

Integrating Sustainable Development Goals into Service-Learning: A Pedagogical Approach for Creating Global Citizens

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Abstract

This paper explores the integration of Sustainable Development Goals (SDGs) into service-learning for fostering global citizenship and addressing societal challenges. Beginning with an overview of the complex issues facing society in the 21st century, this paper emphasizes the importance of engaging students in critical thinking, problem-solving, and collaboration related to service-learning to mitigate societal challenges. The authors explore service-learning projects of university students enrolled in an Education and Social Justice course, advocating for promoting students' essential skills, academic literacies, collaborative abilities, and global citizenship aligning with academic standards and the 17 SDG's outlined by the United Nations.

Keywords: Sustainable Development Goals (SDGs), United Nations, service-learning, global citizenship, societal challenges, project-based learning, collaboration

1. Introduction and Purposes of Study

The 21st century has been marked by significant technological and scientific advancements that have transformed the way we live, work, and interact with our environment. From unprecedented strides in healthcare leading to the eradication of diseases to technological innovations that connect the globe in milliseconds, the progress has been profound. However, these advancements are juxtaposed against a backdrop of enduring and emerging societal challenges that continue to plague global communities. The Sustainable Development Goals (SDGs) allow individuals to understand how issues such as escalating crime rates in urban settings, pervasive poverty, overpopulation in major countries, political and socio-economic crises, and ongoing conflicts such as international wars encompass the complex landscape of global challenges (United Nations, 2015).

Amidst these challenges, the role of education becomes paramount in equipping the next generation with the tools needed to effectively best meet the needs of society to create a more sustainable future for generations to come. The integration of the United Nations' SDGs into educational frameworks offers a strategic avenue to address these multifaceted problems. Service-learning, a pedagogical approach that combines learning objectives with community service, provides a practical and impactful method to engage students in real-world problem solving. Through service-learning, students apply academic knowledge to community challenges, enhancing their learning experiences while contributing to societal improvement (Lin & Shek, 2021).

The SDGs, established in 2015, outline a global agenda to end poverty, protect the environment, and ensure peace and prosperity for all by 2030 (United Nations, 2015). By incorporating these goals into service-learning projects, educational institutions can foster a sense of global citizenship among students, preparing them to act as conscientious global stewards. This integration seeks to advance academic learning and also cultivate essential skills such as critical thinking, collaboration, and problem-solving, which are crucial in today's complex and interconnected world (Salam, Iskander, Ibrahim & Farooq, 2019).

This paper explores the efficacy of integrating SDGs into service-learning initiatives and examines how this approach can be effectively implemented to foster global citizenship and address societal challenges. Drawing on educational theories and empirical research, this integrated approach advocates for the incorporation of service-learning into students' academic literacies and essential skills, aligning educational outcomes with the global

objectives outlined by the United Nations. Through this integrated academic and service-learning approach, we examine how service learning under the framework of the SDGs can transform students into active, informed, and engaged global citizens.

2. Theoretical Foundations of Service-Learning

The integration of SDGs into service-learning initiatives can be underpinned by a rich theoretical framework that spans several disciplines, including education, psychology, and social sciences. This section explores the key theories that support the pedagogical approach of service learning, particularly in the context of preparing students to engage with and address the challenges outlined by the SDGs.

2.1 Service-Learning Defined

Service-learning is an educational approach that combines learning objectives with community service, aiming to provide a pragmatic, progressive learning experience while meeting societal needs. It is characterized by students engaging in community service activities with conscious educational goals and reflected learning (Salam, et al., 2019; Jacoby, 2015). Service-learning not only enriches learning but also fosters civic responsibility and strengthens communities (Tijmsma, Hilverda, Scheffelaar, Alders, Schoonmade, & Blignaut, 2020).

As an educational approach, service-learning integrates learning objectives with community service, aiming to offer both a pragmatic and progressive learning experience while addressing societal needs (McDougle & Li, 2023; Lin & Shek, 2021). This method enriches students' academic learning, cultivates civic responsibility, and strengthens community ties. It is characterized by students actively participating in community service activities aligned with intentional educational goals and reflective learning, thus providing a comprehensive framework for understanding and engaging with societal challenges (Pinto & Ramalho, 2024; Salam et al, 2019).

