Journal of International Agricultural and Extension Education

Volume 32 | Issue 3 Article 7

12-4-2025

Capturing Sustainability: Exploring the 17 UN Sustainable Development Goals Through Visual Representations During a Short-Term Study Abroad

Maria A. Ramsey
University of Georgia, maria.ramsey@uga.edu

Rieley Beauchamp
rieleybeauchamp2020@gmail.com

Jessica Holt
University of Georgia, jaholt@uga.edu

See next page for additional authors

Recommended Citation

Ramsey, M. A., Beauchamp, R., Holt, J., & Campbell, J. H. (2025). Capturing Sustainability: Exploring the 17 UN Sustainable Development Goals Through Visual Representations During a Short-Term Study Abroad. *Journal of International Agricultural and Extension Education, 32*(3), 486-502. DOI: https://doi.org/10.4148/2831-5960.1545

Capturing Sustainability: Exploring the 17 UN Sustainable Development Goals Through Visual Representations During a Short-Term Study Abroad

Abstract

This study explored how undergraduate participants in a short-term study abroad (STSA) program engaged with the United Nations Sustainable Development Goals (SDGs) through visual documentation. Grounded in the framework of Education for Sustainable Development (ESD), the research examined how participants demonstrated awareness of sustainability issues through photographs captured during travel across five European cities (Amsterdam, Bruges, Delft, Leuven, and Paris) in May 2024. Twenty-nine participants from the University of Georgia were instructed to photograph at least five SDGs in each city, identifying the corresponding goal for each image. A quantitative analysis of frequencies revealed all 17 SDGs were represented, with SDG 15 (Life on Land), SDG 11 (Sustainable Cities and Communities), and SDG 9 (Industry, Innovation, and Infrastructure) most frequently depicted. These quantitative findings were complemented by qualitative interpretations of recurring visual themes—livestock and natural landscapes (SDG 15), urban mobility and renewable infrastructure (SDG 11), and tourism and floriculture (SDG 9). The limited presence of human figures across photographs suggests that participants may have gravitated toward accessible, public scenes and felt hesitant to capture social interactions or people, revealing a potential bias toward the environmental dimension of sustainability. Within the ESD framework, these findings indicate cognitive engagement with sustainability concepts but limited socio-emotional or behavioral expression. The study demonstrates the pedagogical potential of visual methods to promote sustainability literacy in international education and offers recommendations for integrating SDG-focused reflection, ethical visual practices, and structured dialogue into future STSA curricula to strengthen critical thinking and global awareness.

Keywords

short-term study abroad, photovoice, experiential learning theory, united nations sustainable development goals

Authors

Maria A. Ramsey, Rieley Beauchamp, Jessica Holt, and Julie H. Campbell

Capturing Sustainability: Exploring the 17 UN Sustainable Development Goals Through Visual Representations During a Short-Term Study Abroad

Maria A. Ramsey, University of Georgia
Rieley Beauchamp, University of Georgia
Jessica Holt, University of Georgia
Julie H. Campbell, University of Georgia

This study explored how undergraduate participants in a short-term study abroad (STSA) program engaged with the United Nations Sustainable Development Goals (SDGs) through visual documentation. Grounded in the framework of Education for Sustainable Development (ESD), the research examined how participants demonstrated awareness of sustainability issues through photographs captured during travel across five European cities (Amsterdam, Bruges, Delft, Leuven, and Paris) in May 2024. Twenty-nine participants from the University of Georgia were instructed to photograph at least five SDGs in each city, identifying the corresponding goal for each image. A quantitative analysis of frequencies revealed all 17 SDGs were represented, with SDG 15 (Life on Land), SDG 11 (Sustainable Cities and Communities), and SDG 9 (Industry, Innovation, and Infrastructure) most frequently depicted. These quantitative findings were complemented by qualitative interpretations of recurring visual themes—livestock and natural landscapes (SDG 15), urban mobility and renewable infrastructure (SDG 11), and tourism and floriculture (SDG 9). The limited presence of human figures across photographs suggests that participants may have gravitated toward accessible, public scenes and felt hesitant to capture social interactions or people, revealing a potential bias toward the environmental dimension of sustainability. Within the ESD framework, these findings indicate cognitive engagement with sustainability concepts but limited socio-emotional or behavioral expression. The study demonstrates the pedagogical potential of visual methods to promote sustainability literacy in international education and offers recommendations for integrating SDG-focused reflection, ethical visual practices, and structured dialogue into future STSA curricula to strengthen critical thinking and global awareness.

Keywords: Short-term study abroad, photovoice, experiential learning theory, United Nations sustainable development goals

Capturing Sustainability: Exploring the 17 UN Sustainable Development Goals Through Visual Representations During a Short-Term Study Abroad

Introduction and Review of Literature

In an increasingly interconnected world, short-term study abroad (STSA) programs in higher education play a crucial role in providing students with opportunities to engage in learning environments that foster new experiences and perspectives (Carley & Tudor, 2010; Perry et al., 2013). These opportunities not only enhance students' understanding of global agricultural issues but also broaden their perspectives on pressing environmental challenges (Bletscher, 2022). Many institutions encourage study abroad experiences as a means for students to deepen their understanding of global agricultural issues (Bletscher et al., 2022). However, even with increased participation in STSA programs, questions remain about whether undergraduate students possess the foundational knowledge of global issues and policies necessary to make a meaningful impact on urgent agricultural and food challenges (Bletscher et al., 2022; Wingenbach et al., 2003).

Most undergraduate study abroad experiences in the United States are short-term, with 60% lasting from one to eight weeks (Institute of International Education [IIE], 2019; McLaughlin, 2021; Redden, 2019). In the 2022–23 academic year, approximately 280,700 U.S. students studied abroad for academic credit, a 49% increase from the previous year (IIE, 2024). Traditionally, the primary purposes of study abroad had been language acquisition and cultural immersion; however, as global education programs have diversified, educators have increasingly leveraged study abroad as a platform for teaching sustainability—such as systems thinking, responsible consumption, and environmental stewardship—within real-world cultural contexts (Kioupi & Voulvoulis, 2019; Zhang & Gibson, 2021). The conceptual links between study abroad and education for sustainable development are well aligned (Long et al., 2014; Zhang & Gibson, 2021), and given that sustainability is a global issue, participation in study abroad may foster a more holistic understanding of sustainability among students (Tarrant, 2010; Zhang & Gibson, 2021).

Evidence suggests sustainability-focused study abroad programs can have lasting effects on students' attitudes and behaviors (Nikula & McBride, 2023). For example, Zhang and Gibson (2021) found participants in a sustainability-themed STSA program retained a "sustainable mindset" years after the program, influencing their everyday choices, career trajectories, and travel behaviors. Similarly, Hane and Korfmacher (2020) reported exposure to new cultures during study abroad can shape the way students think about environmental problems, while Thomas (2020) demonstrated semester-long study abroad programs can deepen students' sustainability understanding through intentional curriculum design. Understanding how students respond to these types of immersive experiences is vital for informing the development of future STSA courses and encouraging faculty to integrate such opportunities into higher education curricula (Synder et al., 2012).

One way to frame and deepen this learning is through the United Nations' (UN) 17 Sustainable Development Goals (SDGs), a globally recognized framework, adopted by all UN Member States in 2015. The SDGs outline interconnected targets designed to address urgent global challenges, including poverty alleviation, environmental sustainability, economic growth, and social equity (United Nations, n.d.). By using the SDGs as an organizing lens, educators can help students situate their experiences within a broader context of global development priorities,

reinforcing connections between local observations and international objectives. In this study, the SDGs served as a lens for participants to immerse themselves in communities and identify unique elements aimed at improving the world. This approach not only supported particants' awareness of global environmental issues but also encouraged them to consider how these challenges intersect with real-world contexts (Bletsher et al., 2022).

Conceptual Framework

This study was grounded in Education for Sustainable Development (ESD) and framed through the UN's SDGs, which together provide a holistic approach to understanding how education fosters sustainability awareness and action. These frameworks share a unifying goal: to equip learners with the knowledge, skills, and values necessary to address complex environmental, social, and economic challenges (Aljuaid, 2021; Garba, 2024).

ESD positions education as a transformative force that enables individuals to critically examine their world and act to build a more just and sustainable future (Rieckmann et al., 2017; UNESCO, 2020). It emphasizes three interrelated dimensions of learning: (1) the cognitive dimension, which refers to the acquisition of knowledge and understanding of sustainability issues; (2) the socio-emotional dimension, which involves values, empathy, and a sense of responsibility toward others and the planet; and (3) the behavioral dimension, which denotes the ability and willingness to act for sustainable change (Rieckmann et al., 2017). Within this framework, learners are viewed not as passive recipients of information but as active participants who co-construct knowledge through reflection, dialogue, and practice, fostering the competencies needed to contribute to the 2030 Agenda for Sustainable Development (UNESCO, 2020).

The SDGs operationalize the vision of ESD into 17 actionable global targets that address urgent challenges such as poverty, inequality, and climate change (United Nations, n.d.). As Aljuaid (2021) emphasized that the SDGs play a significant role in improving global wellbeing, and that global learning serves as the connection between educational practice and the goals' implementation. When embedded in curricula, the SDGs encourage learners to recognize the interconnectedness of global systems and to develop interdisciplinary approaches for addressing sustainability problems (Kioupi & Voulvoulis, 2019; Zhang & Gibson, 2021).

