WIP: A World of Impact: A replicable model for short-term study away programs to advance leadership competencies in global contexts

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A World of Impact: A Replicable Model for Short-Term Study Away Programs to Advance Leadership Competencies in a Global Context

As a large R1 public institution guided by its strategic priority to deliver the No. 1 student experience in the nation through excellence in experiential learning and amplified academic success, the Clemson University College of Engineering, Computing and Applied Sciences Office of Engagement and Experiential Learning is charged with equipping students to graduate with a competitive edge to be the next generation of forward-thinking leaders, innovators, and entrepreneurs. To advance our departmental mission in global contexts, our team proposed, designed, and delivered a high-quality global learning experience that provides actionable resources and delivers cornerstone learning experiences in an international setting.

To reinforce the institutional mission while also evaluating foundational student outcomes, the team was tasked with developing a comprehensive assessment framework to validate existing college-level benchmarks. It was determined that the program should be shaped based on both ABET and KEEN student outcome diagnostics. Preparing engineers to operate effectively in a global leadership context aligns directly with ABET student outcomes related to communication, interdisciplinary teamwork, and understanding ethical and societal issues [11]. Equipping engineers to apply creative thinking to ambiguous problems, assess and manage risk, and persist through and learn from failure connects KEEN's entrepreneurial mindset to the aforementioned engineering skill sets [12]. The integration of ABET outcomes and the KEEN entrepreneurial mindset framework provides a complementary assessment structure that captures both technical competency and leadership mindset development, effectively bridging engineering education with innovation, entrepreneurship, and leadership competencies.

Both quantitative and qualitative research indicate that global engineering programming remains largely inaccessible to students constrained by highly prescriptive curricular structures that offer limited flexibility for academic variation. The elevated level of curricular assessment applied to international engineering coursework further diminishes the viability of exchange programs and independent study opportunities, particularly for those in the early stages of engineering education. Concurrently, this early timeframe is critical to the long-term development of leadership skills and mindset. This work emerges at the intersection of these structural constraints and a demonstrated demand for applied programming that jumpstarts engineering leadership competencies earlier in the collegiate experience.

Accordingly, the presented work identifies and aims to address the fact that participation among early-stage engineering undergraduates in international engagement remains disproportionately low due to curricular and program design barriers. The purpose of this study is to operationalize and analyze a scalable, modular approach for embedding leadership and global competencies into compact, short-term study away programs designed for early curricular engineering students.

Within this paper, we introduce *Leadership on Location*, a short-term faculty-directed global engagement program grounded in experiential learning. The program is structured as a for-credit leadership program that fulfills the introductory course requirement for the Engineering Leadership Minor curricular sequence. The Modular Development for Applied Leadership

(MODAL) framework, outlined below, is a replicable structure for constructing the *Leadership on Location* program proposal, enabling scalability, operational efficiency, and adaptability across institutional and geographic contexts.

global competencies and engineering education

Engineering education emphasizes the development of essential, professional skills alongside technical mastery, particularly as graduates enter an ever-changing workforce shaped by globalization, interdisciplinary collaboration, and team-based organizations. The literature reviewed positions global competence and leadership development as complementary outcomes within technical undergraduate engineering education, with specific attention to early curriculum experiences and study-away program design. These domains highlight the value of integrating leadership learning into academic pathways, providing the rationale for short-term, modular study-away programs such as *Leadership on Location*.

While short-term study-away experiences have been widely explored in higher education literature, limited research has examined conditionally structured, leadership-focused global experiences designed specifically for early-stage engineering students. More so for students as part of a broader minor curriculum, with additional consideration for rigid STEM curricular constraints.

Global competence is framed as an intended outcome of engineering education, driven by industry expansion, organization and team structures, and the need for cross-cultural problem-solving [3]. Within this context, global competence extends beyond awareness to include the ability to collaborate effectively with individuals who approach problems through different cultural, social, and professional lenses.

Engineering graduates are expected to demonstrate skills in intercultural communication, ethical decision-making, group dynamics, teamwork and adaptability across diverse environments [4]. Research suggests these competencies develop most effectively through experiential learning opportunities, rather than solely through classroom instruction. Participation in undergraduate study away programs supports the development of professional skills while deepening understanding of how interpersonal communication, collaboration, and cultural awareness complement a technical degree [3]. