated (Alemagno et al, 2004), or those in rural communities (Bennard et al, 2004; Stuhlmiller & Tolchard, 2015) enrich both the community and the medical student's ability to competently practice medicine.

The objective of this work is to describe three unique anatomical outreach programs that integrate components of service-learning, pathway programs, and community service initiatives in innovative ways. These programs are currently used in accredited medical or Doctor of Physical Therapy programs in the United States. For each outreach program example, the basic structure, pearls, pitfalls, and strategies for successfully navigating common hurdles associated with running these programs will be discussed. These programs were described and reported as a panel discussion to the American Association of Clinical Anatomists at their annual meeting in 2022.

OUTREACH PROGRAM EXAMPLES

The following section provides an overview of three anatomy outreach programs. Each program brings a unique perspective on implementation of community outreach. Summary Table 1 provides a snapshot of each program's variety in target audience age, duration, resource and financial requirements, and necessary collaborations.

Program	Duration of program	Target Audience	Resources Needed	Cost (total or per participant)	Collaborations required
Anatomy Academy	7 weeks, 1 hour/week	-Elementary school-aged children (5th or 6th grade)	-Models -Visual aids -Videos -Handouts -Games	Free for participants. Varies for supplies, dependent upon if you use mostly digital resources, or if using models or visual aids.	- Principals & administrators of schools -Teachers, parents, students.
(WVSOM) Anatomy Lab Educational Program	2-hour program divided between classroom and anatomy lab	-High School Students in advanced sciences, health sciences -Adult Students in allied health programs -High School Science Teachers	-Gross anatomy lab -Classroom -Plastination specimens -Models -Cadavers -Embalmed specimens -Microscopes -Creativity	Free for participants. Must provide own transportation to and from West Virginia School of Medicine.	- Teachers/Instructors from regional schools - West Virginia School of Medicine
(UNMC) High School Alliance	1 academic year for all students. Students may apply for a second year which is focused on research experience. The anatomy course is typically taught only in the spring semester.	-Junior and Senior level High School students interested in healthcare related careers	-Gross anatomy lab and cadavers -Lecture classroom -Certified High School teachers -University faculty -Lab assistants (e.g., graduate students)	Free to participants. Program costs are mostly funded by The Sherwood Foundation, although the associated school districts and University of Nebraska Medical College add significant contributions as well.	- Program and funding sources - Students, parents, and educators - School districts and administrators - Local/community stakeholders - University and program - Faculty and their department Chair - High School Teacher and faculty

TABLE 1. Summary of Outreach Programs

Anatomy Academy

Anatomy Academy is an outreach program designed to combat childhood obesity through educational intervention. Established in 2012 at University of California Los Angeles (UCLA), the program aims to teach anatomy, physiology, and nutrition to elementary school students to promote healthy lifestyles and inspire children to pursue higher education, especially in the sciences (Diaz et al, 2019).

The program consists of seven lessons lasting between 40-60 minutes based on the needs and availability of the school, preferably given once per week over seven consecutive weeks to older elementary-aged students, usually fifth or sixth grade. Programming could be given during a class such as a health or physical education class, or as an after-school program. The program allows for freedom to choose from a variety of resources, such as anatomical models, video games and guided hands-on activities in the classroom or outside. The extent to which these resources are used may depend on individual group needs or funding. The program is free for participants, so the only cost would be to purchase models or other resources needed to run the program.

This program provides opportunities beyond outreach. The mentors involved in Anatomy Academy, who are preclinical undergraduate and professional school undergraduate students and preclinical professional students, also value the service-learning aspect of this program as they self-reflect on challenges and successes to evaluate themselves and see how they can improve the program for future sessions. Receiving formal and informal feedback from stakeholders is an important feature of Anatomy Academy that helps ensure the program is not solely self-serving, but in fact is accomplishing program goals for those it serves.

Some of the possible barriers include finding supportive school partners, having the resources needed to implement the program, and having to compete with school schedules, for both participants and mentors. The successes observed to date include students reporting that they have asked parents to implement some of the healthy changes introduced through the program. Also, repeated invitations from elementary school administrators to return for future sessions indicate success because they feel that Anatomy Academy helps to make positive changes for their students.

One of the keys to the program is establishing sustainability. The resources necessary (such as a supply list and lesson outlines) to begin implementing the program are publicly available ([Anatomy Academy](#)). It is suggested to implement the program across classes of students, so that a group of second year students can mentor the first year students for the following year. Then as classes "move on" and are no longer able to participate, other students are trained to take their place, requiring very little administration to continue the program.

(WVSUM) Anatomy Lab Educational Program:

The focus of the West Virginia School of Medicine Anatomy Lab Educational Program is to bring participants into the anatomy lab to challenge their knowledge and engage in human anatomy at a deeper level through self-directed experience. The

program began in the mid 1980's with a significant redesign in 2013 allowing for the current hands-on station-base experience.

This program was designed to expose visiting students to anatomy, healthcare occupations, osteopathic philosophy, and the medical school experience. Participants begin with didactics in the classroom to determine their depth of knowledge, then are divided into small groups for activities in the lab. Upon completion of the stations, they return to the classroom to debrief the experience. The two-hour sessions are led by faculty and osteopathic medical students who help engage the participants in the stations.

The program benefits the participants (high school and undergraduate allied health students) and medical students through one-on-one learning and peer teaching. Originally developed as outreach, this program has since developed both pathway and service-learning attributes. Participants have gone on to attend and complete healthcare training, fulfilling the pathway objective of the program. After a session, the faculty member meets with the medical students to debrief and reflect on the experience. This time allows the medical students to reflect on their confidence with knowledge, adapting communication level to the learner, and their own journey. While this is not part of their curriculum currently, it could be easily adapted for this purpose.

Resources for the program include items typically present in most gross anatomy labs along with faculty and student time allocated for teaching. The largest barrier to the program is travel cost for the participants. To solve this, the necessary materials were brought to the schools to replicate the original experience as much as possible. The program's success is driven by collaboration with teachers. In 2017, this initiated the creation of a three-day workshop for secondary school teachers to experience cadaver dissection and develop a learning module for their classroom. The sustainability of the program depends on building relationships with science teachers across the region, as well as recruiting and mentoring medical school students as educators. With dedicated time and facility availability, the program will continue for many more years.

(UNMC) High School Alliance:

The University of Nebraska Medical Center (UNMC) hosts a High School Alliance (HSA) for Junior and Senior high school students from varying educational and socioeconomic backgrounds who are interested in pursuing healthcare-related careers. The mission of the program is to generate a more diverse Nebraska workforce by immersing these students in professional-level health sciences educational experiences and setting them on a trajectory to achieve their healthcare-related interests. The HSA began in 2010 and currently enrolls about 85 students per year from 14 surrounding Nebraska and Iowa school districts. The program spans the entire academic year and provides learning experiences students would not typically get in their local high school curricula. Junior students who successfully complete one year of the program may apply to return a second year for a focus on a yearlong research project.

While cadaver-based anatomy courses are well-represented amid professional-level health science programs, they are rare in undergraduate programs and almost non-existent among high school curricula. Of the many science-based courses offered by UNMC HSA, the cadaver-based Human Gross Anatomy course is the most sought after by the students and represents many of the program's outreach values. The

course is taught by faculty of UNMC's College of Medicine from the Department of Genetics, Cell Biology, and Anatomy who teach the HSA students a systems-based approach to learning human anatomy via lectures, prosected cadaver laboratories, and other interactive learning methods (*e.g.*, augmented reality). Faculty involvement is incentivized primarily by the opportunity to participate in service and outreach, and they also earn a modest stiped for their professional development accounts.

The successes of UNMC HSA leans on many key resources and financial contributions. The program receives significant financial support from The Sherwood Foundation, the program's benefactor, which allows students to participate in the program at no cost to them – an especially critical factor for the 35-40% of HSA students that self-identify as being from low socioeconomic status. This financial support in conjunction with UNMC resources (*e.g.*, classroom space, cadavers, faculty expertise, campus resources) sustain the HSA. Another key factor for the HSA's success is the many effective collaborations it demonstrates. A certified public-school teacher works with the UNMC faculty to support class instruction, maintain student organization, and ensure state standards are met; professional-level UMNC students help teach the HSA students in the anatomy labs; and partnerships with local and regional stakeholders and the community help the program achieve its goals, overcome challenges, and grow.

DISCUSSION

Anatomy is an Ideal Place for Outreach

Anatomy education serves as an ideal platform for service-learning as everyone from grade school children to college-level students have some conceptualization, and often interest, in the structure and function of the body. Beyond this, anatomy education utilizes teaching and learning techniques and materials that engage all types of learners, especially through producing hands-on experiences that promote knowledge retention (Keim Janssen, 2013). The programs discussed in this work illustrate prime examples of anatomy outreach programs that engage and interest learners from elementary school children to college students.

Promoting DEI & Health-Related Careers in the Community

A major goal of anatomical outreach is to promote careers in the health professions to young people in the community by providing unique and engaging educational experiences that get them excited about their futures, potentially in the healthcare fields. Many of these types of programs also strive to support diversity, equity, and inclusion initiatives by breaking down barriers of participants of low-socioeconomic status within their communities. One of the programs highlighted in this work identified local elementary schools with a high percentage of children on free-lunch programs to invite those schools to travel to the medical school and participate in their program. The Anatomy Academy described in this work offers a good example of outreach that extends to underserved school-aged children and works to cultivate

healthy lifestyle choices and prevent harmful ones all while teaching them about health and human anatomy. There have been many other previously published examples of programs that have been successful with these same goals (Meyer et al., 2018; Ortug et al., 2021).

Synthesis and Summary of the Programs

Anatomical outreach was offered to elementary students, high school students, high school science teachers and adult students in allied health programs. The educational purposes were quite different between elementary school-aged children compared to others; models, games and videos were typical learning aids. High school students were juniors and seniors or were in advanced placement courses, therefore their experiences often looked similar to college-level opportunities that used organs or full-body cadaveric donors. Youth programs such as Anatomy Academy were low-stakes and lasted for seven weeks with a single hour session per week. Programs targeted for high school students ranged from one-day offerings up to an entire year with regular meetings and potential research opportunities provided after completion. All programs were free to participants; the greater the utilization of human tissue or full-body dissection the greater the operating costs were provided from a charity foundation or provider institution. All programs required collaboration between students, educators, administrators and other community entities.

Challenges in Designing Outreach

The need to carefully consider the curriculum of the outreach program was a challenge that existed with each offering. In some cases, cost and location spurred ample discussion related to designing the curriculum. If transportation for participants to an off-site laboratory can not be provided, abbreviated, transportable, or virtual programs may be offered. In high school-aged programs there were challenges discussed based on selected content to be presented. Determining what regional anatomy is necessary or appropriate in a high school program is a consideration given the participants are minors and are still under the close care of parents. A disclosure and/or parent acknowledgement statement ("permission slip") should be required for programs utilizing human tissues or full-body dissection to respect the personal parental positions. One high school program included reproductive anatomy in the curriculum. Proper visualization and dissection of regions such as the external genitalia was received by students and parents with varying reactions. While the vast majority supported the importance of learning reproductive anatomy at high school age, some found it uncomfortable or against parental approval. In this regard, sensitive content should only be made available to those interested in holistic healthcare and attaining a comprehensive understanding of human function.

Program Sustainability

An important consideration in implementing an outreach program is creating a design that is sustainable and reproducible year-to-year and at different schools, labs, or campuses. Programs should consider financial, resource and effort sustainability. Financial sustainability was maintained by several programs with funding from the participating school, such as funding provided to high school teachers for their participation in the programs. Charitable foundations and community organizations also contributed financially to anatomical outreach programs. Resource sustainability is critical to allowing a program to progress long term. Hosting institutions often must be willing to provide classroom or laboratory spaces. Developing a digital bank of resources, material lists and activity explanations was deemed helpful in programs that have run for multiple years. Effort sustainability is crucial because without the faculty and staff to run a program, months or years of inactivity may be experienced such as when faculty change institutions. One outreach program encouraged participation by providing modest stipends to faculty's development funds. Advocating for student involvement was also shown to be beneficial. Student-instructors that participated in the elementary school program the prior year served as mentors to the new student cohort and aided in the organization of the deliverables. Professional-level students filled the role of teaching assistants in the anatomy labs for the high school program.

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ABSTRACT

Interdisciplinary service-learning (IDSL) has become a staple of healthcare education over the last two decades as a mechanism of training students to provide cohesive, team-based health care in a complicated and sometimes fragmented health care system. This case study describes the perceived learning of Doctor of Physical Therapy (DPT) students from [Blinded] University who attended a week-long interdisciplinary, interuniversity service-learning trip in rural [Blinded]. Qualitative data from two consecutive year teams (n = 26) were collected via surveys and focus groups and thematically analyzed for motivation to attend the trip and perceived learning. Intrinsic motivation to "give back" and desire to hone professional skills were the primary drivers for desiring to attend the trip. Three themes of perceived learning that emerged were 1) impact on core values, 2) perceived improvement in para-clinical (soft) skills including interdisciplinary fluency and cultural competence, and 3) improvement of clinical (hard) skills. The dominant theme was the impact the trip had on students' core values. The learning occurred predominantly in Bloom's affective domain and aligned with the physical therapy profession's Core Values and Code of Ethics

Physical Therapy Student Learning Perspectives in a Volunteer Interprofessional Interuniversity Service-Learning Opportunity: A Case Study Report

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The concept of interdisciplinary healthcare had its roots during the post-WWII third party insurance expansion and further expanded with the advent of Medicare during Lyndon Johnson's presidency (Baldwin, 1996; Hammick et al., 2009). It further emerged as a healthcare educational model at the turn of the 21st century when the Institute of Medicine advocated for the inclusion of interdisciplinary healthcare training in health care education curricula (Committee on Quality of Health Care in America, 2001). Since that time,

interdisciplinary service-learning (IDSL) has emerged as a vehicle to aid in the training of healthcare practitioners in the interdisciplinary practice model, and most institutions training healthcare providers now include IDSL opportunities for their students (Sabo et al., 2015; Stewart & Wubbena, 2014).

The rationale for interdisciplinary care, particularly in medically complex cases, and/or medically diverse institutions operating in a fragmented medical system is that no one can deliver quality healthcare in a vacuum, and that healthcare delivered in an interdisciplinary fashion can lead to improvements in patient care and lowered healthcare costs (Mitchell et al., 2010; Zwarenstein et al., 2009). Therefore, it is incumbent among healthcare educators to develop interdisciplinary learning opportunities for their students.

In the IDSL model, students participate in real world clinical interactions with patients and other healthcare practitioners under faculty supervision. Healthcare students in medicine, physician assisting, pharmacy, dental hygiene, dentistry, physical therapy, occupational therapy, social work, and nutrition science may benefit from these experiences by increasing their knowledge of and comfort levels with other healthcare disciplines (Bouzaher et al., 2020; Fries et al., 2013; Infante et al., 2015; Johnson & Howell, 2017; Neill et al., 2007). Students also seem to benefit by better understanding and improving comfort levels with the cultures they serve (Cerny et al., 2018; Chen et al., 2012; De Leon, 2014; Long, 2016; Martinez-Mier et al., 2011).

Learning appears to take place primarily in Bloom's affective domain, particularly in the area of professional development. This includes acquisition and/or development of attributes and values such as compassion/caring, team building, communication, empathy, professional autonomy, and altruism/integrity (Cerny et al., 2018; Crandell et al., 2013; Flinn et al., 2009; Neill et al., 2007; Wise & Yuen, 2013). Debate still exists, however, in what if any learning takes place in IDSL experiences. Yorio & Yee (2012) conducted a meta-analysis and found support for service-learning in the areas of understanding social issues, increased personal insight, and cognitive development. Celio et al. (2011) reported students demonstrated improvement in personal attitudes toward self and social skills, attitudes toward their education and academic performance, and increased motivation for civic engagement. Conversely, a recent systematic review by Stetten et al. (2019) suggested that there is not sufficient evidence to reach any global conclusions regarding the efficacy of interprofessional service-learning.

Program Description, Implementation, and University Support:

The Farmworker Family Health Program (FWFHP) is an interuniversity, interdisciplinary program that provides medical care for migrant farmworkers and their children at a location 4 hours from the authors' university during the last two weeks of June of each year (Connor et al., 2010; Emory University, 2021; Nichols et al., 2014). Faculty and students from four public and two private universities comprise the team and attend the program. Disciplines include nurse practitioner, nursing, pharmacy, physical therapy, psychology, and dental hygiene. Students perform the services under faculty guidance and typically see 200 school children from migrant farmworker families and 600+ migrant farmworkers. The children are seen in the school setting in the

mornings, and the farmworkers are seen on location in the evenings. Physical therapy services are split between this program and another local DPT program, with each program staying for 1 week.

The successful implementation and delivery of interdisciplinary service-learning experiences in any institution is greatly facilitated in part by 1) a university culture of service, 2) support at all levels of the organization from departmental to university executive leadership, 3) optimism of faculty, 4) time and financial provision for faculty and students, and 5) cooperative and willing partner communities. Conversely, barriers can include fragmented views of service-learning, restricted engagement of faculty and students due to time constraints, limited recognition, or financial constraints (Stetten et al., 2019; Uy, 2019).

This university has provided strong support for this initiative at all institutional levels. The program chair, dean, provost, and university president all offered full support of the initiative from its inception, and they all continue to provide support each year. The university as a whole maintains a strong culture of service driven by the university ideal which reads in part: "to find joy in doing rather than dreaming; to be prepared for service; to be…confident of the limitless reaches of human endeavor" ([Blinded] University, 2021). To this end, the university administration makes provision in the way of time and administrative support for service endeavors. The DPT professors create flexibility in assignments for team members who attend the service-learning trip. By design, students lead fundraising projects to meet the financial obligation of the trip and do not receive institutional financing. This serves the purpose of learning and exercising soft skills such as fundraising, entrepreneurship, community engagement, and marketing/publicity. A substantial portion of the funding each year comes from the local community and donors who appreciate the university's commitment to community service.

The FWFHP is a high priority for the [Blinded] DPT program, not only because of the university and department's commitment to service, but also because of the program's curricular alignment with the experiential model of education. The experiential model of education is defined by Kolb as "the process whereby knowledge is created through the *transformation of experience* [and] results from the *combination of grasping and transforming experience*" (italics added for emphasis) (Kolb, 1984). This is manifested in the curriculum as a form of practice-based education that provides early opportunities for students to reciprocally apply their classroom learning in the clinical setting and intentionally bring back clinical experiences to propel learning.(Hakim et al., 2014) Students begin a year-long structured interdisciplinary clinical experience called the Early Mobility Program (EMP) at a local hospital in their second semester of training, while they are transitioning from foundational science courses into clinical science courses (Thigpen et al., 2016). Students attend the EMP four hours a week for three semesters. Students progress into their first full time clinical experience in the subsequent semester of their training. As a result, students attending this IDSL trip have completed 180 hours in the hospital EMP and 240 hours of clinical education experience in traditional PT clinical settings prior to the trip. The FWFHP offers students an interdisciplinary educational experience in the gap between early clinical training and long-term clinical rotations.

This descriptive case study sought to gain insight into what motivated students to attend a voluntary IDSL experience and also what they perceived they learned after attending the trip. Research questions included:

1. Why are DPT students motivated to attend an intensive, short-term, interuniversity, interdisciplinary service-learning trip?

2. What do DPT students perceive they learned by attending such a trip? Specifically:
   a. What do they feel they learned cognitively?
   b. What do they feel they learned from a psychomotor standpoint?
   c. What do they feel they learned affectively?

Methods

Data Collection:

The project was approved by the Institutional Review Board of [Blinded] University. This is a descriptive case study of two separate DPT service teams experiencing the same bounded phenomenon (the FWFHP) in consecutive years (Butina et al., 2015; Cresswell, 2008; Ebneyamini & Sadeghi Moghadam, 2018). A theoretical thematic analysis was the primary method of data analysis (Braun & Clarke, 2006, 2012). In the first phase of data collection, a purposive sample of the 13 students who attended the program in the first year of data collection were interviewed in focus group format. The semi-structured interview was administered by one of the investigators with open-ended questions that led to follow-up questions. Guiding questions consisted of two primary topics: initial motivation for attending the trip and the benefits of attending the trip. The recording of the interview was transcribed and initially coded by the principal investigator and two other investigators. Once the initial coding was completed, the data were analyzed for patterns and potential gaps in the data set that would merit further investigation. This included inquiring more deeply about students' initial motivation for attending, as well as what they would tell other potential students about the trip.

In the second phase of data collection, purposive sampling included students attending the program in the subsequent year. These 13 students were first given a short questionnaire with open-ended questions that the investigators used to guide the second focus group interview. The second-year focus group interview was conducted 4 weeks after survey administration by the same investigator as the first year focus group, and the data was transcribed and initially coded by the principal investigator and two investigators different from the first year.

Data Analysis

Data from the group 1 focus group and the group 2 survey and focus group were compiled into a first cycle master coding document by the primary investigator. The first cycle compilation of in-vivo codes were divided into two sections: students' initial motivation for attending the trip and their perceived benefits after attending the

experience. Three categories of codes emerged from the first section and 10 categories emerged from the second section (Table 1).

Table 1. Categories of Students' Initial Motivation for and Perceived Benefits from Attending Service Trip

Category	# of responses
Motivation for Attending	
• Desire to give back	23
• Intrinsic motivation (calling)	17
• Improve knowledge and skills competence	14
Perceived benefits	
• Changed life view	31
• Increased desire to give back	21
• Increased awareness of the struggles of others	20
• Increased empathy	10
• Increased attitude of thankfulness	7
• Increased professional behaviors	21
• Increased skills in working in interdisciplinary setting	19
• Increased cultural competence/humility	18
• Increased communication skills with patients	13
• Improved clinical knowledge and skills competence	42

Second cycle coding (Saldaña, 2013) was performed to identify emerging themes and how the various categories and themes might be related to Bloom's domains. From the 13 original categories, three themes emerged. Additionally, each code in each category of codes was assigned a dominant Bloom domain. Some codes were assigned a dominant and a secondary Bloom domain as they had elements of both. As shown in Table 2, Bloom's affective domain was the dominant domain.

A final analysis of the data looked beyond how the emergent themes related to Bloom's domains and explored how, in the context of this case study, the Bloom's domains of learning were related to the American Physical Therapy Association's (APTA) Core Values and Code of Ethics documents (American Physical Therapy Association, 2010, 2019). These are documents that define and guide professional and ethical behaviors in the clinical practice of physical therapy.

Table 2. Number of Codes Assigned to Each of Bloom's Domains

Bloom's Domain	# of responses
Affective	179
Cognitive	84
Psychomotor	28
Codes above with 2 assigned domains*	34

*Some categorized codes had elements of 2 domains

Results

Student Motivation for Attending:

Intrinsic Motivation and "Giving Back." Intrinsic motivation forged from life experience and a desire to "give back" emerged as dominant categories. Some students on the teams grew up in farming families. "[My] family gets to know the migrant workers and appreciates them. [This] population helps the family, so I wanted to return the favor— [there is] a personal connection" said one student. Another student with a family farming background stated that "farmers would be lost without them (migrant workers) and depend on them. They deserve healthcare." In contrast, other students grew up in or had close connections with migrant farmworker families. One student stated that the experience allowed the opportunity to give back "to people that are in a situation similar to what I have been in." Another stated that the motivation came from "my family working in the farms when they first came to this country." Another, drawing from a related personal experience stated "growing up I was undocumented with no health insurance. My dad is still undocumented and does not have health insurance, so this is a population I am really passionate about." Finally a few students who did not have any previous context remarked that they have simply been "called to a life of service," and "getting involved in the community with patients was a no-brainer" for them.

Opportunity to hone clinical skills: Students also perceived the opportunity as a way to increase their clinical knowledge and skills at an opportune time in their training. The service trip occurs in the summer prior to full time clinical experiences in their final year of education. Since the patient/client bases are migrant farm workers and their children, students have the opportunity to work in both pediatric and adult populations. One student thought it would be a "good opportunity to take part in the world of PT and get an early taste of what life would be like as a clinician." Another stated that the "initial instinct was to get the hands-on experience for my clinical professional skills." Another student mentioned the interdisciplinary opportunity by stating "it would be interesting to work with other disciplines…."

The motivations and expectations of these students prior to attending the trip touch on all three of Bloom's domains, with affective motivation being the most dominant. As a group, students desired to participate in a complete, multi-dimensional educational experience (Figure 1).

Figure 1. Students' Initial Motivation for Attending Service-Learning Trip
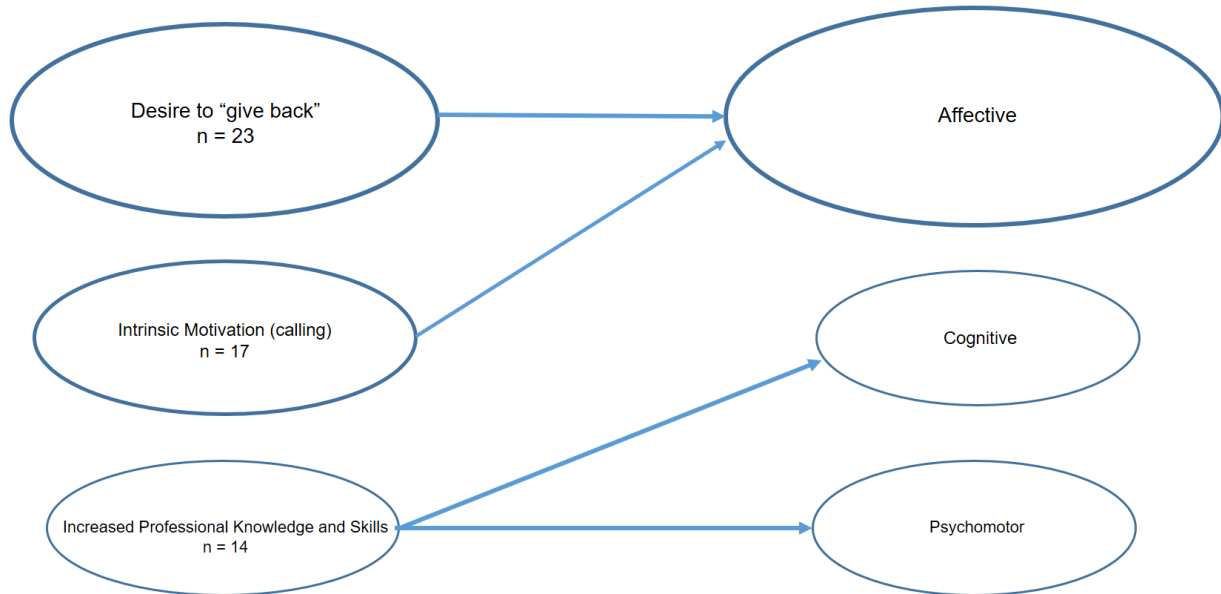

Perceived Benefits:

Three themes emerged during second cycle coding on the benefits of the service-learning trip: 1) impact on core values, 2) improvement in para-clinical (soft) skills, and 3) improvement in clinical (hard) skills (Figure 2).

Theme 1: Impact on core values

Changed life views: When asked what they may tell upcoming students about the trip, many of the students commented on how profoundly the experience changed them. "This trip will change you as a person and a professional on an indescribable level. [It] will impact the lives of others, while also challenging and enhancing your own clinical skills." "It was hands down the most valuable experience I have had in PT school thus far" remarked one student. Another stated, "This trip has permanently changed me…my view on what it means to be a migrant farm worker…. It solidified my duty to serve those in need."

Categories related to changed life views included 1) increased awareness of the struggles of others, 2) increased thankfulness for what they have, 3) increased desire to give back, and 4) increased empathy.

Figure 2. Students' Perceived Benefits from Attending Service-learning Trip—
Categories and Emergent Themes
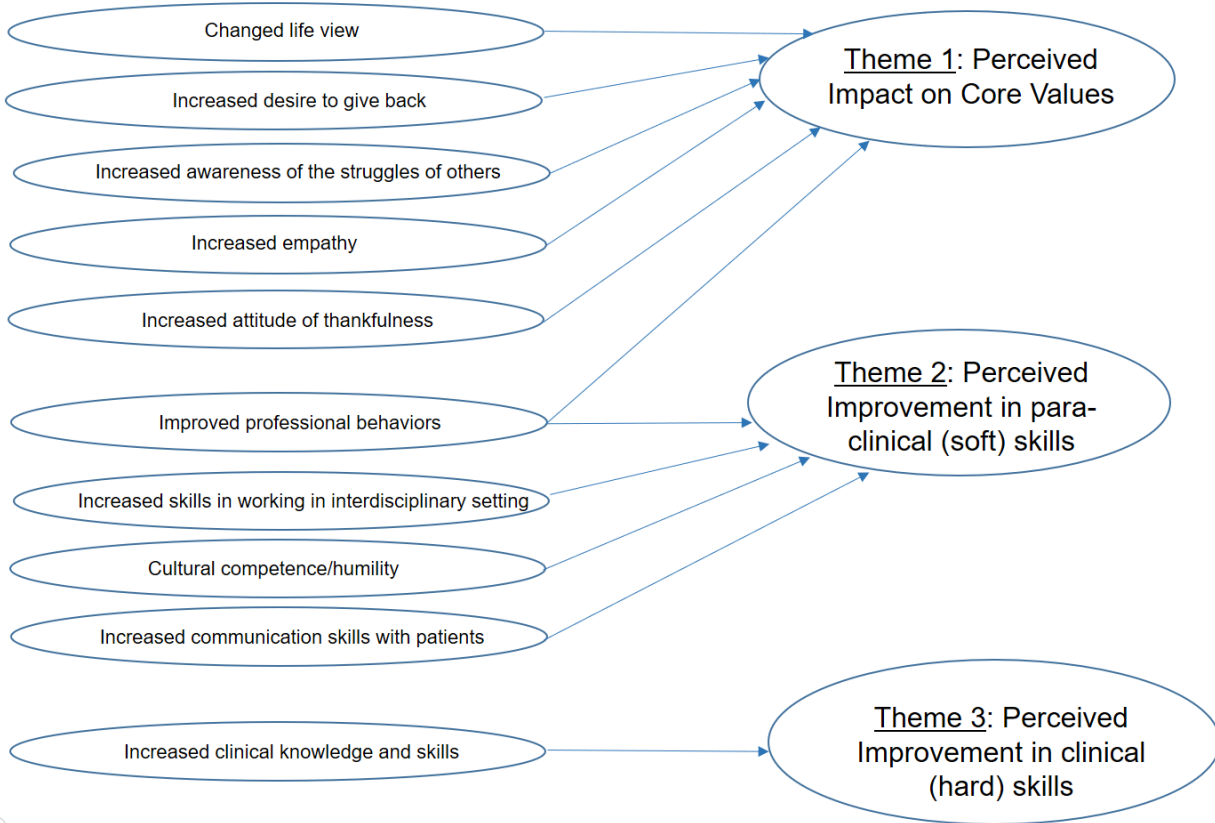
Increased awareness of the struggles of others. Regarding the increased awareness of others' struggles, one student commented, "The most eye-opening thing for me was going out to the farms and picking the vegetables and seeing the working conditions they have. They're out there from sun up to sun down. We were only out there for an hour and a half, two hours, and I was exhausted." Another student reflecting on seeing a farm worker with type II diabetes who underwent a toe amputation remarked "it was very eye-opening that this person literally was bleeding…from his amputation…and risking infection…because he didn't want to go [back] to his home country. That's how much better he felt it was here. That can put something in perspective."

Attitude of gratitude. Regarding increased gratitude, a student with a family history of farm working stated that "[my] dad and uncles had to do this when they first came to this country. It made me appreciate what they have done for me to have a better life." Others remarked that "the big takeaway was how blessed I am and the opportunity that I've been given for education…," and "the whole experience made me more appreciative of the things I have."

Empathy. Related to increased gratitude was increased empathy. A student reported that the experience "helped me grow in compassion because I felt like before I was very analytical with patients." Another stated that the experience "enhanced my empathy. It gave me a new bar…to have more empathy and to look at things from another person's perspective." Another student remarked that they "took away empathy" especially "learning about their living situations and their injuries. We have no idea who suffered so that we may put food on the table." Another student grappling with the lifestyle led by farmworkers remarked that "the sacrifices these workers make for their families is something I can never come close to understanding, but I now see the multiple challenges this poses for individuals on these farms."

Giving back. Some students expressed receiving a strong motivation to give back, while other students related that the trip served to increase their pre-existing desire to give back. "The program increased my awareness for the need for pro-bono work…. It also made me realize that there are more underserved communities and people with low access to healthcare than I originally thought." "I think this impacted me personally by instilling a greater drive to volunteer and help those that may be less fortunate than I am," remarked another student.

Theme 2: Impact on para-clinical skills.

Professional behaviors. A category that emerged that has thematic underpinnings in both the core values and para-clinical skills themes was professional behaviors. Things such as maintaining composure in a hectic environment, working efficiently when tired, establishing rapport quickly, and working as a team player in a fluid environment were all professional skills students brought up. A student remarked that "getting out of your comfort zone and be able to reason and think through and interact when you are really tired" was a valuable lesson learned. Teamwork in a fluid environment was addressed by one respondent: "Regarding teamwork…I think one reason we were so successful is because we were all willing to work together and were very flexible." Regarding rapport, a student mentioned that "the personal connection that you have with the patient…how beneficial that can be…that someone cares for them."

Communication skills. Students were also faced with "having to work with language barriers," and grappled to elevate their non-verbal and interpreter-based communication skills. One remarked that "working with someone translating…sparked an interest in learning a new language…or at least learning basic phrases…to help with future treatments." Conversely, another remarked that when an interpreter was not available, "learning how to read peoples' body language and work with the limited amount [of language] that you had" was valuable.

Cultural competence. Students were exposed to the farmworker culture and lifestyle, which "is so different than what I've ever seen." One student stated that it was valuable "to work with their kids and see how their culture has affected their childhood. Also, being able to see the living conditions of the farmworkers and their working conditions." One student, becoming aware of farmworker living conditions, began asking

the farmworkers specific questions so "that I wouldn't come up with a care plan that included ice when they didn't have a freezer." One student remarked that "I am more prepared to work with patients from a different background than me [because] we all speak the language of health."

<u>Increased interdisciplinary skills.</u> Being an interuniversity, interdisciplinary experience with students working in close proximity afforded spontaneous opportunities for students to interact with and observe students and faculty from other healthcare disciplines. "We were in close proximity where we could watch them (other disciplines) over the same aisle…so we had to interact." One student appreciated a visit from a nurse practitioner student who accompanied the patient to the PT tent. "They were able to give us more in-depth background than what we got on the intake sheet. We were able to incorporate that into… [the] examination, and it shaped what we were thinking." "It also makes us [have to] …explain what we're actually doing…to someone else who kind of understands the language." Finally, one student remarked that it "reinforced the importance of interdisciplinary care and how to work as a team…to provide the best care to the patient." Another student remarked that the experience was "a good opportunity…to see the impact health care professionals have as a whole."

Since the physical therapy profession has continued to evolve into an autonomous profession, offering direct access to patient care, the ability for a PT to know when to refer a patient to another practitioner has increased in importance, and the trip gave students opportunities to hone this skill. In the FWFHP, patients state at intake if they want comprehensive care or primarily want to be seen by the student physical therapist. As a result, students practiced their professional obligation to make referrals as needed. "There were several patients I had to refer to nursing due to non-musculoskeletal problems" remarked one student. In referring to scope of practice, one student remarked that "knowing when to refer to nursing or pharmacy, or when it was in our scope [of practice] or it wasn't" was a valuable experience.

<u>Theme 3: Impact on clinical (hard) skills.</u>

Many students reported the experience helped them gain confidence in their clinical skills. One student mentioned they got "the confidence that skills are there that you didn't know you had until you had to use them right there." Another remarked that they became "more confident and comfortable with working with children and administering the [assessment tools]." "Going [on this trip] was a good review of musculoskeletal disorders…and what we are learning in differential diagnosis. I was able to practice my hands on skill set." Another mentioned that "we saw a lot of differential cases that I've never seen before; eye opening." Others mentioned that they "evaluated more patients during that week…than in my entire 6-week clinical rotation, and "I had to be more aware of red flags and was able to catch some potentially [life] threatening conditions."

In commenting on the uniqueness of the situation (a single visit to impact the patient), one student remarked about the challenge of "creating a treatment/intervention plan that is going to be effective for what they need in a short amount of time with the resources we have." Others mentioned "I learned how to be creative…in my

interventions because we were limited in what resources we could physically bring down with us, but also what they had in their living situations that we could use to incorporate appropriate treatments." Another student remarked that "optimizing what you can do for that person in one visit" was challenging.

Students mentioned efficiency and efficacy were important elements of time management because "there was a line waiting for us and only so many [of us]. We try to help as many people as we can…." Another student mentioned the trip afforded the opportunity to "think quickly on my feet…and then choose something that I thought was going to help." Regarding efficient documentation, one student mentioned "being thorough with documentation, but…short and concise."

Discussion

The student commentary suggests that the students both expected and perceived the experience as a comprehensive learning experience. The emergence of three categories of motivations for attending and ten categories of perceived benefits suggests the students "didn't know what they didn't know," and that the experience exceeded their expectations. The three motivational categories and ten perceived benefits categories also show good alignment with the three domains of learning as described by Bloom (Armstrong, 2010). The students were motivated to have a complete multi-dimensional learning experience, and the trip seemed to deliver on those expectations.

Theme 1: Perceived impact on core values.

Bloom's affective domain was the most dominant, with 179 assigned codes, followed by cognitive with 84 assigned codes and psychomotor with 28 assigned codes. Five categories were clearly affective and contribute to theme 1—perceived impact on core values (Figure 2). "Changed life view" can be considered an overarching category that was driven by the other four codes. A changed life view evolved around students processing what they saw in the struggles of others. This is at the core of Compassion as defined by the APTA as "the desire to identify with or sense something of another's experience."(American Physical Therapy Association, 2019) Witnessing the struggles of others, paralleled by an attitude of thankfulness for what they have, and increased empathy, students perceived this experience to have a profound impact on their values. The integration of these experiences can be strong motivators to take action and "give back."

Core values are the foundation for developing professional behavior. Values are deeply held beliefs that are often laid down early in a student's development, and some may argue that core values do not change very much over time. However, the hierarchical structure of Bloom's affective domain seems to indicate the development and expression of core values can change over time based on life experiences. For example, in order for a student to perceive an impact on their core values, the student must have a desire and willingness to receive new information or experience new situations that may challenge their comfort and their previously held ideas about

themselves, others, or the world. This comes from life experience, and students must see and embrace the value in such experiences.

Many of the students attending the trip had a strongly developed, preexisting level of affective professional development, and this quality actually may have driven their desire to attend the experience. A study performed on PT students from another university attending the same FWFHP in a previous year found that students desiring to attend the trip, who were not selected to go, exhibited a similar degree of professional behavior development as students who attended the trip. Both groups exhibited a greater degree of professional behavior development than students not motivated to attend (Anderson et al., 2014). Still, the expression of core values through behavior can change over time based on life experiences and other factors such as self-reflection. Core values can mature when different values are emphasized or enhanced at key times within one's personal or professional life journey. This experiential learning trip appears to have allowed that to happen.

Theme 2: Perceived improvement in affective skills.

Professional behaviors bridged perceived impact on core values (theme 1) and improvement in affective skills (Figure 2). This bridge encompasses practical patient interaction skills and touches on the APTA core values. Such soft skills as "thinking on your feet," maintaining a professional demeanor when fatigued, adapting fluidly to a rapidly changing environment, quickly establishing a healthy rapport, and negotiating language barriers are all essential professional skills exercised often in daily clinical practice. Being successful in these skills, however, requires the possession, integration, and internalization of core values such as compassion and caring, collaboration, accountability, altruism, and integrity (American Physical Therapy Association, 2019).

Other interrelated categories in professional behaviors are 1) increased skills in interdisciplinary settings, 2) increased communication skills with patients and 3) increased cultural competence/humility. The interuniversity, interdisciplinary nature of the program afforded students opportunity to interact with faculty and students from nursing, nurse practitioner, pharmacy, and dental hygiene. Students had the opportunity to gain a better understanding of how each of the disciplines operate and how they are interrelated to each other. Being in a time bounded microcosm of the health care system, students were able to experience an intense and accelerated phenomenon in action.

The second aspect of the interdisciplinary experience was to go beyond understanding the scope of practice of the various professions and learn the *medical dialects* of the various disciplines. Part of the value of the interdisciplinary experience appeared to be improved dialectic expressive and receptive fluency in order to communicate in what one student alluded to as "the common language of healthcare." Having the opportunity to understand interdisciplinary scope of practice coupled with the ability to communicate via different professional dialects in a shared health care language was very valuable to the students.

In line with communicating with other health care providers was communicating with patients. A majority of the farmworkers and their families were from Mexico and spoke Spanish. In general, the children were more fluent in English, but the adults knew

very little English. Some team members and a faculty member were fluent in Spanish, and there were interpreters intermittently available. This required students to sometimes use body language, eye contact, facial expressions, and a few Spanish words they were learning in real time, to communicate with patients.

Communication across health care disciplines and communicating with patients speaking different languages goes beyond understanding the language or understanding how to communicate through interpreters, it speaks to understanding culture. Each health care discipline has its unique culture, and certainly in this bounded experience, the farmworkers and their children had a unique culture. Students had to learn not only how to communicate in Spanish, through interpreters, or through body language, but also in the context of the patients' culture, so that, as one student mentioned, "I wouldn't come up with a care plan that includes ice when they don't have a freezer."

This evolution of thought implies the development of cultural humility. Students perceived a shift from a simple cognitive awareness of cultural differences to a deeper understanding and compassion towards individuals. The relationships formed in this experience facilitated more appreciation and gratitude towards farm workers, as students began to challenge previous thoughts and feelings. This shift suggests that students moved from cultural competence towards cultural humility. Cultural competence is a staple in medical professional education; however, the tenants imply that once the knowledge is gained, the student has mastered the concepts (Yeager & Bauer-Wu, 2013). During this immersive service-learning experience, students practiced self-reflection and suspended prior assumptions with keen observations into a different culture demonstrating an evolution towards cultural humility. Cultural humility is an ongoing process of self-reflection and discovery in order to build honest and trustworthy relationships, and it has emerged as an important practice for health care professionals (Naber et al., 2021; Oosman et al., 2019; Yeager & Bauer-Wu, 2013).

While students grew towards cultural humility towards individuals who spoke a different language, lived in unfamiliar communities, and experienced harsh working conditions, they also grew to respect different professions on the interdisciplinary team. Students solidified learning about different professions and scopes of practice that built upon previous curricular multidisciplinary simulation-based experiences. Students grew to value and respect peer colleagues from different professions and schools. By the end of the week, students were initiating collaborative multidisciplinary assessments stating they were "way more comfortable by the last day" and were able to "see the impact …health care professionals have as a whole."

Theme 3: Increased clinical knowledge and skills.

The two subcategories that bridge Bloom's cognitive and psychomotor domains in this theme are students' perception of gaining clinical knowledge and gaining proficiency in their manual skills. Many of the codes in this theme were assigned to both cognitive and psychomotor domains, as the knowledge/skill set is learned in school and executed in the clinic as merged domains. During the initial patient interview, the student must plan which psychomotor tasks are to be executed in the objective examination. After completing the objective examination, the student analyzes the data,

makes an assessment, and formulates a treatment plan, which often includes a psychomotor component. As the patient responds, students modify their assessments, and plans are modified. Students perceived a unique opportunity to hone and integrate these skills in a fast paced, demanding, fluid environment and articulated an increase in confidence as they prepared for their full-time clinical rotations during the next semester.

The three themes that emerged from the data relate directly to Bloom's domains and also to the APTA Core Values and Code of Ethics documents (Figure 3) (American Physical Therapy Association, 2010, 2019). Additionally, aspects of the Code of Ethics that align with the emergent themes are 1) the respect of dignity and rights of individuals, 2) integrity in relationships with patients, families, colleagues…and other health care providers 3) meeting the health needs of people locally, nationally, or globally, 4) lifelong acquisition of knowledge skills and abilities, to name a few. There is strong commonality between the APTA documents and Bloom's domains, and most of the overlap occurs in the development of affective behaviors.

Figure 3. The Relationship between Emergent Themes, Bloom's Domains, and APTA core documents
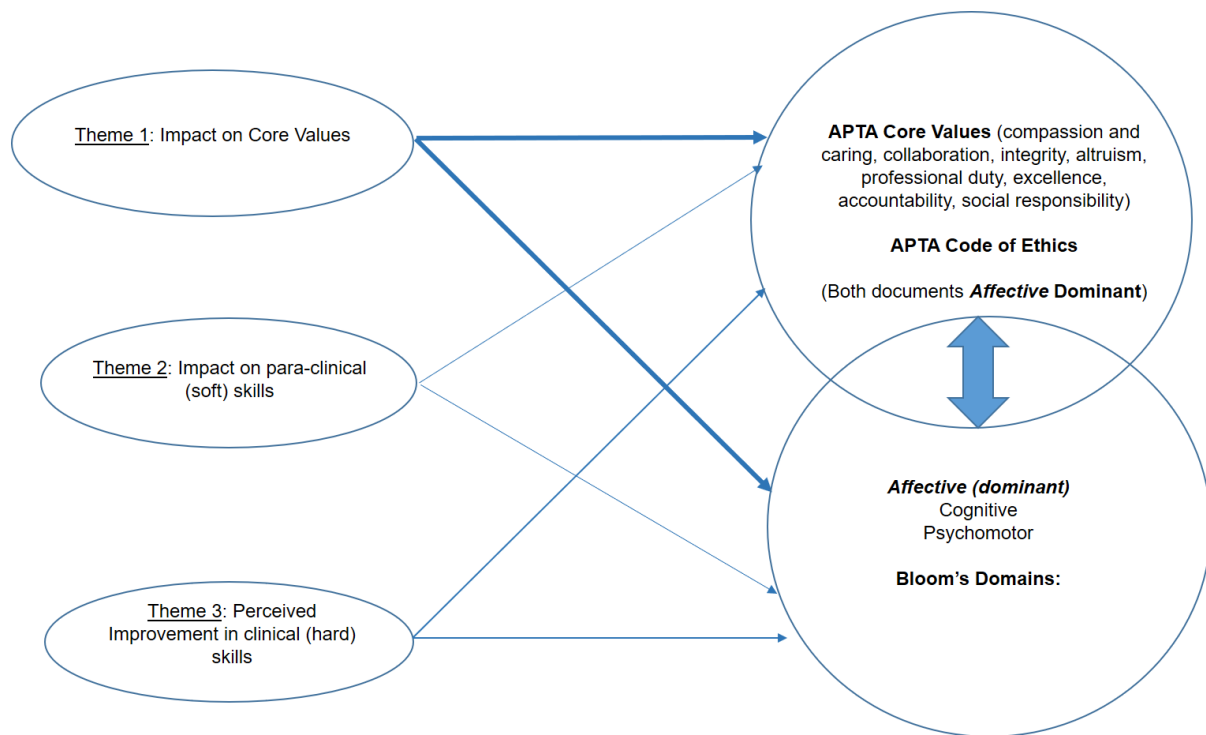
Conclusions

In this case study, DPT students perceived benefits from attending this service-learning trip in the cognitive, psychomotor, and affective domains of learning, with the primary domain being affective. More specifically, learning appeared to be linked to core professional values and the internalization of these values. Comparison of student pre-

and post-trip comments suggested that students "do not know what they do not know" and that the experience far exceeded their expectations. Additionally, a university culture of service is essential for faculty to conceptualize and facilitate these types of interdisciplinary, interuniversity experiences. The successful implementation of IDSL experiences such as the one described in this study is only possible with strong, pragmatic support from departmental, college, and university leadership.

Limitations and Future Research

This is a qualitative descriptive case study, which, by design, offers more flexibility, but lacks the rigor of other qualitative approaches. The study primarily speaks to student perceptions of learning, and as a result, the data are described and discussed without offering any theories or key assertions. Future research can be aimed at learning about why students may not be motivated to attend or what deterrents exist that preclude students from participating in IDSL opportunities. Research can also be geared toward better understanding how immersing students in a culture of service within a contained educational program translates into internalization of service in personal and professional lives after graduation.

Disclosure Statement

The authors report no conflicts of interest.

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ABSTRACT

Service-learning in graduate education is commonly used but has limited studies on its effectiveness. Can service-learning be implemented in graduate education in a way that enhances the experience for the students? Most service-learning research has focused on service-learning at an undergraduate level in nursing, social work, public health, and occupational health (Lu & Lambright, 2010). This study replicates Lu and Lambright's study with Doctor of Physical Therapy program students to expand research on the impact of service-learning experiences on professional skills in graduate students. Our findings suggest *how integrated the project was into the curriculum* and *how much influence students have over how their project progressed* was significant and positively associated with improved professional skills.

Service-Learning Effectiveness at Improving Doctor of Physical Therapy Students' Professional Skills

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Background

Does service-learning (SL) make a difference in graduate education? How can SL be implemented in graduate education in a way that enhances the experience for the students? Lu and Lambright (2010) reported that most service-learning research has focused on undergraduates even though the use of SL has increased in graduate programs throughout the country. They designed a survey to understand the factors influencing the effectiveness of service-learning projects (SLPs) at improving MPA students' professional skills (PS). Lu and Lambright recognized research studies on this topic were focused primarily on undergraduate students and wanted to examine whether the characteristics that make SLPs effective for graduate students are different (2010).

The original study created a professional skills index (PSI), which is an index score using the factor score of the five professional skill outcomes only: (1) ability to work with people more effectively, (2) improved problem solving skills, (3)

improved oral communication skills, (4) improved written communication skills, and (5) development of leadership skills (2010), was used to assess professional skill development. This study used all fourteen skills included in the survey. The scale reliability score for this study is 0.902.

SLPs are used in doctor of physical therapy (DPT) programs across the country to enhance the community impact and leadership skill of graduates so they can meet the mission of the American Physical Therapy Associations Mission of, "Building a community that advances the profession of physical therapy to improve the health of society" (2018). Levkoe et al. (2014) contend that SL is an underutilized pedagogical tool and it helps with the assessment and analysis of the course and contributions to student learning, professional development, and community engagement. Alston et al. (2016) suggested SLPs should be required for future educators earning credentials for the teaching, development, evaluation, and administration of adult learning programs.

Limited research has been performed with SLP experiences regarding its implementation. Menamin et al. (2014) discussed that current published literature appears weak and diverse in nature and has not yielded compelling evidence about the impacts of SL on student learning outcomes. This raises the question about the value DPT students are receiving from their efforts while participating in SL curricular activities.

Research in undergraduate and graduate students have had positive conclusions about the use or SLPs in the curriculum. Undergraduate studies have demonstrated that SL promote social growth, increase self-efficacy, and helps provide culturally congruent care (Amerson, 2012), that students learn by feeling, belonging, placing action in a social perspective, and by sharing experiences with others (Márquez-García et al., 2020). Studies with graduate students have established that SL aided in meeting learning goals and higher overall satisfaction with the SL experience (Maccio, 2011), strengthened student efficacy for teaching, contributed to acquisition of varied teaching strategies and understanding of minority households (Meaney et al., 2012), improved understanding of older adults, lessened fear of working on behalf of older adults, have a better understanding of the older adults consumer desires (Segrist, 2013), SL can impart high-demand skills, transform how students move from knowledge into ideas and ultimately action, and offers opportunities for developing higher-order reasoning and critical thinking (Levkoe et al., 2014). Research about the benefits of SLPs as a curricular requirement in graduate DPT programs and how SL may impact PS may be useful to DPT programs or other graduate programs planning to add SLPs to their curriculum and the data may be valuable to improve current SL curricular effectiveness.

Methods

A replication study using a quantitative survey with graduate DPT students was conducted at a small liberal arts university in Lynchburg, Virginia to answer these questions.

Sample

The survey was administered to 89 DPT students. Two students were participants in a different type of SLP and three students did not complete the entire survey. A total of 84 students completed the survey, for a response rate of 94%. The data were analyzed with SPSS 26.

Service-Learning Projects

In the DPT program studied, SL is embedded throughout the curriculum as a curricular thread, not one specific course. Students choose their SLP from four options: Free PT Clinic, Special Olympics, Wheels on the James, and Girls on the Run. See Table 1.

Table 1

Description of Service-Learning Project

Project	Description of Service-Learning Project
Free PT Clinic	Provides pro bono physical therapy services to uninsured or underinsured individuals
Girls on the Run	Provide positive role models, education on self-esteem and physical fitness to elementary aged girls through running
Special Olympics	Provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities
Wheels on the James	Provide AmTryke therapeutic tricycles to individuals who are unable to ride traditional bikes

Research Question

Research questions were: 1) Will DPT student involvement in a SLP focusing on the factors that influence SL effectiveness improve student PSI? 2) If so, which factors were most important for improving the professional skills?

Hypotheses

Based on Lu and Lambright's study, two hypotheses were generated:

Hypothesis 1) Students who spend more than two hours per week outside of class working on SLP will have greater improvement in professional skills than those who spend fewer than two hours per week.

Hypothesis 2) Students who participate in SLPs as members of groups that work very much as teams will have greater improvement of professional skills than those who do not.

Further, based on the primary investigator's experience with DPT students and SLP, three additional hypotheses were generated:

Hypothesis 3) Students who spend a great deal of time discussing their projects in class will have greater improvement of professional skills than those who discuss their projects some time or less.

Hypothesis 4) Students whose SLPs are very well integrated into the course material will have greater improvement of professional skills than students whose projects are less integrated.

Hypothesis 5) Students who have a great deal of influence over how their projects progressed will have greater improvement of professional skills than students who had little influence.

Survey Instrument

The survey instrument in the study was adapted from the Lu and Lambright survey (2010) to be specific to a DPT program. The survey asked each student to identify the SLP in which they participated, followed by 21 questions. The instrument asks students using a 1-5 Likert scale to rate how helpful the SLP was at achieving 14 goals as summarized in Table 2. Several quantitative follow-up questions were asked using free response or scaled answers about how much or how little their SLP helped them master course material, improve problem-solving skills, understand community issues, and other potential goals of SL (2010). It also poses questions about the SLP as it relates to the course, both on a general and on a day-to-day level. Two questions are geared towards student's incorporation of group work and the final series of questions are

demographic in nature, including gender, age, undergraduate major, and previous experience with SL.

Professional skills identified by the survey are used daily by physical therapists and are included in the American Physical Therapy Association definition of a professional and in the Core Values of the Physical Therapist & Physical Therapist Assistant (2019).

Lu and Lambright (2010) found that "providing multiple points of engagement for students in SLP can enhance their professional skills". This would include more hours involved with the project outside of class, more time reflecting in class about the project, and more direct contact with beneficiaries of the project. Regression analysis demonstrated the model explained 37% of the variation in the professional skills index (PSI), see Table 2 for the PSI Score. Their findings suggested that future research focus on effective SL models for graduate students more generally (2010).

Setting specific modifications were made to the survey that Lu and Lambright administered to graduate Master of Public Administration (MPA) students. The word "course" was changed to "program" throughout the survey. Due to the limited number of students in the program who may self-identify as non-White, a demographic question about race was removed to maximize anonymity of the survey.

Data Collection and Analysis

Data were collected from two DPT cohorts after class time during the 11th week of the Fall semester. The DPT programs administrative assistants administered a brief pencil and paper survey about participation in one of the four SLPs to each student enrolled in the program. No instructors were present during the completion of the survey in order to protect the anonymity of the students completing the survey. See Appendix 1 for the Student Survey.

In questions one and three, students were asked to describe their SLP and suggest ways it could be improved. All other questions focused on how effective the SLP was at helping them achieve 14 PSI outcomes. These questions used a 1 to 5 Likert scale, 1 indicating the project was not helpful and 5 indicating the project was extremely helpful, to rate how helpful their chosen SLP was at achieving each outcome. In addition, several close-ended questions about the structure of the SLP were asked including: level of instructor guidance, in-class time for reflection, amount of time spent on the project outside of class, student influence over the direction of the project, and whether the project involved group activities. If students had participated in group activities, they were asked to assess how well their groups had worked as teams. Finally, the students were asked a series of demographic questions including gender, age, volunteer experience, past involvement with service-learning, concurrent involvement in other service-learning projects, work experience, and status as a full-time student.

Lu & Lambright created a PSI from five professional skill outcomes (2010). For a more comprehensive analysis, the researchers included all 14 professional skill outcomes from the survey in the PSI. Cronbach's Alpha for the PSI is 0.902, suggesting the items in the survey have a high internal consistency. Total item statistics demonstrate an overall reliability of the coefficient for the set of variables in the index. All items from the index were kept. Descriptive statistics for the PSI score and its

components are included in Table 2. Survey data were analyzed using both ANOVA and multiple regression. Level of significance is set at p≤.05.

Table 2

Descriptive Statistics for the Professional Skills Index Score and Its Components

Survey Item	Mean	Std. Deviation	N
Master material covered in curriculum	3.0119	1.37529	84
Tie together concepts in the curriculum	3.1310	1.38651	84
apply concepts covered in the curriculum to real situations	3.7381	1.29055	84
developed a deeper understanding of the material covered in the curriculum	3.2024	1.25899	84
developed a deeper understanding of material outside of the curriculum relevant in your graduate program	3.7619	1.07119	84
develop a better understanding of the role of public/nonprofit administration	4.1071	1.15140	84
learn to work with people more effectively	4.2143	.93230	84
improve my problem-solving skills	3.6190	1.22134	84
Improve my oral communication skills	3.9167	1.11083	84
improve my written communication skills	2.8333	1.40424	84
develop my leadership skills	3.7976	1.09522	84
feel more connected to my community	4.2857	.84414	84
develop a deeper understanding of the complex problems facing my community	3.8214	1.14240	84
Become more involved in volunteer activities	4.3810	.87681	84

*Cronbach's Alpha Based on Standardized Items is 0.902, N = 14.

Results

The relative descriptive statistics on the different SLP showed no significant trends in the means or the number of students who participated in SLP (n=84) indicating all groups can be compared to each other. Wheels on the James had the fewest participants (16) and Free PT Clinic the most participants (26).

Table 3 is the ANOVA analysis. Results indicate the chosen SLP, project integration into the curriculum, time spent in class, and student's influence on the project had significant impact on the PSI. As in Lu and Lambright's (2010) study, these investigations findings suggest that providing multiple points of engagement in SLPs is critical for improving students' professional skills. This finding identifies hypothesis 1 and 2 to be not significant and indicates hypotheses 3, 4, and 5 need further investigation.

Table 3

The Impact of Project Characteristics on Professional Skills

	Professional Skills Effectiveness Index Score					
Project Characteristics	Sum of Squares	df	Mean Square	F	Sig.	R Squared
SLP	14.507	4	3.637	8.163	.000	.292
Project Integration	11.782	2	5.891	12.846	.000	.243
Time in Class	3.684	2	1.842	3.250	.044	.074
Project Influence	7.385	2	3.693	7.084	.001	.149

ANOVA results show a small to moderate correlation between the different variables, R =.564 which represents a high degree of correlation R^2 = .318, indicating 31.8% of the DV can be explained by the model (p=0.000). Examination of the F ratio to predict if the model is a good fit for the data and if the independent variable predicts the dependent variable in a statistically significant way, $F(4,78) = 9.108$, p< .05, which does indicate the model is a good fit for the data. The SLP students participated in, project integration into students learning, time in class, and student influence on the project all had a significant impact on the PSI.

Testing the statistical significance of the independent variables, the following reported to be significant: *service-learning project (t=-.739, p=.046), how integrated was the project into the material covered in the curriculum (t=3.542, p=.001), and how much influence did you have over how this project progressed (t=2.797, p=.006). How much time was spent in class* did not report to be significant at p<.05 level. In reviewing the collinearity of the variables, all reported tolerance values >.01, thus indicating there is not a problem of collinearity with the data set.

The Levene's Statistic reports at .201 value indicating there is Homogeneity of Variances as p>.05.

One-way ANOVA were conducted to determine if *service-learning project (SLP)* had an impact on the development of students' professional skills. SLP was statistically significant $F_{(2,83)}=8.163$, p=.000, $R^2=.292$. The SLP were important in improving the PSI.

For hypothesis 3, One-way ANOVA to determine if *time spent in class discussing the project* had an impact on the development of students' professional skills was statistically significant $F_{(2,83)}=3.250$, p>.05, $R^2=.044$.

Tukey's post-hoc analysis compared all possible combinations of group differences for *SLP* and the *time spent in class discussing the project*. The p-value for each group (little time, some, a great deal) reported above the $p \leq .05$ level, thus the differences between each group were not statistically significant.

For hypothesis 4, One-way ANOVA to determine *if integration of this project into the material covered in the curriculum* had an impact on the development of students' professional skills was statistically significant $F_{(2,80)}=12.846$, p=.000, $R^2=.243$.

Tukey's post-hoc analysis reported the level of integration of the SLP into the curriculum in the categories of not at all integrated, somewhat integrated, very well integrated was statistically significant ($p \geq 0.05$) for differences between groups. A majority of the students, 52%, responded that the project was somewhat or very well integrated with the curriculum.

For hypothesis 5, One-way ANOVA to determine if *student influence on the project* had an impact on the development of their professional skills was statistically significant $F_{(2,81)}=7.084$, p=.001, $R^2=.149$.

Tukey's post-hoc analysis reported the level of influence students had on the project (a little, some, a great deal), one p-value was above the .05 level (some/a great deal = .445).

Table 4 represents Tukey's post-hoc analysis of the PSI compared to SLP. These results indicate that the Free PT Clinic had a significant and positive impact on the PSI when compared to Girls on the Run, Special Olympics, and Wheels on the James. No other significant relationships were demonstrated among SLPs. The Free PT Clinic has a different organizational and leadership structure compared to the other three SLP groups.

Table 4

Multiple Comparisons of Service-Learning Projects with Tukey HSD

Dependent Variable: Professional Skills Index Score				
(I) SLP	(J) SLP	Mean Difference (I-J)	Std. Error	Sig.
Free PT Clinic	Girls on the Run	1.0916	.20437	.000
	Special Olympics	.7550	.19308	.002
	Wheels on the James	.6377	.21179	.028

Table 5 represents the regression analysis of the data. The model explains 35.8% of the variation in our PSI. This is not consistent with our ANOVA findings. The regression analysis demonstrated two of the four variables, Service-Learning Project and Time in Class are no longer significant. *How integrated was this project into the curriculum* and *how much influence did you have over how this project progressed* continued to be significant and positively associated with improvements of professional skills, with Betas of .394 and .364, respectively. Analysis demonstrated no issues with multicollinearity.

Table 5

Coefficient Regression of Professional Skills Index

Model	Unstd. Coefficients		Std. Coefficients	t	Sig.
	B	Std. Error	Beta		
Service-Learning Project	-.055	.073	-.086	-.758	.451
How integrated was this project to material covered in the curriculum	.435	.135	.394	3.217	.002
How much time in class was spent discussing this project	-.050	.171	-.036	-.290	.772
How much influence did you have over how this project progressed	.394	.146	.364	2.701	.009

Post-hoc test in Table 5 indicated that there is a significant positive impact of the Free PT Clinic on the index compared to the other three SLPs. This impact is not represented in Table 6, therefore, Free PT Clinic was isolated as its own independent variable and examined in the regression. Table 6 highlights the significant positive association the Free PT Clinic had on perceived improvement in professional skills. This model improves our explanation of variance in the PSI to 45.9%.

Table 6

Association of the Free PT Clinic on perceived Improvement in Professional Skills Development

Model	Unstd. Coefficients		Std. Coefficients	t	Sig.
	B	Std. Error	Beta		
Free Clinic	.446	.196	.271	2.270	.027
How integrated was this project of material covered in the curriculum	.331	.140	.299	2.357	.021
How much time in class was spent discussing this project	.025	.162	.018	.152	.879
How much influence did you have over how this project progressed	.387	.137	.358	2.818	.006

Discussion

This study examined the factors that influence the effectiveness of SLP at improving DPT students' professional skills. The specific SLP, how integrated the project was into the curriculum, how much influence the student had over how this project progressed, and how much time in class was spent on discussing this project all had positive impacts on the PSI. In addition, our ANOVA analysis, as in Lu and Lambright's (2010) study, suggested that providing multiple points of engagement in SLPs is critical for improving students' professional skills.

The first two hypotheses derived from the Lu and Lambright study were not significant in this study.

Hypothesis 1) Students who spend more than two hours per week outside of class working on SLP will have greater improvement in professional skills than those who spend fewer than two hours per week – not significant.

Hypothesis 2) Students who participate in SLPs as members of groups that work very much as teams will have greater improvement of professional skills than those who do not – not significant.

The three hypotheses created by the researchers were found to be significant.

Hypothesis 3) Students who spend a great deal of time discussing their projects in class will have greater improvement of professional skills than those who discuss their projects some time or less.

Hypothesis 4) Students whose SLPs are very well integrated into the course material will have greater improvement of professional skills than students whose projects are less integrated.

Hypothesis 5) Students who have a great deal of influence over how their projects progressed will have greater improvement of professional skills than students who had little influence.

The PSI examined the influence of each SLPs impact on students' professional skills and indicate the Free PT Clinic had a significant and positive impact on the PSI when compared to Girls on the Run, Special Olympics, and Wheels on the James. This finding suggests how the instructors designed the Free PT Clinic matters in developing students' professional skills. SLPs can be time and labor intensive for students and faculty members, yet, our findings suggest if SLPs are an important part of a DPT programs curriculum, then students may be inclined to spend time on projects that are designed to develop specific DPT program competencies and professional skills that will enhance student practice.

The regression analysis explained 37% of the variation in our PSI, yet it is not consistent with our ANOVA. ANOVA demonstrates two of the four variables, Service-Learning Project and Time in Class, were no longer as significant. However, how integrated the project was into the curriculum and how much influence students have over how their project progressed continued to be significant, and positively associated with improved professional skills. This suggests that DPT programs/instructors looking to use service-learning as a platform to improve their students' professional skills should be encouraged to find projects that involve a significant amount of meaningful work outside of the classroom, be specifically aligned with curriculum and program goals, and be flexible enough to enable students to gain ownership of their learning.

Our findings suggest how effectively SLPs are designed, student influence on SLPs, and their alignment with program curriculum can improve DPT students' professional skills. Results also suggest that service-learning seems to be an excellent addition to the curriculum for helping DPT students develop professional skills.

For DPT students to benefit from this pedagogical tool, program faculty should consider SLP design that allows students to influence the SLP they in which they choose to participate, how the SLP is to be implemented in the community, and that the projects should align with the curriculum or program requirements. This may enhance a student's perception of value for time spent and prove more beneficial as a teaching model for development of engaged and productive community leaders when they are practicing professionals.

In the DPT program all four SLP are now designed similarly to the Free PT Clinic relative to the findings in this study. Each SLP is student lead with a faculty to mentor the leadership of the SLP, versus the faculty member leading the group. The students have autonomy to organize the SLP governance structure the way that they feel is best. Each group has created leadership roles the focus on a mentoring style of leadership that allows for succession planning and institutional memory to be preserved. The organizations vary in structure, but generally have 2 directors, a secretary, treasurer, marketing, social media, fundraising, and other committee chairs as required for proper functioning of the SLP. The level of success the SLP groups have is strongly controlled by the students. The hours of operation of the Free PT Clinic are determined by the students, the events created by or participated in by the groups is decided by each SLP group and its members.

The role of the faculty member is to mentor the leadership of the SLP on how to manage the group, engage with community partners, design programs, organize and lead event planning and booth creation when participating in community events, and to be a conduit between university and community partners. Improving efficiency of leadership enables the students to focus on helping the community and spend less time breaking down university administrative barriers.

The graduate DPT students truly enjoy the participation in the SLP groups. They see the SLP as a way to leave a legacy for the DPT program and for the community. After graduation many of them continue to engaged with the groups to provide assistance and connections for their SLP groups. Students taking active control of the groups improves salience of the SLP and improves the connections between SLP, curricular content, and professional practice. Seeing their efforts provide real benefits to the community provides value for time spent working in the groups and keeps them engaged and excited to grow the SLP each year.

Given the modest sample size, replicating this study in other settings would be helpful in supporting the accuracy of our findings. This study has implications for future SL research in DPT and other graduate programs. By recognizing the unique context of SLPs in developing professional skills, future research can help instructors capitalize on the effectiveness of this pedagogical tool. The challenges lie with instructors using a SLP effectively to provide students with opportunities for positive outcomes that help them develop their professional skills.

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Alexis Ehrhardt

Alexis brings significant experience working with government officials and has served as President and CEO of the Danville Pittsylvania Chamber of Commerce since January 2018. In this role, she has advocated on behalf of more than 500 members on a wide array of policy issues and led the Chamber's Legislative Committee in developing a legislative agenda that they present annually to state officials prior to the General Assembly session. She has served on the Tobacco Region Revitalization Commission and on the Secretary of Commerce and Trade's committee on paid family and medical leave. In her work with the Tobacco Commission, Alexis chaired the strategic planning committee and advocated for specific projects with an eye toward long-term transformational efforts for southern and southwest Virginia.

Alexis also has experience in higher education and secondary education. Prior to leading the Chamber, she served in several roles at Averett University in Danville including as executive director of the Center for Community Engagement and Career Competitiveness, director of academic partnerships, and assistant for academic affairs. She also worked at Danville Community College, the Institute for Advanced Learning and Research in Danville, as an independent college counselor, and in admission and financial aid at Chatham Hall.

After graduating magna cum laude from Emory University, Alexis earned her Master of Education degree from UVA's School of Education and Human Development, focusing on higher education. She earned her Doctor of Education degree from the University of Lynchburg, where she focused on leadership studies.

Patrick Shuler

Patrick is the Administrator for the new Jones and Cabacoy Veteran Care Center in Virginia Beach, Virginia. He has been working in healthcare leadership in the Hampton Roads area for the past 9 years. During that time, he successfully led three high performing Skilled Nursing Facilities in Virginia Beach and Chesapeake. Before transitioning careers, Patrick worked in public education as a teacher, administrator, and coach. He has completed a Master degree in Leadership from Virginia Tech and a Doctor of Education in Educational Leadership at the University of Lynchburg. Although not a veteran himself, Dr. Shuler comes from a vary patriotic family as the grandson of Donald E. Shuler, a decorated Rear Admiral in the Navy, and brother of Andrew D. Shuler who was Combat Controller in the Air Force Special Forces.

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Dr. James Rinella serves as a distinguished educator within the Campbell County Schools in Virginia, where he has dedicated his career to fostering an environment of excellence and innovation in education. With a strong background in educational leadership as a graduate of the University of Lynchburg Doctor of Education, and a deep commitment to student success, Dr. Rinella has played a pivotal role in developing and implementing programs that enhance learning outcomes and prepare students for future challenges. His leadership style, characterized by collaborative decision-making and a focus on evidence-based practices, has significantly contributed to the advancement of the school district. Dr. Rinella's contributions extend beyond administrative duties, as he actively engages with the community and stakeholders to ensure that the educational needs of all students are met, making him a respected figure in the field of education within Virginia.

Appendices

Appendix 1

Student Survey – Service-Learning

Service-Learning Project (circle the one in which you participate):

Free PT Clinic

Special Olympics

Wheels on the James

Girls on the Run

Cohort: A   B   C

1)   Describe the service-learning project for this course in two to three sentences.

2)   On a scale of 1 to 5, please rate how helpful the service-learning project in this course was at achieving the following goals: 1 = project was not helpful 5 = project was extremely helpful

master material covered in the curriculum	1	2	3	4	5
tie together concepts covered in the curriculum	1	2	3	4	5
apply concepts covered the curriculum to real situations	1	2	3	4	5
develop a deeper understanding of the material covered in the curriculum	1	2	3	4	5
develop a deeper understanding of material outside of the curriculum relevant in your graduate program	1	2	3	4	5

develop a better understanding of the role of public/nonprofit administration	1	2	3	4	5
learn to work with people more effectively	1	2	3	4	5
improve my problem-solving skills	1	2	3	4	5
improve my oral communication skills	1	2	3	4	5
improve my written communication skills	1	2	3	4	5
develop my leadership skills	1	2	3	4	5
feel more connected to my community	1	2	3	4	5
develop a deeper understanding of the complex problems facing my community	1	2	3	4	5
become more involved in volunteer activities	1	2	3	4	5

3) How could this service-learning project be improved? (Free Response)

4) How much guidance did the instructor provide on this project?

O a little guidance
O some guidance
O a great deal of guidance

5) How integrated was this project into the material covered in the curriculum?

O not at all integrated
O somewhat integrated
O very well integrated

6) How much time *in class* was spent discussing this project?

O a little time
O some time
O a great deal of time

7)   On average, how many hours per week did you spend working on this project outside of class?

O less than 2 hours
O 2–5 hours
O more than 5 hours

8)   How much influence did you have over how this project progressed?

O a little influence
O some influence
O a great deal of influence

9)   Are you currently participating in a major service-learning project for another class you are taking this semester?

O yes

O no

10)   If you answered yes to question #9, how much has the work you have done on the service-learning project in this class helped you with the service-learning project?

O not at all
O somewhat
O a great deal

Only answer questions 11 and 12 if you took part in group activities as part of the service-learning project for this course.

11)   How many members were in your group?

12)   How well did your group work as a team?

O not at all like a team
O somewhat like a team
O very much like a team

Background Information

13) Gender: O male O female

14) Age: O 21–29   O 30–39   O 40–49   O 50 or older

15) Race/Ethnicity

16) Are you a domestic or international student?

O domestic   O international

17) What was your undergraduate major?

18) What is your graduate student status?

O full-time   O part-time

19)   How many years of public and/or non-profit administration paid work experience do you have?

O None
O 3 years or less
O 4–5 years
O More than 5 years

20)   Prior to this semester, how involved were you in volunteer activities?

O not at all involved
O somewhat involved
O very involved

21)   Prior to this semester, how many major service-learning projects had you participated in as an undergraduate and/or graduate school student?

O 0   O 1   O 2   O 3   O more than 3

ABSTRACT

This current study measured the impact of a one-time semester-long course-based civic engagement activity on student learning and participant impact, particularly participants' willingness to engage in community dialogue and promote awareness of social justice issues within their communities. The service-learning project involved on-campus and online students from three criminal justice courses and a hybrid format event titled "*Finding Common Ground: Social Justice Issues Surrounding Mental Health & Mental Illness & Disorders*" at a Midwestern teaching institution. The two-hour event included roundtable discussions to promote open dialogue about mental health and mental health illness and disorders. Learning and self-impact were measured via self-constructed questions and the Civic Engagement Short Scale Plus (CES^{2+}). Results indicated increased endorsement for community engagement and positive qualitative feedback on self-empowerment. The findings provide insights into the potential benefits of service-learning activities, such as mental health community roundtables, for fostering community dialogue, personal growth, and social justice activism. The insights gained from the current study can inform future planning and enhancement of civic engagement initiatives while also contributing to developing community-based education and outreach strategies.

Unveiling the Transformative Power of Service-Learning: Student-Led Mental Health Roundtable Discussions as Catalysts for Ongoing Civic Engagement

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Mental health is a critical social and public health issue that affects individuals across various societal strata, which has become a popular and important topic for community discussion (Swaner, 2007). There are several ways to promote open dialogue and create safe spaces for communities to come together and engage in conversations about mental health. One is through civic engagement activities. Civic engagement offers a platform for individuals to engage in critical discussion with their communities, nurturing a consensus of responsibility through dialogue and education (Gallant et al., 2010). Such activities often communicate essential social and community issues, raise awareness, and facilitate social transformations (Eyler, 2002; Terry & Lockwood, 2020). One particular format of the current civic engagement activity was to utilize community roundtable discussions. Roundtable discussions encourage open communication and mutual learning experiences (Bringle & Steinberg, 2010). They can involve people with diverse backgrounds, encourage everyone to participate and share their views and gather feedback from participants about issues that can be improved within each community. The current study

measured personal endorsement for ongoing community engagement after participating in a one-time civic engagement event—this community dialogue was a student-led mental health roundtable discussion, at a Midwestern teaching institution.

Literature

Intersectionality of experiential-learning, service-learning, and civic engagement

Experiential-learning. Experiential-learning is a broad set of pedological practices that captures a range of processes whereby students learn from connecting experience to classroom learning (Kolb, 1984). These processes are different than community volunteerism as reflection is key (Burke & Bush, 2013). It is important to understand the intersectionality of experiential-learning, service-learning, and civic engagement and how these educational strategies work together to facilitate a learning environment that is holistic, participatory, and world ready. The current study utilized Dewey's educational philosophy, which states learning should be rooted in practical, real-life experiences and interactive learning rather than rigid and disconnected from the real-world activities that are overly reliant on mechanical memorization (Jorgensen, 2017). Dewey's educational framework endorses experiential-learning, where learners gain knowledge, skills, and comprehension through active participation (Gleason et al., 2011). An essential element of experiential-learning is reflection, which is instrumental in cultivating career awareness, applying academic theories to hands-on experiences, and dismantling stereotypes (Blair et al., 2014). Recent research on experiential-learning has examined its implementation in diverse settings, from higher education to corporate training (Kolb & Kolb, 2017; Terry & Lockwood, 2020). Studies have demonstrated that experiential-learning can enhance engagement, amplify comprehension of complex concepts, and cultivate hands-on working experiences (Whitley et al., 2017). By connecting experience and reflection into learning, experiential-learning enables students to grasp abstract concepts, hone critical thinking skills, and apply their acquired knowledge in real-world scenarios (Chiang et al., 2021).

Service-learning. While experiential-learning is an umbrella pedagogical term, service-learning serves as one example of this unique form of learning. Service-learning is a type of experiential-learning that connects community service to education and reflection to enhance the learning process, cultivating social responsibilities and community collaborations (McClam et al., 2008). Community service-learning acts as a vehicle for universities to contribute to broader social issues (Butin, 2010; Terry & Lockwood, 2020). This approach encourages students to develop a sense of social accountability by actively contributing to activities that enhance their communities' overall quality of living. It promotes student learning and skill development through hands-on participation in service experiences addressing community needs (Salam et al., 2019). Service-learning activities are designed to benefit both the community and the participating students.

Civic Engagement. Civic engagement activities can function as a form of service-learning when integrated into a more extensive curriculum with reflection and analysis. Within the service-learning framework, civic engagement often encompasses activities that bolster community living standards through political and non-political means (Cress

& Stokamer, 2020). Such activities may involve volunteering in the community, attending public meetings, participating in local government affairs or coordinating community events to promote civic engagement and shared governance. Overall, experiential-learning, service-learning, and civic engagement are interconnected concepts crucial to providing comprehensive educational experiences in higher education. These elements allow students to apply academic theories to real-world challenges, interact with communities addressing diverse needs, and acquire critical skills contributing to their future success (Jonassen, 2000).

Personal Development in Civic Engagement

Numerous quantitative studies have evaluated the impact of service-learning on students through different lenses. Some scholars have quantitatively assessed academic learning (Eyler, 2000), personal and interpersonal development (Eyler et al., 2003), and civic engagement (Eyler et al., 2003). Other scholars have qualitatively examined the influence of service-learning on stereotypical attitudes (Hirschinger-Blank & Markowitz, 2006) as well as multicultural competencies (Root et al., 2001). Though past studies have delved into the impact of service-learning on students' personal growth, there is a need for additional research to assess the effects on students *and* project participants.

Civic engagement activities, like community roundtable discussions, offer distinct opportunities for individuals to engage with issues pertinent to their community. Studies indicate that civic activities focusing on mental health awareness enhance participants' understanding of mental health issues and mental health literacy and the diverse perspectives of others surrounding these issues (Boyd & Brackmann, 2012). Engaging in civic activities, such as community roundtables, can cultivate critical thinking skills by engaging in discussions, challenging assumptions, and analyzing differing perspectives (Nokes et al., 2005).

Raising Awareness through Civic Engagement

Beyond the personal benefits delineated earlier, civic engagement activities revolving around mental health issues can educate the public, reduce stigma, and nurture a supportive and understanding environment. Community-oriented forums can help dismantle stereotypes and misconceptions, leading to a better-informed and compassionate society (Corrigan et al., 2012; Daniele et al., 2022). Mental health issues often suffer from stigmatization, resulting in social isolation and discouraging individuals from seeking help (Martin, 2010). Through open dialogue, communities can work towards demystifying mental health, providing a supportive environment for individuals to seek support without fear of judgment or rejection. Such participation can increase community-based support networks and resources, nurture a sense of acceptance and understanding among community members, and provide a platform for individuals to share their experiences and learn about the resources available to them (Luo et al., 2020). Mental health dialogues can also lay the groundwork for local policy changes and interventions (Rones et al., 2000). Civic involvement regarding mental health issues can bridge the gap between policymakers and their communities, leading to better informed, efficient, and supported mental health policies (Hanney et al., 2003).

In the current project entitled *Finding Common Ground: Social Justice Issues Surrounding Mental Health & Mental Illness & Disorders,* three courses (one on-campus course and two online courses) researched mental health challenges and disorders with slightly different sub-focal areas (e.g., grassroots programs and suicide rates within the profession). The researchers aimed to provide data to inform future civic engagement activities and community-based educational efforts. The current study sought to extend the understanding of service-learning impacts experienced by students and participants. As such, the current study utilized the following research questions:

- Upon participating in the *Finding Common Ground* event, participants will report an increase in endorsement and internalization of making a difference in communities using the CES[2+].
- Upon participating in the *Finding Common Ground* event, student leaders will report an increase in endorsement and internalization of making a difference in communities using the CES[2+].
- Upon participating in the *Finding Common Ground* event, participants will report an increase in knowledge about mental health through open-ended questions on the post-test survey.
- Upon participating in the *Finding Common Ground* event, participants will report an increase in personal commitment to continue community dialogue through open-ended questions on the post-test survey.

Methods

Participants

Students from three courses at a Midwestern university were involved in different phases of the service-learning project as part of their course requirements. The three courses included: 1) an on-campus criminal justice class entitled Social Justice: Policy and Action; an online criminal justice course with the same social justice title; and 3) an online criminal justice course entitled Mental Health and the Criminal Justice System. All students completed a series of assignments including: 1) a list of ten peer-reviewed empirical sources; 2) an annotated bibliography of the ten sources; and 3) a brief in-class presentation (for the on-campus course) or discussion board (for online students). Lastly, on-campus students (n=7) (this piece was optional for online students) then led roundtable discussions on their topics in a hybrid format, offering in-person and virtual attendance options. The event was held in hybrid format for a total of two hours during the evening hours of the Fall 2022 semester.

In total, the seven on-campus students along with three online students attended and participated in the roundtable event. In addition to the roundtable student leaders (n=10), there were 43 additional attendees either in-person (n=26) or virtually (n=17). A pre- and post-test were employed, and six surveys were eliminated from the data as the participant completed only the pre or post-test, but not both. While there was a total of 53 individuals in attendance, there were a total of 19 pre- and post-test surveys completed (student leaders: n=6; attendees: n=13). Ages ranged from 18 to 54 with a mean age of 25.5. Race/ethnicity was consistent with the university's mostly Caucasian population. Specifically, 14 identified as Caucasian, one identified as multiracial, one as

Asian, one as African American, and two preferred not to respond to this question. Fourteen participants identified as students, two as staff members, and three identified their role as "Other" but did not specify. Thirteen identified as women, four as men, and two declined to answer the gender identity question. Lastly, ten of the 19 participants identified themselves as living with mental illness while 15 individuals knew of someone close to them with lived experience with mental illness.

Materials and Procedures

The current study aimed to measure the impact of a one-time civic engagement activity, for both the student learning impact as well as participant impact, through self-constructed questions as well as use of the Civic Engagement Short Scale Plus (CES^{2+}) (Purdue, 2022). The CES^{2+} was created to assess an individual's endorsement and internalization of making a difference in communities. The tool is quantitative in nature and uses a 6-point Liker Scale (1=not at all; 6=very high degree) based on Bloom's Affective Domain. The CES^{2+} is comprised of 14 questions broken down into the sub-themes of: 1) Community Diversity & Culture; 2) Knowledge Analysis; 3) Civic Identity & Commitment; 4) Civic Communication; 5) Civic Action & Reflection; and 6) Civic Contexts/Structures. While sub-themes are provided, Purdue (2022) has yet to establish validity or reliability of the short scales. CES^{2+} was used as a pre-and post-test measure for those attending the *Finding Common Ground* event.

The researchers then developed a self-created list of additional items including both quantitative and qualitative questions to assess the impact of the one-time civic engagement event. These questions ranged from inquiring about training and professional experience with mental illness to prior involvement in similar civic engagement events. Table 1 outlines the additional questions added to the pre-test portion of the project. Table 2 provides a reference for questions added only to the post-test portion.

Table 1: Self-created Pre-test Survey Questions

Have you received formal training on mental illness and disorders in the past?
Will you, or do you, work directly with people with lived experience with mental health challenges?
Have you ever attended a community event similar to the one provided on November 7, 2022, known as the Finding Common Ground event?
If yes to the previous question, in total, how many events similar to this have you attended?
On a scale of 1 through 10, how well do you think you understand the social issues surrounding mental health and mental illness and disorders?
Do you have lived experience with mental illness?
Does someone close to you have lived experience with mental illness?

Table 2: Self-created Post-test Survey Questions

What did/does participating in the Finding Common Ground event mean to you?
Please appraise the quality, value or the importance of participating in the Finding Common Ground event.
If you have one, please provide a goal statement: What you will do as a result of your participation in the Finding Common Ground event?
By participating in the Finding Common Ground event, your knowledge, skills, attitude, or behavior has improved. (5-point Likert Scale provided)
What was your primary reason for taking part in the Finding Common Ground event?
Please provide additional information about the Finding Common Ground event that you believe is important to share.

Results

CES[2+] Findings

First, to test hypothesis 1, the researchers examined overall differences between pre-event endorsement of making a difference in the community and post-event endorsement. A significant difference was found between the pre-event (M= 4.24, SD= .58) and post-event (M= 5.04, SD= .31) endorsement of making a difference in the community t[18] = -3.44, p = .002 when utilizing the full sample. Overall, participants reported greater interest in internalizing the importance of engagement in making a difference in the community after participation in the civic engagement event.

Second, to test hypothesis 2, a comparison was made between responses provided by students leading the civic engagement roundtable and other participants. No significant difference was found between the pre-event (M= 4.26, SD= .40) and post-event (M= 4.92, SD= .27) endorsement of making a difference in the community t[5] = -2.36, p = .06 for students leading the event. However, for all other participants, a significant difference was found between the pre-event (M= 4.23, SD= .71) and post-event (M= 5.08, SD= .35) endorsement of making a difference in the community t[12] = -2.68, p = .01.

Next, as an extension of hypothesis 2, paired-samples t-tests were run to assess pre- and post-event differences on each of the six sub-themes. A significant difference was found between the pre-event Civic Communication sub-theme (M= 4.24, SD= .58) and post-event Civic Communication sub-theme (M= 5.04, SD= .31; t[18] = -3.44, p = .002. A difference approaching the significance level was found between the pre-event Community Diversity & Culture sub-theme (M = 3.82, SD = .15) and the post-event Community Diversity & Culture sub-theme (M= 5.14, SD = .02; t[18] = -4.14, p =.053. No significant difference was found between the pre-event Knowledge Analysis sub-theme (M = 4.47, SD = .02) and post-event Knowledge Analysis sub-theme (M = 5.21, SD = .13; t[18]= -4.66, p = .13), the pre-event Civic Identity & Commitment sub-theme (M =4.56, SD = .00) and post-event Civic Identity & Commitment sub-theme (M =5.15, SD = .13; t[18]=-2.71, p = .11), the pre-event Civic Action & Reflection sub-theme (M =4.51, SD = .00) and the post-event Civic Action & Reflection sub-theme (M =4.63, SD

= .19, $t[18]$ = -1.80, p =.32, or on the pre-event Civic Contexts/Structures sub-theme (M =3.92, SD = .40) and the post-event Civic Contexts/Structures sub-theme (M =4.92, SD = .16, $t[18]$ = -6.33, p =.09.

Qualitative Findings

To test hypothesis 3, specific to understanding mental health and mental illness and disorders, participants self-identified how well they understood this as a social issue, pre- and post-event participation. Prior to engaging in the event, the average rating on a scale of 1-100 (1= no understanding; 100=complete understanding) was a 75. After participating in the event, the average self-rated score increased to 85. Additionally, the CES[2+] findings suggest that, overall, the one-time civic engagement activity was effective in increasing one's endorsement in further engaging and promoting the importance of making a difference in one's community. Finally, to test hypothesis 4, the remaining findings outline uncovered themes from the open-ended/qualitative survey questions. Participants were asked to respond to the questions of, "*What did/does participating in the Finding Common Ground event mean to you?*" and "*What will you do as a result of your participation in the Finding Common Ground event?*" Three themes emerged.

Working together**.** Participants provided written responses about the importance of working together to share ideas. For example, when asked what their participation meant to them and/or what they would do moving forward, the following provides a few examples of this theme:

"Working together to find avenues to help others as well as share some ideas."

"Spreading more awesomeness of mental health in the criminal justice system."

*"*Working together to find avenues to help others as well as share some ideas."

"The event resulted in me feeling more hopeful about community's working together for change."

*Increase Knowledge***.** Participants noted a key takeaway as helping increase mental health literacy in others. As most survey participants were students, this theme included recognition of being able to speak with groups outside of one's comfort zone, within the classroom:

"I want those in the criminal justice field to know more about mental health issues."

"I want to help others talk about mental health to learn about the topic."

"It gave me a different perspective through conversation with different age groups."

"I will continue to spread more awareness of mental health to those around me."

"I plan on doing events comparable to finding common ground to give people opportunities to understand and communicate better."

Personal Engagement**.** The final theme that emerged was specific to student growth and evolvement due to participation. Some students focused on the importance

of being able to further understand the perspective of others while some said they were now more comfortable with themselves:

"Participating in the Finding Common Ground event meant a lot because as a virtual student, I'm not always able to interact with classmates, so when I'm able to meet more people, I consider what they have to say even more."

It actually meant a lot to me because it helped me with my anxiety and to come out of my shell."

"This event will help me continue to keep an open mind to ensure I'm taking an active part in positive change."

"I will continue my own personal growth as well as find more ways to help my community."

"I want to find ways to help promote mental health in my community."

Discussion

Through this experiential-learning civic engagement project, the researchers aimed to assess the perceived personal impact of participating in roundtable discussions on mental health topics. The pre-and post-test surveys were used to examine the effectiveness of these discussions as a form of civic engagement that could lead to ongoing interest in participating in community dialogues. As with all projects, this event, and the data collection, had limitations.

Limitations

First, to the best of the researchers' abilities, it seemed there was a lack of options for a survey to assess the impact of a one-time civic engagement activity. While the CES[2+] was the best fit given the current project, validity and reliability were lacking, including for the six sub-themes. Second, this event focus (mental health), including the hybrid format, had not been facilitated before. As such, there were some audio barriers for virtual attendees due to the inability to prevent the spread of volume from one roundtable to the next. Therefore, it is possible that virtual participants were not able to engage to the same degree as those in-person. This could also have influenced if they chose, or were aware of, the possibility to complete the pre-and post-survey. Lastly, although the researchers had assistants in place to help facilitate the logistics of the event, it seemed many participants were unaware of the option to complete the pre-test survey. Their lack of pre-test completion subsequently prevented their post-test completion. Additionally, an increased sample size would help to further confirm the effectiveness of a one-time community civic engagement event on endorsement to continue in community dialogue.

Implications & Future Directions

This study yielded valuable insights into the personal impact of participating in a one-time civic engagement activity. Overall, in support of hypothesis 1, findings suggest

a one-time event, such as the current *Finding Common Ground* dialogue event, can have a significant impact on one's endorsement to continue community-based conversations. If a two-hour event can inspire one to commit to ongoing community improvement, it seems many universities and other agencies can implement such activities to further spread interest in community dialogue without exerting significant time and labor. Future scholars should replicate the current project and consider if longer involvement in a similar activity would result in even greater endorsement for change. It would also be valuable to measure the sustained endorsement of commitment to civic engagement through a longitudinal design.

Student leaders participated in the project throughout a full academic semester, not just for the two-hour event. They spent many hours and submitted numerous course assignments to prepare. For hypothesis 2, the researchers assumed that an increase in hands-on involvement with the topic would result in higher endorsement for the importance, along with being the event leaders. However, the findings did not support this assumption. It seems their semester-long involvement may have interfered with measuring an event pre- and post-test as possible endorsement for the importance of such a project may have occurred at some point prior the event, during the academic semester. The current methodology cannot confirm this assumption. If future instructors want to implement a similar project within a course, it could be valuable to use the CES[2+] or similar tool *throughout* the semester, rather than at the event, only.

Qualitative questions provided support for hypotheses 3 and 4. Providing participants with open-ended questions allowed them written expression on the impact the project had on them as well as plans to continue such facilitation or participation. Specifically, participants mentioned the importance of working together, building knowledge on the subject, and personal engagement in ongoing community change.

Conclusion

The project utilized a course-based semester-long project that involved online and on-campus students from several courses and across multiple professors. Campus students were required to complete the full set of assignments, including facilitation of the hybrid event, while the event facilitation was optional for online students. A pre-and post-test survey was utilized to measure the effectiveness in endorsement to further engage in community change. Overall findings found endorsement of engagement in community activities from participation in the two-hour *Finding Common Ground* event. Qualitative responses also favor the implementation of such a project as participants reported personal gains, an interest in sharing knowledge regarding the topic, and a desire for ongoing community dialogue. The study represents a major step towards understanding the personal impact of civic engagement activities, specifically in community discussions on mental health. The findings can help with the planning and improvement of future civic engagement initiatives and can contribute to a body of knowledge that can inform policy and practice in community-based education and outreach.

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ABSTRACT

In April 2023, a group of 1 administrator, 5 faculty, and 20 students from the University of Louisiana Monroe (ULM) traveled to the Dominican Republic to participate in an interdisciplinary service-learning project lasting six days. Disciplines involved included pharmacy (2 faculty members and 9 students), physical therapy/kinesiology (1 faculty member and 5 students), social work (1 faculty member and 4 students), and political science (1 faculty member and 2 students). The home base for the group while in the Dominican Republic was Abba's House Children's Center, a nonprofit Christian organization tasked with feeding, educating, and providing limited medical care to approximately 125 children living in the barrio of Cienfuegos. During the service-learning experience, ULM students engaged in various service and learning activities tied to their programs of study. Students and faculty completed the *Community Service Attitude Scale* (CSAS) before and after the service-learning experience (Schwartz & Howard, 1977). A total of 14 students (70%) submitted both a pre- and post-trip CSAS survey. There was a significant improvement in scores for 21 out of 25 items on the CSAS. This international interdisciplinary service-learning program positively impacted students' attitudes toward community service including awareness of global needs.

The Impact of an International Service-Learning Experience on University Students' Community Service Attitudes

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Over the past decade, there have been increasing calls for greater interaction between higher education and the "real world" (Markaki et al., 2021), for higher education institutions to educate students about democratic citizenship (Rockenbach, 2020), and to attend to students' moral development (Hudson & Brandenberger, 2023). In response, a greater emphasis has been placed on service learning in academia. Service-learning is defined by Bamber & Hankin (2011) as a teaching strategy that employs social service in higher education students' learning to improve or eliminate problems in communities while collaborating with community partners who have direct connections to the problems. Students and faculty engaged in such service-learning projects

experience improved civic and social dimensions of learning (Marta & Gonzalez, 2012), become more socially responsible, gain a greater focus on social justice (Lucas et al., 2013), increasingly engage in reflective practices of such experiences (Markaki et al., 2021), and become more empathetic (Herrmann, 2020; Chang et al., 2019). In addition, international service-learning (ISL) experiences have been instrumental in preparing students for a global workplace and developing their intercultural competence (Hammersley, 2013). While scholars have not been able to agree on a primary definition of intercultural competence, stating that its meaning varies according to the context of usage, most scholars agree on three primary elements of intercultural competence: attitudes, knowledge, and skills (Deardorff, 2011; Moule, 2011; Portera, 2014; Sue & Sue, 2015). Attitudes include those attributes that facilitate interpersonal relations such as curiosity, respect, acceptance, openness, empathy, and flexibility. Intercultural knowledge is knowledge and awareness of not only one's cultural self, but also the cultures of others. Finally, skills in this context would encompass one's ability to utilize and apply their knowledge in solving a problem, completing a task, or managing a conflict (Tang & Schwantes, 2021).

Bringle and Hatcher defined ISL as:

A structured academic experience in another country in which students (a) participate in an organized service activity that addresses identified community needs; (b) learn from direct interaction and cross-cultural dialogue with others; and (c) reflect on the experience in such a way as to gain further understanding of course content, a deeper understanding of global and intercultural issues, a broader appreciation of the host country and the discipline, and an enhanced sense of their own responsibilities as citizens, locally and globally. (2011, p. 19)

Markaki et al. (2021) identified the following general service-learning goals: "provision of opportunities to enrich student learning experiences, increase confidence in problem-solving, teach civic responsibility, and strengthen communities" (p. 3). Not only do students and faculty benefit from such experiences, but community needs are often met. For example, students bring specialized skills, fresh ideas, and high levels of enthusiasm and have the capacity to meet real community needs.

Partnerships involving service-learning are often referred to as Academic Service Partnerships (ASPs) and are defined as "strategic relationships between educational and clinical practice settings that advance practice, education, innovation and research, leveraging the talents of both partners and thus, advancing mutual interests and priorities" (Markaki et al., 2021, p. 1). Van de Ven (2007) identified key attributes of ASPs to include collaboration, leadership across all involved entities, engagement in scholarship related to community needs, and regular communication.

Studies of service-learning in the United States and North America are fairly prevalent, but studies of service-learning in Latin America and the Caribbean are limited (Markaki et al., 2021). In fact, in a review of the global literature, DeGeest et al. (2013) found that 85% of all such ASPs were in the United States, 7% were located in Canada, 5% in Australia, and the remaining 3% in other countries, suggesting that either information about ASPs is not being reported in other locations or is simply more prolific in the U. S.

Trip Preparation

The first conversations surrounding the possibility of such a trip occurred between two faculty members, one in education and one in pharmacy beginning in 2021. The education faculty member, Dr. Watson, already had a working partnership with Abba's House Children's Center (AHCC) and its director, Mr. Rodriguez, and had visited the location previously. The pharmacy faculty member, Dr. Rotundo, had begun working on a different service-learning project in the Dominican Republic previously, which had to be canceled due to the COVID-19 pandemic. The two decided to gauge interest in such a project among ULM faculty and students by initially presenting the idea at a meeting of the ULM Interprofessional Education Committee in 2021. Interest was high, and Drs. Watson and Rotundo continued to spread the word about such a trip among students and faculty at other meetings and events. By 2022, it was apparent that there was enough interest to begin officially planning such a trip. Trip plans continued and ramped up in 2022, with the trip slated to occur in April 2023 during ULM's spring break.

Nine faculty leaders interested in participating in the trip began to regularly meet and plan. Ideas discussed included fund-raising initiatives, such as writing an internal ULM Student Activity Enhancement Fee (SAEF) grant application and an internal ULM Opportunity Fund (OF) grant application. The primary purpose of these grant applications was to cover the costs of the trip for students (plane fare, hotel, and meals).

In the fall of 2022, 25 students submitted their applications, which were evaluated by faculty according to a rubric template. Twenty-two students were notified of their acceptance to participate in the trip. By January 2023, the SAEF application was funded in its entirety and students were notified that their trip expenses would be covered by this funding. During the winter of 2023, leading up to departure, students obtained passports, travel vaccinations, and attended three Zoom planning sessions designed to prepare them for international travel, trip experiences, and the culture of the Dominican Republic. Pharmacy students also collected donations of over-the-counter medicines and medical supplies for the Children's Center. By the time airline tickets were reserved in February, four participants had withdrawn from the trip due to various reasons including health. On April 8th, the team departed for Santiago, Dominican Republic. The final team consisted of five faculty, one senior administrator, and 20 students.

Mr. Rodriguez, the director of AHCC, met the team at the Santo Domingo airport and two buses transported all team members to a hotel in Santiago, approximately 30 minutes from AHCC in Cienfuegos. The next day students were transported to AHCC where they painted the interior of the Center as part of their service activities. An orientation dinner took place at the hotel that evening where team members met the translators and discipline-specific hosts they would be working with throughout the week and learned the history of AHCC and some of the details of the coming days.

Cienfuegos

Cienfuegos is a barrio located on the northwest edge of Santiago in the Dominican Republic. In close proximity to Cienfuegos is an expansive landfill (Rafey Landfill) that is constantly smoldering and contributes significant pollution to the environment in the area. The Rafey Landfill receives up to 1800 tons of waste per day. It is in the dump where many of the first children receiving services from the Center were originally located, scavenging through the refuse looking for items to sell to help support their families. These children often "trash-picked" in temperatures above 100 degrees and for 12 hours or more per day, looking for plastic, tin, paper, glass, and copper to sell in local junk stores and for food for their own consumption.

The houses of Cienfuegos residents are often clapboard shanties with tin roofs pieced together with scavenged cast-off materials from the dump and streets. There are no latrines, limited furniture, rudimentary cooking equipment, and family members often sleep on the floor on mattresses. See figures one and two. Many of the parents/guardians, if they are fortunate enough to have a job, work in sweat shops for approximately $1.50 per hour, which keeps them locked in poverty.

Figure 1

Figure 2

Abba's House Children's Center

The Children's Center was established in 2009 and arose out of the conviction of Mr. Rodriguez, who first became committed to providing for impoverished children when he encountered them at the Rafey Landfill and on the streets while he was walking to and from college. As a college student, he forged a bond with several of the children and would bring food to them each day on his way to school. Years later, as a pastor and certified teacher of English, Mr. Rodriguez established the Children's Center in a small, rented building where he served as Director. Mr. Rodriguez later partnered with a U.S. donor to obtain funds for the construction of AHCC in 2016. The same donor regularly provides funds in the amount of $1,500 per month, which provides enough money to feed most of the now 125 children three meals per day, five days per week. The primary mission of AHCC is to provide educational, nutritional, social, emotional, medical, and spiritual care for orphaned, abandoned, or otherwise needy children living in extreme poverty in the Cienfuegos area. Currently, several individual donors also help to provide finances so these services can continue to be offered.

Evidence indicates that Abba's House Children's Center is a solution and impetus for breaking the cycle of impoverishment among the families of the children it serves. Over 750 children have been served at AHCC over the past nine years, at least 70 of whom were at significant risk of sexual trafficking/exploitation. Greater than 300 of those children arrived at the Center with anemia and parasites, all of whom were treated medically and are now healthy. Over 300 of those children learned to read and write at the Center. Over 200 Center graduates now serve as leaders at many area churches. Over 100 graduates went on to become secretaries, nurses, receptionists, teacher assistants, and cosmetologists. Additionally, one female attendee recently graduated from medical school.

Service-Learning Project

Drs. Watson and Rotundo, along with Mr. Rodriguez and faculty leaders planned an intricate schedule of activities for each discipline participating in the project. Activities began on Sunday with all disciplines working together to paint the interior of the Center. Later on the same day, the entire team of faculty and students were transported to Juan XXIII Municipal Hospital where they attended a presentation on health care in the Dominican Republic led by Drs. Watson and Rotundo. That evening, the team met and interacted with Mr. Rodriguez, and a team of 7 translators and 5 community leaders at an orientation dinner at the hotel where they were introduced to the week's planned activities. Beginning the second day of the trip (Monday), the student teams were divided by discipline to participate in these activities. What follows are descriptions of each discipline's activities for the week.

Kinesiology/Physical Therapy

On Tuesday, the physical therapy students and their faculty member toured Pontifica Universidad Catolica Madre y Maestra's (local university) physical therapy and medical school departments where they had an opportunity to engage with Dominican Republic physical therapy students and share contact information to help build a support and network around physical therapy education for future collaborative opportunities. Dr. Jones, the faculty physical therapy lead, shared her contact information with the previously mentioned university's physical therapy faculty and medical staff for future collaborations to assist in meeting community medical and educational needs. Students also engaged in clinical observations of physical therapy practices with intervention in multiple settings throughout Dominican Republic hospitals, clinics, and the general community. These observations included orthopedics, neurology, pediatrics, outpatient/community-based clinics, and prosthetics and orthotics. Finally, students organized sports/play activities to enhance physical fitness while maintaining safety and supporting team-building skills with the children of Abba's House Children's Center.

Pharmacy

Because of the larger size of the Doctor of Pharmacy group (9 learners and 2 faculty members, Dr. Rotunda and Dr. Andonie), the group split up for many of the activities to allow for small-group discussion and ensure that all students had the chance to fully participate. On Monday, one group of students visited the outpatient pharmacy at the municipal Hospital Periferico de Cienfuegos with a local pharmacist and then interviewed community members at the Abba's House Children's Center medical clinic about their medications and health needs. Another group accompanied physical therapy students to a local university and rehabilitation center to learn about the medical system in the Dominican Republic, guided by a local physician. On Tuesday, all students and faculty toured the municipal Hospital Periferico de Cienfuegos with a local pharmacist, including visits to the inpatient pharmacy, hospital wards, and tuberculosis dispensing area. In the afternoon, one group visited a pharmacy specializing in dermatological products, and another group visited a private community pharmacy. On Wednesday, students conducted health screenings of community members at the AHCC medical clinic, including blood pressure and blood glucose screenings, medication counseling, and a health needs assessment. In the afternoon, students visited the homes of residents in the community with a local physician to complete a health needs assessment to guide future activities in the community.

Political Science

Two students and one faculty member from Political Science engaged in a variety of activities while in the Dominican Republic, alongside their local guides: a cultural coordinator, translator, and a contracted driver who remained with them throughout the trip to transport them to the city. On Monday, the first day of group activities, Political Science students and faculty visited the provincial government building in Santiago, where they learned about the history of Santiago and viewed citizens lining up to receive governmental services and assistance. Across the street from the provincial government building is a famous park, revered by locals as it has been the site of important, historical political speeches. There, students witnessed a peaceful political protest in action. The park is also home to a number of statues commemorating the founding fathers of the country as well as a historic gazebo. Next, students walked through the city center of Santiago, the architecture of which is strongly influenced by Spanish and French colonial eras, to the Fortaleza San Luis, where they were given information about the history of the Fort during the fight for Dominican independence and the transformation of the Fort over time from military site to government building complex and museum. Afterward, students took a walk through a large, winding tourist market, where their cultural coordinator demonstrated that the presence of a significant number of Haitian vendors in the market signified that despite stereotypically negative media coverage of the relationship between Haiti and the Dominican Republic, Haitians were welcome in the country. After lunch, students and faculty were taken to the Santiago Justice Palace, where a local attorney took them on

a tour of the facility and explained the intricacies of the Dominican justice and legal systems - students were excited to be able to receive such a personal welcome to the Justice Palace and to have the opportunity to see courtrooms and ask questions about the legal system directly of a practicing attorney in the country. Afterward, students sampled traditional Dominican street food from a vendor in Santiago and drove through a major agricultural market in the city, where vendors typically sell produce and other goods to commercial buyers.

The following day, Tuesday, students and faculty began the morning with a trip to the Santiago City Hall. There, they met with a number of local government officials, including appointed and elected leaders, such as alderman, party leaders, and public administration officers. Students were privileged to view a video chronicling the recent cleanup effort in Santiago spearheaded by the current mayor and have detailed discussions on the role that public art has played in the revitalization of the city. They discussed with city leaders the burgeoning role of women in local government and political leadership as well as regional and national electoral structures. Students were also able to tour the actual meeting room in which aldermen cast votes. Next, they visited the Leon Cultural Center, where they viewed fantastic Dominican art and historical exhibitions and learned about the Center's role in preserving local cultural traditions. After lunch, Political Science students visited the Santiago Archives, where a diligent staff discussed how they preserve historical records and documents and how they are attempting to share genealogical records with the public. Students were treated to a first-hand view of how the genealogical records are carefully scanned and uploaded online to a free, globally accessible search engine. Afterward, students and faculty toured the local public library in Santiago, where they learned of the various Santiago citizens awarded by the library due to their active participation in maintaining the library facilities and materials. Next, students and faculty visited a local historic bar in Santiago, Casa Bader, founded in 1939. There, they heard from a local official about how the bar forbade women to enter until just ten years ago, due to the desire to differentiate the bar from the proliferation of brothels in the city at the time of the bar's founding. The bar is also distinctive for its Lebanese roots, which continue to inform the street food the bar offers patrons. Students ended the day by "haggling" with the vendors (with the assistance of their cab driver) at the Santiago tourist market, which their translator assured them is a core part of Dominican culture.

Wednesday, Political Science students once again gathered with students from other disciplines at Abba's House Children's Center and Clinic, where students interacted with the children, toured the village, patronized local stores, and viewed the homes of some village residents. Thursday, after spending the day at the beach, Political Science students, along with all other disciplines, returned to the city center in Santiago to receive a cultural demonstration. At a historic home converted into a cultural center and restaurant on the edge of the historic city park, students and faculty were treated to dinner and a lesson in traditional Dominican dancing and culture, including an appearance by Carnival characters and their signature whips.

In summary, Political Science students received an excellent introduction to Dominican politics, governance, culture, and history. All of their local guides were extremely helpful and informative at each point of the trip and very happy to talk with them about the Dominican way of life, as were various officials and employees at each location they visited. Spontaneous welcomes were the norm; for instance, local party leaders chose to welcome students and faculty into their offices and speak with them about party politics while at City Hall, though they had not been specifically asked to do so before students arrived. Everyone the Political Science students met went above and beyond to answer their questions and attempt to provide the most enjoyable and informative experience possible while in the Dominican Republic. One Political Science student, when asked about the most liked or beneficial aspects of the trip, noted, "[I liked] [t]raveling through Santiago and visiting the government buildings and museum. I enjoyed meeting all of the government officials and thought our cultural expert was incredible. Almost everyone I met on this trip had been welcoming and kind." At multiple points throughout the trip, Political Science students noted that they felt this trip had reinforced their choice of academic major. Such experiences will not only generate great memories but allow students a new understanding of how service-learning can enhance academic careers.

Social Work

Four students were identified as social work majors. On Monday, Tuesday, and Wednesday, these students, the faculty member, and a local social worker known by most Cienfuegos residents walked among the homes in the village of Cienfuegos, stopping at many of the houses to meet the residents and interview them. The purpose of the interviews was to provide demographic data for a report needed by the Dominican Republic government. Information collected included the total occupants of each home, genders, and ages of occupants, health conditions of occupants, literacy levels, and income sources. At the end of the week, these data were tabulated and submitted to the government representative. On Wednesday, social work students attended a Cienfuegos community meeting in which they met local social leaders and observed how community problems are identified and ultimately presented to governmental leaders. In the afternoons, social work students worked with children at AHCC with crafts and education.

Debriefing/Reflection

Each evening, a formal debriefing session took place during the evening meal and involved both faculty and students. Students and faculty were asked to reflect on moments during the day that had specific meaning to them. These reflections included expressions of empathy towards the impoverished, admiration of discipline-specific faculty skills, respect for cultural differences, the collaborative troubleshooting of problems, how practice with discipline-specific skills in new contexts built confidence in students, admiration for translators and professionals of the host country, the difficulties

of communicating to patients via interpreters, learning to be professional in dire situations, showing love and compassion to an oppressed people, and so much more. The debriefing sessions also proved to be an effective means of troubleshooting practical problems such as transportation and scheduling, reviewing the day's activities, discussing the following day's plans, and providing closure for each day's activities.

Challenges in Implementation

This first cross-college global service-learning project was not without challenges. Funding notice was received too late for many students who initially showed interest in following through. Some students waited for passports to arrive up until the final week. Once on the ground in the Dominican Republic, students expected the schedule to be rigidly adhered to, without consideration of third-world complications. When the schedule had to be changed several times, students voiced frustration. In addition, students forged friendships with interpreters, and then expected them to be included in extracurricular activities, not considering the added cost this would produce that neither the university nor the interpreters could afford.

Methodology

Table 1 summarizes characteristics of the students completing the experience. Fifteen of the participating students were female (75%) and five were male (25%). One student (5%) was classified as a sophomore, 7 (35%) as juniors, 3 (15%) as seniors, and 9 (45%) as graduate students.

Table 1

Demographics of Student Trip Participants (*n=20*)

Characteristic	N (%)
Gender	
Female	5 (25)
Male	15 (75)
Classification	
Sophomore	1 (5)
Junior	7 (35)
Senior	3 (15)
Graduate Student	9 (45)

Convenience sampling was utilized for this study. All 20 students were offered the opportunity to complete the pre- and post- tests, but 14 (70%) opted to do so. The pre-experience survey was completed at a U.S. airport prior to departure while the post-

experience survey was administered upon arrival back to the U.S. at the Miami airport six days later.

