

Global Service-Learning Improves Employability Skills: A Comparative Study among Alumni Students from the United States and Uganda

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Abstract

Global service-learning interconnects service-learning, study abroad, and international education programs to enhance global competence among students through their immersion in distinct cultures, while working with communities. This study was grounded in the employability skills framework that clusters skills into applied knowledge, effective relationship, and workplace skills. We employed a comparative census study involving service-learning alumni from Iowa State University (ISU) and Makerere University (MAK), who participated in a summer service-learning program in Uganda as undergraduates between 2006 through 2019. The study sought to determine the level of improvement in employability skills among program alumni. A self-administered questionnaire was sent to 274 alumni through Qualtrics. The response rate was 94.2%. Overall, effective relationships led by open-mindedness and teamwork skills had the highest improvement for both groups, followed by workplace skills led by communication, and applied knowledge led by problem-solving skills. An independent sample t-test by the university revealed that MAK alumni reported higher levels of improvement in employability skills than ISU alumni. Specifically, MAK alumni reported significantly improved skills in teamwork and ISU alumni reported significantly improved skills related to emotional intelligence. Housing arrangements and year of participation in service-learning significantly accounted for the differences. Binational housing arrangements showed a greater influence in improving alumni skills, and service-learning programs should emphasize binational residences. Alumni could obtain additional benefits from engaging in activities to improve their research, critical reflection, and public speaking skills, which are among the key skills related to success in graduate school and employability during and after college.

Introduction

Service-learning, an experiential learning pedagogy, is among the high-impact practices in the United States with a transformative potential in shaping students' learning and development (Bringle &

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Hatcher, 2023; Eyler et al., 2023; Furco et al., 2024). The National Service-Learning Clearinghouse in the United States defines service-learning as “a teaching and learning strategy integrating meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities” (Ryan, 2012, p. 4).

A form of experiential learning (Kolb, 2015), service-learning pedagogy emphasizes the “centrality of working with, not just in or for the community” (Bringle & Clayton, 2020, p. 48). These engagements improve the reciprocity of learning by students getting immersed in the communities where they provide a service and learn. Students benefit from service-learning outcomes such as personal growth (Chabot et al., 2022; Fong et al., 2022), academic learning (Anjeche et al., 2025; Ikendi et al., 2023), self-authorship (Frederickson et al., 2023), cognitive growth (Eyler et al., 2023), identity development (Ikendi et al., 2025; Sherwood et al., 2025), intercultural competence and reflection on complex global issues (Deardorff & Edwards, 2023; Grain et al., 2019; Ikendi et al., 2025; Lee et al., 2025; Pusch & Merrill, 2023).

As a high-impact program, service-learning prepares participants to face the social issues that communities face. Service-learning graduates are prepared with practical work-life and problem-solving skills (Vetter & Wingenbach, 2019; Zainuri & Huda, 2023) and leadership skills (Khofi & Sunoko, 2025; Nguyen et al., 2024; Robinson & Magnusen, 2024), which enhance their employability after college. In social aspects, service-learning programs help students to build social bonds for global citizenship, self-confidence, and positive attitudes to various societies (Hartman et al., 2023; Tran et al., 2024).

Bringle and Hatcher (2023) described service-learning as a “pedagogy that is best suited to prepare graduates to be active global citizens in the 21st century” (p. 3). Students experience a real field environment that changes their perception of themselves, their peers, and the community, which improves their intergroup contact relations through authentic communication pursuant of common goals, and develops their ability to learn about and address social problems in communities (Conner & Erickson, 2017; Ikendi et al., 2025; Martín-Ondarza et al., 2022). To enhance global citizenship, the traditional United States service-learning program (Furco et al., 2024) was internationalized.

Internationalization of Service-Learning

Bringle and Hatcher (2023) provide an example of how international service-learning has developed in colleges and universities and state that it was a result of the “international collaboration between the Center for Service Learning and the Indiana University–Purdue University Indianapolis Office of International Affairs” (pp. xi-xii). The collaboration emphasized “service learning as a distinctive aspect of the development of study abroad and strategic international partnership” (pp. xi-xii). These developments culminated in the conceptualization of international service-learning—an interconnection between the service-learning pedagogy, study abroad programs, and international education.

The service-learning approach brings study abroad programs and international education into an experiential learning model for students to learn in the international community and get immersed in the international culture (Bringle & Hatcher, 2023). In international service-learning, the service-learning program brings its four facets of academic activity bearing credit, community service, reflective elements, and civic responsibility, as students interact in communities.

Studying abroad brings in the element of classical and liberal education involving the students’ ability to afford international travels to go and learn, for instance, about the linguistics, art, culture, and customs of different countries (Savicki & Brewer, 2023; Vande Berg et al., 2023). In a classical and liberal education system, the key rationale for studying abroad is global citizenship attained through global engagements and appreciation of global values, diplomacy, and American national and international peace (Savicki & Brewer, 2023; Vande Berg et al., 2023). Earlier, study abroad programs were mostly Eurocentric;

however, programs have expanded to countries in all continents (Ikendi, Mwenyi, Somers et al., 2025; Institute of International Education, 2024).

International education also brings two main elements to the service and learning, including technical and topical aspects (Bringle & Hatcher, 2023). The technical aspect emphasizes student learning about how contracts to provide services in critical sectors such as finance, education, health, agriculture, or security are negotiated between countries. The topical aspect, involves students learning a specific theme of another country or region, for instance, agricultural systems, geography, and/or culture, on how it affects the region's welfare.

To facilitate students' global competence in learning, universities such as Iowa State University developed global resource programs, which encompass programs such as study abroad, service-learning, global internship, and related senior-level research projects (Nonnecke & Acker, 2019). In the preamble to the histories of service-learning around the globe, Giorgetti (2024) acknowledges that "the consolidation of the practice of service-learning in the world recognizes formal institutionalization processes, both in universities and schools, and even in educational policies" (p. 10).

Institutionalization of Service-Learning Around the Globe

The long history of impact of the United States' service-learning pedagogy has influenced the institutionalization of service-learning programs around the globe (Furco et al., 2024). In Europe, for instance, service-learning was initially considered as a mechanism to promote the elements of democratic and active citizenship; however, it has since become the focus of promoting experiential learning in higher education (Aramburuzabala et al., 2019; Compare et al., 2025; González-Luna, 2024; Paz-Lourido & Somers, 2024; Resch et al., 2023).

In Asia, service-learning was initiated in 2002 out of an academic conference on service-learning held in Japan (Hok-Ka, 2024). By 2006, the Asian Office of Service Learning was set up, which adopted a slogan "Serving to Learn and Learning to Serve" (p. 336). Hok-Ka et al. further note that there were gaps in how the pedagogy could enhance teaching and academic learning while focusing on providing a service to the community. Subsequent developments have resulted in making service-learning mandatory in some Asian countries (Lin et al., 2024; 2025) and the development of evaluation tools to measure its outcome (Lau et al., 2024a; 2024b; Ngai et al., 2024).

In Latin America, the Latin American Center for Service-Learning (CLAYSS), instituted in 2002, coordinates the development of service-learning programs within the region (González, 2024; Regina & Ferrara, 2017). CLAYSS emphasizes solidarity—the bond that the programs create with communities in working together for common developmental goals. CLAYSS communicates with the public through academic publications (e.g., Tapia, 2021), service-learning guides (e.g., Rolón, 2020), service-learning experiences (e.g., Ferrara & Bejenaru, 2021), and other collections (e.g., Jouannet et al., 2023) to foster the development and adoption of service-learning programs across the Latin American region.

In Africa, service-learning programs are growing and increasingly being recognized as an innovative experiential learning pedagogy supporting the growth and learning of transferable employability skills for both students and teachers (Bouwman, 2024; Ikendi et al., 2023; 2025). Despite its benefits, African countries still lack regulatory bodies or associations to provide leadership in service-learning programs. Other regions have established bodies providing service-learning leadership, such as the United States National Service-Learning and the National Youth Leadership Council [NYLC] (Furco et al., 2024; NYLC, 2024), the European Observatory of Service-Learning in Higher Education (González-Luna, 2024; Paz-Lourido & Somers, 2024), the Service-Learning Asia Network (Hok-Ka, 2024), and the Latin American Center for Service-Learning (González, 2024; Regina & Ferrara, 2017).

Nevertheless, in Africa, South Africa has the most prominent policies on service-learning programs in higher education (Bouwman, 2024; Erasmus, 2023). Some universities in South Africa have designed their policies (Lowe et al., 2022) and tools (Mitchell, 2020) to foster the development of service-learning programs. Like the rest of the world, service-learning offer similar benefits to participating students, including social responsibility, fostering motivation in education, enhancing students' reflection, and ethical commitments in Africa and intercultural competence development among other outcomes (Anjeche et al., 2025; Anafi et al., 2025; Ikendi et al., 2023; 2025; Macharia & Muchiri, 2025).

Despite the benefits, Smith-Tolken and Bitzer et al. (2017) earlier noted that "University curricula conducive to community work and service-learning are more complicated than what meets the eye" (p. 30). These aspects call for harmonization of experiential learning programs, including service-learning in higher education, to foster the values of the 21st century *engaged campus* model, encompassing teaching, research, and extension with communities as partners (Tapia, 2024). The success of service-learning depends on the place and its history, built and natural environment, the opportunities the place offers to learners, constraints, and the people and culture (Furco & Norvell, 2019). Those parameters partially account for the growing strength of the service-learning program of our study in between the United States and Uganda (Ikendi et al., 2023; 2025; Ikendi, Mwenyi & Retallick, 2025; Nonnecke et al., 2015).

Description of the Study Program: The Service-Learning Program in Uganda

The service-learning program of our study is part of the education programs of Iowa State University (ISU) of the United States through its Center for Sustainable Rural Livelihoods (CSRL), whose goal is to build the human capacity of young program participants as responsible global citizens (Ikendi et al., 2023; 2025; Nonnecke et al., 2015). CSRL is based in the College of Agriculture and Life Sciences at ISU, partnering with Makerere University (MAK) located in Kampala, Uganda and local not-for-profit non-government organizations, including Volunteer Efforts for Development Concerns (2004-2014) and ISU Uganda Program (ISU-UP), 2014 to date (Butler & Acker, 2015; Ikendi & Retallick, 2025).

The service-learning program was born out of a needs assessment conducted in 2005 among partner institutions and local community stakeholders (Nonnecke et al., 2015). The outcome was the adoption of the school garden learning model as the most appropriate activity that could fulfill the students' curriculum on reciprocal service and learning with communities and also meet the CSRL goals of ending hidden hunger in schools through using school garden proceeds for lunch programs (Byaruhanga et al., 2017; Nonnecke et al., 2015; 2016). The adoption of school gardens coincided with its emphasis by the Food and Agriculture Organization of the United Nations (2005) after the publication of the school garden guidelines to foster nutrition and experiential learning, a concept that was coined by John Dewey in the early 1900s in the United States (Ralston, 2011; 2014).

Since its inception in 2005, the service-learning program has expanded to include semester-long programs and Spring break internships (Ikendi, 2025). However, this study focused on the summer program, named *Creating a School Garden: Service-learning in Uganda*, whose name was derived from its main activity (Ikendi et al., 2023; Nonnecke et al., 2015). The original setup of the program was as a course-based academic program led by ISU CALS and MAK faculty who served as instructors. The initial stages included participating students from CALS and other colleges, including Engineering and Human Sciences. In the early years, the program was four weeks, and it gradually grew to six weeks for ISU students. In 2007, the program was expanded to 10 weeks for MAK students to meet their curricular requirement of a 10-week field internship experience in their summer semesters (Nonnecke et al., 2015).

By 2019, the threshold of this study, the program worked with five primary and two secondary schools to establish school gardens and related projects as outdoor learning laboratories to learn the agriscience of food production and related development projects (Ikendi et al., 2023). The program also