The effectiveness of service-learning is further underpinned by several educational theories that explain its impact on student learning and development. David Kolb's 1984 Experiential Learning Theory is central to understanding the mechanics behind service learning. Kolb (1984), in his classic service-learning theory, suggests that learning is a cyclical process involving four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. In service learning, students undergo this cycle as they engage in community activities (concrete experience), reflect on these experiences (reflective observation), derive broader understandings (abstract conceptualization), and apply their new knowledge in real-world settings (active experimentation).

Complementing Kolb's theory, Lev Vygotsky's Social Development Theory highlights the importance of social context in learning. Vygotsky (1978) emphasized that learning occurs through interactions with others and that cognitive development is significantly enhanced through these social interactions. Service-learning leverages this dimension by immersing students in community settings where learning is contextualized within real-world social interactions, thereby enriching their cognitive and social development.

Albert Bandura's Social Learning Theory also supports the framework of service learning by recognizing the role of modeling and observation in learning. Bandura (1977) maintained that observing the behaviors, attitudes, and emotional reactions of others within a community influences and shapes students' own behaviors and attitudes. Through service-learning, students witness and emulate positive community interactions and leadership behaviors, which contribute to their holistic educational experience.

Collectively, these theories provide a robust theoretical framework for service-learning, highlighting how such educational experiences are not only about serving but also about learning through active and reflective engagement with the community. This active serving and learning approach not only addresses the immediate educational goals but also instills lifelong skills and values that contribute to personal and societal well-being.

2.2 Historical Context and Evolution of the SDGs

The SDGs are not merely aspirational targets but are the result of a long-standing global commitment to sustainable development. This commitment was formalized through several key milestones in the history of international policy. The journey began in June 1992 at the Earth Summit in Rio de Janeiro, Brazil, where over 178 countries adopted Agenda 21, a comprehensive plan of action to build a global partnership for sustainable development aimed at improving human lives and protecting the environment (<https://sdgs.un.org/goals>).

Further commitments were made with the unanimous adoption of the Millennium Declaration at the Millennium Summit in September 2000 at the United Nations Headquarters in New York. This summit was pivotal as it led to the establishment of the eight Millennium Development Goals (MDGs), focusing on reducing extreme poverty by 2015 (<https://sdgs.un.org/goals>). The subsequent Johannesburg Declaration on Sustainable Development in 2002 and the Rio+20 Conference in 2012 continued to build on these foundations, emphasizing multilateral partnerships

and sustainable practices (<https://sdgs.un.org/goals>).

In 2015, a landmark year for international policy shaping, the 2030 Agenda for Sustainable Development was adopted, marking the transition from MDGs to SDGs (<https://sdgs.un.org/goals>). This agenda, adopted at the United Nations Sustainable Development Summit, introduced 17 SDGs that set a broader and more inclusive range of objectives for global development. Notable frameworks from the same year, such as the Sendai Framework for Disaster Risk Reduction and the Paris Agreement on Climate Change, underscore the comprehensive approach taken to ensure sustainable development across various fronts.

Over time, substantial work has been done to address the needs of society and create a sustainable future for generations to come. Some accomplishments include: (<https://sdgs.un.org/goals>)

- At the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro, Brazil, in June 2012, Member States adopted the outcome document “The Future We Want” in which they decided, among other things, to launch a process to develop a set of SDGs to build upon the MDGs and to establish the UN High-level Political Forum on Sustainable Development (<https://sdgs.un.org/goals>).
- In 2013, the General Assembly set up a 30-member Open Working Group to develop a SDG proposal (<https://sdgs.un.org/goals>).
- In January 2015, the General Assembly began the negotiation process on the post-2015 development agenda. The process culminated in the subsequent adoption of the 2030 Agenda for Sustainable Development, with 17 SDGs at its core, at the UN Sustainable Development Summit in September 2015 (<https://sdgs.un.org/goals>).
- 2015 was a landmark year for multilateralism and international policy shaping, with the adoption of several major agreements (<https://sdgs.un.org/goals>)
 - Sendai Framework for Disaster Risk Reduction (March 2015)
 - Addis Ababa Action Agenda on Financing for Development (July 2015)
 - Transforming our world: the 2030 Agenda for Sustainable Development with its 17 SDGs was adopted at the UN Sustainable Development Summit in New York in September 2015.
 - Paris Agreement on Climate Change (December 2015)
- Now, the annual High-level Political Forum on Sustainable Development serves as the central UN platform for the follow-up and review of the SDGs (<https://sdgs.un.org/goals>).

