

From Classroom to Community: Service-Learning and the Sustainable Development Goals

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ABSTRACT ¹

Education for Sustainable Development (ESD) is crucial for equipping individuals with the competences needed to address the pressing social, economic, and environmental challenges of our time. Despite the recognized potential of service-learning in cultivating competences that can promote sustainable development, there is a lack of empirical research exploring the development of these competences among students. Hence, this study examined the effectiveness of service-learning as a pedagogical approach to ESD in fostering essential competences among students. The research involved 43 groups of students, who engaged in addressing various sustainable development issues through service-learning. A thematic analysis of students' written reflections revealed the development of six key competences: systems thinking, anticipatory, normative, strategic, interpersonal, and intrapersonal competences. These competences were nurtured through real-world engagement that enabled students to understand complex, interconnected sustainable development issues, anticipate future challenges, set ethical and practical goals, plan and implement strategic solutions, collaborate effectively, and display resilience amid challenges. The findings show the transformative potential of service-learning in aligning education with the Sustainable Development Goals (SDGs) and preparing students to contribute meaningfully to sustainable development by addressing community issues, creating impactful initiatives, and promoting personal and social transformation.

Keywords: Service-Learning, Sustainable Development Goals, Education for Sustainable Development, Competences

1. INTRODUCTION

The adoption of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) was driven by a global consensus that urgent and impactful action is needed to address the pressing environmental, social, and economic challenges facing the world [1]. The 17 SDGs were developed in response to this universal call to action to end poverty, protect the planet, and ensure that all people, regardless of their circumstances, can live with dignity and in peace [2, 3]. These SDGs represent common aspirations for creating a more sustainable future. They provide a roadmap for countries and public, private, and civil society actors to work together toward sustainable development [1, 2].

SDGs, with their comprehensive approach to addressing global challenges, have the potential to bring about significant positive changes in societies around the world. However, the desired social transformation is still not within reach despite ongoing efforts to meet the targets of the 17 SDGs. The triple crisis of growing inequality, accelerating climate change, and the debilitating pandemic have hindered progress toward fully realizing the SDGs by 2030 [1].

Notwithstanding the challenges posed by this crisis, opportunities remain for collective action and innovative solutions that can bring us closer to attaining SDGs, including the goal of quality education. One such opportunity is to harness the power of education, which can contribute to achieving SDGs by raising awareness, promoting understanding, and mobilizing action toward sustainable development [4]. In this regard, education serves both as a goal and a means of fulfilling other aspects of sustainable development [5].

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Hence, Education for Sustainable Development (ESD) has become imperative, as its transformative paradigm offers a vital approach to reimagining education today [6]. ESD not only focuses on learning content and outcomes but also emphasizes the importance of pedagogy and the overall learning environment to provide a holistic and transformative educational experience [7, 8]. The main purpose of ESD is to empower learners with the knowledge, skills, values, and attitudes necessary to think and act sustainably for the benefit of the present and future generations [6].

Given the urgency of ESD, educational institutions should prioritize its integration into their curricula. However, ESD should not be merely an add-on to the existing curriculum. It should form the core of teaching and learning [7]. This process of curricular integration considers not only the competences that learners should acquire but also the strategies and methods that facilitate effective learning and the application of this learning in real-world settings [7, 9]. ESD entails an educational approach characterized by action-oriented, transformative pedagogy [8]. Such an approach should foster self-directed learning, encourage participation and collaboration, promote problem-solving, integrate multiple disciplines, and bridge the gap between formal and informal learning [7]. It should include opportunities for students to believe that they can contribute to achieving the SDGs by creating structures that cultivate agency [10].

An action-oriented and transformative pedagogy that can facilitate ESD is service-learning [11]. Proponents of service-learning define it as a credit-bearing educational experience wherein students engage in community service to address the articulated needs of the community and reflect on their community engagement to deepen their understanding of course content, appreciate their discipline more broadly, and enhance their personal values and civic responsibility [12]. This pedagogy brings together students, educators, and the community as agents of change, who can tackle the environmental, social, and economic issues that define our global landscape [11].

Several studies have found that service-learning can have a positive impact on students in various ways, such as cognitive development, personal growth, and sense of citizenship [13, 14, 15, 16]. However, few studies have investigated the impact of service-learning on students in terms of the competences that are essential to addressing sustainable development issues [17]. Furthermore, most research conducted on the impact of service-learning on students is based on self-reported surveys. Students' written reflections are often overlooked in the literature as a rich source of data. More empirical evidence from qualitative research is needed to further understand the influence of service-learning on students' knowledge, skills, values, and attitudes [18].

Hence, this study examined the specific competences that were fostered among students as they responded to sustainable development issues as part of their community engagement in service-learning. This qualitative research can offer a better understanding of service-learning as a pedagogical approach to ESD, as its findings can provide deeper insights that quantitative measures alone cannot achieve. Practical insights into the competences that service-learning can bring about can also help educators design targeted, impactful educational practices that would allow students to address real-world issues related to sustainable development. Lastly, the study can inform educational institutions in making policies that can support the integration of ESD and service-learning into their curricula.

2. THEORETICAL FRAMEWORK

Competence carries several meanings, depending on its purpose. It can be considered a personal attribute, behavior, or outcome [19]. Others view it as an ability, disposition, process, relation, state of being, or integration of resources [20]. In this study, competence refers to the knowledge, skills, values, and attitudes necessary to perform tasks effectively and successfully to meet complex demands. It includes both cognitive and non-cognitive abilities to solve real-world problems, such as sustainable development issues [5, 21].

Several scholars have proposed a list of competences as desired outcomes of ESD. Weik and colleagues summarized these competences from the literature based on their conceptual similarities to systems thinking competence (the ability to analyze complex systems in society at local and global scales while accounting for cascading effects, inertia, feedback mechanisms, and other systemic elements associated with sustainable development issues), anticipatory competence (the ability to assess, consider, and construct future scenarios related to sustainable development), normative competence (the ability to chart and specify objectives, goals, and targets for sustainable development while negotiating and reconciling environmental, social, and economic considerations), strategic competence (the ability to plan and organize interventions, transitions, and governance for sustainable development), and interpersonal competence (the ability to inspire, empower, and support collaborative and inclusive problem resolution) [21]. Giangrande and colleagues validated these key competences through a series of workshops and suggested adding intrapersonal competence (the ability to function in a challenging world, while looking after one's wellbeing and staying committed as an agent of change) to the list given that ESD holds a transformative potential [5].

These six key competences encompass a comprehensive set of abilities that are crucial for students to contribute effectively to sustainable development. These reflect the

multifaceted nature of sustainable development issues and the integrated approaches required to address them. Together, these competences can provide a robust framework for guiding educational practices and curricula aimed at preparing students to respond to the complex and interconnected challenges that affect contemporary society.

Service-learning can provide a practical, collaborative, and reflective environment in which students can develop and apply competences that are essential for addressing sustainable development issues. It immerses students in real-world contexts, where they can apply theoretical knowledge to practice, thus fostering key competences in a meaningful and impactful way. By addressing real community needs through service-learning, students develop a sense of responsibility and commitment to sustainable development.

This theoretical framework substantiates the suitability of qualitative research to investigate the development of key competences within the real-life context provided by service-learning. It informs the selection of written reflections as data sources for this study and guides the analysis of the gathered data according to predefined competences. Additionally, the theoretical framework offers a lens through which to interpret and support the findings and propose practical recommendations for educational practices.

3. METHOD

This qualitative study adopted a case study research design to examine the competences that can be fostered among students as they engage in service-learning as part of their ESD. A case study design was used in this study, as it is most suitable for investigating a phenomenon within its real-life context [22]. This study examined the effectiveness of service-learning as a pedagogical approach to ESD. By identifying the competences that service-learning can bring about among students, this case study can provide insights into the real-world applications of ESD and inform future educational practices that are more aligned with the aspirations of ESD.

