

Learning through service: Perceptions of undergraduate computing students on community extension programs

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Abstract

Community extension programs serve as an important avenue for promoting community engagement, experiential learning, and social responsibility among students. This study examined the perceptions of graduating undergraduate students regarding community extension programs implemented as part of their On-the-Job Training (OJT) requirements. A mixed-methods descriptive research design was employed involving 118 graduating students from Computer Science, Cybersecurity, Entertainment and Multimedia Computing, Network Administration, and Web Development programs. Data was collected through an online evaluation questionnaire consisting of quantitative ratings and open-ended questions. Quantitative data were analyzed using descriptive statistics, while qualitative responses were analyzed through thematic analysis. Findings revealed that students generally evaluated the community extension activities positively in terms of activity quality, fulfillment of expectations, learning enhancement, and perceived benefits to beneficiaries. Analysis of students' reflections identified several recurring themes, including the development of empathy and social responsibility, appreciation of farmers and community workers, knowledge sharing, women's empowerment, and the importance of preserving academic resources through digital archiving. Students also reported gains in leadership, communication, teamwork, and community awareness. Despite the positive experiences, participants recommended improvements in planning, coordination, communication, and logistical arrangements to enhance future extension initiatives. The findings suggest that community extension programs provide meaningful learning experiences that complement academic training while fostering civic engagement and personal development among graduating computing students. Continuous evaluation of extension activities is recommended to ensure their relevance, effectiveness, and responsiveness to the needs of both students and community beneficiaries.

Keywords: community extension, service-learning, experiential learning, community engagement, student perceptions

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1. Introduction

Community extension is widely recognized as one of the core functions of higher education institutions alongside instruction and research (Calimpos et al., 2023). Through extension programs, universities contribute to community development by addressing social needs and strengthening their engagement with local communities (Corpuz et al., 2022). These initiatives enable higher education institutions to apply their knowledge, expertise, and resources to address community concerns and support local development efforts (Reyes et al., 2025). They also foster meaningful partnerships between academic institutions and community stakeholders, creating opportunities for collaboration, knowledge sharing, and social engagement (Reyes et al., 2025). Furthermore, community extension serves as a platform for service-learning, allowing students to apply classroom knowledge in real-world settings while developing civic responsibility and social awareness (Schultes et al., 2025). Such experiences help students connect academic learning with community needs, promoting personal growth and positive social involvement (Mabborang et al., 2024).

Community extension serves not only as a means of community development but also as an avenue for experiential learning. Through real-world experiences, students can apply classroom knowledge, develop practical skills, and enhance their understanding of societal issues (Kong, 2021; Uyen et al., 2022). One widely adopted approach is service-learning, which combines academic learning with meaningful community engagement and provides students with opportunities to interact with diverse groups and gain firsthand experience in addressing community needs (Holsapple, 2012). Research has shown that service-learning contributes to improved academic engagement, leadership, problem-solving skills, and overall learning outcomes among university students (Moely & Ilustre, 2014; Pinto & Costa-Ramvalho, 2023). It also helps develop important graduate attributes such as social responsibility, citizenship, teamwork, and employability skills (Millican et al., 2011). Furthermore, participation in community-based activities enables students to apply their knowledge in practical settings while fostering civic engagement and a deeper sense of responsibility toward society (Ahmad et al., 2022; Frias et al., 2025). Through these initiatives, higher education institutions contribute not only to community welfare but also to the personal and professional growth of students (Malibiran, 2023; Mandaing, 2025).

As community extension programs continue to grow, evaluating their outcomes has become increasingly important. Evaluation provides valuable information on program effectiveness and helps identify areas for improvement (Uy et al., 2023). Although extension outcomes are often measured through self-reported experiences and perceptions, which may be subject to bias (Joshi et al., 2024), these perspectives remain important in understanding participants' learning and engagement. Furthermore, student feedback can provide useful insights for improving community extension initiatives and encouraging greater participation in future programs (Asio et al., 2023). Understanding how students perceive and interpret their experiences is particularly important, as these perceptions influence the value they attach to community engagement activities and their overall learning outcomes (Muriello, 2020). Consequently, assessing students' perceptions of community extension programs can provide meaningful evidence for strengthening extension services and enhancing their impact on both students and the communities they serve (Ottoson & Green, 2020).