As doctoral students and faculty members actively engaged as representatives to the United Nations, Jovic, Brand, and Kim have had the privilege of participating in ongoing dialogues and collaborative exchanges that shape global educational and developmental policies. This engagement has emphasized the value of integrating these global goals into our teaching and research practices. This integration not only aligns with SDG #4, which focuses on Quality Education, but also fosters a pedagogical environment where students are encouraged to engage in learning that is deeply interconnected with real-world challenges. As United Nations Representatives, the first two authors of this article often engage in collaborative discourse exchanges with world leaders, representatives, and heads of state, actively seeking new and innovative instructional approaches to best meet students’ needs. Through this engagement of collaborative discourse, Jovic, Brand, and Kim disseminate information and educate about the SDGs from the UN to our classrooms and fuel our students’ intrinsic motivation to ignite and spur change in the world.

Recently, the second author attended the UN’s “Inclusive Quality Education for All” event, where in-depth discussions focused on supporting students’ abilities through an asset-oriented approach, an approach where Jovic, Brand, and Kim recognize students’ strengths and talents and build upon their schematic knowledge/skills that they already hold. It became evident that all leaders across the world believe that active learning, both inside and outside the classroom, grounded in strategies such as discussion circles, Socratic seminars, and community-building activities, serve as opportunities for students to not only strengthen their critical thinking and communicative proficiencies but to create a community. This type of community, created by active serving and learning, ignites and encourages changes in creating a more sustainable future. By creating safe and welcoming environments where community building and respect are at the center of discussion, students’ intrinsic motivation toward inquiry, learning, and growth is fueled. Early experiences with service-learning, therefore, may pave the way for students’ continual and ongoing community service (Pinto & Costa-Ramalho, 2022). In promoting service-learning, we think creatively and encourage students to apply their knowledge, skills, talents, and experiences to benefit their communities and our world.

United Nations events, such as the one described, allow educators and researchers to dive deeper into the educational research that exists and engage in discussions with heads of state worldwide. These discussions focus on creating a sustainable future for generations to come through active and project-based learning. Pedagogical approaches and strategies that support student growth/development are the backbone of these events. The authors of this article believe that engaging in active learning projects supporting the UN's sustainable development goals enables us to glean new ideas and perspectives, inspire other educators, K-12 students, and administrators, and enhance their life-long learning journey.

At the public school level, the second author regularly integrates research/project-based learning into instruction, as it allows students to strengthen their communicative proficiency and engage in collaborative learning, an approach coined by educators and researchers worldwide. In addition, project-based collaborative learning allows students to research real-world issues and seek solutions to these problems. This author has found that students' intrinsic motivation is fueled, and the classroom is filled with inquiry and higher learning. More specifically, this author has found that student-centered independent research projects are primarily focused on meeting urgent needs of their communities (SDGs #8, #11, #13). Recently, world hunger has been an issue of interest among many, so students have engaged in an independent research project to look for new and innovative ways to combat this issue. Through in-depth research reviewing policies and procedures of the community, state, and school districts, students and community members drafted potential solutions to address the UN's Goal #2, "Zero Hunger."

3. Educational Approach and Methodology

In light of the theoretical and historical roots of service-learning and the SDGs, it seems reasonable to start exploring how such values can be enacted within education. This crossroads between the transnational aims of the SDGs and the practical consequences of place-based learning requires a practical model whereby students' learning can be linked to socially impactful outcomes. With active and experiential learning approaches, teachers can align classroom practice with international goals, and create a culture of questioning, questioning and engagement. This process not only educates students in society's struggles, but empowers them to become a force for change within their own communities. This section elaborates on the methods employed to integrate the 17 Sustainable Development Goals (SDGs) into university-level service-learning projects within a Social Justice course. The primary goal of these projects is not only to promote understanding of the 17 UN SDGs (see Figure 1) but also to apply them practically by addressing global issues through direct community engagement. As defined in our theoretical framework, service-learning combines academic learning with meaningful community service, allowing students to address real-world problems while developing crucial skills and knowledge. (Santos-Rego, Mella Nunez, Naval, & Vasquez Verdera, 2021).

3.1 Implementation of SDG-Linked Service-Learning Projects

At the outset of her "Grand Challenge" Education and Social Justice course, the first author of this study introduced students to the SDGs through a series of lectures, illustrative slides, and interactive discussions designed to enhance their understanding of each goal's implications and relevance. Following this foundational knowledge, students were tasked with selecting a service-learning project that aligned with one or more of the SDGs (see Figure One, below). The selection process was guided by both the students' interests and the urgent needs of the community, ensuring that each project had a clear, impactful objective.

Each project was designed to address specific global challenges such as homelessness, climate change, poverty, pollution, and educational disparities. For instance, one group focused on SDG 13 (Climate Action) by participating in a local community's tree planting event, while another tackled SDG 4 (Quality Education) by developing tutoring programs for underprivileged children in the community. These projects were not only about service but were deeply integrated with academic objectives, requiring students to apply theoretical knowledge in planning, executing, and reflecting on their activities (<https://www.springernature.com>).



Figure 1. United Nations Sustainable Development Goals (SDGs)

Source: SDG, <https://sdgs.un.org/goals>.

The service-learning projects were a required, culminating component of a “Grand Challenge” course at a large northeastern university. Two three-credit Grand Challenge courses are required of all students at this university; these courses address timely societal issues such as gender equality, racial relations, world hunger, the effects of poverty, immigration, the rights of Indigenous Peoples, climate change, the LBGTQ+ population, and applications of freedom of speech. The course under review enrolled two sections of a cross-discipline/cross-level (first-year through senior students) course entitled Education and Social Justice. Twenty-Five undergraduate students from various academic disciplines and levels (first year through seniors) were enrolled in each of two sections of the course, taught by the Instructor/first author, for a total of 50 students. A central component of the course involved service-learning, which enlisted the four stages of classical experiential learning as discussed by Kolb (1984): a. concrete experimentation; b. reflective observation; c. abstract conceptualization; and d. active experimentation/application to real-world situations. In preparation for the concrete experimentation stage, students selected their service-learning projects based on personal interests, partner organizations, including homeless and women’s shelters used in previous semesters, and scheduling/availability. Two 70-minute classes were devoted to assisting students in identifying the service-learning site of their choice and other students in the class with whom they could work in a group to visit the site and perform needed services. The course instructor invited three site managers from the local homeless shelters and disability services groups to speak to the class to inform and recruit several volunteers. In dyads or groups of 3-5, students sharing rides, commuted to their selected service-learning sites. Aside from transportation, the required actual service-learning hours transpired from 2-3 hours. The projects were implemented during two consecutive months near the end of the academic semester. The course instructor/author contacted managers or directors at each service learning site to ascertain students’ attendance and satisfactory completion of the required four hours of service. Students were also required to submit photographs of themselves delivering the services at their sites.

3.2 Data Collection and Analysis

In their Reflective Observation phase (Kolb, 1984) of their projects in the last month of the semester, the students shared, and the instructor/first author collected, detailed information regarding the implementation of the SDGs in these projects. This information included Project Reports, Community Partner Feedback, and Summary Reflection Slide Shows. The four-page, typed Project Reports were submitted to the instructor at the conclusion of the service-learning projects. Reports included the following sections: (a) Theoretical foundation and background of the theme or issue; (b) Service-learning site (location, description, contact information, and rationale for selection); (c) Group members; (d) Date(s) and times of service; (e) Goals for the Project; (f) Roles of each group member; (g) Strengths and weaknesses of the project and individual contributions; (h) Future real-world applications and (i) the SDGs addressed in the project.

Using brief surveys, phone calls, text messages, or in-person, follow-up visits, the course Instructor solicited anecdotal Feedback from the project site managers after the projects. The Instructor verified that each student on the Report actually participated in the Service-Learning for the hours and dates they listed on the Report. The Instructor asked the site managers for a description of the services rendered and the degree of satisfaction with these volunteers’ services. After the visit summary conversation, the course Instructor asked site managers how the visits might be improved and how, specifically, future groups might assist in service learning at these sites.

In their Abstract Conceptualization and Real-World Application Phases (Kolb, 1984), students shared their reflections with the class, including the project's strengths and challenges, implications and future applications, and the SDGs addressed. Students, in groups of three to five, selected a class day and time to present their 10-12 slide Service-Learning slideshows to the class. Each group member presented at least three of the slides illustrating their service-learning experience. The creative and colorful slide shows consisted of a summary similar to the Service-Learning Report (above) and addressed the following components: background of the topic; location and mission of the project; goals for the project, individual contributions, individual and group accomplishments, strengths and weaknesses of the project, implications, future applications, and SDGs addressed. Including the follow-up questions and discussion, the presentations were each approximately 30 minutes in length.

Enlisting the Socratic learning approach discussed above, a question-and-answer session/whole group discussion followed each presentation. Class members and group presenters were encouraged to examine the impact of the projects on the community and the world and the continuance of the projects for future groups of students. The analyses, based upon Table 1 focused on identifying which SDGs were most frequently addressed, the nature of the interventions, and the outcomes related to community impact and student learning. These analyses provided critical insights into the sites and projects themselves, as well as the effectiveness of service-learning as a pedagogical tool for engaging with global issues through the lens of the SDGs.

Table 1. Service-Learning Sites and Related SDGs by Two Class Sections

Class Section One	Class Section Two	Class Section Three	Class Section Four
Warm Welcome House: Preparing and Serving Dinner at Homeless Shelter SDGs: 3, 10, 12, 16, 17	Holiday Cards for Nursing Home Residents SDGs: 3, 10, 16, 17	Classroom African Art project SDGs: 1, 2, 4, 9, 10, 15, 16, 17	Classroom Library Diversity Book Screening/Set Up DGs: 4, 5, 10, 16, 17
Serving Thanksgiving Meal at Homeless Shelter SDGs: 2, 3, 10, 12, 16, 17	Holiday Cards for Veterans SDGs: 3, 10, 16, 17	Serving Meals at Soup Kitchen SDGs: 2, 3, 10, 12, 16, 17	Charter School LGBTQ+ Book Sharing and Storytelling 3, 4, 5, 10, 16, 17
Class Section Two Animal Shelter Donations and Clean-Up SDGs: 2, 3, 10, 15, 16, 17	Tree Conservancy: Tree Planting SDGs: 9, 11, 13, 15, 17	Homeless Shelter Leaf Raking and Composting SDGs: 3, 8, 9, 13, 15, 16, 17	Big Brother/Big Sister Clothing/ Household Goods Donations and Resales SDGs: 1, 3, 5, 8, 9, 10, 11, 12, 16, 17
Beach Clean Up SDGs: 3, 6, 9, 11, 13, 14, 15, 17	Nursing Home Games and Conversations SDGs: 3, 4, 5, 10, 16, 17	Crisis Line Training and Volunteering SDGs: 3, 4, 5, 10, 16, 17	Workshop for First Generation Students SDGs: 3, 4, 8, 10, 16, 17

4. Data Findings

Interestingly, the most frequently student-cited SDGs enlisted in the aforementioned service-learning projects were numbers 10 (reduced inequalities), 16 (peace, justice, and strong institutions) and 17 (partnerships for the goals). The reasons for the relative frequency of SDG number 10 (reduced inequalities) relates to the students' predominant selection of projects with urban schools, homeless shelters, underserved student populations, veterans' homes, nursing homes, and generally underserved communities and populations. SDG numbers 16 and 17 were cited frequently because of these SDG links to the themes of both the social justice class and this project, that of promoting peace and partnerships to achieve the SDGs between the university and neighboring communities. The least or not selected SDGs were numbers 10 (clean water and sanitation), 7 (affordable and clean energy), and 14 (life below water). The remaining SDGS were identified and applied between two to twelve times in the various service-learning projects.