Setting and Participants

This study was conducted at Ateneo de Manila University (ADMU), an institution of Catholic higher education in the capital of the Philippines. Rooted in Jesuit values, ADMU is committed to addressing pressing societal challenges through education, formation, research, and community engagement [23]. The university's service-learning programs, with their emphasis on social justice, nation-building, and sustainability, make it an ideal setting for exploring real-world applications of ESD.

ADMU offers the course SocSc 13 or *The Economy, Society, and Sustainable Development* as part of the general education curriculum for undergraduate students and as an illustration of ESD. The course is aligned with ADMU's strategic priority areas, such as education reform and transformation, integral ecology, universal health and well-being, and bridging cultural divides. It aims to deepen students' understanding of the economic and social development processes by focusing on poverty, exclusion, inequality, and vulnerability in the Philippines. It uses service-learning as a pedagogical approach to help students explore alternatives to address sustainable development issues. Paired with the government-mandated civic welfare program, the course provides students with meaningful opportunities to engage with government and non-government agencies, people's organizations, and civil society groups to contribute to initiatives that benefit marginalized communities and participate in efforts to achieve the SDGs. It seeks to equip students with the knowledge, skills, values, and attitudes necessary to promote sustainable development by challenging them to propose and implement socially just and environmentally sustainable solutions.

Four teachers of SocSc 13 self-nominated their classes in the first semester of the academic year 2023 to 2024 to be part of this study. Students under these teachers were eligible to participate in this study within the specified academic term. Those students, who gave their consent for their groups' written reflections to be collected for the purpose of this research, were included as study participants. These students were in their third year of undergraduate studies and belonged to the academic disciplines of fine arts, diplomacy and international relations, political science, psychology, management, biology, health sciences, and engineering.

Data Gathering and Analysis

Written reflections of the study participants were collected after they were marked by their teachers. These submitted reflections detailed the community service rendered by the students for their service-learning and documented their cognitive and non-cognitive learning as they sought to address sustainable development issues. Any identifying information in the written reflections was masked to ensure anonymity and privacy of the study participants.

Thematic analysis was performed to uncover the underlying themes and patterns, draw insights, and gain a deeper understanding of the written reflections. It involved reading through the submitted reflections several times and noting down the impressions arising from the data to become familiar with the content. Subsequently, initial codes were generated deductively from predefined competences by going through the data systematically and labelling the data that appeared interesting or relevant. The related codes were collated into potential themes. Broader patterns were then identified by grouping codes into

overarching themes. The extracts for each theme were then checked for coherence. Thereafter, the themes were reviewed against the dataset to ensure that they accurately represented the data. When necessary, themes were merged, refined, or discarded. Finally, the emerging themes from the written reflections were defined to capture their essence and supported with examples to provide evidence of competences fostered through service-learning within the context of ESD [24].

4. FINDINGS

The submitted reflections from the 43 groups of students underwent thematic analysis. Each group comprised four to six students belonging to the same academic discipline. Through their community engagement in service-learning, these groups became aware of the pressing sustainable development issues in the community to which they were deployed. These sustainable development issues include deficits in knowledge and skills in electronics, robotics, and programming among public high school students; disinformation on the country's history of martial law; the need of adolescents for psycho-educational support on mental health and substance use; shortage of human resources for primary health care; insufficient understanding of climate change and other environmental issues; the need for reintegration of migrant workers; and the socio-cultural, political, and economic challenges affecting small- and medium-sized enterprises (SMSEs). In response to these articulated needs of the community, the services rendered by these groups of students consisted of tutoring public high school students about electronics, robotics, and programming; using social media to create a memorial on martial law; delivering educational modules for mental health awareness and substance abuse prevention; providing health screening and assisting in community health care centers; developing children's storybooks about climate justice and sustainable practices; conducting a survey on biodiversity and promoting environmental preservation; designing educational videos and drafting policy briefs to support migrant workers; and strengthening the operations and resource allocation of SMSEs. Each of these initiatives aims to contribute to achieving an array of SDGs.