In the School of Computing, community service is a required component of the On-the-Job Training (OJT) program. As part of this requirement, graduating students participate in various community extension activities that allow them to apply their knowledge and skills outside the classroom. Students from the Web Development and Entertainment and Multimedia Computing programs conduct their community service activities during the first semester, while those from the Computer Science, Cybersecurity, and Network Administration programs participate during the second semester. These activities are carried out either in partner communities of the School

of Computing or through extension programs organized by the university. Through these experiences, students are given the opportunity to work with community members, address local needs, and gain practical insights that complement their academic learning.

Despite the recognized value of community extension and service-learning programs, limited studies have examined how graduating SOC perceive their community service experiences as part of their OJT requirements. Given the role of community engagement in promoting learning, social responsibility, and personal development, it is important to understand how students evaluate these activities and the insights they gain from participation. Therefore, this study investigates the perceptions of graduating SOC students regarding community extension programs implemented through their OJT experience.

2. Review of related literature

2.1 Community Extension and Community Engagement

Community extension and community engagement play an important role in higher education by connecting academic institutions with the communities they serve. Through these initiatives, universities provide opportunities for students to apply their knowledge and skills in addressing real community needs while developing a deeper sense of social responsibility. Studies have shown that participation in extension activities enhances students' understanding of social and cultural issues, strengthens interpersonal relationships, and encourages a greater willingness to help others (Balila et al., 2016). Community engagement also serves as a valuable learning experience, allowing students to develop leadership, empathy, and civic awareness through direct interaction with community members (Ramil et al., 2025). Furthermore, students who participate in community service activities gain a broader understanding of societal conditions and become more aware of their role in contributing to positive social change (Basco, 2024). Effective extension programs are those that are responsive to the needs of communities and regularly evaluated to ensure their relevance and impact (Dayao et al., 2024). Collectively, these initiatives not only promote community development but also contribute to the personal growth, values formation, and social consciousness of students (Gruezo et al., 2024; Ontal & Rabang, 2026).

2.2 Experiential Learning and Service-Learning Theory

Experiential learning and service-learning provide students with opportunities to apply classroom knowledge in real-world settings, making learning more meaningful and relevant. Through active involvement in community-based activities, students not only strengthen their academic and technical competencies but also develop greater awareness of social and environmental issues (Lee & Perdana, 2023). Research has shown that service-learning creates benefits for both students and communities by enhancing students' confidence, empathy, collaboration skills, and readiness for future employment while encouraging community participation and engagement (Sari & Norasikin, 2025). Beyond skill development, these experiences contribute to personal growth by fostering professionalism, ethical responsibility, and a deeper commitment to serving others (Jacobs, 2020). Reflection is a key component of this process, as it enables students to examine their experiences, connect them to academic concepts, and gain deeper insights from their community involvement (Rose, 2020). Furthermore, participation in service-learning activities such as volunteer work, cultural immersion, and community engagement helps students develop leadership abilities, cultural awareness, and civic responsibility, preparing them to become active and socially responsible members of society (Norman, 2019). Collectively, these findings highlight the value of service-learning as an effective approach for developing students' knowledge, skills, values, and engagement with their communities.

2.3 Student Development Outcomes of Extension Programs

Community extension programs provide students with opportunities to learn beyond the classroom while developing positive values and life skills. Balila et al. (2016) found that participation in extension activities helped

students strengthen their attitudes toward their studies, family, community, and the environment. Similarly, Bhambu (2022) reported that involvement in extension programs fostered social responsibility and encouraged positive attitudes toward work, community service, and environmental stewardship. Extension programs also allow students to apply practical skills and gain confidence through real-world experiences. In addition to benefiting students, these initiatives contribute to community development and skills enhancement among beneficiaries (Esteban, 2025). However, continuous assessment and improvement are necessary to ensure that extension programs remain responsive to community needs and achieve their intended impact (Niegas, 2024).

2.4 Literature Gap

The literature shows that community extension and service-learning programs contribute to student learning, personal development, social responsibility, and community engagement. However, most studies have focused on the general outcomes of extension programs, student attitudes toward community service, or the impact of these initiatives on communities and beneficiaries. Limited attention has been given to the experiences and perceptions of undergraduate computing students involved in community extension activities as part of their On-the-Job Training (OJT) requirements. In particular, there is a lack of evidence on how these students perceive the learning opportunities, values, and skills they gain from participating in different community extension initiatives. To address this gap, the present study examines the perceptions of graduating undergraduate School of Computing students regarding community extension programs and the learning experiences derived from their participation. This study contributes to the existing literature by providing evidence on the perceptions of graduating undergraduate computing students regarding community extension programs undertaken through OJT. It also integrates quantitative evaluations and qualitative reflections across multiple extension activities, offering a broader understanding of the educational value of community engagement within computing education.

2.5 Objectives of the Study

This study aimed to examine the perceptions of graduating School of Computing students regarding community extension programs and the learning experiences gained through their participation. Specific Objectives are as follows:

- Evaluate the community extension activities in terms of: activity quality, fulfillment of expectations, enhancement of learning; and perceived benefits to beneficiaries.
- Identify the learning experiences and insights gained from participation in community extension activities.
- Determine the values and competencies developed through participation in the programs.
- Examine students' perceptions of the contribution of community extension activities to community development.
- Propose recommendations for improving future community extension initiatives.

3. Methodology

Research Design - This study employed a mixed-methods descriptive research design to examine the perceptions of graduating School of Computing students regarding community extension programs. The quantitative component was used to evaluate the effectiveness of the extension activities in terms of activity quality, fulfillment of expectations, learning enhancement, and perceived benefits to beneficiaries. The qualitative component explored the students' learning experiences, insights, and recommendations through their written reflections. The combination of quantitative and qualitative data provided a more comprehensive understanding of students' experiences in community extension activities.

Research Participants - The participants of the study were graduating students from the School of Computing who completed community extension activities as part of their On-the-Job Training (OJT) requirements. A total of 118 students participated in the study, representing five academic programs: Computer Science (35), Web Development (26), Entertainment and Multimedia Computing (27), Network Administration (19), and Cybersecurity (11). The respondents participated in various community extension activities conducted during the academic year, including community farming, gift-giving activities, digital thesis dataset development, women's community celebration programs, and technical skills training activities.

Research Instrument - A researcher-developed evaluation questionnaire administered after the completion of the community extension activities. The instrument consisted of two parts. The first part assessed students' perceptions of the activities in terms of activity quality, fulfillment of expectations, enhancement of learning, and perceived benefits to beneficiaries using a five-point scale ranging from Poor to Very Good. The second part included open-ended questions that allowed students to describe their learnings, insights, and recommendations. The questionnaire was developed based on the objectives of the community extension program and was informed by previous studies emphasizing the importance of evaluating students' experiences, learning outcomes, and perceptions of community engagement activities. The evaluation indicators were aligned with the literature on community extension effectiveness and student involvement (Ontal & Rabang, 2026; Dayao et al., 2024), experiential and service-learning outcomes (Lee & Perdana, 2023; Sari & Norasikin, 2025), and students' reflections of community service experiences (Muriello, 2020; Ramil et al., 2025). The combination of quantitative and qualitative questions enabled the study to obtain both numerical assessments and detailed insights regarding the students' experiences in the program.

Data Collection - Data was collected after the completion of the community extension activities through an online evaluation questionnaire administered to graduating SOC students. The survey link was disseminated through the respective OJT Coordinators, who distributed the questionnaire to students participating in the extension programs as part of their OJT requirements. Prior to completing the survey, respondents were informed of the purpose of the study and assured that their participation was voluntary and that all responses would be treated confidentially. The instrument gathered both quantitative and qualitative data, including students' evaluations of the activities, perceived learning outcomes, reflections, insights, and recommendations. The accomplished questionnaires served as the primary source of data for the study.