Feedback from schools and institutions included notes of gratitude, such as the following from directors, principals, and supervisors at the various organizations in which the students served:

(from a Homeless Shelter director): "Your students are a joy! They are always welcome to visit the Warm Welcome House to rake leaves, tend the garden, prepare and serve meals, and clean our rooms. We are happy to partner with [your university]."

(from a local rural school librarian): "Your students were wonderfully helpful in organizing our school library

and so interested in our diversity book selection.”

(from a local suburban school teacher): “The [grade two] students were fascinated by the creative and beautiful African art projects the university students introduced. They are welcome to return anytime!”

(from a nursing home activities director): “The residents [at our Nursing Home] loved having the university students interact with them and play games with them. Please come back again next year!”

(from an urban charter school Head of School): “Our students [progressive charter school students] loved learning more about the LGBTQ+ population through interesting books and storytelling methods.”

The students’ final reflections noted their appreciation for service learning, as they made comments such as the following in their Summary Reflections:

“As a future therapist, I found working with the Crisis Hotline a really important experience. I learned so much about the critical importance of being there for others in need.”

“Telling and reading stories about the LGBTQ+ population to students was empowering and even life-changing for me. As a son of two gay mothers, I know the importance of respecting and teaching about diversity.”

“Working in an Animal Shelter helped me realize that animals deserve social justice, too, the same as humans. Since my major is Animal Science, this project was both timely and relevant to my future career. I fell in love with all the animals and had to use great restraint to not take home one of the puppies!”

5. Discussions

5.1 Leveraging SDGs in Service-Learning: A Pedagogical Approach

Following the historical context of the SDGs, Jovic, Brand, and Kim delved into how these goals are practically applied through service-learning initiatives in educational settings, including public schools and universities. The service-learning projects described herein align with the SDGs and actively contribute to their realization. Students engaged in these projects tackle issues from local community needs to global challenges, embodying the spirit of the SDGs by promoting sustainable development through education.

Service-learning components are strategically designed to incorporate SDG targets in courses such as Education and Social Justice. Students chose projects that resonated with their personal and academic interests, ranging from environmental conservation to social equity, all the while contributing to specific SDGs. For instance, projects like tree planting directly supported SDG 15 (Life on Land), while initiatives such as crisis hotline support addressed

5.2 SDG 3 (Good Health and Well-being)

In general, students selected most of the 17 SDGs in their service-learning projects. Given the fact that virtually none of the students were previously familiar with the SDGs, the project was successful at helping students to not only identify and define the 17 SDGS but also to apply them in community service-learning. Moreover, all of the students reflected in their summary reflections that their service-learning projects were impactful and memorable and contributed meaningfully to their future careers. They also enjoyed the camaraderie and collaboration of their peers, and remarked that they appreciated the opportunity to get to know each other through riding to the project sites, performing the services, and occasionally stopping for a casual dinner on the drive home.

Through the integration of service-learning and SDGs, students gain academic knowledge and develop a profound sense of global citizenship and responsibility. This educational approach encourages them to think critically and act compassionately, paving the way for a more sustainable and equitable world.

6. Implications and Conclusion

This project, uniting the 17 United Nations SDGs with actual service-learning experiences, laid a solid foundation for students pursuing various disciplines to both identify and apply the SDGs in real-life settings. The service-learning projects were very successful and memorable from all indications— the actual projects, feedback from schools and agencies, and students’ summary reflections. Students were intensely engaged in each phase of their service-learning journeys, from concrete experimentation to reflective observation to abstract conceptualization state to real-world applications (Kolb, 1984).

Given the fact that SDGs 6 (clean water and sanitation), 7 (affordable and clean energy), and 14 (life below water) were enlisted very few times and by very few students, Brand contemplated how they may encourage students from various university disciplines to incorporate more of the SDGs into their selected service-learning projects. For example, the Brand might provide videos and slideshows on local and regional areas with polluted water and sanitation (SDG 6). Junior and senior electrical engineering students in the class might be encouraged to mentor

first and sophomore-level students enrolled in the university's engineering program (SDG 7). Students might then partner to raise money through in-person and online platforms to support clean-up efforts. Biological Science majors might pursue a service-learning project involving partnering with a local aquarium or group of marine biologists to investigate underwater species (SDG 14).

Future course offerings require additional time for service-learning. For example, extra class time might be devoted to service-learning planning, and additional site managers might be invited to speak to the class and solicit volunteers. In addition, the service-learning projects might be expanded to include a wider group of university students. The project sites might be expanded to include more out-of-state locations or even international projects, such as working alongside a new university grant project designed to encourage urban high school students to attend the university or offering virtual projects involving an ongoing service-learning project with students and faculty at an elementary school in western Kenya. Many university students reported that the service-learning project was their favorite and most impactful course component. Allowing more class planning time for the projects and increasing the time devoted to the projects are promising future directions suggested by the students.

Many students ride-shared to their service-learning sites. However, because of their academic schedules, transportation was often overly time-consuming and a scheduling challenge for some students; in the future, educators might devote more time to scheduling and matching students to service-learning sites close to their university housing or homes. Educators might work with agencies and schools to create a virtual sign-up list, matching the students' schedules with their peers and the availability of the schools and agencies.

Future service-learning projects/studies might also involve the collaboration of students who are enrolled in various university disciplines. For example, a university education class might temporarily join a university psychology class, addressing SDG 16 (Peace, Justice, and Strong Institutions); students might collect surveys of students of color on campus and determine lived incidents of microaggressions (e.g., stereotyping, discrimination) and macroaggressions (bullying, extreme instances of verbal abuse, and violence). After analyzing the results, they might collectively plan the necessary steps (seminars, classes, guest speakers, other campus events) involved in making the campus and community a more welcoming and safe place. Future studies might promote and examine service-learning experiences in the elementary, middle, and high schools enlisting targeted UN SDGs. Involving students in service-learning from an early age onward may exert a cumulative impact on students' desire to continue proactive service-learning in the future.

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Appendix A

https://www.springernature.com/gp/researchers/sdg-programme?sap-outbound-id=379B314001B027947CE62DBD70F2CAAEBED374F6&utm_source=automation&utm_medium=email&utm_campaign=111_STT5771_0000032336_CONR_JRNLS_REP1_GL_PMLS_034LA_SPRMAINRC3&utm_content=EN_60113_20240502&mkt-key=8D09219F09111EDE94F627F1D7590138 (Insert this reference if we decide to include their brief summaries of each SDG.)

<https://www.springernature.com/gp/researchers/sdg-programme/sdg17>

1: Sustainable Development Goal 1 (SDG 1) of the United Nations aims to end poverty in all its forms everywhere by 2030. Poverty is a complex and multifaceted problem, and there is no single solution. However, research has shown that there are a number of effective strategies for reducing poverty.

2: Sustainable Development Goal 2 (SDG 2) of the United Nations aims to end hunger, achieve food security and

improved nutrition, and promote sustainable agriculture by 2030. Hunger is a complex problem with many root causes, including poverty, inequality, conflict, and climate change.

3: Sustainable Development Goal 3 (SDG 3) is one of the 17 Sustainable Development Goals established by the United Nations in 2015. The official wording of SDG 3 is: “To ensure healthy lives and promote well-being for all at all ages.” SDG 3 research focuses on key targets like: reducing maternal mortality, ending preventable deaths for children under five, fighting communicable diseases, reducing mortality from non-communicable diseases, and promoting mental health.

4: Sustainable Development Goal 4 of the United Nations aims to ensure inclusive and equitable quality education, and to promote lifelong learning opportunities for all. Education is a fundamental human right, and it is also essential for economic growth, social development, and environmental protection.

5: Sustainable Development Goal 5 (SDG 5) of the United Nations aims to achieve gender equality and empower all women and girls. Gender equality is essential for sustainable development, as it allows women to reach their full potential and contribute to their communities and economies.

6: Sustainable Development Goal 6 (SDG 6) of the United Nations aims to ensure availability and sustainable management of water and sanitation for all. Clean water and sanitation are essential for human health and well-being, and also critical for sustainable development.

7: Sustainable Development Goal 7 (SDG 7) is one of the 17 Sustainable Development Goals established by the United Nations in 2015. The official wording of SDG 7 is: “Ensure access to affordable, reliable, sustainable and modern energy for all.” Access to clean and affordable energy is key to economic growth, social development, and environmental protection.

8: In an era defined by globalization, technological advancement, and economic complexities, the pursuit of equitable economic development is more critical than ever. That is why the United Nations established its Sustainable Development Goal (UN SDG) 8: Decent Work and Economic Growth. Work on this SDG focuses on labor markets, entrepreneurship, and economic policies in pursuit of a more prosperous, inclusive, and sustainable global economy.

9: Sustainable infrastructure and industrialization are essential for achieving the United Nations Sustainable Development Goals (SDGs). Infrastructure provides the foundation for economic growth and development, while industrialization creates jobs and opportunities. However, traditional infrastructure and industrialization models are often unsustainable. SDG 9 aims to build resilient infrastructure, promote sustainable industrialization, and foster innovation.

10: United Nations Sustainable Development Goal (SDG) 10 aims to reduce inequality within and among countries. Inequality is a major obstacle to sustainable development, as it limits opportunities for people and communities, and can lead to social unrest and conflict. SDG 10 calls for action to reduce inequality in income, wealth, access to education and healthcare, and other areas. This goal also calls for the promotion of social inclusion and non-discrimination.

11: Sustainable cities and communities are essential for a sustainable future. United Nations Sustainable Development Goal (SDG) 11 ‘**Sustainable Cities and Communities**’ aims to make cities inclusive, safe, resilient, and sustainable. This goal calls for action to improve urban planning and management; provide access to basic services, such as water and sanitation; reduce urban poverty and inequality; promote sustainable transport and energy; and protect and restore urban ecosystems.

12: Sustainable consumption and production is the use of natural resources in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs. This is the focus of United Nations Sustainable Development Goal (UN SDG) 12, a goal that calls for a major shift in the way we produce and consume goods and services.

13: Climate action is essential for achieving the United Nations Sustainable Development Goals (SDGs), and is the focus of SDG 13. Climate change is having a devastating impact on people and ecosystems around the world. SDG 13 calls for urgent action to combat climate change and its impacts.

14: Sustainable Development Goal 14 (SDG 14) is one of the 17 Sustainable Development Goals established by the United Nations in 2015. The official wording of SDG 14 is: “Conserve and sustainably use the oceans, seas and marine resources for sustainable development.” The oceans cover more than 70% of the Earth’s surface, and play a vital role in regulating the climate, providing food and jobs, and supporting biodiversity. Achieving SDG 14 means protecting the oceans for future generations.

15: United Nations Sustainable Development Goal (SDG) 15 aims to protect, restore, and promote the conservation and sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss. Land degradation is a major threat to sustainable development, as it can lead to food insecurity, water scarcity, climate change, and the loss of biodiversity. SDG 15 calls for action to protect and restore land ecosystems, to sustainably manage forests and halt desertification.

16: Sustainable Development Goal (SDG) 16 is one of the 17 Goals established by the United Nations in 2015. The official wording of SDG 16 is: “Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.” Peace and justice are essential for economic growth, social development, and environmental protection. Achieving SDG 16 means creating a world where everyone has the opportunity to reach their full potential and live together in peace and security.

17: Addressing complex societal challenges that impact interconnected systems requires us to consider different regional and local contexts to identify equitable solutions.

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