Scholars have emphasized that achieving these goals requires innovative educational design that moves beyond knowledge transmission toward experiential learning and critical problem solving (Garba, 2024). Garba (2024) argued that while sustainability knowledge has expanded, its translation into action remains a major gap. Bridging this gap involves curriculum reform that links theoretical understanding to real-world application through methods that cultivate critical thinking, systems awareness, and civic responsibility (Leiber et al., 2020; Song et al., 2019). Similarly, Rieckmann et al. (2017) emphasized that sustainability education must cultivate updated skills, values, and attitudes that prepare learners for action, while also encouraging institutions to embed sustainability principles into their organizational practices.

In higher education, the integration of ESD and SDGs has proven particularly valuable in preparing students to confront sustainability challenges on a global scale (Garba, 2024; Pham Xuan & Lindqvist, 2025). Universities serve as key agents of change, embedding SDG principles into curricula to promote lifelong learning, inclusivity, and equity (Leal et al., 2018; Lei et al., 2024; UNESCO, 2025). As Pham Xuan and Lindqvist (2025) explain, this alignment equips learners to develop the perspectives and problem-solving abilities needed to address

sustainability challenges. However, despite increasing attention to these frameworks, a significant knowledge gap remains regarding how effectively they are implemented across education systems worldwide (Sachs et al., 2025). This underscores the importance of research that explores how ESD and SDG integration materializes in practice, particularly through experiential formats such as study abroad.

In this study, the SDGs functioned as the applied framework, guiding observation, analysis, and meaning-making as participants documented sustainability through photography. This framework connects global learning theory with applied sustainability education, positioning students' visual interpretations as indicators of emerging sustainability literacy, an early phase of awareness and recognition that precedes behavioral transformation (Aljuaid, 2021; Garba, 2024). By situating study abroad within the intersection of ESD and the SDGs, this research contributes to understanding how international experiences can cultivate global perspectives and foster deeper engagement with sustainability principles across disciplinary and cultural contexts.

Purpose and Research Questions

The purpose of this study was to examine undergraduate participants' perceptions of the SDGs through their photographic representations during a STSA program in Europe. Specifically, the study aimed to:

1. Explore participants' perspectives on global environmental issues by identifying the SDGs most frequently captured in their photographs.
2. Identify the themes associated with each of the 17 SDGs represented in participants' photographs across five European cities (Amsterdam, Bruges, Delft, Leuven, and Paris).

Methodology

This qualitative study employed a reflexive visual thematic analysis approach to examine how undergraduate participants visually represented the SDGs during a STSA program in five European cities: Amsterdam, Bruges, Delft, Leuven, and Paris. The assignment was adapted from traditional photovoice methodology, which empowers participants to document their lived experiences through photography and reflective engagement (Wang & Burris, 1997; Swarts et al., 2021). In this foundational year of implementation, the activity was framed as a photographic documentation assignment rather than a full photovoice project, as participants were not yet required to provide written reflections. The resulting images were analyzed qualitatively to explore how students perceived and represented global sustainability priorities through the SDGs.

Participants

Participants ($N = 29$) were undergraduate students enrolled at the University of Georgia who attended a STSA program in Europe in May 2024. They included 24 female and 5 male students representing multiple academic disciplines: 23 from the College of Agricultural and Environmental Sciences, 1 from the College of Engineering, 2 from the College of Business, 2 from the College of Education, and 1 from the College of Arts and Sciences. All participants were 18 years of age or older. Due to the small sample size and to protect participants' identities, further demographic details are not reported.

Recruitment occurred through enrollment in the faculty-led STSA course. Participants were informed that their course photographs might be included in a research study evaluating learning outcomes related to sustainability and global awareness. Informed consent was obtained, and participants were given the opportunity to opt out of having their images included in the dataset without penalty. This project was reviewed and deemed exempt by the University of Georgia Institutional Review Board because it involved analysis of non-sensitive, de-identified student work.

Data Collection Procedures

As a course assignment, participants were instructed to take a minimum of five photographs in each of the five cities visited (Amsterdam, Bruges, Delft, Leuven, and Paris) resulting in at least 25 images per participant. In total, participants submitted 753 photographs, which served as the dataset for this study. Each photograph was required to represent one of the 17 SDGs, and participants were encouraged to capture a range of goals rather than repeatedly focusing on the same few; however, participants were not required to capture all 17 SDGs.

Before departing for the study abroad program, participants completed several preparatory learning units, including a dedicated unit on the SDGs. This unit provided background information, an overview of each goal, and links to the official SDG website to help participants understand the purpose, targets, and indicators associated with each goal.

During the program, photographs were taken across a mix of structured class activities and independent exploration. For example, participants captured images during guided site visits, industry tours, and cultural excursions, as well as during designated free time to allow for individual interpretation and creativity. While students were not required to submit written justifications for each image, they selected the SDG they felt each photograph represented and uploaded it accordingly, demonstrating individual reasoning through the act of categorization. The intent was to document authentic, context-specific representations of the SDGs as participants encountered them in public spaces, historical sites, markets, and other locations relevant to the program itinerary. This included the Floating Flower Market and Volendam Harbor near Amsterdam; the historic canals and marketplaces of Bruges and Delft; the Kruidtuin Leuven (Belgium's oldest botanical garden); and the La Défense business district and central Paris, including cultural landmarks and public transport systems.