Emerging themes from the written reflections revealed the key competences that were fostered in using service-learning as a pedagogical approach to ESD. These themes include an understanding of complex, interconnected sustainable development issues (systems thinking competence), foresight into the challenges to sustainable development (anticipatory competence), promotion of sustainable development for a more just and equitable society (normative competence), methodical planning and implementation of solutions to sustainable development issues (strategic competence), collaboration and effective communication (interpersonal competence), and resilience and determination (intrapersonal competence).

Systems Thinking Competence

Their community engagement in service-learning allowed the students to recognize the multifaceted and interrelated nature of sustainable development issues. When they examined the needs of their partner community, the students understood the multiple factors that contributed to these needs. For instance, a group of diplomacy and international relations students saw how "the interconnectedness of economic, social, and political factors adversely affected the reintegration of migrant workers into their families and communities." This group learned that reintegration is not just about providing economic support, but also attending to the social and environmental contexts that migrant workers return to. These insights were critical to their development of policy briefs that aim to facilitate the "sustainable reintegration of migrant workers." A group of psychology students learned to view substance use among adolescents in the broader context of society. They realized that adolescent substance use is not merely a personal choice or a family issue but is influenced by broader societal factors, such as peer pressure, economic stress, availability of substances, and community norms. This broader understanding guided their delivery of psycho-educational programs that aim to "foster a healthy mindset" by addressing not only individual behaviors but also the social and environmental influences that contribute to substance use. Additionally, several health sciences students took advantage of "how various disciplines can come together" to fully understand the complexities of the local health system. This interdisciplinary approach helped them recognize how the social determinants of health are linked to health outcomes.

Students also realized how various societal elements influence one another, given that problems in one aspect can involve the whole. However, the thought that "small acts can make a difference in society" motivated fine arts students to create storybooks to promote climate justice. They recognized that education and awareness are crucial for long-term change and that engaging children through storytelling could be a powerful way to instill the values of environmental stewardship and social responsibility. In doing so, they hoped to "inspire the next generation to act toward a more sustainable and just world."

Anticipatory Competence

As the students came up with solutions to the identified needs of their service-learning community, they learned to anticipate and prepare for future scenarios that may hinder efforts toward sustainable development. They recognized the importance of foresight and a proactive mindset in ensuring that the community would truly benefit from their initiatives. For example, biology students considered various factors, such as the environmental state, economic opportunities, and community acceptance, when they proposed ways to rehabilitate a neighborhood river. By

engaging with the community about turning janitor fish, an invasive species, into alternative sources of livelihood, these students “not only promoted ecological restoration and addressed socio-economic vulnerability but also ensured that the community would adopt [their] innovative solution.” This ability to think ahead of their proposed solutions’ environmental, social, and economic viability helped them get the community more involved in sustainable practices. Similarly, management students considered several factors, such as the effectiveness of the training and financial assistance to SMSEs, their need for ongoing support from the local government, and their potential for scalability, in suggesting solutions to help these enterprises sustain their businesses. These students learned to anticipate the evolving needs of SMSEs for economic resilience when they recommended regular monitoring and feedback mechanisms to ensure that the government support that these small businesses received would remain relevant and effective over time. This involved “looking beyond immediate financial assistance to consider factors, such as business training, access to markets, and the development of robust support networks.”