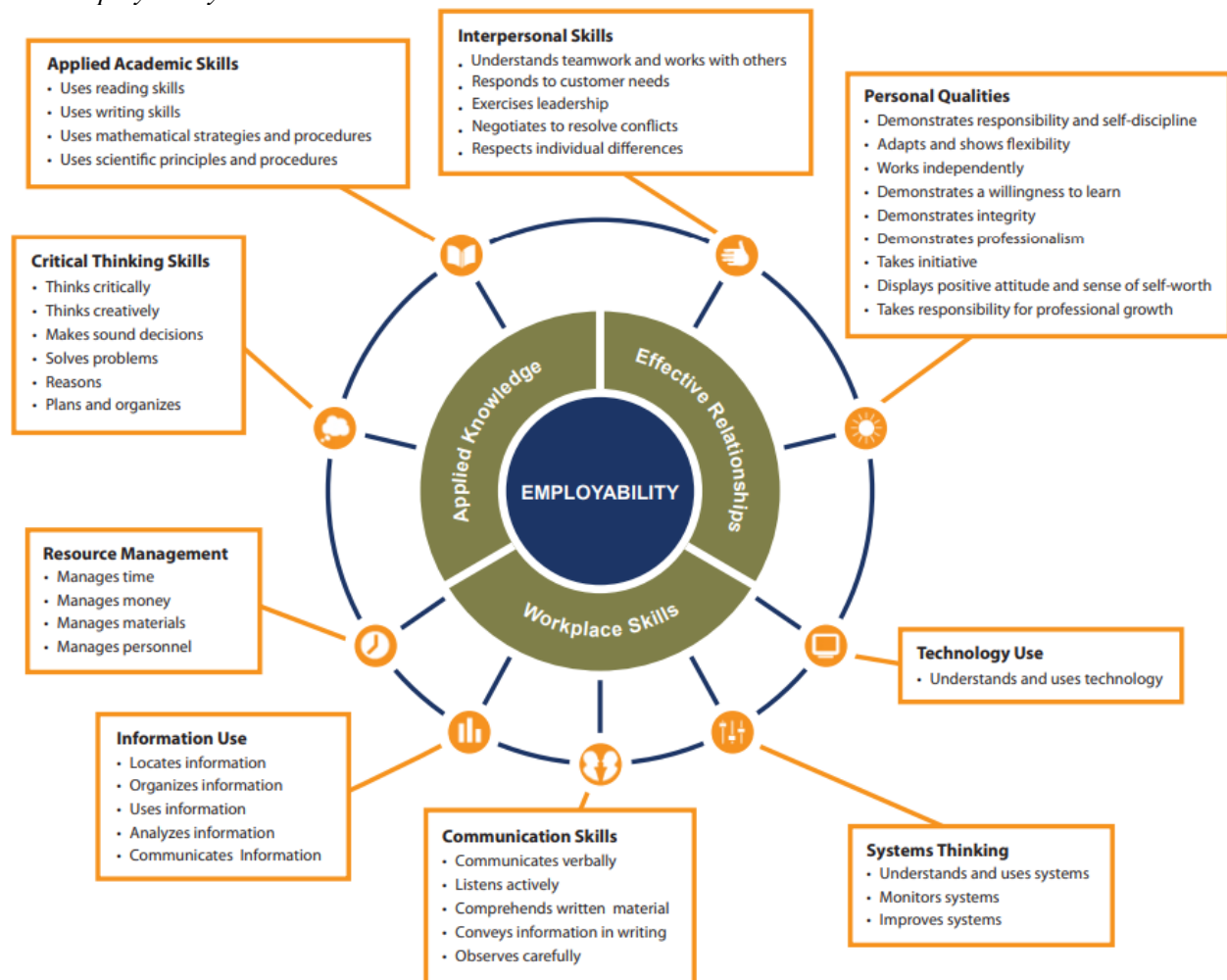
incorporated different school garden-related bi-national team projects to address school and community needs in nature conservation through agroforestry; youth entrepreneurship through beekeeping; public health education through sanitation and hygiene projects, soil improvements through composting; water resources in crop production through irrigation; postharvest management through grain storage projects; livestock management; and school lunch and feeding projects. The school garden and related projects are accomplished through an experiential learning approach (Ikendi et al., 2023). Students work together with their instructors, local facilitators, communities, and schools to benefit school pupils and their communities, while learning as well as facilitating students' development of integrated employability skills to foster their college and career readiness.

Theoretical Framework

The employability skills framework (Figure 1) was the foundation of this study. The Perkins Collaborative Resource Network developed the framework, with guidance and supervision of the United States Department of Education and Office of Career, Technical, and Adult Education (2018).

Figure 1

The Employability Skills Framework



Source: The Employability Skills Framework adopted from the Office of Career, Technical, and Adult Education, an official website of the United States Department of Education (2018).

The long-term vision of the employability skills framework is to help students, educators, potential employers, and other stakeholders, including policymakers, in establishing a universal language around the essential skillset required of potential employees to succeed in their workplace across sectors and at various levels of employment. Employability skills are sometimes known by many other descriptors, such as soft skills, workforce readiness skills, or career readiness skills. The framework clusters skillsets in three broad categories, including applied knowledge, effective relationships, and workforce skills.

Applied knowledge skills describe an interface of thoughtful integration of academic knowledge and technical skills, put to practical use at the workplace (United States Department of Education and Office of Career, Technical and Adult Education, 2018). The applied knowledge skills are clustered into two, including applied academic knowledge and critical thinking skills. During academic training, applied academic skills are evident in students' daily homework assignments, classwork, fieldwork during internships, and question-and-answer exchanges during lessons. Such skills include reading, writing, math, and science, especially in practical procedures. Critical thinking skills manifest in students' homework, team projects, and presentations, especially as they think creatively and critically in making sound decisions to solve problems at hand, and reason with their procedures. Critical thinking is synonymous with critical reflection, considered an architectural foundation of learning in service-learning programs (Ash & Clayton, 2009; Choi et al., 2023; Ikendi et al., 2023).

Effective relationship skills describe the interpersonal skills and personal qualities that enable individuals to interact effectively with clients, coworkers, and supervisors (United States Department of Education and Office of Career, Technical and Adult Education, 2018). Interpersonal skills reflect the ability to work independently and as a member of a team towards a common goal, contributing fairly, understanding peers, and listening with respect to individual differences. Personal qualities are inherent attributes such as self-discipline, flexibility, integrity, and proactiveness towards the initiatives being undertaken to accomplish a goal. In multicultural programs, effective relationships are vital in the development of authentic relationships, which influence the natural flow of conversations during interactions and the development of intercultural competence (Conner & Erickson, 2017; Ikendi, 2025; Ikendi et al., 2025; Martín-Ondarza et al., 2022; Somers, 2025).

Workplace skills are an interface of the analytical and organizational skills and understandings that employees need to successfully perform their tasks (United States Department of Education and Office of Career, Technical and Adult Education, 2018). These skills range from resource management, such as managing time and resource allocation, information use to support understanding of and evaluation of varied information that support program activities, system thinking to help in understanding the interconnected components of systems in our workplace, and appropriate technology use. Given the multicultural nature of service-learning programs and their associated host organizations (Ikendi & Retallick, 2025), understanding the interconnected workplace skills places service-learners in an appropriate position to interact with the program and use available resources to accomplish the activities.

Purpose and Objectives of the Study

This study assessed the extent to which the global service-learning experiences improved alumni's employability skills. The alumni of our study participated in the program between 2006 through 2019. Assessing the long-term outcome of global service-learning helps the program administrators to understand the impact their programs have had on the participants, plan for program improvements, and provide accountability for funds (Kiely, 2023). The most popular service-learning program assessment method involves surveying alumni participants (Bringle et al., 2023).

In the agriculture education profession, this study aligns with the second priority of the American Association for Agriculture Education (AAAE) national research agenda, focusing on "what evaluation

methods, models, and practices are effective in determining the impacts of educational programs in agriculture and natural resources?" (Thoron et al., 2016, p. 41). In the current AAAE research values, this study aligns with "implementing programming for international development," specifically, focused on "developing human capital across cultural and geographic boundaries" (AAAE, 2023, p. 13). The objectives of this study were to:

1. Determine the level of improvement global service-learning has had on alumni employability skills.
2. Identify if there were any differences between Iowa State University and Makerere University alumni on how global service-learning improved their employability skills.
3. Explain the differences in alumni's demographic characteristics and their level of improvement in employability skills during their global service-learning experience.
4. Determine the impact the global service-learning program has had on alumni's skills development after their participation.

Methodology

This study was part of a larger census study that allowed the investigators to answer questions about what impact "Creating a School Garden: Service-learning in Uganda" program had on the alumni's academic, skills, and intercultural competence development. Approval to conduct this study was granted by the IRB at ISU as "Exempt" under IRB#: 21-263-01. Electronic mail communication through Qualtrics was used in data collection between February 7th through March 10th of 2022. This method collects substantial amounts of data from dispersed populations (like the service-learning alumni who are in other countries) and increases the speed of obtaining results (Ary et al., 2019; Dillman et al., 2014). The population for this census survey consisted of all the alumni of the summer school garden service-learning program. The alumni in this study are former students who participated in and completed any of the summer service-learning programs between 2006–2019. The activities were completed in the Kamuli district, Uganda, through CSRL (Ikendi et al., 2023). The alumni were identified from the program's database with a list of updated e-mail addresses through the Associate Director, Education Programs. The total population was 291 alumni, among whom 166 and 125 were from MAK and ISU, respectively.

Instrumentation

The survey instrument was designed based on the guidelines of the Tailored Design Method, which allows researchers to customize the survey mode to reduce errors, adopt multiple contacts, and focus on content to induce a positive social exchange (Dillman et al., 2014). The main survey was designed in blocks and sections. This paper focuses on three sections of a total of eleven questions. The introductory section with three questions asked what university the alumni attended, their year of participation, and their year of study at the university. The main section had two questions, including a scale question that asked about the level of the global service-learning program's influence on alumni's employability skills improvement. The question was a set of five-point Likert scale with 18 Likert items (employability skills). The scale was composed of "1=no improvement" through "5=excellent improvement." Another question asked global service-learning's impact on alumni's skills, as it either had "1=little impact", "2=significant impact but diminished", or "3=had a significant impact throughout their life as they carry out their responsibilities". The demographic section had six questions that asked about gender, the house and location of residence during service-learning, current education level, the place where alumni grew up, employment status, and any alumni's engagements with CSRL after their service-learning experiences.

Establishment of Reliability for Consistent Results

In the design of the survey tool for the main study, systematic and rigorous steps were followed to ensure that the final survey tool was valid and, once deployed, ensure data collected were consistent with

the study objectives (Ary et al., 2019). The survey tool was reviewed by a team of 12 members with different experiences and specialties in higher education, global service-learning, and research methods. The review team included five professors from ISU and two from Makerere and Kyambogo, and five graduate students at ISU. The systematic review followed the authors' designed panel of experts' guidelines aimed at identifying whether each item in the survey tool was: i) relevant to the objectives of the study, ii) clear and concise, iii) not "multi-barreled", and iv) free of technical jargon. Each item in the evaluation form of the survey tool had a comment section, and in general, final comments were submitted together with a summary indicating whether content, construct, and face validity should be: i) retained as is, ii) modified and retained, and iii) deleted, for each item in the survey tool. All items in the tool were modified as needed and retained.

Data Collection

Following the Tailored Design Method (Dillman et al., 2014), an *invitation letter* was sent on February 7th, 2022, to 291 alumni in a single e-mail using a *blank carbon copy* feature to protect the privacy of alumni emails while informing them about the upcoming survey. The letter stated the purpose and the importance of their participation to get accurate feedback. Seventeen of the 291 e-mails were undeliverable, and none of the 274 alumni with valid e-mails opted out of the study. On February 9th, the *initial link* to the questionnaire was sent through Qualtrics to the 274 alumni along with a *cover letter* explaining the purpose of the research, confidentiality, a request for a timely response, and thanking them for their voluntary and willingness to participate in the study.

Consent was embedded at the end of the cover letter, where alumni who chose to participate clicked *yes* and continued. All sections were marked, and directions were provided for each section and question. Alumni, 150 (54.8%), completed the survey on the initial invitation. On February 18th, an email was sent to 124 alumni to remind them of the survey sent earlier and that their responses were critical, and 52 alumni responded. A follow-up letter is one of the most effective ways to increase the return rate (Dillman et al., 2014). To further encourage response, a follow-up letter and a link were sent to 72 alumni on February 28th three weeks after the original survey, and 40 alumni responded. On March 7th, a final reminder was sent to 32 alumni who had not completed the survey, and 16 alumni responded.

Data collection lasted for 30 days and was closed on March 10th, 2022, with an overall response rate of 94.2% (258 of 274), with Makerere University at 95.6% (151 of 158), and Iowa State University at 92.2% (107 of 116). Before commencing data analysis, Cronbach's alpha was employed to determine the internal consistency of Likert responses, and its alpha value was 0.94, showing a high level of internal consistency (McNeish, 2018).

Data Analysis

Data were exported from Qualtrics to Excel for cleaning and reorganization of variables. All 18 skills were categorized into three clusters: applied knowledge, effective relationships, and workplace skills as per the employability framework (Table 1). The next step, the data were transferred to IBM-SPSS 30 statistical software for analysis. For the first objective, to determine the level of improvement in employability skills, frequencies and percentages were used. For the second objective which focused on determining if there are any differences between Iowa State University and Makerere University alumni on how service-learning improved their level of employability skills, an independent sample *t*-test at $p \leq .05$ was used, along with Cohen's (*d*) to measure the effect size of differences in the means (Cohen, 1988) between MAK and ISU alumni. In the third objective to explain the differences in alumni's demographic characteristics and their level of improvement in employability skills, an ANOVA and *post hoc* analyses were performed at $p \leq .05$. For the fourth objective, chi-square, a bivariate statistical tool, was employed. We determined the impact that the service-learning program has had on the improvement of alumni's employability skills long after they participated in the program (2006–2019).

Table 1

Description and Operationalization of Employability Skills that were Reported Improved During Service-Learning among Student Alumni from Makerere University and Iowa State University

Category	Specific Skills	Operationalized skills during service-learning were through....
Applied Knowledge Skills	Problem-solving	Creativity, critical analysis, innovativeness, and research to respond proactively to cases, evaluate new situations, and develop feasible plans.
	Critical reflections	Writing reflexive journals on field activities, processes, and critical thinking during discussions with peers and facilitators.
	Teaching	Collaborative lesson planning, adopting multiple teaching methods, use of relevant teaching materials, and the assessment of learners.
	Research	Writing project concept notes, conducting experiments with peers on projects, report writing, and sharing of findings.
Effective Relationship Skills	Teamwork	Goal setting, cooperation, tolerance, multitasking, respectfulness, and reliability with peers.
	Open-mindedness	Active listening, positive thinking, inquisitiveness, and listening to peers to learn innovative ideas and new knowledge.
	Integrity	Understanding work ethics, trustworthiness, reliability, loyalty, and being principled at work to achieve set goals.
	Flexibility	Critical thinking, patience, open-mindedness, and proactiveness required to adapt to a variety of situations and challenges during fieldwork.
	Positive attitude	Passion, positive thinking, enthusiasm, self-confidence, and being receptive to feedback relevant to future work ethics.
	Leadership	Goal setting, creativity, coaching, mentoring, motivating, and guidance to students and pupils in schools.
	Professionalism	Communication, reliability, maturity, respectfulness, and self-accountability in the tasks.
	Openness	Enthusiasm, initiating projects, and positive reception of constructive criticism to learn new concepts and processes.
Workplace Skills	Emotional intelligence	Understanding how to express feelings, self-awareness, empathy, trust, self-regulation, relate to peers, and interpret peers' behaviors.
	Communication	Networking, kindness, negotiations, respect, facilitation, and clarity during conversations, discussions, and meetings.
	Self-motivation	Setting goals, resilience, contributing to projects, high commitment, and a desire to achieve set goals with minimal supervision.
	Self-confidence	Self-reliance and awareness, determination, and courage to accomplish goals and targets.
	Organizational	Time management, planning, delegation, and resource allocation required to accomplish projects and duties on time.
	Public speaking	Clarity, confidence, articulation, alteration of vocal tone, and awareness of body language during discussions.

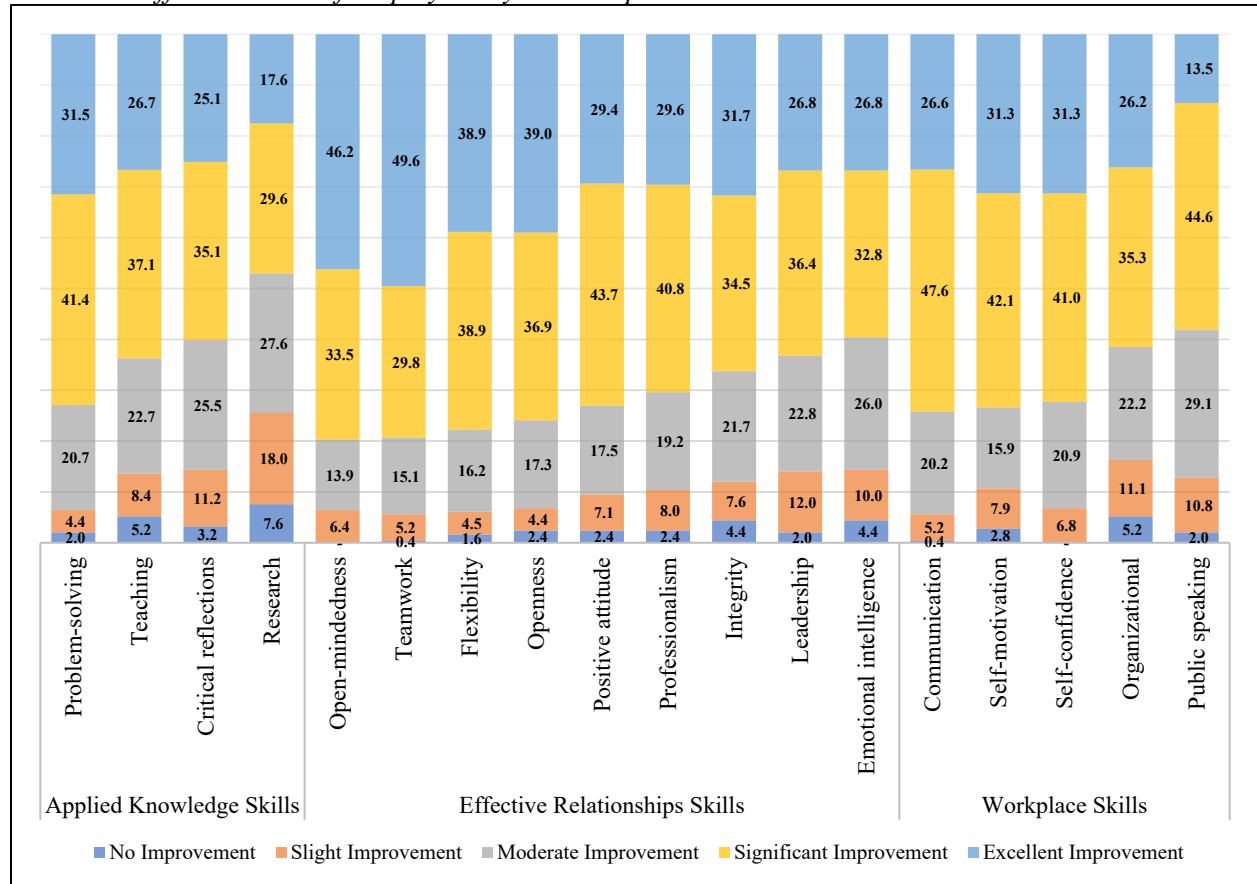
Findings

Levels of Improvement in Employability Skills among Global Service-Learning Alumni

Alumni indicated their rating on the level of improvement in each of the 18 employability skills considered in this study because of their participation in global service-learning (Figure 2). Under the three categories of the employability framework, in the applied knowledge skills category, alumni rated problem-solving as the most improved and research as the least improved skills. In the effective relationships category, alumni rated teamwork and open-mindedness as most improved and emotional intelligence as least improved. In the workplace skills category, they rated communication and self-motivation as most improved and leadership and public speaking as least improved during their service-learning experiences.

Figure 2

Percentage of Both Makerere University and Iowa State University Global Service-Learning Alumni who Indicated Different Levels of Employability Skills Improvement



Differences in the Levels of Employability Skill Improvement among the Alumni

An independent sample *t*-test was used to determine the differences in the overall level of improvement of employability skills among the Makerere University (MAK) and Iowa State University (ISU) global service-learning alumni. Levene’s test indicates a violation of the assumption that the groups being compared have equal variance ($p=0.032$). To address this issue, an ANOVA output was analyzed based on equal variance not assumed.

The combined complete responses were (MAK, $n=136$, ISU, $n=97$). The overall results indicate that global service-learning experiences led to higher levels of improvement in employability skills of MAK alumni ($M=4.00$, $SD=0.586$) than they did for ISU alumni ($M=3.74$, $SD=.776$); $t(183.080)=2.340$, $p=.032$, Cohen’s $d=.38$ (small effect size).

Based on the three clusters of employability skills, overall, effective relationship skills had the highest improvement for both groups, followed by workplace skills and applied knowledge skills (Table 2). In all three employability skills categories, there were statistically significant differences with MAK reporting higher levels of improvement than ISU global service-learning alumni at varying effect sizes.

Table 2

Mean Differences in Levels of Employability Skills Improvement among the Global Service-Learning Alumni from Makerere University and Iowa State University.

Categories of skills	Specific skills investigated	MAK alumni			ISU alumni			Statistic	
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>	<i>d</i>
Applied Knowledge	Problem-solving	148	4.0	.869	103	3.9	1.028	.033	.13 ^T
	Critical reflections	148	3.8	.945	103	3.6	1.218	<.001	.18 ^T
	Teaching	148	3.8	1.118	103	3.7	1.088	.942	
	Research	148	3.5	1.078	102	3.1	1.283	.048	.32 ^S
	Total	145	3.7	0.753	102	3.6	0.959	.001	.21^T
Effective Relationships	Teamwork	149	4.5	.783	103	3.9	1.012	.023	.56 ^M
	Open-mindedness	148	4.1	.892	103	4.3	.919	.399	
	Integrity	146	4.1	.956	103	3.4	1.168	.001	.64 ^M
	Flexibility	146	4.1	.918	101	4.1	.958	.059	
	Professionalism	149	4.0	.908	101	3.7	1.113	<.001	.32 ^S
	Positive attitude	149	4.0	.874	103	3.8	1.115	<.001	.18 ^T
	Openness	147	3.9	.928	102	4.3	1.014	.126	
	Leadership	148	3.9	.985	102	3.5	1.088	.015	.41 ^S
Emotional intelligence	147	3.7	1.057	103	3.7	1.179	.015	.04 ^T	
Total	139	4.1	0.700	98	3.9	0.820	.047	.18^T	
Workplace Skills	Self-motivation	149	4.1	.843	103	3.6	1.173	<.001	.48 ^S
	Self-confidence	147	4.1	.851	102	3.7	.944	.051	
	Organizational	149	4.1	.900	103	3.1	1.158	.004	1.00 ^L
	Communication	149	4.0	.797	103	3.9	.901	.027	.19 ^T
	Public speaking	148	3.8	.824	103	3.3	1.000	.004	.48 ^S
Total	147	4.0	.641	101	3.6	.783	.021	.63^M	
Overall		136	4.0	.586	97	3.8	.776	.032	.38^S

Note. Cohen's *d* (Effect Size) at ^T=Trivial, ^S=Small, ^M=Medium, ^L=Large.

Scale on Skills Improvements: "1=No Improvement" through "5=Excellent Improvement."

Differences in Alumni Demographic Characteristics and their Levels of Improvement in Employability Skills during their Global Service-Learning Experiences

An ANOVA was used to determine the differences based on the three employability categories, and also used a *post hoc* analysis to determine the exact groups that reflected statistically significant differences. In applied knowledge, housing arrangements or residence during service-learning, year of participation, and level of education during the survey time showed significant differences (Table 3).

Alumni who lived in Mpirigiti Rural Training Center residence (Ikendi & Retallick, 2025) had higher levels of improvement in applied knowledge skills than peers who lived in other residences. Housing residence was coded as a dummy variable with "1=Mpirigiti Center residence" that housed all students, both MAK and ISU of the same year; and "2=all other residences" where students in the same year were housed in different locations Kamuli town house-(MAK+ISU); Naluwoli village houses (MAK); Namasagali rural house (MAK); Namasagali College houses (MAK+ISU); Namasagali University houses (MAK+ISU). Similarly, alumni who resided in the Mpirigiti Training Center also had higher levels of improvement in their effective relationship and workplace skills than their peers in other residences.

The year of participation, specifically alumni who participated in the recent years of 2016-2019, had significantly higher improvements in their applied knowledge, effective relationships, and workplace

skills than alumni of the 2011-2015 years. On education level, alumni classified as undergraduates indicated higher improvements in their applied knowledge, effective relationships, and workplace skills than alumni who were classified as graduates with master's or doctorates. Relatedly, the home where alumni grew up, specifically alumni who grew up in rural settings, indicated higher improvements in their effective relationship and workplace skills than alumni who grew up in semi-urban and urban areas.

Table 3

Influence of Demographic Characteristics and Employability Skills Improvement of the Global Service-Learning Alumni from Iowa State University and Makerere University.

Variables	Applied Knowledge				Effective Relationships				Workplace Skills			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>
Residence												
Mpirigiti	55	3.9	0.82	0.009	52	4.2	0.71	0.054	55	4.0	0.70	0.043
All others	192	3.6	0.85		186	3.9	0.76		193	3.8	0.74	
Year												
2006-2010	53	3.6 ^{a,b}	0.92	0.009	49	4.0 ^{a,b}	0.71	0.012	52	3.7 ^{a,b}	0.74	0.016
2011-2015	97	3.5 ^a	0.84		95	3.8 ^a	0.81		98	3.7 ^a	0.76	
2015-2019	97	3.9 ^b	0.78		94	4.1 ^b	0.68		98	4.0 ^b	0.67	
Class												
Freshmen	16	3.9	0.87	0.284	16	4.3	0.44	0.300	16	3.9	0.50	0.150
Sophomore	132	3.7	0.83		127	4.0	0.77		130	3.9	0.72	
Juniors	85	3.6	0.84		80	4.0	0.77		88	3.8	0.76	
Seniors	14	3.4	0.96		14	3.9	0.78		14	3.4	0.88	
Gender												
Male	108	3.7	0.83	0.292	101	4.0	0.76	0.589	109	3.9	0.73	0.316
Female	137	3.6	0.85		134	3.9	0.75		137	3.8	0.74	
No Answer	2	2.8	1.01		2	4.0	0.55		2	3.4	0.28	
Education												
Bachelors	122	3.8	0.78	0.063	118	4.1	0.70	0.243	123	3.9	0.69	0.051
Masters	87	3.5	0.90		83	3.9	0.83		86	3.7	0.78	
PhD	38	3.6	0.89		36	3.9	0.71		39	3.8	0.73	
Home												
Urban	83	3.7	0.86	0.373	78	3.9	0.76	0.059	84	3.8 ^{a,b}	0.65	0.047
Semi-urban	77	3.6	0.88		75	3.9	0.77		77	3.7 ^a	0.77	
Rural	87	3.7	0.81		84	4.1	0.71		87	4.0 ^b	0.76	

Note. Scale on Skills Improvements: "1 = No Improvement" through "5 = Excellent Improvement."

Long Term (2006-2019) Influence of Global Service-learning on Alumni Human Development

The perception of impact of global service-learning on alumni was measured on three scales: little impact, significant impact but has diminished, and significant impact throughout. The results indicate that the majority of alumni, 181 (72.4%), concurred that global service-learning experiences have had a significant impact throughout their lives (Table 4).

There were factors believed to explain the relationship between the global service-learning impact and alumni's employability skills improvement long after their participation. A chi-square was employed to determine. The majority of the alumni (79.8%) who reported having engaged in the CSRL program activities in Uganda and Iowa State University after their service-learning believed their participation in service-learning had a significant impact on their employability skills throughout their lives.

A total of 130 (51.6%) of the alumni reported participating in CSRL activities that contributed to their personal development and CSRL's goal of ending hunger. Among those alumni, 87 (66.9%) were from

MAK, and 43 (33.1%) were from ISU. The alumni (40.8% of 130) reported participating in at least one activity. Specifically, the majority of the alumni participated as service-learning student leaders (40% of 130), the majority of whom are MAK alumni.

Some alumni (28.5%) reported having completed and/or are completing research projects with CSRL programs. Among the MAK alumni, 28.7% completed a two-month internship program at ISU, 23.0% reported having volunteered with CSRL in Kamuli district, and 10.4% were or are currently employed by the CSRL program in Kamuli district. Among the ISU alumni, 46.8% reported having completed an internship with CSRL, and 14.9% had also completed a semester-long service-learning program after the summer program.

Table 4

Impact of Global Service-Learning on Iowa State University and Makerere University Alumni's Employability Skills After Participation in the Program Expressed as Percentages.

Variable indicators	Had little impact (n=10)	Significant but diminished (n=59)	Significant throughout (n=181)	p
<i>Alumni's University</i>				
Iowa State University	3.9	29.4	66.7	.197
Makerere University	4.1	19.6	76.4	
<i>Current Education</i>				
Bachelors	3.3	16.3	80.5	.051
Masters	5.7	28.4	65.9	
Doctorate	4.0	35.9	61.5	
<i>Employment Status</i>				
Not employed	0.0	15.0	85.0	.448
Self-employed	9.1	18.2	72.7	
Officially employed	3.9	24.8	71.4	
<i>CSRL Engagements</i>				
No engagements	6.6	28.9	64.5	.012
Had engagements	1.6	18.6	79.8	

Discussion

This study was a comparative census between global service-learning alumni from Iowa State University (ISU) and Makerere University (MAK) who participated in the summer school garden program between 2006 through 2019. The study sought to determine the alumni's level of improvement in various employability skills, along with an assessment of the factors that contributed to the skills improvement and differences between and among the alumni groups. Our discussions are based on the three clusters of employability skills: applied knowledge, effective relationship building, and workplace skills (United States Department of Education and Office of Career, Technical and Adult Education, 2018).

Alumni Self-reported Levels of Improvements in Applied Knowledge Skills

The applied knowledge skills integrate academic knowledge and technical skills (United States Department of Education and Office of Career, Technical, and Adult Education, 2018). Specifically, both MAK and ISU alumni showed higher improvements in their problem-solving skills, with MAK alumni having statistically higher improvements than ISU alumni. In the context of this study, problem-solving skills were demonstrated through creativity, critical analysis, innovativeness, and research to respond

proactively to cases, evaluate new situations, and develop feasible plans in performing their program activities, including teaching and establishing school gardens (Ikendi et al., 2023; Nonnecke et al., 2015). Other research also concurs that service-learning programs prepare graduates with problem-solving skills, including nursing programs (Mumba et al., 2022), which enhance their employability after college (Vetter & Wingenbach, 2019; Zainuri & Huda, 2023).

Critical reflection skills were another applied knowledge skill where MAK alumni had higher improvement than ISU alumni. Alumni demonstrated critical reflections through writing reflexive journals on field activities, processes, and critical thinking during discussions with peers and facilitators. These skills were instrumental in alumni cognitive development through critical reasoning and questioning their participation in the program activities (Ikendi et al., 2023). Moreover, critical reflections are key components of academic service-learning programs (Ash & Clayton, 2009; Choi et al., 2023), which usually begin in the preparatory stages of the program (Ikendi, 2025; Ikendi et al., 2023). This aspect undergirds the essence that learners can begin from any stage of the experiential learning cycle (Kolb, 2015), to which Coleman et al. (2024) termed such reflections as “reflection-pre-experience” (p. 297).

Research, though the least improved skill among the applied knowledge, was an instrumental skill among the alumni. Alumni research skills were demonstrated through writing project concept notes, conducting experiments with peers on projects, report writing, and sharing of findings. In developing research skills, the research culture is embedded in binational team projects, such as grain storage, poultry, sanitation, agroforestry, and school feeding, where students develop project proposals during the spring semester in their pre-departure orientations (Ikendi et al., 2023; Nonnecke et al., 2015). The knowledge, feedback, and guidance alumni received in their research projects contributed to their academic development through community engagement and reciprocity, and the growth of their scholarship of research and discovery during and after college. The immersion of service-learners in communities collaborating with them provides unique opportunities to learn about community problems that require scientific inquiry to find solutions.

The CSRL program relies on indigenous knowledge (Masinde & McMillan, 2015) and scientific research findings (Acker et al., 2015) for the development and implementation of livelihood education programs in Kamuli, Uganda. Moreover, alumni indicated they participated, completed, and/or are completing research projects related to their academics and the CSRL program’s goal of ending hunger. The findings of several alumni research projects supported by the CSRL program have guided the design of extension education materials and the diffusion of innovations (Ikendi, Mwenyi & Retallick, 2025).

The findings and recommendations from alumni research projects have supported improvements in postharvest technologies (Mayanja et al., 2018; Tumutegyereize et al., 2022), food safety (Nabwiire et al., 2023; Ssabika et al., 2024), public health (Buyinza et al., 2024), piggery production (Walugembe et al., 2014), soil management (Akitwine, 2021; Wokibula et al., 2024), tomato production (Tusiime et al., 2019) and pumpkin production (Kwikiiriza, 2022). Most of these alumni projects are experimental research, demonstrating that experiential learning programs such as global service-learning can foster transformational learning, from hands-on experiences to mastery of concepts to developing and testing concepts in new situations (Coleman et al., 2022; Ikendi et al., 2023; Ingles & Retallick, 2025; Knobloch & Smith, 2024), resulting in personal, organizational, and community development.

Alumni Self-reported Levels of Improvements in Effective Relationship Skills

Effective relationships describe the interpersonal skills and personal qualities that enable individuals to interact effectively with clients, coworkers, and supervisors (United States Department of Education and Office of Career, Technical and Adult Education, 2018). In this category of employability skills framework, alumni reported that teamwork, open-mindedness, openness, and flexibility were the most

improved skills during their global service-learning experience. On teamwork and integrity skills, MAK alumni reported a greater improvement than ISU alumni, with a medium effect size in their differences. In their service-learning experience, teamwork skills were demonstrated through goal setting, cooperation, tolerance, multitasking, respectfulness, and reliability with peers, whereas integrity skills were demonstrated through understanding work ethics, trustworthiness, reliability, loyalty, and being principled at work to achieve set goals for their various field activities in schools and communities.

Our study program is multicultural and all the service-learning activities that students participated in, including, among others, assisting with school teaching, school gardening, binational team projects, critical reflections, and presentation of progress reports, are done as a binational team (Ikendi et al., 2023; Nonnecke et al., 2015). These activities, for instance, binational team projects, require collaboration among students and their facilitators from developing proposals and concept notes to implementation and assessments. These activities start during the pre-departure orientations in the spring semesters to discuss and lay out plans for every activity and project (Ikendi, 2025; Ikendi et al., 2023; Nonnecke et al., 2015). The team spirit exhibited by students enabled proposals and concept notes to be written and discussed through e-mail communication and in orientation seminars among students from their respective universities. During summer, students meet to move forward with the developed proposals to implement their projects, which demonstrate gradual development and improvements in effective relationship skills.

Leadership, though among the least improved skills, was an instrumental skill in alumni service-learning experiences. Leadership skills were demonstrated through goal setting, creativity, coaching, mentoring, motivating, and guidance to students and pupils in schools during activities such as setting up school gardens and teaching. Moreover, 40% of 130 alumni who participated in CSRL activities after their service-learning indicated they had served as student leaders, leading to further improvements in their leadership skills. This leadership service demonstrates the multiplier effect of the transfer of knowledge after their experiential learning experiences. Service-learning programs nurture students into future leaders as they work in teams to accomplish projects and also develop the attributes of servant leaders (Ferdiansyah et al., 2022a; Khofi & Sunoko, 2025; Nguyen et al., 2024; Robinson & Magnusen, 2024).

