

Artificial Intelligence Transforms Marginalized Communities through a Study/Service Abroad Internship Program

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Research Statement

This research explores two distinct but complementary study abroad programs. In 2023, we led a group of twenty students to spend seven weeks in Cape Town, South Africa, and in 2024 we led another group of nineteen students who spent six weeks in Ghana, West Africa. Students collaborated closely with local Non-Government Organizations (NGOS), using their skills to develop Al-driven technology software applications that address critical issues such as low literacy rates, limited access to technology, and inadequate community infrastructure. The software applications developed during the study abroad programs have yielded substantial impacts, reaching thousands of individuals in both regions. This is part of a larger analysis that will expand to East and North Africa.

Literature Review

Study abroad programs face significant competition from typical engineering internships. Internships in the engineering field can provide salaries of around \$70,000 (Glassdoor, 2019), allowing students to secure their professional careers with a great financial benefit and the opportunity to hone their skills in a real-world environment. In contrast, students looking to participate in study abroad programs typically face substantial costs, often amounting to \$8,000 or more (UFIC). This financial burden can deter students from choosing international educational experiences, despite the invaluable benefits they provide regarding cultural immersion, global perspectives, and personal growth. Research indicates that study abroad experiences significantly contribute to personal growth, with students often reporting increased self-confidence. adaptability, and independence as they navigate unfamiliar environments (Dwver, Engle 2024).

Research Questions

- 1.How can the integration of AI technology in real-world software development enhance students' technical and entrepreneurial skills?
- 2. What strategies can be employed to improve students' communication skills when explaining complex technical concepts to non-technical audiences?
- 3.In what ways does experiential learning with local organizations contribute to the development of cross-cultural collaboration skills among students?
- 4. How does the integration of historical and cultural activities into the curriculum enhance students' cultural competency?
- 5. What impact does empowering students to apply their skills in underdeveloped communities have on addressing literacy rates and improving access to data?

Methodology

We used qualitative analysis to capture and code data from interviews and observations on the technologies developed, the impacts on the communities served, and the personal and professional growth experienced by participating students. We synthesize the lessons learned over two successful cohorts in Africa, demonstrating how these findings can enhance future international servicelearning initiatives.



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Combined natural language generation (NLG) and image synthesis to create visualizations of flora, fauna, water systems for 269 acres of wetland





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Ghana West Africa

An offline mobile app for female farmers to digitalize their financial transactions, empowering over 2,000 women with financial control and literacy.



A website that included tutorials for managing content and donations for a domestic abuse shelter **serving Ghana at large.**





Findings/Analysis

- Understanding Infrastructure: Students recognized that understanding local infrastructure is crucial, particularly regarding electricity and internet access.
- Safety Considerations: Students quickly realized the importance of comprehending safety dynamics, particularly in areas with heightened risks.
- User-Centered Design: Students had to adjust their design thinking to
 effectively create technology solutions suitable for a different cultural
 context using Al.
- Cultural Shock and Logistical Challenges: The importance of logistics and time management became increasingly evident during the study abroad program, particularly in Ghana. Students faced significant challenges related to transportation, spending extended hours on the bus due to the remote locations of their accommodations, which were situated far from the city
- **Empathy and Cultural Sensitivity:** The experiences in these programs significantly enhanced students' empathy and cultural sensitivity, which are essential attributes for developing technology aimed at accessible communities.

Conclusion/Discussion

Students gained technical global experience by considering various factors when creating technology, such as literacy levels, technological infrastructure, and cultural attitudes towards technology. For instance, in communities with low digital literacy, developers would need to simplify interfaces and minimize data requirements, ensuring that technology is usable for everyone. Additionally, they became acutely aware of the importance of involving community members in the design process, allowing users to express their needs and preferences directly.

By prioritizing a user-centered approach, students became advocates for inclusive technological solutions that respect and empower marginalized communities. This shift in perspective not only enriched their educational experience but also laid the groundwork for meaningful, long-lasting contributions to the communities they worked with.

Our program can serve as a blueprint for future programs in underserved and underdeveloped communities as we expand to East and North Africa.

Acknowlegments

Computer & Information Science & Engineering Department University of Florida International Center EDU Africa Non-Government Organizations Teaching Assistant & Students *References Available Upon Request



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Authors



Introduction

This report presents student experiences (N=40) from a study abroad program held in West and South Africa. The program was a post-requisite to an Introduction to Software Engineering course. Students created Artificial Intelligence software for populations with low literacy rates and inadequate access to technology. The experience shifted students' worldviews by increasing sensitivity to an underdeveloped population and its available resources. This offers valuable insights for designing similar programs that promote an understanding of global collaboration and greater social responsibility in computing for underdeveloped communities. This is part of a larger analysis that will expand to East and North Africa.

Program Overview

The AI Study/Service Abroad Internship Program partners computer science students with NGOs in South Africa (2023) and Ghana (2024) to develop AI-driven solutions for underserved communities. Key components:

Goals: Enhance technical skills, cross-cultural collaboration, and accessible design for low-literacy users.

Structure: 6-7 week immersive experience with NGO projects, coding workshops, and cultural excursions.

Participants: 39 students (2023: 20 CS majors; 2024: 19 CS majors + 1 journalism minor), diverse in gender and ethnicity.

Outcomes: Custom software (offline-capable, low-data) for local needs, documented for sustainability.

Students gained real-world problem-solving skills while navigating infrastructure challenges (e.g., load shedding) and cultural contexts. Recruitment targeted CS courses, leveraging the director's accolades (AI Educator of the Year) for engagement.

Lessons Learned

Understanding Infrastructure – Students learned to adapt to unreliable electricity and internet access, incorporating backup systems and flexible timelines. Safety Considerations – Programs enforced strict safety protocols, especially in high-risk areas like Vrygrond township. User-Centered Design – Solutions were redesigned through community engagement to meet local needs and cultural contexts. Cultural Shock and Logistical Challenges – Poor transportation planning in Ghana caused excessive travel time, limiting free exploration. Empathy and Cultural Sensitivity – Direct community interactions deepened students' understanding of socio-economic challenges and the need for tailored solutions.





Authors

Introduction

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Discussion

References

Method



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Introduction

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Methods

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Discussion

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Extra Information 2

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