Data Analysis - The quantitative data were analyzed using descriptive statistics, specifically frequency counts, percentages, and weighted means. Frequency counts and percentages were used to summarize the respondents' profiles, while weighted means were computed to determine students' evaluations of the community extension activities in terms of activity quality, fulfillment of expectations, enhancement of learning, and perceived benefits to beneficiaries. The qualitative responses were analyzed using thematic analysis. Students' reflections, insights, and recommendations were carefully reviewed and coded to identify recurring ideas and patterns. Similar responses were grouped into categories and organized into themes that reflected the participants' learning experiences, social responsibility, community awareness, personal development, and suggestions for improving future community extension initiatives. The findings from both quantitative and qualitative analyses were integrated to provide a comprehensive understanding of students' perceptions of the community extension programs.

Trustworthiness of Qualitative Findings - To enhance the trustworthiness of the qualitative findings, the students' responses were examined carefully to identify common ideas and shared experiences. Responses that conveyed similar meanings were grouped together and organized into themes. These themes served as the basis for understanding and interpreting the participants' experiences. To further support the analysis, selected statements from the students' reflections were included to illustrate and validate the themes that emerged from the data.

Ethical Considerations - Participation in the study was voluntary. Prior to data collection, the purpose of the study, the nature of participation, and the intended use of the data were explained to the participants through an

informed consent statement included in the online questionnaire. The survey link was distributed through the respective OJT Coordinators to graduating students who participated in the community extension activities. Students were informed that their participation was voluntary and that choosing not to participate would not affect their academic standing or OJT requirements. To protect their privacy, no personally identifiable information was collected, and all responses were treated confidentially and reported only in aggregate form. Submission of the completed questionnaire signified the participants' informed consent to take part in the study.

4. Results and Discussion

Table 1 shows the respondents' evaluation of the different community outreach activities. Among the activities conducted, Community Farming in Sitio Malupa received the most favorable assessment, suggesting that participants found the experience meaningful, beneficial, and relevant to both student learning and community needs. Gift Giving for Kids, Post Women Celebration, and the Digital Thesis Dataset activity were also viewed positively by the respondents. These activities were generally perceived as valuable opportunities for community engagement while providing learning experiences that supported students' personal and academic development.

In contrast, AutoDesk Maya Training received a less favorable evaluation compared to the other activities, indicating opportunities to improve its planning, delivery, or participant engagement. Nevertheless, respondents still recognized its contribution to learning and skills development.

Table 1
Evaluation of Community Outreach Activities by Activity Type

Activity	N	Category 1	Category 2	Category 3	Category 4	Overall Mean	Interpretation
Community Farming (Sitio Malupa)	31	4.52	4.35	4.52	4.61	4.50	Very Good
Gift Giving for Kids(Brgy. Capaya)	22	4.00	3.77	4.09	4.36	4.06	Good
Post Women Celebration (Brgy. Lourdes)	14	4.07	3.93	3.79	4.29	4.02	Good
Digital Thesis Dataset (HAU Library)	27	3.70	3.70	3.78	3.93	3.78	Good
AutoDesk Maya Training (BED Grade 11 & 12)	24	3.25	3.17	3.62	3.42	3.36	Average

Table 2 shows that the respondents viewed the community outreach activities positively. They believed that the activities provided meaningful benefits to the communities served while also offering valuable learning experiences. The findings further suggest that the outreach programs generally met the participants' expectations and helped strengthen their sense of social responsibility and community involvement.

Table 2
Community Extension Evaluation

Category	Mean	Interpretation
How did you find the activity?	3.92	Good
How well did it meet your expectations?	3.81	Good
Does the activity promote and enhance learning?	4.00	Good
Does the activity help the beneficiaries?	4.13	Good
Overall mean	3.97	Good

4.1 Analysis of Students' Learnings and Insights

An analysis of the students' open-ended responses revealed several recurring themes regarding their experiences in the community outreach activities. The responses indicate that the activities provided opportunities for personal growth, community engagement, and appreciation of the experiences of others.