Community Service Attitudes Scale

The Community Service Attitudes Scale (CSAS) was utilized in this study to measure students' attitudes toward community service pre- and post- the service-learning experience (Shiarella et al., 2000). The CSAS is based on Schwartz's altruistic helping behavior model (Schwartz, 1977; Schwartz & Howard, 1982, 1984). Schwartz defined altruistic helping behavior as one's awareness of the needs of others and one's level of desire to help others. The model involves a series of progressive cognitive and affective steps, starting with the realization of a need and ending with an obvious helping response.

From Schwartz's model, community service attitude questions were developed by Shiarella et al. (2000) so that separate scales corresponded to each step of the model. For the purposes of this study, the Shiarella et al. survey was modified to twenty-five items, 24 of which focused on community service attitudes, while the 25th was related to the intent to participate in service-learning. Shiarella and colleagues purposely crafted intention items as outcome measures as intentions are often predictive of future behavior (Ajzen, 1988). A 5-point Likert-type scale was provided for response choices for all 25 items, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. Table 2 showa the pre-post- test items matched to the following phases in Schwartz's model (1977): awareness, actions, ability, connectedness, moral obligation, empathy, and helping.

Table 2

Community Service Attitude Scale Items Matched to Schwartz's phases.

Awareness
1. Some global communities need our help.
2. There are people in global communities who need help.
3. There are needs in global communities.
4. There are people in global communities who have needs that are not being met.

Actions
5. Volunteer work at global community agencies helps solve social problems.
6. College student volunteers can help improve global communities.
7. Volunteering in global community projects can greatly enhance the community's resources.
8. The more people who help, the better things will get.

Ability
9. Contributing my skills will make the community a better place.
10. My contributions to the global community will make a real difference.
11. I can make a difference in a global community.

Connectedness
12. I am responsible for doing something to improve the global community.
13. It is my responsibility to take some real measures to help others in need.

Moral Obligation
14. It is important to me to have a sense of contribution and helpfulness through participating in service-learning.
15. It is important to me to gain an increased sense of responsibility from participating in service-learning.
16. Other people deserve my help.
17. It is important to help people in general.
18. The global community needs good volunteers.
19. It is important to provide useful service to global communities via service-learning.

Empathy
20. When I meet people who are having a difficult time, I wonder how I would feel if I were in their shoes.
21. I feel bad that some people are suffering from a lack of resources.
22. I feel bad about the disparity across countries.
23. Without service-learning projects and community service, today's disadvantaged individuals have no hope.
24. It is critical that citizens become involved in helping disadvantaged communities in other countries.

Helping
25. I want to do this (service-learning) activity.

Student responses to the CSAS were entered into SPSS Statistics Version 28 (IBM Corporation) for analysis. A paired t test was performed for each of the 25 items in the questionnaire and for each student's mean score for all questions. A two-sided P-value < 0.05 was considered statistically significant.

Results

Table 3 provides the results from the paired t test across all 25 items.

Table 3

Paired T-test Results (N=14)

Item	Pre-Mean	Post-Mean	Two-Tailed P Value
1	4.50	5.00	**0.013**
2	4.79	5.00	0.082
3	4.71	5.00	**0.040**
4	4.57	5.00	**0.008**
5	3.36	4.21	**<0.001**
6	3.79	4.57	**<0.001**
7	3.79	4.43	**0.002**
8	3.64	4.29	**<0.001**
9	3.79	4.43	**<0.001**
10	3.57	4.36	**<0.001**
11	3.36	4.21	**<0.001**
12	3.43	4.29	**<0.001**
13	3.64	4.50	**<0.001**
14	4.43	4.64	0.189
15	4.57	4.86	**0.040**
16	4.21	4.50	**0.040**
17	4.57	4.71	0.336
18	4.36	4.86	**0.003**
19	4.29	4.93	**<0.001**
20	4.50	4.86	**0.019**
21	4.43	4.79	**0.019**
22	4.07	4.71	**0.007**
23	2.86	3.64	**0.003**
24	3.64	4.57	**<0.001**
25	4.79	4.93	0.165
Mean, all items	4.07	4.61	**<0.001**

Items with statistically significant differences are bolded.

Discussion

This study supports the value of this international, interprofessional service-learning project to improve college students' attitudes toward community service. A significant improvement was seen for the majority of items (21 out of 25) on the CSAS questionnaire following the trip. This improvement was seen even with high baseline scores which indicated overall positive attitudes toward community service prior to the trip. Changes in attitudes were particularly apparent for the Actions, Ability, and Connectedness domains of the CSAS questionnaire. This trip was the first time for many of our students to interact with members of an underserved community outside of the U.S., and these changes may relate to students' reflections on their own role in meeting international needs.

A growing body of literature supports the transformative power of international service learning on students in higher education. Niehaus & Crain (2013) provided an overview of literature examining student outcomes from international service learning, including students changing field of study or career goals, empathy for the host culture, increased efficacy to help others, desire to participate in future international experiences, intent to advocate on behalf of the poor, and intent to live a more socially conscious lifestyle. However, there is a lack of published literature using quantitative methods to examine the impact of international service learning on student attitudes toward community service. Our study helps to address this gap and contribute to the existing knowledge about international service-learning outcomes for college students.

This service-learning experience was unique in several ways, and differences in setting and structure may limit the applicability of our results to other experiences. The interdisciplinary nature of our team allowed students to learn from other disciplines' experiences. Students were in varying stages of their college education spanning undergraduate and professional training. Discipline-specific hosts facilitated activities for each group, including interactions with the local community in ways meaningful to each discipline. There was at least one faculty member present for each discipline to facilitate learning and reflection. Most students had little to no experience with international travel, which likely influenced the impact of the service-learning trip.

This study has some limitations to consider. It was a pilot project with a small sample size, and we were not able to attain post-trip surveys from all students due to the difficulty of following up after the return to the U.S. This was the first offering of this service-learning experience, and results should be confirmed over time as the experience evolves. Future work should examine other aspects of this and similar service-learning experiences, such as perceptions of the host community and effects on students' career choices and interprofessional teamwork competencies.

Conclusion/Next Steps

The University of Louisiana at Monroe identified student success and community engagement as two defining pillars in its 2022-2027 Strategic Plan. This international service-learning project aligned with the Strategic Plan's goal of preparing students to compete, succeed, and make contributions to a global society that is ever-changing. When conversations began around the Divisions for Academic and Student Affairs partnering together to create an experience for students that was academic and co-curricular in nature, the two divisions never imagined how this combination of community-service, instruction and reflection in one international, cross-disciplinary experience would impact students as they prepared for job placement. This international service-learning experience impacted students, both personally and professionally. One student stated, "I learned so much. I also realized how important it is to communicate with patients and how much it impacts their care when you are not able to communicate with them adequately." Another student shared "I was so moved by the level of gratitude of the people of the Dominican Republic for receiving a service that we often take for granted at home in the US. It made me want to do more service-learning trips like this." Moreover, the National Association of Student Personnel Administrators (NASPA), has identified as one of its strategic goals, Advocacy for Student Success, which includes critical thinking, fostering community, and collaborations with global partners to foster student learning and success. This NASPA goal is another signal that the ULM's global relationship building will ensure students are able to navigate an everchanging global society.

Fullerton et al. (2015) described such experiences as "epiphanic," which is echoed in one ULM student's feedback after this service-learning experience: "This experience has helped to confirm that I am in the right profession.." When students participate in high impact experiences such as this international service-learning project, the potential for long-lasting positive outcomes is significant, for both the students and their university. These outcomes could include increased student success, social responsibility, career development, job preparation, enhanced university relations, and more. ULM has made the decision to repeat this experience at least annually, and conversations are presently occurring about locating a permanent funding source. In addition, Academic Affairs and Student Affairs at ULM will continue to forge relationships with local, national, and foreign entities for additional service-learning experiences, thus creating more transformative projects, services, and experiences.

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ABSTRACT

Service-Learning (SL) is a powerful methodology to acquire competences and values in Higher Education. However, there is still no widespread use in Information and Computer Science (ICS) degrees where most of the subjects are focused on the development of theoretical and practical contents purely related to technical competences. In this paper, we show the structure of a SL methodology to develop Bachelor's Thesis: 1) definition of proposals considering all the competencies of the Bachelor's Thesis subject and the needs of entities; 2) development of applications using agile methodologies, and 3) assessment of the SL experience from students, entities and professors. We present an experience developed in the 2019/2020 academic year with two entities devoted to disfavoured people. The results show both the high technical and professional quality of the projects and the high satisfaction of entities and students. We hope that the development of applications with the collaboration of non-profit entities allows the acquisition of both specific and transversal competencies on ICS degrees at the same time enhancing the development of useful professional ones.

Service-Learning Methodology to Develop Bachelor's Thesis in Information and Computer Science Degrees

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Introduction

Service-Learning (SL) is a pedagogical model that integrates community service with curricular learning. In SL, students actively participate in an authentic service activity that meets the real needs of a user group served by a community partner, usually a non-profit entity (Nejmeh, 2012). As was shown by Astin et al. (2000), the participation of students in SL projects leads to positive effects in many important aspects, such as the academic performance, leadership abilities or social values. Moreover, students involved in this type of projects show great satisfaction after completing the SL activities (Buch, 2008), and they appreciate the opportunity of helping other people and consider the service as a personally meaningful experience (Astin et al., 2000; Jacoby, 2014).

In the context of Higher Education, some previous experiences have shown that collaboration between university and special needs groups enables students to acquire social competencies and values, fosters community relations, and contributes to citizenship education (Hebert & Hauf, 2015; Kahne et al., 2000; Astin et al., 2006). In this sense, universities have valuable

resources to develop SL programs oriented to provide useful outcomes to the community partners and social entities (Bringle & Hatcher, 1996). In addition, SL helps to guarantee the introduction in university studies of the Sustainable Development Goals adopted by United Nations Member States (UDNP, 2015). The 17 goals have been defined to balance social, economic and environmental sustainability in order to provide a shared blueprint for peace and prosperity for people and the planet. Some previous works as Melaugh & Kindschuh (2017), Benning et al. (2018), Castro et al. (2020), Yuhlong et al. (2018) and Seban (2013) have shown the benefits of using SL as a way to teach the students about sustainability and to start collaborations between community partners, local governments and associations.

Since its incorporation into academia, SL has predominantly occurred outside the Information and Computer Science (ICS) disciplines. As proposed by Nejmeh (2012), we use ICS to refer collectively to computer science, information systems, computer engineering, and software engineering. Sanderson (2003) noted that "computer science is not very visible in the service-learning community." In the same way, Adams & Runkles (2004) pointed "while service-learning is becoming more common in college curriculums, it is still noticeably absent from many computer science programs." Like other authors, we believe that the development of SL projects in ICS degrees provides benefits to students because they develop curricular projects with real needs in mind. Hanks (2007) pointed out that "they get to work on real projects rather than throwaway toy projects devised by the professor. This leads to greater student motivation and involvement with the projects." Robinson & Hall (2018) indicated that "the content is highly applied and requires the creation of a (minimally viable) solution for and by the completion of the course."

To ensure that projects are completed in a short time, typically a quarter or a semester, it seems appropriate to use agile software development methods (directly known as Agile). Agile refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams (Beck et al., 2001; Chao & Brown, 2009). In general, Agile promotes a disciplined project management process, a set of good engineering practices intended to enable rapid delivery of high-quality software, and a business approach that aligns development with customer needs. Thus, the combination of Agile and SL seems sufficient to acquire the required technical, professional and social competencies.

In this work, we propose the development of applications (apps) as Bachelor's Thesis on ICS degrees to serve non-profit organizations and to guarantee the acquisition of specific and transversal competencies. We focus our attention on achieving two objectives: 1) the acquisition of the curricular competencies related to Bachelor's Thesis from an adequate application of Agile for solving real problems; 2) student's civic and emotional engagement and, ultimately, education, not only on curricula, but also on etic and social values.

Background

In this section, we review some SL projects developed by universities, but the revision done by Nejmeh (2012) is strongly recommended for more information on SL in ICS degrees.

The Engineering Projects In Community Service (EPICS) represents a great experience in the development of SL projects in Computer Science and Software Engineering (CSSE) that started at Purdue University in 1995. From this year on, several universities have created instances. Oakes & Bagchi (2012) describe a program at Butler University's CSSE department in which, each year, students are enrolled in teams consisting of students and professors from different courses. In 2006, the Humanitarian Free and Open Source Software Project (HFOSS Project) began at Trinity College as a small independent study whose goal was to engage Computer Science undergraduate students by building free and open source software. This project included students from a dozen U.S. colleges and universities (Tucker et al., 2012). In 2008, Agile Alliance created an Agile Software Factory (ASF) to help developers build applications quickly and consistently using well-known architecture and design patterns. In the ASF, university ICS departments serve as a clearinghouse for software development requests from non-profit entities and continue to provide maintenance and technical support for finished software systems (Beck et al., 2001). The ASF is an interesting way to conduct SL projects: the ASF locates non-profit entities that need software solutions to be developed or receives a request from them; the ASF evaluates their feasibility as a SL project for students in software engineering courses and, once the students complete the software system, the ASF provides ongoing maintenance and technical support services for the non-profit entity.

Chao & Brown (2009) describe six SL projects localized by ASF in autumn 2008, developed by 46 students divided into six groups. The authors reported several problems during the completion of these projects: difficulty in coordinating the team members' schedules, difficulty in maintaining communication with students, and difficulty in completing sprints in a short period. Students and entity satisfaction was assessed through surveys whose results showed, for example, that 100% of the 46 students agreed that they had acquired competencies in the class that were applicable to the real world and five of the six entities strongly agreed that they had received the same quality of software as from professional developers.

Other experiences of SL in ICS courses are described in the literature as a collaboration between the university and a non-profit entity, but they cannot be considered ASF. Hanks (2007) describes the experience of transforming traditional practices into SL. The experience was repeated for three years with different results, but Agile was used only in the third year. In the first and second year, only one team successfully completed the project. The other teams did not complete their work due to interpersonal problems within the team (failure to meet commitments, lack of communication, and implicit expectations that someone else would do the work). In the third year, Agile was used to develop the SL project. In this case, the professor had tracked the progress of the project as each sprint ended and all teams finished. Therefore, this work is a clear example of how Agile improves SL project delivery, but we miss an assessment from students and entities about satisfaction.

Robinson & Hall (2018) have described an experiential learning scenario in which blended classroom methodology and elements of SL were employed. The class worked in conjunction with an elderly care entity. The students were tasked with creating a study aid tool for the elderly for the U.S. citizenship test. The work focused on working using Agile, but not on developing a final product. Although some feedback was collected from students and users, no formal method for the assessment of this experience was done.

Motivation

At our university, SL-based experiences started in the 2015-2016 academic year. Eighty-eight proposals on different disciplines have been reported since then. In particular, in the 2019-2020 academic year, eighteen new experiences were developed. We have classified that list taking into account five academic disciplines: Humanities and Arts, Social Sciences, Natural Sciences, Engineering and Architecture, and Medicine and Health.

Figure 1 shows the number of new proposals in the 2019-2020 academic year for each discipline, where the high number of experiences in Social Sciences is apparent. We can also see that there are only two proposals in the discipline corresponding to Engineering and Architecture, being our experience the only one on the area of ICS. In fact, our proposal is the first SL activity on ICS developed in our university.
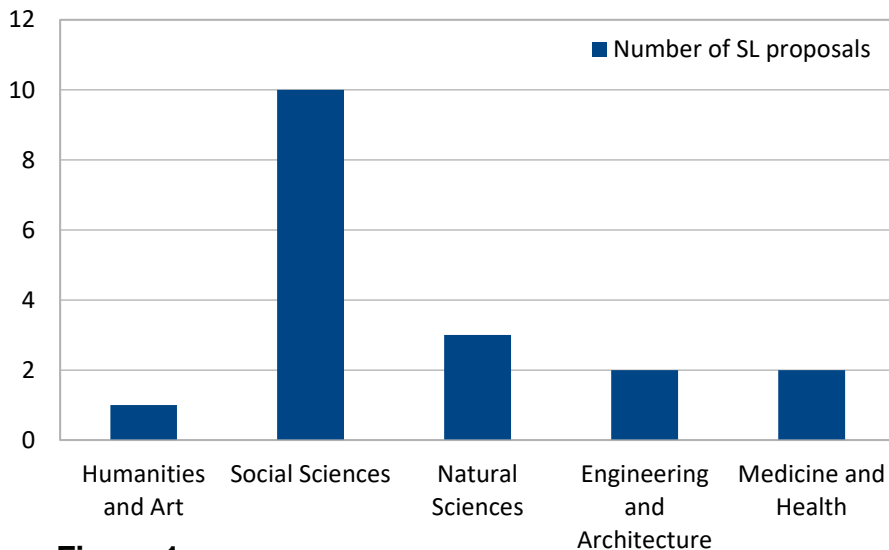

Figure 1

Number of Service-Learning experiences in the 2019-2020 academic year classified by academic discipline: Humanities and Arts; Social Sciences; Natural Sciences; Engineering and Architecture; Medicine and Health

We have also classified these experiences according to the Sustainable Development Goals adopted by United Nations Member States in 2015 (UNDP, 2015). Figure 2 shows the results obtained from the information given by the authors of each

proposal. Most of the proposals are aligned with goal 4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all). Other relevant goals are goal 3 (ensure healthy lives and promote well-being for all at all ages), goal 10 (reduce inequality within and among countries) and goal 17 (strengthen the means of implementation and revitalize the global partnership for sustainable development).

Figure 2

Number of Service-Learning experiences in the 2019-2020 academic year classified by the Sustainable Development Goals adopted by United Nations Member States.
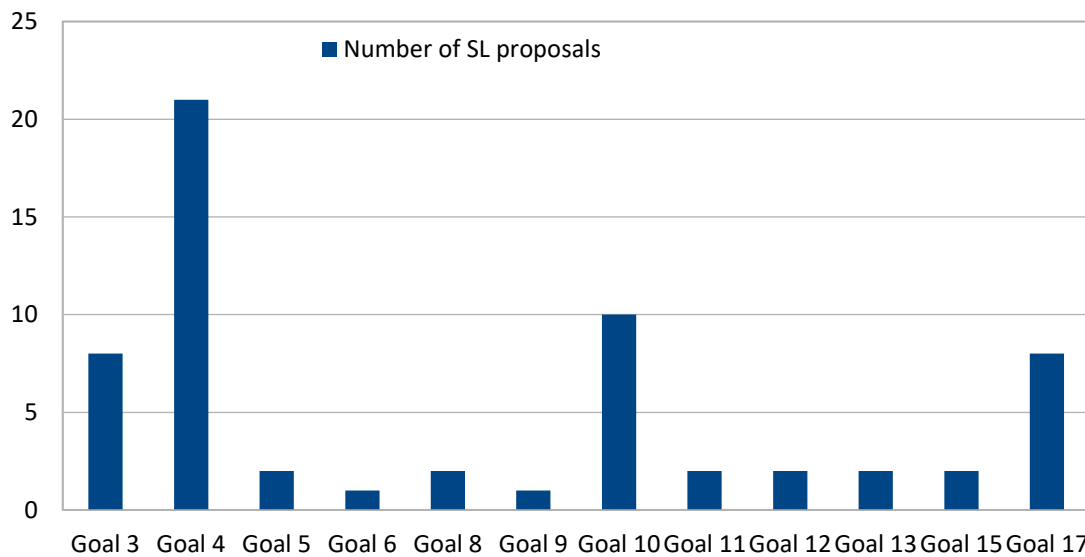
In general, the results show that professors of ICS degrees do not get involved in SL experiences. We think that the technical contents given on ICS degrees can be directly used to serve disadvantaged collectives through the development of apps to solve real problems, while at the same time allowing students acquire transversal and professional competencies. In particular, we consider that universities must promote thesis and dissertations aligned with the SL pedagogical model and with the Sustainable Development Goals.

Table 1 presents our analysis about the acquisition of several competencies usually indicated in ICS degrees and the method to achieve them using SL to develop Bachelor's Thesis.

Table 1

Transversal competencies and acquisition using Service-Learning and Agile

Competencies	Acquisition with Service-Learning
Ability to solve problems	The students develop their work taking into account the needs of the target groups.
Teamwork	The development of the projects involves working in a multidisciplinary team.
Capacity for analysis and synthesis	The development of a computer application, its explanation to users and the writing of the report require a great capacity for analysis and synthesis.
Ability to organize and plan	The utilization of Agile makes it necessary to organize and plan the different phases of development.
Concern for quality	Students are aware at all times of the importance of developing a useful and high-quality application.
Ability to generate new ideas (creativity)	The applications must be 100% original, which demonstrates the creativity of students both in terms of functionality and aesthetics.
Express themselves correctly, both orally and in writing	During the work, the students prepare different intermediate documents and participate in meetings. Students also elaborate a final document and give an oral presentation.
To develop for the exercise of an open, cultured, critical, committed, democratic and solidary citizenship, able to analyse the reality, to diagnose problems, to formulate and to implant solutions based on the knowledge and oriented to the common good	Carrying out the work in collaboration with groups of users with functional and cognitive diversity allows us to state that students have achieved this competencie.
Critically evaluate the knowledge, technology and information available to solve the problems they have to face	Students have to select the most appropriate technologies for the development of the application. In addition to using knowledge acquired during the degree, they learned and used new tools and technologies.
Assume as a professional and citizen the importance of lifelong learning	Conducting a Bachelor's Thesis is the first step in facing their future professional life. A project carry out with groups of users with functional and cognitive diversity allows them to have a wider vision of the reality that the one that is obtained with the work done only in the academic scope.

In addition, the use of Agile produces important benefits for the development of these SL projects. Table 2 collects our final conclusions about benefits and limitations of using Agile in SL. However, Agile is not a method for carrying out SL activities and additional tools should be included in the process. For instance, the assessment of curricular contents is done by an external panel of professors and satisfaction of the agents is evaluated using surveys.

Table 2

Benefits and limitations of using Agile in Service-Learning

Service-Learning	Agile
Way of involving students, professors and entities	**Benefits:** • Small cross-functional teams, identification of roles and assignment of responsibilities.
Guarantee of acquisition of technical, professional and social competencies	**Benefits:** • Acquisition of technical and professional competencies since students solve real problems using one of the most used methodologies. **Limitations:** • Guarantee of acquisition of social competencies but it needs to develop projects with some entity of disadvantaged collectives.
Academic activity	**Benefits:** • Multi-level planning, which implies adaptation to schedule and time limitations restricted by academic periods. • Continuous testing, which can be used to measure progress and prevent deviations or malfunctions. Surveys could complement that assessment from satisfaction measurements of the involved agents (students, entities and users). **Limitations:** • Evaluation of curricular competencies is not involved.

Materials and methods

We have divided the development of the SL projects in three steps. In the first step, the contact is initiated between all the agents involved in those activities: students, non-profit entities and professors. In the second step, the software product is developed considering the identified needs and using Agile. The third step corresponds to the

evaluation of the experience that requires the elaboration of different surveys considering aspects related to SL and software quality.

Step 1: Identification of needs and entities for the project

Collaboration between non-profit entities and the university is a vital component in SL projects. This collaboration usually arises from the proposals of such entities to improve the daily work with disadvantaged people. The collaboration is established in an agreement that indicates, among others, the following sections:

- SL projects are curricular activities that are developed in the context of university degrees. The projects can, therefore, be developed in any subject, including master's thesis and external internships. It is also possible to develop projects in the context of PhD programs.
- The realization of the projects covered by this agreement does not imply any type of employment relationship between the student and the entity, since the activity developed by students is strictly academic. The activities carried out must be in line with the student's learning and the subject's competencies and they cannot lead to the substitution of professional services.
- The activity carried out under this agreement must not be paid.

We identify the needs of our entities and explain to professionals time and difficulty limitations of the proposal. Subsequently, we propose the project as a Bachelor's Thesis indicating that it will be developed with a non-profit entity. As suggested by Felten & Clayton (2011), the project is defined to guarantee that student's work is aligned and complementary with the curricular goals and expected learning outcomes for that subject. Once the project is selected by students, we must be aware of some aspects, such as student motivation (e.g. previous volunteer activities), personal restrictions (e.g. ease of travel to the location of the entity, number of subjects the student is enrolled in, etc.) and academic time constraints (e.g. expected date of defence). All this information, provided by both the university institution and students, is used to establish a first timetable for the project. Since Agile is studied in ICS degrees during undergraduate courses, the learning of this methodology is not included in our time estimation.

Step 2: Agile project development

Taking into account the needs identified in the previous step and the time constraints indicated by students, we schedule a project duration of approximately three months. Also, three people were involved in each of our projects, taking on different roles:

- Product Owner: a co-supervisor of the project was in charge of ensuring the interests of entities against the development team. This role served as a bridge between both entities and development team transferring needs from one side to the other.
- Agile Master: a co-supervisor of the project oversaw the correct execution of Agile recommendations.

- Development team: in a professional environment the teams usually consist of between 5 and 9 people, but Bachelor's Thesis are usually carried out by only one student.

The projects are divided into several iterations, referred to as sprints in Agile. A sprint is a single development cycle, usually one to two weeks long. Each sprint is reviewed by the development team and potential end-users (in our case, the entity's users) and the knowledge gained from this review is used to determine the next step of development. We planned the following project sprints:

- First sprint: Project preparation, which includes an initial meeting with the non-profit entity to determine the system requirement and the preliminary planning.
- Intermediate sprints (4 or 5 sprints): Delivery of a functional product (as a first scaled-down but functional version of the complete system) to be shown to the entity. The student is responsible for producing release notes to clarify the product performance at each sprint. The entity staff gives suggestions on how to improve the product according to their needs.
- Final sprint: Documentation development, not just a reference manual for the entity after software installation but also the work document corresponding to the Bachelor's Thesis.

Step 3: Project assessment

Since Bachelor's Thesis is an academic activity, students obtain a qualification after finishing the project. They must present a written document and give an oral presentation. A panel of professors evaluates those projects considering the quality of both the written document and the presentation (i.e., acquisition of competencies on oral and written communication) and the technical aspect of the work (i.e., acquisition of specific competencies of the university's degree).

In Bachelor's Thesis developed with SL, it is also needed to evaluate the satisfaction of agents involved in this activity. For that purpose, we define the surveys that both students and entity staff will use to evaluate SL activities when the project ends. Tables 3 and 4 show the questions of these surveys. For the entity staff, we focus our attention on the assessment of the process and the satisfaction with the final product. The survey for students has questions related to their appreciation of the acquisition of competencies and the entire process. The questions are evaluated from 1 to 5 (1: strongly disagree; 2: disagree; 3: neutral; 4: agree and 5: strongly agree). Users who had cognitive difficulties that limited their understanding of the survey or had visual or reading difficulties could carry out an alternative survey based on the selection of a pictogram as answer to those questions, which were verbally posed by a member of the entity's staff.

Table 3

Survey for entity staff

Identifier	Question
Entity 1	The project arises to cover a need of the entity.
Entity 2	The communication between entity and members of the university (student and supervisors of the Bachelor's Thesis) has been frequent and regular to keep everyone well informed about activities and progress.
Entity 3	We have collaborated to establish a shared vision and set common goals to work on the needs of the community.
Entity 4	We have collaboratively established action plans to achieve the specified goals.
Entity 5	We have had the opportunity to share knowledge and understanding of the resources and needs of the community.
Entity 6	We believe that the project will be useful for users of the entity.

Table 4

Survey for students

Identifier	Question
	Curricula Competencies:
Curricula 1	The project has clearly defined learning objectives.
Curricula 2	It is explicitly and intentionally related to the objectives and contents of the subject.
Curricula 3	It will help me learn how to transfer knowledge and skills from the academic context to professional life.
	Social Competencies and values:
Social 4	It will help me to identify and analyze different points of view to improve understanding of social and educational problems.
Social 5	It will help to develop my conflict resolution and group decision-making skills.
Social 6	It will help me to understand and assess the backgrounds and contexts of those who receive the service and myself.
Social 7	It encourages me to recognize and overcome stereotypes.
	Process:
Process 8	During the project, I have been engaged in the idea approach, planning, development and assessment of all the process.
Process 9	I have been involved in the decision-making processes.
Process 10	I have been involved in creating an environment that promotes trust and the expression of ideas.
Process 11	I have been involved in the assessment of the quality and effectiveness of the activity.

In this way, the development of SL activities and the obtained results are analyzed by professors to identify their strengths and weaknesses, and thus improving the activity for the following academic years. In particular, a quantitative analysis of the results obtained from surveys in Tables 3 and 4 are used by us to determine the satisfaction of the involved agents. This analysis of the SL experience completes the evaluation of the acquisition of competencies that, as mentioned, is performed by the panel of professors during the Bachelor's defense and by advisors.

Results

During the 2019-2020 academic year, we developed two SL projects using the method described in previous section. The objective of carrying out these projects with a non-profit entity is to meet the growing demand for computer applications that help the realization of therapies and the daily development of people with functional or cognitive diversity.

The participants of this experience were two students of the degree in Computer Engineering, four professors of the Department of Computer Engineering and one professor of the Department of Physiotherapy, Medicine and Biomedical Sciences. In addition, two different non-profit local entities were involved in the development of these SL projects.

Project 1: Application for game-based therapies

This project was performed as a service to a non-profit organization with four user's services and more than 150 users whose mission is to improve the quality of life of people with cerebral palsy and other related disabilities by defending their rights and supporting families, services to associated entities, and institutional cooperation. Different techniques and tools, including apps, are usually incorporated in intervention with people with cerebral palsy in order to work for the improvement of different aspects of their daily life by contributing to their autonomy (Bax et al., 2005; Pousada et al., 2014) . Based on their knowledge and professional experience, therapists define a set of activities that work certain aspects of these diversities. The results of each session are usually registered for the improvement and monitoring of the evolution of each user. In this context, this first project, entitled "Micro:bit board-based assistive product for people with disabilities", is focused on developing an application that aims to include games in the therapy of people with cerebral palsy. The use of games in therapies allows users to improve both motor and cognitive skills. The application allows therapists to define games adapted to the needs of each user and to track their progress. Due to the motor limitations of these users, the micro:bit board with Bluetooth was used as the interface between users and games. A micro:bit board is an embedded system created by BBC to promote digital creativity (BBC, 2020). All programs can be made using MakeCoder, Python, or Scratch and transferred to the board. The utilization of Bluetooth avoids the use of cables in the room where the therapy is performed. The project was divided into seven sprints. Most of the sprints lasted one or two weeks, following the recommendation from Agile, although two of them needed one additional week because the student was not familiar with the technologies employed in this

project. Its realization was affected by constraints due to Covid-19: meetings and presentations were done remotely and a single face-to-face test was done with users, among others.

The face-to-face test was performed after the end of the fourth sprint in the entity's building with the participation of the development team, two therapists and two users. A complete therapy was performed, including registration of users, gaming, and analysis of results. Due to the motor limitations of users, communication between student and users was carried out by means of a card with pictograms. It was a very satisfactory experience because the student was able to check the usefulness of the app and, in addition, the feedback from the test allowed him to adjust several application parameters. Figure 3 shows two photos corresponding to this session (at the top) and two screenshots of the resulting app (at the bottom). During a session, the therapist chooses the service using the menu shown in the figure at the left bottom side. The therapist also chooses the game from a list of games associated to this service and determines some parameters: time, sensitivity, objective, etc. All the results obtained during the session were recorded so they could be analyzed or exported. Unfortunately, the pandemic situation caused by Covid-19 made the involvement of the student in the final test impossible. For that event, only therapists and users attended.

Figure 3

Balance board (left) and screenshots of service module (bottom) and game module (right)

Table 5 summarizes the Agile methodology used to develop the project. It was completed on time and the student was able to defend it in September 2020. The evaluation panel consisted of professors of the Information Systems specialization. The advisers do not participate in this process. Following this process, it received a rating of 9.5 out of 10, which leads to an outstanding grade qualification. This work was also presented at a conference for young researchers that provided the student with valuable experience, because it was his first contact with an event devoted to the dissemination of projects in a non-academic context. The project was also finalist for a national "makers" award.

Table 5

Execution of the project "Micro:bit board-based assistive product for people with disabilities"

User's diversity	Sprints	Technologies	Real planning
Cerebral palsy	7 sprints: an initial sprint of 1 week, 2 intermediate sprints of 3 weeks and 3 of 2 weeks, and a final sprint of 1 week	Micro:bit Phyton MySQL	14 weeks Student's work: 300 hours Supervisor's work: 20 hours

The assessment of the SL experience was done by using the surveys described in Table 3 and Table 4. According with the entity staff survey (Table 3), the two therapists answered "totally agree" to all questions. Some additional comments were collected from them:

> *"This application will be very useful for our users."*

> *"We would like to create our own games."*

> *"It was difficult to keep track of therapies before."*

> *"We have many ideas for other applications."*

With respect to the evaluation done using the student survey in Table 4, the student answered "totally agree" to all survey items related to "curricula competencies". On the case of "social competencies and values", the assessment was "totally agree" for all questions except for [Social 5], which was evaluated as "neutral". This question is related to the acquisition of competencies for conflict resolution and decision-making skills. Finally, with respect to the process, the student answered "totally agree" to the [Process 8] question and with "agree" to the rest of them. This student also added the following comment:

"Working with disadvantaged groups is always a pleasant job, mainly because of the gratitude they usually show towards people who want to help, as has been this experience. The happiness and gratitude shown by the users of the program during the tests, by itself, makes it worthwhile to have taken the time to develop something like this project."

Project 2: Application for a digital agenda

This project was done as a service to a non-profit organization formed by a group of families with children with functional diversity. Several professionals run home care and intervention programs (psychopedagogic, speech therapy, psychomotor, etc.) for children with Autism Spectrum Disorder, Asperger's Syndrome, Williams Syndrome, Fraxile X Syndrome, Sotos Syndrome, Dandy-Walker, etc.

Autism Spectrum Disorder is a neuro-biological developmental disorder that manifests during the first three years of life and will last throughout the life cycle (Zwaigenbaum et al., 2015). The characteristic that best defines people with Autism Spectrum Disorder is the presence of a distinctive deterioration in the nature and quality of social and communicative development (influenced by the specific biological and environmental circumstances of the individual). Usually, these people have a greater difficulty in learning social and communicative skills but, with the help of specific teaching methods, which are mostly characterized by making social information explicit, they acquire a greater ease in assimilating that information (Lord et al., 2018).

In this context, the second project consisted in the development of a digital agenda for children with Autism Spectrum Disorder. Figure 4 shows several screenshots of the resulting application, which aims to establish the diary routine of children with Autism Spectrum Disorder. The application provides a visual representation of the current tasks or activities for users, and it also helps them to anticipated the following items in their routines. The mobile app was developed taking into account the difficulties of people with that disorder. Thus, the use of pictograms that represent the tasks to be performed throughout the day had great importance. The mobile app can be configured by users, therapists or families through a simple interface.

Figure 4

Screenshots of tasks' management (two left images) and of routines' management (two right images)
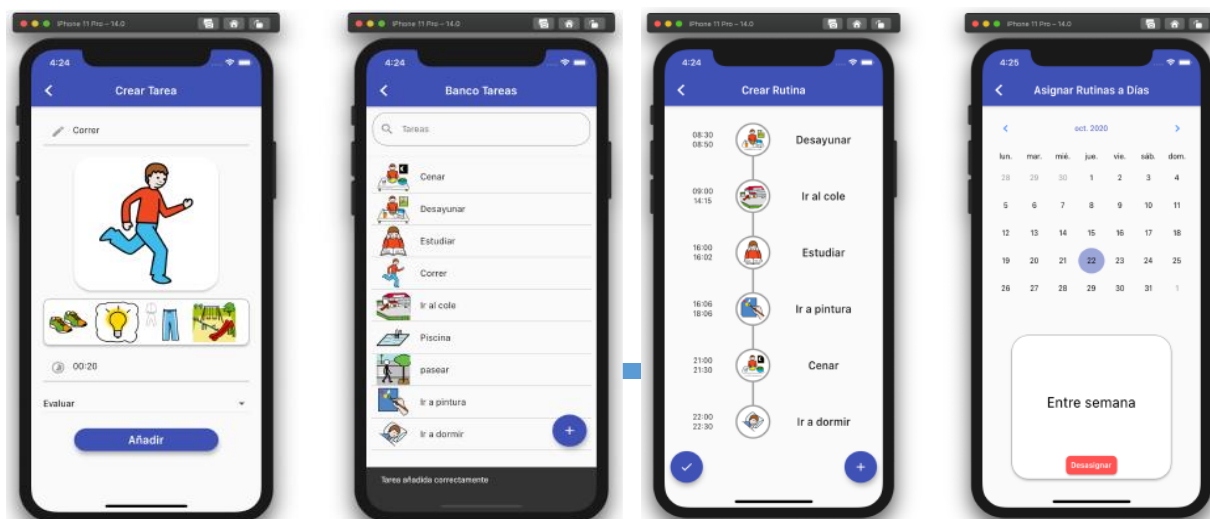
The mobile app also has a statistics module (Figure 5) that allows therapists or families to visualize the data related to the tasks completed by the user in real time. Thus, the specialists can track the progress of each individual user and adapt the tasks according to his or her needs.

Figure 5

Statistics module of app in project 2

Due to the Covid-19 pandemic, most of the meetings were conducted online, but the student had the opportunity to have two face-to-face meetings with therapists to make a presentation of the app features. Table 6 summarizes this experience using Agile. The project was completed on time and the student was able to defend it in September 2020 obtaining the maxima qualification of 10. In addition, the project was the winner of two awards at our university as the best Bachelor's Thesis in sustainability and development cooperation, and as the best Bachelor's Thesis on ICT.

Table 6

Execution of the project "Digital agenda for children with Autism Spectrum Disorder"

User's diversity	Sprints	Technologies	Real planning
Autism Spectrum Disorder	7 sprints: an initial sprint of 1 week, 5 intermediate sprints of 2 weeks, and a final sprint of 2 weeks	Dart Flutter Firebase	13 weeks Student's work: 300 hours Supervisor's work: 20 hours

With respect to the assessment of the SL experience, three therapists participated by answering the survey shown in Table 3:

- One therapist pointed out an assessment "totally agree" all items, thus showing the satisfaction with work development.

- The second therapist marked the top rating for all of them, except for [Entity 4] and [Entity 6], which were answered "agree". These are related to the degree of achievement of the specified goals and to the future use in the daily life of the users in the entity.

- The third therapist answered "totally agree" on all but [Entity 5], which was answered "agree". This is related to the exchange of experience and knowledge on the needs of the users. These results show that more collaboration between all the agents is demanded by the entity and are also understandable since entity and users, used to working with traditional but heavy paper-based planning, have their doubts about switching so radically to a mobile platform.

In addition, some additional comments were collected from the therapists:

"The statistics module is very useful."

"The design is very attractive."

With respect to the evaluation done by using the student's survey in Table 4, the student gave the maximum qualifications on all items, except for [Social 5] and [Social 7], which were evaluated "agree" with the following comments:

"I don't see it relevant that my project is directly connected to conflict resolution."

"On a personal level, in general, I am not a person who has stereotypes, however, when talking with my environment, it helped me a lot to recognize stereotypes that people have that I used to overlook."

It is important to note that this student was already committed to this group before this work, because he participated as a temporary volunteer in camps of different organizations that worked with children with these kinds of difficulties.

Discussion

The experience described in the previous sections shows that the combination of the SL methodology and Agile to the development of a Bachelor's Thesis in ICS degrees allows students to acquire transversal competencies and social values. The two Bachelor's Thesis obtained a high academic qualification. Regarding the satisfaction surveys, all comments received from entity staffs involved in the SL projects were very positive. In fact, project 1 will be used for the four services provided by the entity and project 2 will be distributed with a free-software license. Assessment received from students was also very positive for both projects. They indicated a high degree of

satisfaction, especially regarding the acquisition of technical competencies. For social competencies, the ratings depend on the previous experience of the students. In the case of project 1, this was his first contact with an entity dedicated to people with diversity. The student of project 2, however, was already familiar with this type of entities because he had previously carried out volunteer activities. This fact has strongly contributed to the overall work since he was able to transfer these previous experiences to the design of interfaces for people with cognitive difficulties.

We also consider that higher educational institutions must guarantee that graduates have the knowledge and the skills needed to develop their professional careers facing social problems. In this sense, we want to note that three different sustainable development goals were worked on in the projects described in this paper: goal 4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), goal 10 (reduce inequality within and among countries) and goal 17 (strengthen the means of implementation and revitalize the global partnership for sustainable development).

Conclusions

In this work, we have proposed the development of applications with the collaboration of non-profit entities using a SL pedagogical method. Agile is used to achieve a final product according to time constrains, to stablish continuous monitoring and to identify roles in a multidisciplinary team. An external professors' panel evaluates the work taking into account academic criteria, while the Service-Learning experience is evaluated by students, entity staffs and professors.

Two projects were carried out as Bachelor's Thesis in 2019-2020 academic year, where students had to develop apps to help people with cerebral palsy or autism spectrum disorders. The experience shows that the combination of the SL methodology and Agile for the development of a Bachelor's Thesis in ICS degrees allows students to acquire transversal competences, while Sustainable Development Goals are introduced in ICS degrees. Both projects received high academic scores.

Although the results were very satisfactory, we agree with other authors' considerations about taking into account the additional effort and commitment required to incorporate SL projects to subjects in higher education. For example, Castro et al. (2020), Chao & Brown (2009), and Ruiz-Montero et al. (2020) pointed out that: 1) on the professors' side, this methodology requires extra time for planning and execution and also for the search of an adequate entity that can meet their needs (e.g., asking non-profit entities in the surrounding area to act as community partners, making sure that the partners are satisfied with their collaboration with students); 2) on both professor's and entity's side, it is not easy to reconcile the subjects' schedule with that of the entity; 3) on the students' side, the SL projects must be finished in a limited time (usually a quarter or a semester) and 4) on entity's users, they can have doubts about their participation or not in these projects. In addition, the fact of involving entities may create expectations in vulnerable groups that should be treated with extreme care. The authors of this work consider that this methodology combining learning and community service allows students to acquire competencies that are not considered in other types of projects, and the collaboration with non-profit entities serves to enrich the

values of society. For these reasons, in following academic years, we continue to use the method presented in this paper to develop other Bachelor's Thesis.

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Institutionalizing Service-Learning to Address Urban Campus Food Justice

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ABSTRACT

A First-Year Seminar course was designed using high-impact practices supporting food justice at a university serving mainly urban, minority, Hispanic, and first-generation students. The course was initially taught using participatory experiential learning but without service-learning. After an urban farm was added to campus to support the institutionalization of a garden-based service-learning program, the course was redesigned to add a service-learning component. Students were required to work at the farm composting, cultivating, and harvesting food for distribution to fellow food-insecure students for a minimum of ten hours throughout the semester. Service-learning students, as opposed to participatory experiential learning students, reported overall greater satisfaction with the course and its activities, had a 3% higher grade point average and a 9% lower drop, fail, and withdrawal rate. Service-learning students expressed a connection to campus community, a sense of feeling cared for, greater awareness of food justice issues and the ability to work toward community-based solutions and grow their critical consciousness. The added service-learning component significantly improved course outcomes and provided much needed assistance in the development of a new garden-based program.

Introduction

The institutionalization of service-learning at universities serving mainly urban, minority, Hispanic, and first-generation students is integral to student success and retention. This investigation uses garden-based service-learning and participatory experiential learning in a First-Year Seminar to address issues of food justice affecting an urban campus and the surrounding community. For the purposes of this investigation, experiential learning is defined here as the cognitive incorporation of sensations gained through exposure or involved contact. It includes the experience itself, which is later reflected upon and subsequently assimilated as new knowledge. Experience without reflection and assimilation is just experience. Service-learning is fundamentally experiential learning with the addition of meaningful engagement with critical issues facing a community.

Mitchell (2008) makes the distinction between "traditional" versus "critical" service-learning. According to Mitchell (2008) and others, traditional service-learning models may go no further than required volunteerism or charity (Forbes *et al.*, 1999; Cipolle, 2010). In contrast, critical service-learning incorporates a "social change orientation, working to redistribute power and developing authentic relationships" or relationships based on a true connection (Mitchell, 2008). Building courses and programs around service-learning is a high-impact practice employed by many universities to improve student learning outcomes (Chute, 2017).

The First-Year Seminar experience is another high-impact practice available to freshmen to support them in engaging with campus life early in their academic career and developing supportive relationships with faculty, staff, and peers. These experiences are shown to promote student engagement, improve student outcomes, and boost retention rates (Ben-Avie *et al.*, 2012; Skipper, 2017). These classes are typically smaller than average undergraduate general education courses to encourage meaningful faculty-student and peer-to-peer interactions. They employ a variety of best practices for deeper learning such as developing an academic mindset, gaining critical awareness, and becoming self-directed (Ben-Avie *et al.*, 2012; Skipper, 2017).

California State University Dominguez Hills (CSUDH), its students and surrounding community of south Los Angeles have long suffered the effects of disinvestment and environmental racism. With the most diverse student population among the 25 universities located in Los Angeles County, CSUDH is a Minority-Serving Institution (MSI), Hispanic-Serving Institution (HSI), and Predominantly Undergraduate Institution (PUI). Underrepresented minorities are 76% of the student body, 67% are first-generation college students, and 64.2% are eligible for Pell grants (Fall 2017 data).