To facilitate organized data management, images were submitted digitally through the university's eLearning Commons platform using designated folders for each city. When submitting, participants were required to indicate which SDG each image represented. Photographs were taken individually, although informal discussions among participants about their observations and ideas were encouraged to promote deeper reflection.

Data Analysis

Data were analyzed using reflexive thematic analysis (RTA) following the six-phase framework of Braun and Clarke (2024): (1) familiarization with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. All analysis was conducted manually without qualitative software to maintain close engagement with the images. Researchers independently examined all photographs, generating initial descriptive codes based on visible features, contextual cues, and

SDG representations. Through iterative discussion and reflexive memoing, these codes were refined into broader interpretive themes that captured patterns across the dataset.

Although intercoder agreement was not quantified, consistent with RTA's emphasis on researcher subjectivity rather than reliability (Braun & Clarke, 2024), the research team engaged in collaborative reflexive dialogue to ensure transparency and depth of interpretation. This process emphasized meaning-making over consensus and reflected the interpretivist orientation of the study.

Reflexivity and Bracketing

Throughout analysis, researchers practiced bracketing (Moustakas, 1994) by consciously identifying and setting aside preconceived ideas related to European culture, sustainability imagery, and specific SDG expectations. Reflexive journaling was used before and after each coding round to record assumptions and analytic decisions. These memos, together with team debrief meetings, served to illuminate researchers' positionalities as agricultural educators and study abroad facilitators, thereby enhancing interpretive awareness.

Trustworthiness and Rigor

Several strategies were implemented to ensure the credibility, transferability, dependability, and confirmability of the findings (Lincoln & Guba, 1985). Credibility was enhanced through peer debriefing among the research team, member checking with participants, and by comparing emergent themes to course objectives and field notes. During member checking, preliminary themes and exemplar photographs were shared with participants after initial coding, and students provided verbal and written feedback confirming that the interpretations aligned with their intended representations of the SDGs. This process helped ensure the accuracy and authenticity of the findings and reinforced participants' voices within the analysis.

Dependability was supported by maintaining a detailed audit trail of coding decisions, reflexive memos, and meeting notes. Confirmability was promoted through reflexive bracketing and analytic triangulation. Member checking also strengthened confirmability by allowing participants to validate the researchers' interpretations and enhance the transparency of the analytic process.

Limitations

In traditional photovoice methodology, each photograph is typically accompanied by a brief caption or narrative description to provide context and insight into the participant's perspective (Wang & Burris, 1997). Because this was the foundational year of a two-year comparative project, participants in this study were only required to submit photographs without written captions. The 2024 dataset therefore represents the baseline condition—photographic documentation without narratives—allowing for future comparison with the 2025 study, which includes a full photovoice design requiring captions and group reflection sessions. While this approach limited the participatory voice typical of photovoice, it provided valuable insights into visual perception and informed the design of the subsequent iteration. To mitigate this limitation, researchers triangulated across member checking feedback, program itinerary materials, and observational field notes to provide contextual grounding and strengthen the interpretation of themes despite the lack of written narratives.

Results

RQ1: Explore participants' perspectives on global environmental issues by identifying the SDGs most frequently captured in their photographs.

Participants submitted photographs that represented all 17 SDGs across the five European cities visited. Table 1 summarizes the frequency with which each SDG was captured. The three most frequently captured were Life on Land (SDG 15; *n* =80), Sustainable Cities and Communities (SDG 11; *n* = 69), and Industry, Innovation, and Infrastructure (SDG 9; *n* = 58).

Table 1

Frequencies of Sustainable Development Goals Captured in Participants' Photographs

SDG	Title	Frequency (*n*)
1	No Poverty	33
2	Zero Hunger	41
3	Good Health and Well-Being	36
4	Quality Education	38
5	Gender Equality	31
6	Clean Water and Sanitation	42
7	Affordable and Clean Energy	35
8	Decent Work and Economic Growth	42
9	Industry, Innovation and Infrastructure	58
10	Reduced Inequalities	37
11	Sustainable Cities and Communities	69
12	Responsible Consumption and Production	44
13	Climate Action	38
14	Life Below Water	43
15	Life on Land	80
16	Peace, Justice and Strong Institutions	51
17	Partnership for the Goals	35

RQ2: Identify the themes associated with each of the 17 SDGs represented in participants' photographs across five European cities (Amsterdam, Bruges, Delft, Leuven, and Paris).

Thematic analysis revealed participants visually represented all 17 SDGs across the five cities visited. Each SDG was associated with one to three distinct themes that emerged from the

images. These themes reflected recurring patterns of environmental, cultural, and infrastructural observation, demonstrating how students visually engaged with sustainability concepts through contextual awareness rather than narrative explanation. However, because participants did not provide written captions, interpretations of meaning were derived primarily through researcher triangulation of visual content, itinerary materials, and member-checking feedback. Consequently, the themes represent how researchers identified sustainability indicators reflected in students' images, not necessarily the participants' direct interpretive intent.

Table 2

SDGs and Associated Themes Identified in Participants' Photographs

Sustainable Development Goal	Associated Themes
1. No Poverty	Extravagance; Efficiency; Culture
2. Zero Hunger	Culture; Food culture
3. Good Health and Well-being	Infrastructure; Culture
4. Quality Education	Citizen Art; Literature; Formal Institutions
5. Gender Equality	Local Voice
6. Clean Water and Sanitation	Accessibility
7. Affordable and Clean Energy	Culturally Rooted; Citizen Accepted
8. Decent Work and Economic Growth	Business Diversity
9. Industry, Innovation, and Infrastructure	Edifice; Tourism
10. Reduced Inequalities	Local inclusion
11. Sustainable Cities and Communities	Green Urbanization; Cultural Regard
12. Responsible Consumption and Production	Sustainability; Accountability
13. Climate Action	Floristry; Infrastructure
14. Life Below Water	Waterfowl; Flora
15. Life on Land	Wildlife; Floristry
16. Peace, Justice, and Strong Institutions	Tranquility; Symbolism
17. Partnerships for the Goals	Multicultural

While all 17 SDGs were represented, the top three goals (SDG 15, SDG 11, and SDG 9) are illustrated below through representative participant photographs. The prominence of SDGs 15, 11, and 9 reflects participants' engagement with sustainability, urban infrastructure, and economic activity in European contexts. Each of these SDGs was visually represented through recurring motifs that reflected participants' engagement with environmental sustainability, infrastructure, and economic activity in European contexts.

Life on Land (SDG 15)

Images for SDG 15 (n = 80) commonly depicted livestock, wildlife, and vegetation, emphasizing agricultural landscapes and rural ecosystems. Themes included Wildlife and Floristry, highlighting participants' awareness of biodiversity and agricultural sustainability (see Figures 1 and 2).

Figure 1

Participant photograph representing SDG 15: Life on Land, depicting grazing livestock in a rural European setting

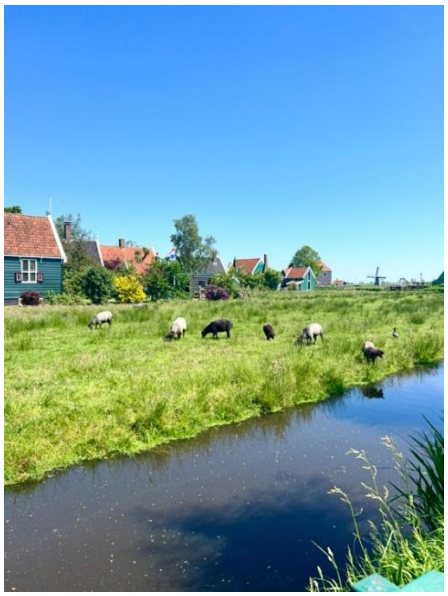

Figure 2

Participant photograph representing SDG 15: Life on Land, showing a close-up of a goat in an agricultural setting.

Sustainable Cities and Communities (SDG 11)

SDG 11 was frequently represented through urban photographs often featured public transportation, bicycles, wind turbines, and architecture integrating green spaces. These reflected themes of Green Urbanization and Cultural Regard, aligning with participants' observations of sustainable infrastructure (see Figures 3–5).

Figure 3

Participant photograph representing SDG 11: Sustainable Cities and Communities, showing bicycles parked outside a residence.

Figure 4

Participant photograph representing SDG 11: Sustainable Cities and Communities, depicting a windmill.

Figure 5

Participant photograph representing SDG 11: Sustainable Cities and Communities, showing a European train station platform and commuter rail infrastructure.

Industry, innovation, and infrastructure (SDG 9)

SDG 9 (*n* = 58) represented through images of tourism sites, construction, and local markets, emphasizing Edifice and Tourism. These photographs captured visible intersections between culture, economy, and infrastructure in European city life (see Figures 6 and 7).

Figure 6

Participant photograph representing SDG 9: Industry, Innovation, and Infrastructure, showing the Eiffel Tower as a symbol of tourism and cultural heritage in Paris.

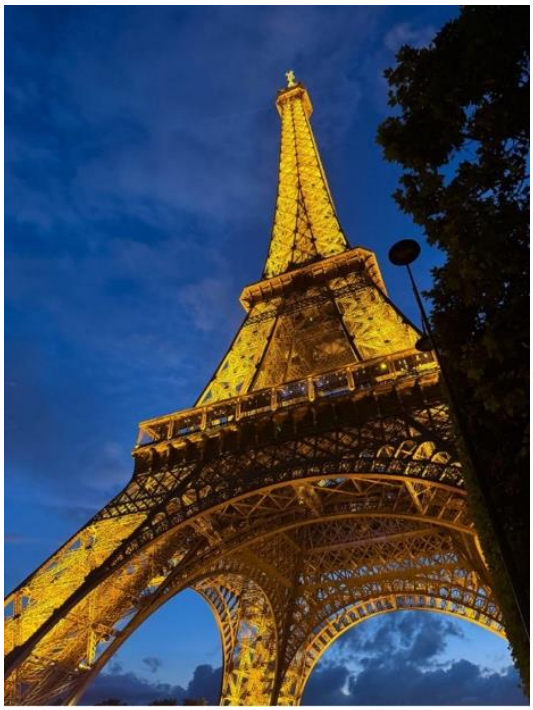

Figure 7

Participant photograph representing SDG 9: Industry, Innovation, and Infrastructure, depicting a floral bouquet stand in a European marketplace.

Conclusions, Discussion, and Implications

This study examined how undergraduate participants visually represented the SDGs during a STSA program in five European cities. Findings were interpreted through the framework of ESD, which emphasizes learning through awareness, critical observation, and contextual understanding (Rieckmann et al., 2017; UNESCO, 2020).

Participants collectively submitted photographs representing all 17 goals, illustrating broad awareness of sustainability themes encountered in varied cultural and geographic contexts. The three most frequently photographed goals (SDG 15, SDG 11 and SDG 9) reflect participants' engagement with visible forms of environmental, infrastructural, and economic sustainability. These findings echo previous work showing that study abroad experiences heighten awareness of tangible sustainability features in both rural and urban settings (Bletscher et al., 2022; Tarrant, 2010; Thomas, 2020). However, they also suggest that what participants chose to capture may have been influenced by accessibility bias, a preference for photographing easily observable or publicly accessible features rather than those requiring interpersonal interaction or consent.

The thematic analysis revealed that participants' photographs reflected observable sustainability indicators more than personal interpretations. Because written captions were not collected, researcher interpretation of themes was guided by triangulation across visual evidence, itinerary context, and member-checking feedback. Consequently, the themes illustrate how sustainability was manifested through imagery rather than how it was conceptualized by participants. Still, these visual representations provide insight into how learners begin to recognize sustainability across contexts, a key early outcome aligned with ESD's cognitive and socio-emotional dimensions (Rieckmann et al., 2017).

The prominence of SDG 15 suggests that agricultural and ecological systems remain central reference points for participants engaging in global learning. These photographs often depicted livestock, vegetation, and rural landscapes, reinforcing the environmental literacy

component of ESD and supporting previous findings that agricultural contexts deepen awareness of human–nature interdependence (Hane & Korfmacher, 2020). The frequent representation of SDG 11 similarly underscores that visible sustainable infrastructure, such as public transit, bicycle lanes, and green spaces, captures attention and fosters reflection on urban sustainability. This aligns with Kioupi and Voulvoulis (2019), who noted that exposure to sustainable urban design supports systems thinking and environmental responsibility. Meanwhile, the prevalence of SDG 9 imagery highlights participants' awareness of economic structures and industrial innovation as essential to sustainable development, complementing findings by Zhang and Gibson (2021) that sustainability learning often extends beyond environmental issues to include social and economic dimensions.

A notable finding was the absence of humans as primary subjects in most photographs. While previous visual and participatory studies have often included people as central elements to represent the social dimensions of sustainability (Mukembo et al., 2020), participants in this study focused predominantly on places, infrastructure, and natural environments. Within the framework of ESD, this pattern suggests partial engagement—strong cognitive awareness of environmental and infrastructural sustainability, but limited socio-emotional and behavioral expression. The lack of human representation reveals an underemphasis on the participatory and equity-oriented aspects of sustainability, which are central to ESD's holistic learning outcomes (Rieckmann et al., 2017; UNESCO, 2020). Previous research has emphasized that full sustainability literacy requires progression from recognition to reflection and, ultimately, to action (Aljuaid, 2021; Garba, 2024). Providing participants with explicit guidance on ethical and culturally sensitive ways to photograph people could therefore foster richer visual narratives that integrate human and community perspectives, helping them connect environmental sustainability with social inclusion and shared responsibility.

Overall, these findings reinforce that integrating the SDGs into STSA programs offers an effective scaffold for cultivating sustainability literacy. Through the lens of ESD, the photographic documentation process served as both a pedagogical and analytic tool that helps participants identify sustainability while supporting the development of awareness, empathy, and contextual understanding. Consistent with Long et al. (2014) and Zhang and Gibson (2021), the results illustrate that sustainability-focused STSA experiences promote systems thinking and can foster lasting cognitive shifts that inform participants' future engagement with sustainability challenges. For educators and program designers, these outcomes underscore the value of aligning experiential learning tasks with global sustainability frameworks and integrating intentional reflection to transform observation into informed understanding and, ultimately, sustainable action.

Recommendations

The findings of this study offer several recommendations for educators, program coordinators, and researchers seeking to strengthen sustainability-focused STSA programs. Integrating the SDGs within the framework of ESD can create learning environments that foster awareness, reflection, and action, key dimensions of sustainability literacy.

Before departure, incorporating explicit instruction on the SDGs and their global and local implications can help participants connect what they observe abroad to broader sustainability systems. As emphasized by Kioupi and Voulvoulis (2019), introducing systems thinking early in the learning process encourages participants to view sustainability as an

interconnected challenge that spans environmental, economic, and social dimensions. Preparing participants with this conceptual grounding may help them interpret sustainability practices in diverse contexts rather than viewing them as isolated or place-specific phenomena.

During the program, embedding structured reflection opportunities is essential to bridge observation and understanding. Reflection through guided journaling, small-group discussions, or post-activity debriefs can help participants analyze how their experiences align with or challenge sustainability concepts. Such reflective practices activate the socio-emotional domain of ESD by fostering empathy, ethical awareness, and a sense of shared responsibility (UNESCO, 2020). Encouraging participants to articulate their insights about what they see and photograph can deepen their understanding and promote more meaningful engagement with sustainability issues.

The results of this study also indicate the importance of providing guidance on ethical and culturally sensitive approaches to visual documentation. Many participants focused on landscapes, infrastructure, and urban spaces while omitting the human and community dimensions of sustainability. Offering pre-departure and in-country instruction on responsible photography, particularly when capturing people or local communities, can address this gap and help participants more fully engage with the social dimensions of sustainability. Doing so aligns with Zhang and Gibson's (2021) observation that cross-cultural engagement in study abroad programs can enhance participants' appreciation of community-driven sustainability practices.

Exposure to both rural and urban settings should also be intentionally incorporated into program design. Participants' photographs emphasized SDG 15 (Life on Land) and SDG 11 (Sustainable Cities and Communities), suggesting that engagement with both natural and built environments broadens sustainability awareness. A balance of ecological and infrastructural contexts allows participants to compare how sustainability challenges manifest across scales and settings, reinforcing systems thinking as a key ESD competency (Rieckmann et al., 2017).

Finally, future research should further examine how ESD principles can be operationalized within study abroad contexts through longitudinal and participatory methods. Requiring participants to include reflective captions, conduct post-trip analyses, or engage in participatory coding could illuminate how sustainability awareness progresses into sustained behavioral change. Expanding this line of inquiry may also help identify best practices for integrating ESD-based pedagogy into global agricultural and environmental education programs.

By intentionally aligning study abroad curricula with ESD and the SDGs, educators can create transformative international experiences that move participants beyond passive observation toward critical reflection and responsible global citizenship. These approaches not only advance sustainability literacy but also prepare future professionals to approach agricultural and environmental challenges with the contextual understanding and ethical awareness needed to contribute meaningfully to a more sustainable world.

References

Aljuaid, H. (2021). Connecting United Nations Sustainable Development Goals (SDGs) with global learning. *International Journal of English Language and Linguistics Research, 9*(3), 15–25. https://ssrn.com/abstract=3847345

Bletscher, C., Gould, M., & Qu, S. (2022). The Exploration of Undergraduate Attitudes and Knowledge about International Agricultural Issues and US Agricultural Policy. *Journal of International Agricultural and Extension Education, 29*(2), 7–23. https://doi.org/10.4148/2831-5960.1010

Braun, V., & Clarke, V. (2024). Reporting guidelines for qualitative research: A values-based approach. *Qualitative Research in Psychology, 21*(3), 399–438. https://doi.org/10.1080/14780887.2024.2382244

Carley, S., & Tudor, R. K. (2010). Assessing the impact of short-term study abroad. *Journal of Global Initiatives: Policy, Pedagogy, Perspective, 1*(2), Article 5. https://digitalcommons.kennesaw.edu/jgi/vol1/iss2/5

Garba, A. (2024). Achieving sustainable development goals through curriculum innovation and development. *Journal of Arabic Language Teaching, 4.* https://doi.org/10.35719/arkhas.v4i2.2157

Institute of International Education. (2019). Duration of study abroad. Institute of International Education. https://www.iie.org/Research-and-Insights/Open-Doors/Data/US-Study-Abroad/Duration-of-Study-Abroad

Institute of International Education. (2024). Open doors 2024: U.S. study abroad. https://opendoorsdata.org/annual-release/u-s-study-abroad/

Kioupi, V., & Voulvoulis, N. (2019). Education for sustainable development: A systemic framework for connecting the SDGs to educational outcomes. *Sustainability, 11*(21), 6104. https://doi.org/10.3390/su11216104

Leal Filho, W., Raath, S., Lazzarini, B., Vargas, V. R., de Souza, L., Anholon, R., Quelhas, O. L. G., Haddad, R., Klavins, M., & Orlovic, V. L. (2018). The role of transformation in learning and education for sustainability. *Journal of Cleaner Production, 199,* 286–295. https://doi.org/10.1016/j.jclepro.2018.07.017

Lei, C. U., Chan, W., & Wang, Y. (2024). Evaluation of UN SDG-related formal learning activities in a university common core curriculum. *International Journal of Sustainability in Higher Education, 25*(4), 821–837. https://doi.org/10.1108/IJSHE-02-2023-0050

Leiber, T., Stensaker, B., & Harvey, L. C. (2020). Bridging theory and practice of impact evaluation of quality management in higher education institutions: A SWOT analysis. In Quality assurance in higher education: Contemporary issues. Routledge. https://doi.org/10.4324/9780429293276-9

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

Long, J., Vogelaar, A., & Hale, B. W. (2014). Toward sustainable educational travel. *Journal of Sustainable Tourism, 22*(3), 421–439. https://doi.org/10.1080/09669582.2013.819877

McLaughlin, J. S. (2021). Teaching environmental sustainability while transforming study abroad. *Sustainability*, *13*(1), 50. https://doi.org/10.3390/su13010050

Moustakas, C. E. (1994). Phenomenological research methods. SAGE Publications Inc. https://doi.org/10.4135/9781412995658

Mukembo, S. C., Edwards, M. C., & Watters, C. E. (2020). Development of livelihood skills through school-based agripreneurship projects integrating youth-adult partnerships: The experiences of youth partners in Uganda. *Journal of International Agricultural and Extension Education, 27*(4), 111–127. https://doi.org/10.5191//jiaee.2020.274111

Nikula, P., & McBride, K. (2023). The age of sustainable education abroad: Key questions and trends. In K. McBride & P. Nikula (Eds.), *Sustainable education abroad: Striving for change* (pp. 1–10). The Forum on Education Abroad. https://doi.org/10.36366/SIA.4.978-1-952376-34-4.1

Perry, L., Stoner, K. R., Stoner, L., Wadsworth, D., Page, R., & Tarrant, M. A. (2013). The importance of global citizenship to higher education: The role of short-term study abroad. *British Journal of Education, Society & Behavioural Science, 3*(2), 184–194. https://doi.org/10.9734/BJESBS/2013/2910

Pham Xuan, R., & Håkansson Lindqvist, M. (2025). Exploring Sustainable Development Goals and curriculum adoption: A scoping review from 2020–2025. *Societies, 15*(8), 212. https://doi.org/10.3390/soc15080212

Redden, E. (2019). Study abroad numbers continue steady increase. *Inside Higher Ed*. https://www.insidehighered.com/news/2019/11/18/open-doors-data-show-continued-increase-numbers-americans-studying-abroad

Rieckmann, M., Mindt, L., Gardiner, S., Leicht, A., & Heiss, J. (2017). Education for Sustainable Development Goals: Learning objectives. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000247444

Song, W., Ren, S., & Yu, J. (2019). Bridging the gap between corporate social responsibility and new green product success: The role of green organizational identity. *Business Strategy and the Environment, 28*(7), 1241–1254. https://doi.org/10.1002/bse.2205

Swarts, T., Hannes, K., & Rodrigues-Quiles, J. A. (2021). Sociocultural and psychological acculturation strategies of South African international students in a Flemish university in Belgium: A photovoice study. *Journal of Comparative & International Higher Education, 13*(5), 177–201. https://doi.org/10.32674/jcihe.v13i5.2763

Synder, L. U., Micklebart, M. V., & Eylands, V. (2012). Students' experiential learning of hydroponics and local markets on the island of Roatán, Honduras. *Journal of International Agricultural and Extension Education, 19*(1), 54–63. https://doi.org/10.5191/jiaee.2012.19107

Tarrant, M. A. (2010). A conceptual framework for exploring the role of studies abroad in nurturing global citizenship. *Journal of Studies in International Education, 14*(5), 433–451. https://doi.org/10.1177/1028315309348737

UNESCO. (2020). Education for Sustainable Development: A roadmap. Paris: UNESCO. https://doi.org/10.54675/YFRE1448

UNESCO. (2025). *Education 2030: SDG 4*. https://www.unesco.org/en/education2030-sdg4

United Nations. (n.d.). *The 17 goals*. United Nations Sustainable Development Goals. https://sdgs.un.org/goals

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health Education & Behavior, 24*(3), 369–387. https://doi.org/10.1177/109019819702400309

Wingenbach, G., Boyd, B., Lindner, J., Dick, S., Arispe, S., & Haba, S. (2003). Students' knowledge and attitudes about international agricultural issues. *Journal of International Agricultural and Extension Education, 10*(3), 25–35. https://doi.org/10.5191/jiaee.2003.10304

Zhang, H., & Gibson, H. J. (2021). Long-term impact of study abroad on sustainability-related attitudes and behaviors. *Sustainability,* 1*3*(4), 1953. https://doi.org/10.3390/su13041953