Theme 1: Development of Empathy and Compassion

Many participants highlighted the importance of kindness, generosity, and understanding of the needs of others. Students involved in gift-giving and community celebrations reflected on how simple acts of giving can bring happiness and make a positive difference in the lives of beneficiaries. These experiences helped them develop a greater sense of empathy and social responsibility. This theme is reflected in the following responses:

“Simple things we take for granted in our everyday lives can be a blessing to others.”

“The importance of kindness, empathy, and sharing with others.”

Theme 2: Increased Appreciation for Community Members and Beneficiaries

Students gained a deeper appreciation for the efforts and contributions of various members of the community, particularly farmers and women. Participants recognized the challenges faced by these groups and expressed greater respect for their roles in society. The outreach activities allowed them to better understand the realities experienced by community members. This theme is reflected in the following responses:

“I experienced for a short time how farming is truly tiring.”

“We should be grateful for the work farmers do and continue supporting them”.

Theme 3: Meaningful Learning Through Real-World Experiences

Many respondents described the activities as valuable learning opportunities that extended beyond the classroom. Students reported learning practical skills, gaining new perspectives, and applying their knowledge in authentic community settings. These experiences enabled them to connect academic learning with real-world situations. This theme is reflected in the following responses:

“I learned how to properly search for information and gather important details for digitalizing research.”

“The activity opened my eyes to how important farming is in everyday life.”

Theme 4: Recognition of Service and Community Engagement

Participants recognized the significance of contributing to society and giving back to the community. Several responses emphasized the value of volunteerism, collaboration, and using one's skills to support others. The activities helped students appreciate their role as future professionals who can contribute to community development. This theme is reflected in the following responses:

“Giving back to the community.”

“Using your strengths to help others.”

The findings show that the community outreach activities were generally well received by the students. Participants viewed the programs as meaningful opportunities to contribute to the community while gaining valuable learning experiences. The activities helped students develop a greater appreciation of community needs, strengthened their sense of social responsibility, and allowed them to apply their knowledge and skills in real-world settings. Overall, the results suggest that the outreach initiatives were successful in promoting both student development and community engagement.

Educational Implications of the Study

The results show that community extension programs can play an important role in student development and community engagement within higher education institutions. For schools, these activities provide opportunities to strengthen their outreach initiatives while supporting the holistic development of students. For faculty members and program coordinators, the findings highlight the need to design activities that are relevant to students' fields of study and responsive to the needs of partner communities. Doing so can help students connect classroom learning with practical experiences. For students, participation in community extension activities encourages the development of social responsibility, teamwork, communication skills, and a better understanding of community concerns. The study also points to the importance of regularly evaluating extension programs to identify areas for improvement and ensure that they continue to benefit both students and community partners.

5. Conclusion and Recommendations

The findings show that community extension programs provided valuable learning experiences for graduating School of Computing students. Participation in the outreach activities helped students develop empathy, social responsibility, and a better understanding of community needs. It also gave them opportunities to apply their knowledge and skills beyond the classroom while engaging with different sectors of society. Overall, the programs contributed to both student development and community engagement. This study was limited to graduating undergraduate students from the School of Computing of a single higher education institution. The findings were based on students' self-reported responses and reflected their personal perceptions and experiences of the community extension activities. The views of community beneficiaries, faculty coordinators, and partner organizations were not included in the study. As such, the findings should be interpreted within the context of the participants and extension activities examined.

Based on the findings, the school should continue implementing community extension programs that promote student engagement and meaningful community involvement. Future activities may focus on improving program planning, communication, coordination, and logistical support to further enhance participants' experiences. Regular evaluation of extension initiatives should also be conducted to ensure that the programs remain responsive to the needs of both students and community beneficiaries. For future research, studies may include the perspectives of beneficiaries, faculty members, and community partners to provide a more comprehensive assessment of extension programs. Comparative studies involving other academic disciplines or institutions may also be conducted to determine whether similar outcomes are observed among different student populations. Additionally, longitudinal studies may be undertaken to examine the long-term influence of community extension participation on students' personal, academic, and professional development.

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