According to a recent study by the National Student Campaign Against Hunger and Homelessness (Dubick *et al.*, 2016), food insecurity is more prevalent among students of color. Fifty-seven percent of Black or African-American students reported food insecurity, compared to 40% of non-Hispanic white students. Additionally, more than half of all first-generation students (56%) were food insecure, compared to 45% of students who had at least one parent who attended college. At CSUDH, 9 in 10 students are students of color, and 90% receive some kind of need-based financial aid and prone to food insecurity based on our demographics.

The CSUDH campus is located in South Los Angeles (LA), which has 0.57 full-service grocery stores per every 10,000 people, in contrast to west LA, which has 1.03 full-service grocery stores per every 10,000 people (Fox, 2017). Shaffer (2002) calculated that "[I]n Los Angeles County, zip codes whose populations are 40–100% white have an average of 2.21 times as many supermarkets per person as compared to zip codes where the population is 40–100% African American." Various measures of health, including diabetes, also correlate with ones distance to a supermarket. Additionally, 73% of South LA restaurants sell fast food, as compared to 42% in West LA (Murray, 2015). This food apartheid has left generations of CSUDH students disadvantaged to cook and eat healthy, daily meals. Addressing food justice issues at CSUDH through service-learning requires an understanding of the unique culture and built environment of South LA as an urban campus serving disadvantaged communities.

The course used a garden-based approach as the focal point for service-learning activities to address food justice issues. The institutionalization of the program required 1) partnerships and collaboration, 2) administrative support, 3) the infrastructure of the farm itself, and 4) long-term planning (Bringle & Hatcher, 2000). Through a collaborative effort between students, faculty, and facilities, the proposal for the CSUDH Urban Farm was approved by Presidential Cabinet in February 2018. Financial backing from the CSU Chancellor's Office via a "Campus as a Living Laboratory" grant was used to support its launch.

Course Objectives

The course built a garden-based program to act as a living laboratory and an epicenter for institutionalized service-learning. Its goals were to provide students with a high-impact educational experience and to use service-learning as scaffolding by which students could build authentic relationships and true connection to campus life. By serving the CSUDH community, students would more readily assimilate into campus life, thereby increasing student success and retention. Develop a food production and distribution network on campus. Students would develop critical awareness of food justice issues and work toward community-based solutions. Identify issues or problem areas that require future research and curriculum improvement.

Methods

The First-Year Seminar course is listed in the university catalog as UNV 101 Personal, Social and Intellectual Development. In addition to fulfilling an Area E Lifelong Learning and Self-Development General Education requirement, the seminar provides small class sizes (no more than 25 students) to facilitate faculty-student mentorship to all incoming first-year students as part of student-success initiatives. Faculty develop discipline-based curricula using high-impact educational practices such as learning outside the classroom and meaningful student-faculty and peer-to-peer interactions that encourage freshmen to explore and engage in campus life—all intended to promote student engagement, improve student outcomes, and boost retention rates (Ben-Avie *et al.*, 2012; Skipper, 2017). Courses run for a full 16-week semester for 3 credits.

The discipline-based subtopic for the course developed for this study was Urban Agriculture and included themes from Environmental Studies such as food apartheid, food security, food waste, pollution, the history of American agriculture, the globalization of food production, and the resulting social and environmental consequences.

The course was taught during the spring semester with an experiential learning component but without a service-learning component and again during the fall semester with a service-learning component added. Perceived teaching effectiveness surveys were administered by the university for each course toward the end of the semester. During the fall semester, a pre-survey was conducted towards the beginning of the semester and a post-survey was conducted towards the end of the semester, both administered through the CSUDH Center for Service Learning, Internships & Civic Engagement (SLICE) to assess the service-learning component added to the course.

Course Design

In both spring and fall semesters, students were asked to engage in the same amount of activities both inside and outside of the classroom, answer in class questions with free writing, develop a final presentation given at the end of the semester, and complete both a midterm and final exam. Spring semester only, students were required to attend and write about their experiential learning for various campus activities including the annual Earth Day celebration, Environmental Justice Fair, tour of the new CSUDH Urban Farm, and the Community Engagement Symposium, an annual SLICE event. Other activities included exploring the various food options on and around campus (and the lack thereof), including several food banks available to students.

The activities during the spring semester included high-impact practices to encourage students to investigate and use campus resources outside the classroom but excluded any specific service-based component. In particular, the spring semester students were encouraged to participate in a variety of campus activities pertaining to environmental, food, and service-related issues, learning about what others were doing to make an impact, and to reflect and write about their learning. Spring was the first semester that the CSUDH Urban Farm was open on campus, and the UNV 101 students went on a tour where they were told what activities were being developed by other students at the farm, but they were not required to volunteer.

Fall semester only, students were required to engage in activities such as composting, food cultivation, harvesting, and food distribution at the CSUDH Urban Farm for a minimum of ten hours throughout the semester. Fall students were asked to keep a reflection journal chronicling their weekly experiences in service-learning to provide a structured opportunity for reflection. The reflection journal assignment required students to include the date and time spent on each service-learning activity they undertook, a description of the activity, and a reflection on the experience and any thoughts on how the activity related to issues discussed in class. Students were asked to use the notes in their reflection journal to write a two-page reflection paper on how their service impacted their understanding and learning of the course material. Five hours were dedicated to keeping a reflection journal, writing a reflection paper and giving a final presentation in class for a minimum of 15 hours of service related activities in in total. Not only were fall students required to work at the farm as part of their grade, they were encouraged to bring food waste from home to compost.

All students, in both spring and fall semesters, were informed that the food harvested from the farm would be distributed to students for free through campus food banks to address food insecurity on campus. The number of activities was equivalent for both semesters and the same themes were talked about during the lecture portion of both courses. Both spring and fall courses incorporated a reflection practice to integrate experiences, examine beliefs, and gain deeper understanding. The spring course required students to free write on questions posed in class related to their activities, receive feedback, and then take their writing home and further expand on it in a formal essay. The fall course's reflective practice took the form of a weekly reflection journal entry for which students received feedback and which they expanded into a formal reflection paper. Incorporating a reflective practice for the experiential learning in the spring and a service-learning component in the fall is a high-impact practice that seeks to bridge the gap between experience and theory (Bringle & Hatcher, 1999).

Results

The service-learning survey, conducted toward the beginning of the fall semester, received 26 responses from the 26 students enrolled in the course (100%). A post-survey, conducted toward the conclusion of the fall semester to gauge changes resulting from experiences gained (Table 1), received responses from 19 of the 24 students (79%) enrolled in the course. Respondents answered 5 multiple-choice questions in both the pre- and post-survey, with the option of making an additional comment for the post-survey only (Table 2). Additionally, 2 short-answer questions were asked in the post-survey only; responses are included in Table 2.

Table 1. Service-learning survey, where n=26 for a=pre-survey and n=19 for b=post-survey, reported in percentage, with number of respondents below. Questions 6b and 7b were short answer, post-survey only, with results included in Table 2.

Questions (a=pre-survey, b=post-survey)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Q1a Do you think this experiential learning activity (service-learning) will relate well to your course curriculum?	46.2 12	38.5 10	15.4 4	0.0 0	0.0 0
Q1b Do you think your experiential learning activity (service-learning, internship, or volunteering) related well to the course curriculum?	63.2 12	31.6 6	5.3 1	0.0 0	0.0 0
Q2a Do you feel the service activity will give you a better understanding of the classroom curriculum?	46.2 12	38.5 10	15.4 4	0.0 0	0.0 0
Q2b Do you feel you have a better understanding of the classroom curriculum from this experience?	52.6 10	47.4 9	0.0 0	0.0 0	0.0 0
Q3a Do you think this project will help the community or agency you will be working with? (i.e. solve problems, advocate for their cause effectively, help educate others about the cause, raise the profile of the community/agency, help them with their work?	42.3 11	38.5 10	19.2 5	0.0 0	0.0 0
Q3b This experience helped the community or agency (i.e. solved problems, advocated for community cause, helped educated about the community, raised the profile of the community, helped them with their work).	42.1 8	42.1 8	15.8 3	0.0 0	0.0 0
Q4a Do you think students from other courses would benefit from this type of experiential learning?	50.0 13	42.3 11	3.9 1	3.9 1	0.0 0
Q4b Students from other courses would benefit from this type of experiential learning.	42.1 8	47.4 9	10.5 2	0.0 0	0.0 0
Q5a Do you think that this experience will change/affect your thinking about the community/agency, its problems and or the solutions to the problems?	50.0 13	30.8 8	19.2 5	0.0 0	0.0 0
Q5b This experience affected my thinking about the community (or agency), its problems and or the solutions to the problems?	47.4 9	52.6 10	0.0 0	0.0 0	0.0 0
Q6b Explain how this experience affected any of the following: attitude toward the community/agency, goals (personal, academic, or career). How did this experience affect you?					
Q7b How did this experience give you a better understanding of your course (i.e. facts, ideas, viewpoints)?					

Table 2. Results of service-learning survey including the category to which the comment pertained, the number of respondents making similar comments, and the percentage of the total comments made (n=113).

Category	Respondents	Percentage
Importance of Urban Food Production	11	10%
Preventing Food Waste	16	14%
Importance of Food Security	13	12%
Preventing Pollution	10	9%
Change in Attitude/Understanding/Perspective	25	22%
Benefit of Learning from Activities	34	30%

Comments in Table 2 were analyzed according to the major themes discussed during the semester by how often the themes appeared and what specific words were used. Statements addressing the importance of urban food production made up 10% of the comments with 11 responses. One student said, "This experience got me to connect with the community and actually got me to grow and maintain a farm." Also representative of this category were comments like, "Going to the urban farm gave me experience about how to start a small farm even if we live in the city," and "helped me to want to start a farm in my backyard."

Issues of preventing food waste, including the importance of composting, was another popular theme and made up 14% of the overall comments with 16 responses. Wasted food is a major contributor to global greenhouse-gas emissions and climate change and comprises nearly a third of the total refuse in LA (Fox, 2018). Some students expressed a potential behavioral change regarding food waste: "This experience affected me because I have a deeper understanding towards food waste. I was also able to learn little things that I could do to help eliminate food waste every day." All the remarks concerning composting were of a positive nature.

Importance of food security comments were mostly intertwined with helping the campus community by growing food, "This helped my school's community because all the food that we were able to grow at the farm was given back to the students that attend CSU Dominguez Hills." This category made up 12% of the total comments with 13 responses. Preventing pollution, including issues of recycling, was mentioned in 9% of the responses with 10 references: "It gave me solutions to problems we face in our daily lives, in this case overcrowding landfills with trash."

Many students (25 responses and 22% of total comments) expressed a change in attitude/understanding/perspective that was beneficial to them, often using the terms "opened my eyes" or "opened my mind." Direct and to the point, one student said, "I've changed the way I see food." They also expressed ideas about how to apply their knowledge: "It has made me more wanting to be in the government and help fix laws and make them so they can help the environment."

By far, the largest number of comments expressed how students experienced a benefit of learning from activities, making up 30% of the total responses (34 out of 113): "I was very surprised by the way the class grabbed my attention based on the way the class was structured"; "It allowed me to physically experience what we learn in class by working in the farm."

Perceived teaching effectiveness surveys, administered by the university, were conducted for both spring and fall courses toward the end of the semester. The results were within normal variation between two separate versions of the same course, except for what might be done to improve the instructor's teaching in the course (Table 3). In the spring course (without service-learning), 3 students reported that nothing further was needed, while 5 students requested some variation of more activities and fewer lectures such as "more time at the farm"; 6 students did not answer the question (n=14). Near the conclusion of the fall semester (with service-learning), 9 students reported that nothing further was needed, while 2 students requested more explanation and 1 student requested more student-faculty interaction, with 2 students not responding to the question (n=14). In each semester, one student dropped the course after the third week of class, leaving 24 students in the spring and 25 in the fall semester. The participation rate in the spring was 58% for the survey and 33% for the question to improve the instructor's teaching. The following fall semester, the participation rate was 56% for the survey and 48% for the question concerning instructor's teaching.

Table 3. Perceived teaching effectiveness surveys comparing student responses to the question, "What might be done to improve the instructor's teaching in this course?" There were 24 students total in the spring and 25 in the fall (excluding students that dropped); 14 students responded to the survey each semester.

Spring (n=14)	Respondents
Nothing	3
More Activities/Fewer Lectures	5

Fall (n=14)	
Nothing	9
More Explanation	2
More Student-Faculty Interaction	1

The number of activities between the two semesters was roughly equivalent in terms of the assignments except for that activities in the spring were participatory in nature without a direct connection to service-learning. The spring course also gave students less time outside the classroom. Additionally, activities during the spring often included going to another building on campus. With the exception of Earth Day, the Environmental Justice Fair, and the CSUDH Urban Farm tour, all other activities were held indoors for a total of 3 hours and 45 minutes of class time. Comparatively, fall semester offered students the possibility of 13 hours of outdoor class time, of which ten hours were required. More than half (56%) of the fall students logged more outdoor service-learning hours at the farm than was required for their grade (Table 4).

The grade distribution between spring and fall semesters did not differ significantly, aside from normal variation between two separate courses on the same topic (Table 5). The average grade during the spring semester was 2.71 (n=24), while it was 2.80 (n=25) during the fall semester (an increase of 3%); overall both courses averaged a B-minus. Notably, 3 students (13% of the class) received a zero or F grade in the spring semester whereas only 1 student (4% of the class) received a zero or F grade during the fall semester. Additionally, 1 student dropped after the 3rd week of the

spring and fall semesters, leaving 24 students in the spring and 25 in the fall. The drop, fail, and withdrawal rate (DFW) was 17% (4 students) for the spring semester and 8% (2 students) for the fall semester.

Table 4. Service-learning hours fall students worked at CSUDH Urban Farm. A total of 13 hours was available for students to work, ten hours were required for the course.

Student	Hours	Student	Hours	Student	Hours	Student	Hours	Student	Hours
#1	0	#6	9	#11	10	#16	12	#21	13
#2	6	#7	9	#12	11	#17	12	#22	13
#3	6	#8	9	#13	11	#18	12	#23	13
#4	7	#9	10	#14	11	#19	12	#24	13
#5	8	#10	10	#15	12	#20	12.5	#25	13

Table 5. Letter grade and grade point average (GPA) distribution comparing spring and fall semesters and number of students receiving that grade.

Grade	GPA	Spring	Fall	Grade	GPA	Spring	Fall
A	4	3	7	C	2	2	3
A-	3.67	6	3	C-	1.67	1	0
B+	3.33	3	5	D+	1.33	0	1
B	3	3	1	D	1	1	2
B-	2.67	2	2	D-	0.67	0	0
C+	2.33	0	0	F	0	3	1

Discussion

The service-learning survey in Table 1 indicates that, overall, the pre-survey expectations of the course were met effectively by the time of the post-survey. When asked if the experiential learning related well to the course curriculum, 94.8% of students reported favorably (Table 1); one student commented, "I do believe this was a great way of learning the course. When we have a class session, we are able to reflect on it, then we go into service-learning."

One of the more difficult tasks at the farm is turning the compost pile. None of the students had ever composted before. Several issues related to composting were discussed during lecture over the semester, including global food waste, the addition of greenhouse gases from food production, fertilizer pollution, and dead zones. Students were asked to bring food waste from home to contribute to the compost pile. While it was certainly not their favorite activity, students worked in self organized groups and rotated tasks in a coordinated effort to work on composting. "It helped me interact more with my classmates, working in groups to get a task done." By the end of the semester, students reported a real sense of accomplishment and even astonishment that food could be turned into dirt and dirt could be turned into food: "Visiting the farm taught me that our food waste could be taken back into the soil to help make the soil rich in nutrients again."

The physicality of farm work is well suited to experiential learning, as it provides students with tactile, embodied experiences that then become cognitively associated with the academic material. All of the students reported that they had a better understanding of the course curriculum because of their experiences at the farm (Table 1): "I feel that I do have a better understanding of the classroom curriculum because when we would go to the farm, a lot of it was hands-on learning."

The majority of students reported feeling that they had been of service to their community (Table 1), although community identification varied somewhat between students. The majority identified with CSUDH and the surrounding community: "We helped a community of students at Dominguez Hills who do not always have the benefit of eating [fresh] food every day and to bring awareness on stuff we can do in an urban environment to grow your own farm." A few students reported identifying with the global community by helping with greater issues of pollution and climate change: "I was able to learn about recycling and helping the planet more." As one of the course objectives is to use service-learning as scaffolding to build authentic relationships and true connection to campus life, a more structured discussion of various communities seems warranted, particularly to examine student belonging in the campus community in addition to all the other community identifications they experience in their lives.

The course offers additional opportunities for deeper learning. Students could not only reflect on helping their communities but work to address the root causes of the problems they face. An orientation toward social change is pivotal for critical service-learning (Mitchell, 2008). Asking the students to reflect on the relationship between the ability to grow food and the redistribution of power would help to further these objectives. The conditions of food apartheid in South LA have been well recognized for decades (Shaffer, 2002). Most of the students in this first-year seminar are local and have lived their entire lives surrounded by a broken food system. If students were given the opportunity to consider the imbalance of power that leads to these injustices, they might discover how having the ability to feed oneself healthy, nutritious food is a radical act that shifts power into their hands.

Surprisingly, when students were asked on the post-survey whether they believed other students would benefit from this type of learning experience, many responded in the negative. Paradoxically, respondents overwhelmingly reported having a net positive outcome from taking the course but were less inclined to agree that this type of learning experience might be beneficial to other students. Three of the total of 15 responses (20%) stood out. One student remarked, "It might not be everyone's forte because we do get dirty." This sentiment was voiced by several students during the semester. Accommodations were made to adjust activities to their interest and comfort level, while they were urged to explore an unfamiliar environment outside their comfort zone. Another student said, "I would say it depends on the student because if they aren't interested, it's a waste of time," while the third said, "I feel that if a student wants to learn more about how to care for our planet, they would learn a lot from this course." the implication being that the desire to learn might not always be present.

Student interest and commitment are essential in any course. However, a high-impact educational experience—particularly garden-based service-learning—requires a greater level of responsibility and self-direction (Aftandilian & Dart, 2013). Similar courses have also emphasized the need for students to take ownership of service-

learning activities to gain a sense of empowerment and accomplishment (Rhoads, 1997; Ward, 1999; Mitchell, 2008; Aftandilian & Dart, 2013; Archiopoli & Murray, 2019). The nature of the service work involved may need to be more explicitly stated in the university catalog and/or emphasized at the beginning of the semester so that those who lack interest can self-select early on and find other courses that are a better fit.

All the students reported that the experience affected their thinking about the problems and solutions discussed in class: "I understand important matters going on behind our very eyes, and I have options to do something about it." Many of the comments implied that they had been given a lot to think about: "I wasn't aware of all the food waste and ways we can help grow our own food. This course helped me see many of the problems there are, which then makes me wonder how I would like to live in my future." The development of critical consciousness takes time (Cipolle, 2010). Guiding students in the course to develop critical awareness of food justice issues plants the seed for them to continue growing in awareness in the years to come.

All the students reported a positive impact on themselves or their attitude towards the community. "It affected me very positively, I have learned what bonding with nature is all about, as well as how to respond to certain environmental problems." One student remarked, "It just shows the school actually cares." In this remark, "the school" is the CSUDH community, and the implication is that the community cares about the student(s). Feeling cared for by a community to which one has given service is an indication of the development of an authentic relationship in critical service-learning (Mitchell, 2008).

During the spring semester the CSUDH Urban Farm was still in its infancy, having been approved only in February of that year. The spring semester course included participatory experiential learning activities, but students did not work on the farm or participate in any other service-learning activity in the course. The perceived teaching effectiveness survey was used to compare the spring and fall versions of the course. The results indicated a significant difference in student comments about how to improve the instructor's teaching in the course. Fourteen participants responded to the survey in each semester, with a participation rate of 58% for spring and 56% for fall, the difference being statistically insignificant.

Notably, during the spring semester, only 33% of the students answered the question of how to improve the course, and 5 of the 8 students who responded (63% of respondents) requested some variation of more activities and fewer lectures. In contrast, during the fall semester, 48% of students answered the question, and 9 of the 12 (75% of respondents) reported that nothing further was needed to improve the course.

This disparity between the two semesters is likely not related to the number of activities, as students were given the same number of activities in the two semesters. Therefore, adding more activities to the spring semester, as the students requested, is unlikely to address their dissatisfaction. However, the two semesters differed significantly in type of activity, given that fall incorporated the service-learning component. The service-learning survey results to question 4 (Table 1) indicate that while students were satisfied with the service-learning activities, they acknowledged that these might not speak to everyone. Indeed, not having a liking for the course material or not enjoying the learning environment would be off-putting to some students (Dunwoody

& Frank, 1995; Xu & Webber, 2018). Perhaps the spring students enjoyed the material and wanted to spend more time outside and at the farm, as the course had already attracted a majority that wanted hands-on experiences.

It is beyond the scope of this investigation to determine whether or not the service-learning component was directly responsible for greater student success during the fall semester as compared with the spring semester. All the students who received an F grade had stopped coming to class during the semester and failed to withdraw before the deadline. Issues regarding student retention can be complex and highly individual, influenced by a multitude of factors such as differences in demographic backgrounds and financial pressure (Xu & Webber, 2018). The course structure and curriculum is specifically designed to support the retention of first-year students as part of the student-success initiative, with small class sizes and more individualized student-faculty and peer-to-peer interactions. A 13% failure rate and 17% DFW rate in the spring semester is notable and disappointing, while the 4% failure rate and 8% DFW rate in the fall semester marks important improvement. Causes for the higher DFW rate in the spring are likely multifaceted (Dunwoody & Frank, 1995) and warrant further study.

Conclusions

The building of the physical infrastructure of the CSUDH Urban Farm was a major step in the institutionalization of the garden-based service-learning program. In both spring and fall semesters, students were provided with a high-impact educational experience. However, in contrast to participatory experiential learning students, service-learning students reported greater satisfaction with the course and its activities, had a 3% higher GPA, and a 9% lower failure and DFW rate. Service-learning students expressed a connection with campus community and even a sense of feeling cared for. Students exhibited critical awareness of food justice issues and the ability to work toward community-based solutions and grow their critical consciousness. The garden-based service-learning component led to a significant improvement in course outcomes.

Some changes in the course going forward would likely improve outcomes further. An explicit description of the nature of the hands-on service work for the experiential learning version of the course in the university catalog or at the beginning of the semester would work to ensure the proper level of student commitment. A more explicit discussion of community would emphasize student belonging and encourage deeper involvement. A structured opportunity for reflection on the relationship between the ability to grow food and the redistribution of power will be added to the curriculum.

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