Alumni who volunteered their time as student leaders demonstrated an altruistic calling, with the power of wisdom as alumni ambassadors of the program. The effectiveness of these student leaders is due to their willingness to share power and authority with the learners through empowerment. The student leaders need to lead students into cohesive teams to accomplish school garden work, as well as the binational team projects (Ikendi et al., 2023; Nonnecke et al., 2015). This level of leadership practice defines servant leaders whose fabric expresses that “natural feeling that one wants to serve, to serve first” (Greenleaf, 1977, p. 15). It also demonstrates students as people power leaders, who help their subordinates to grow, and empower them to build independence, creativity, innovativeness, trust, and build community, attributes which are critical in students’ programs like college camps, and also increase their employability (Bush et al., 2023; Carson et al., 2024; Cletzer et al., 2023).

Relatedly, emotional intelligence is key among the effective relationship skills in the employability framework. The emotional intelligence skills were demonstrated through an understanding of how to express feelings, self-awareness, empathy, trust, self-regulation, relate to peers, and interpret peers’ behaviors. Moreover, ISU alumni demonstrated higher improvements in emotional intelligence skills than MAK alumni. Studies in service-learning, including the Uganda program, have shown that white students go through stages while advancing their racial and ethnic identity development than students of color, who find it easier to identify themselves with the communities during service-learning (Ikendi et al., 2025; Kasravi, 2023; Lott & Brundage, 2025; Mitchell & Donahue, 2023). This development influences improvements in their emotional intelligence and fosters the importance of multicultural service-learning programs on students development.

In China, Pong and Lam (2023) conducted an experimental study among youths in Hong Kong who participated in service-learning and a comparative group that did not participate and assessed their levels of improvement in their emotional intelligence and adversity quotient. In their study, adversity meant “a state of serious and persistent difficulty,” and adversity quotient “a measure of how individuals perceive and respond to difficulties and adversity” (Tian & Fan, 2014). Using the Wong and Law Emotional Intelligence Scale and the Adversity Response Profile, Pong and Lam (2023) found that youth who participated in service-learning had improved emotional intelligence and adversity quotient than their counterparts who never participated.

Similarly, Torres et al. (2022) assessed the impact of a mediator service-learning program among California students in Peace and Conflict Studies and used the Social-Emotional Expertise Scale (McBrien et al., 2020). In their results, prior to service-learning, the overall scale was 3.75 and rose to 4.32 after their service-learning experience, demonstrating the impact that these programs have on students’ emotional intelligence. Other studies in Europe, for example, Gregorová et al. (2024), also show the positive impact of improvements in the emotional intelligence of students who participated in service-learning programs.

Alumni Self-reported Levels of Improvement in Workplace Skills

Workplace skills are an interface of the analytical and organizational skills and understandings that employees need to successfully perform their tasks (United States Department of Education and Office of Career, Technical and Adult Education, 2018). All skills in our study, including self-motivation, self-confidence, organizational, communication, and public speaking skills, aligned with workplace skills of the employability framework, showing that MAK alumni had higher improvements than ISU alumni. Self-motivation was a key skill in the program among alumni, demonstrated through setting goals, resilience, contributing to projects, high commitment, and a desire to achieve set goals with minimal supervision.

In other studies, through a photovoice, pre-service teachers reiterated the importance of self-motivation as a key element of their success in a service-learning area unfamiliar to them and echoed the role of peer support to adapt to the new sociocultural life (Ferdiansyah et al., 2022b). A lack of self-motivation during learning has negative implications that are transferable to the workplace (Husaini et al., 2022; Panda et al., 2023). Relatedly, self-confidence skills are critical in service-learning that improve workplace skills. Self-confidence in this study was demonstrated through self-reliance and awareness, determination, and courage to accomplish goals and targets during service-learning. While developing a framework for implementing service-learning, Jenkins and Sheehy (2022) also acknowledged that self-confidence is a key element that service-learning instills in students during their learning experience.

Communication and public speaking skills, though among the least improved during service-learning, are key to students’ learning and employability. Communication skills were demonstrated through networking, kindness, negotiations, respect, facilitation, and clarity during conversations, discussions, and meetings during their activities. Several studies have shown that service-learning fosters improvements in communication skills among students ranging from the business field (Blewitt et al., 2018), health and medical (Mara et al., 2024), education (Halverson et al., 2025), and library sciences (Montesi et al., 2025).

Relatedly, public speaking skills were demonstrated through clarity, confidence, articulation, alteration of vocal tone, and awareness of body language during discussions, especially working in a multicultural environment with school pupils, communities, and among service-learners. Gohar (2024) designed and implemented a service-learning program to improve students’ EFL productive skills (oral and written performance), and after administration of the assessment, results showed a greater improvement in these skills and recommended the use of the service-learning approach to improve receptive language skills. Lee et al. (2025) also implemented a service-learning approach in a volunteer medical program, and the post-program assessment indicated a significant improvement in medical students’ public speaking skills.

Conclusions and Recommendations

The results of this study suggest that global service-learning programs have the potential to improve the students' employability skills (applied knowledge, effective relationships, and workplace skills). These skills can be fostered through greater engagement of service-learners in teams to accomplish their service-learning activities. Through teamwork, several cooperative skills are simultaneously developed and improved. For instance, teamwork requires members to be open-minded, open to discussions, have effective communication, be flexible, have high integrity, be self-motivated, and exercise professionalism, among other qualities, which result in improvement in those respective skills. Similarly, engaging alumni in different program activities after their global service-learning experiences has had implications for further development of skills, for instance, in student leadership, research projects, volunteerism, and employment. These engagements further alumni's professional development and continued camaraderie and belonging through consistent communications, including through social media, a key factor in modeling alumni ambassadors of the program (Ikendi, Mwenyi et al., 2025).

During service-learning, alumni benefited overall but could benefit more by engaging them in activities to improve their research and critical reflections for applied knowledge skills, leadership and emotional intelligence for effective relationship, and communication and public speaking for workplace skills, which are part of the building blocks for graduate school and employability. Given the fact that the majority of the alumni were graduate students at the time of the study, it means service-learning has a multiplier effect on academic retention, degree completion, and pursuit of graduate school (Ikendi et al., 2023; Wyels & Martinez, 2024). Continued mentorship and engagement of students in research project activities shall benefit them to improve their research skills, contributing to their academic progress and finding actionable solutions to community problems identified during their engagements with communities. This approach of mentorship fosters the goals of the 21st century higher education model of an *engaged campus* (Tapaia, 2024). In this model, institutions and communities are partners in the development of research agendas and experiential programs such as service-learning, support those research developments.

In the same instance, additional facilitation in guided critical reflections would benefit students in developing their critical thinking, questioning, and reasoning. Those critical reflection aspects are helpful to develop students' capabilities in confronting their worldviews related to questioning their participation in the global service-learning activities. Additionally, it is a norm in service-learning programs for students to share their accomplishments with the general public through presentations (Jenkins & Sheehy, 2022; Olson & Scharrer, 2022). These activities call for mentoring students in the preparation of presentations and public speaking skills, skills that were among the least improved, needing emphasis during their service-learning experience.

The housing arrangement resonated as a key factor influencing the development of the three employability skills: applied knowledge, effective relationships, and workplace skills. This study recommends that institutions implementing multicultural service-learning should consider a binational housing arrangement where students can interact effectively to foster their skills in intercultural relations

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