Normative Competence

Since students must identify the SDGs that their service-learning aims to address, set the goals for their community engagement, and indicate criteria of success, they became more purposeful and practical in responding to the articulated needs of the community to which they were deployed. For example, a group of health sciences students sought to “formalize the roles of community health workers” as part of the human resources for health upon knowing that these volunteers received a meager allowance from the government. This recommendation for “fair compensation” was communicated to the community and local health officials to ensure that “[their] goals were aligned with the needs and capacities of the community.” Additionally, engineering students set well-defined goals to promote quality education by tutoring public high school students using structured lectures and hands-on activities to enhance their understanding and skills in electronics, robotics, and programming. Their efforts to reduce educational disparities highlight their advocacy for equitable access to learning opportunities, as they believe that “no student should be left behind because of a lack of resources or prior knowledge.” On the other hand, a group of fine arts students focused on educating the public as part of “preserving historical narratives by designing a digital campaign to address disinformation about martial law.” This digital campaign aimed to adapt accounts from martial law survivors to social media content that is “digestible and engaging with a broader audience.” Educating the public about past injustices can help prevent their recurrence and foster a culture of accountability and awareness. Such examples show how normative competence can be applied to create meaningful initiatives

that contribute to SDGs based on students’ perceived capabilities.

Strategic Competence

Through service-learning, students learned to navigate challenges, engage stakeholders effectively, and employ methodological approaches toward sustainable development by demonstrating strategic planning and organized problem-solving. For example, political science students faced significant challenges in obtaining the necessary data from their partner non-government organization, as data requests were either delayed or not responded to. To overcome these challenges, the students employed various strategies, such as “establishing multiple lines of communication using direct emails, making phone calls, and setting up in-person meetings.” They realized that “direct interactions were far more effective in eliciting responses and building trust with [the partner organization].” Management students also saw the strategic importance of engaging with stakeholders to build relationships and gather insights into the needs and challenges of SMSEs. In doing so, these students became better equipped to develop recommendations to enhance the sustainability of SMSEs. These include “rebranding and marketing assistance proposals, partnership initiatives, and educational seminars to improve business operations and planning.” On the other hand, a group of psychology students recognized the need to make educational modules on mental health awareness and substance use prevention more relevant and suitable for adolescents. They “adjusted [their] teaching strategies by incorporating interactive and engaging activities.” Similarly, engineering students demonstrated a strategic and organized approach to problem-solving by “meticulously preparing handouts and activity sheets to help public high school students gain knowledge and skills in electronics, robotics, and programming.”

Interpersonal Competence

Service-learning not only equipped students with the necessary knowledge and skills, but also instilled values and attitudes crucial for fostering collaboration and collective action that are essential for addressing sustainable development issues. Diplomacy and international relations students, for instance, exhibited teamwork when discussing as a group after conducting interviews with migrant workers to better understand their socio-cultural, political, and economic contexts. Such discussions helped the students synthesize diverse perspectives, identify key challenges, and refine their approach to issues affecting migrant workers based on feedback and new insights. Listening to the personal narratives of migrant workers also allowed students to “build empathy and demonstrate solidarity with them.” By engaging deeply with these stories, students could “humanize the issues, express collective support, and develop policy recommendations that would truly benefit

migrant workers.” Similarly, fine arts students established relationships based on mutual respect with martial law survivors, as they created “a safe space for the voices of these victims to be heard.” This empathetic engagement was reflected in the way the students created social media content that was “faithful to the survivors’ lived experiences, while making it accessible to a broader audience.” On the other hand, biology students and community residents learned from each other while collecting damselflies, as the former raised awareness among the residents about the ecological significance of these insects. In contrast, the latter offered practical tips to the students on catching these bioindicators of environmental health. By working together for specimen collection, both contributed to environmental conservation. The collected data and specimens were used to “assess the health of local ecosystems and to provide valuable information for ongoing conservation efforts.”

Intrapersonal Competence

Managing stress, maintaining personal well-being, and staying motivated were crucial skills that the students honed through their service-learning. Students remained resilient and adaptable despite various challenges, from heavy workloads and communication issues to poor coordination. For example, health sciences students encountered initial difficulties in communicating with each other amidst “heavy workloads that tested [their] resilience.” They overcame these challenges by “ensuring clear communication, meeting regularly, and working as a team.” This proactive approach helped them manage stress and stay focused on their goals despite the demanding circumstances. A group of biology students also encountered difficulties coordinating their schedules for area engagement, collecting and analyzing biological samples, and effectively communicating their findings to the community about their local ecosystem. Instead of being discouraged by these challenges, they looked after their well-being and “remained dedicated to their aim for meaningful change” by working collaboratively, adapting to new situations, and supporting each other throughout their service-learning. Hearing firsthand about the challenges and aspirations of SMSEs, management students felt “a deep sense of responsibility and urgency in making a meaningful impact.” Positive feedback and gratitude from SMSEs validated their efforts and encouraged them to strive for even greater outcomes.

5. DISCUSSION

Investing in education is investing in achieving all the SDGs so that people can transform themselves, their families, their communities, their nations, and the world at large [3]. Education is seen as a catalyst for achieving SDGs because it empowers individuals with the knowledge, skills, values, and attitudes needed to drive personal and social transformations. Specifically, through

education, individuals gain the capacity to transform their lives and, by extension, influence wider environmental, social, and economic changes.

By engaging in real-world community issues and reflecting on their experiences in service-learning, students can develop essential competences that can prepare them to contribute meaningfully to sustainable development. Service-learning not only enhances academic learning, but also fosters civic responsibility and community engagement, making it a critical component of ESD.

In this study, service-learning allowed students to see the interconnectedness of sustainable development issues and the importance of addressing these issues through a multidisciplinary approach. They learned that sustainable solutions require understanding and addressing the root causes of problems, engaging with the community, and considering broader environmental, social, and economic contexts. This ability to analyze complex systems is essential for understanding the interrelation of social-ecological systems and identifying points of intervention [5, 21]. A comprehensive understanding of complex systems not only enriches students’ academic learning but also prepares them to be more effective and empathetic leaders in their future careers.

In addressing sustainable development issues, students learned to assess future scenarios, value long-term planning, and maintain a proactive attitude toward sustainability. Their experiences in service-learning equipped them to foresee potential outcomes and challenges, which are essential in coming up with meaningful and forward-thinking solutions for their partner communities. The ability to understand concepts of time, uncertainty, risk, and intergenerational equity is critical for assessing sustainability, creating transition strategies, and envisioning sustainable futures [21].

Service-learning also allowed students to gain a deep understanding of the ethical dimensions of sustainable development, the ability to define and prioritize sustainability goals, and a commitment to ethical principles and inclusive approaches. There were meaningful and relevant opportunities for students to engage directly with sustainable development issues, which helped them to develop a nuanced understanding of the ethical implications of their actions. Specifically, students learned to navigate ethical dilemmas by considering the long-term impact of their decisions on various stakeholders, including future generations. This competence is vital for setting sustainable development priorities and ensuring that actions are aligned with overarching sustainability principles and values, such as equity, social justice, and respect for all individuals [5, 21].

Additionally, service-learning offered opportunities for students to demonstrate a comprehensive understanding of

sustainable development strategies, effective planning and organizational skills, a deep appreciation for strategic thinking, and a proactive and determined attitude to contribute to SDGs. It provided students with practical experiences to plan, organize, and execute their initiatives systematically as well as adapt their strategies based on feedback and changing circumstances. As a result, they became well-equipped with the ability to develop and execute effective strategies that drive sustainable transformations in various contexts [21].

Students recognized the importance of inspiring and empowering the community, supporting collaborative problem-solving, facilitating inclusive processes, and demonstrating empathy and respect for diverse viewpoints through community engagement experiences in service-learning. These efforts not only contributed to the success of their initiatives but also fostered a sense of partnership and mutual respect between students and the community. Involving the community to address sustainable development issues facilitates a sense of ownership among those in the community by feeling valued and capable of making meaningful contributions [21]. Through these experiences, the students developed social skills to serve them well in future community engagements.

Throughout their service-learning, students exhibited a strong sense of personal responsibility and dedication toward attaining the SDGs. Their meticulous planning, deep community engagement, and efforts to ensure long-term positive outcomes demonstrated their commitment to making a meaningful difference. Despite encountering challenges, they remained motivated. These experiences not only enriched their understanding and skills, but also prepared them to be resilient, adaptable, and responsible agents of change in society. Such personal transformation is seen as essential for social change, and service-learning plays a crucial role in facilitating this process [5].

These competences collectively call attention to the diverse abilities necessary to advance sustainable development and show how service-learning can be a pedagogical approach for ESD. They emphasize the critical role of both individual and shared capacities in promoting a sustainable future, reflecting the complex nature of sustainable development issues and the integrated approaches needed to address them effectively.

Implementing service-learning in educational settings therefore has a far-reaching societal impact. It not only enriches students' educational experiences, but also empowers communities, fosters civic engagement, promotes personal growth, and contributes to long-term social change. Integrating service-learning into curricula as part of ESD aligns educational practices with global efforts to achieve SDGs. This approach positions educational institutions as pivotal players in addressing the pressing environmental, social, and economic challenges that we face.

Hence, educators need to support the development of each competence among students participating in service-learning programs that are focused on sustainable development. They can integrate systems thinking by asking students to work on sustainable development issues that involve multiple stakeholders and diverse disciplines. They can include future-oriented tasks, such as scenario planning and risk assessments, so that students can anticipate challenges that may arise as they carry out their service-learning. Educators can also require students to conduct needs assessments and community consultations to ensure that their initiatives address real issues and are ethically sound. Making students develop detailed project plans, including timelines, resource allocation, and stakeholder engagement strategies, can foster strategic thinking, while placing students in environments where they must communicate and work with diverse groups can promote their ability to collaborate with peers and stakeholders. Structured support systems, such as reflective journaling, peer support groups, and regular check-ins, can help students manage stress and remain motivated despite encountering challenges. Lastly, encouraging students to reflect on their personal growth and the impact of their work on their own values and attitudes can strengthen their self-awareness. These approaches can ensure that students engage in meaning-making wherein the elements of reality, reciprocity, and reflection are present as they undergo service-learning [25].

6. LIMITATIONS AND FURTHER RESEARCH

This study had several limitations that could affect the generalizability of the findings.

First, the study was based on reflections from a specific group of students at a single institution, which may not provide a comprehensive understanding of the competences fostered through service-learning across different contexts or educational settings. Future studies should include multiple institutions to enhance the generalizability of the findings.

Second, the study involved students of self-nominated teachers, which might introduce a selection bias, as these teachers may already be more committed to and skilled in implementing effective service-learning practices. Future research may include a broader range of teachers with varying levels of experience and commitment to service-learning to examine the influence of teacher practices and attitudes on the development of students' competences.

Third, the study relied on self-reported data from students' written reflections, which may have been subject to social desirability bias and selective memory. Students may have overemphasized positive experiences or omitted negative ones. Future research should triangulate data by incorporating additional sources, such as interviews, focus

groups, observations, and feedback from community partners. This multi-method approach can provide a more holistic and balanced view of the competences developed through service-learning.

Finally, the study captured competences developed over a single academic term. This short-term perspective may not fully reveal the long-term impacts of service-learning on students' competences and their application in future endeavors. Further studies can benefit from tracking students' development of competences over multiple terms or years. Follow-up with students after graduation and entering the workforce can provide insights into the lasting effects of service-learning on their professional and personal lives.

7. CONCLUSION

Service-learning bridges the gap between classroom learning and community engagement, providing students with invaluable experiences that prepare them to meaningfully contribute to sustainable development. By fostering systems thinking, anticipatory, normative, strategic, interpersonal, and intrapersonal competences, service-learning empowers students to address community issues, create impactful initiatives, and promote both personal and social transformation. These competences are essential in effectively attending to sustainable development issues to bring about meaningful change in society. As such, service-learning is a powerful pedagogical approach that aligns education with the aspirations of the SDGs by cultivating a generation of informed, skilled, and committed individuals ready to lead the way toward a sustainable future.

8. DECLARATION OF COMPETING INTERESTS

The authors declare that they have no conflicts of interest. Ethics approval (AdMUREC_23_121) was obtained prior to data collection.

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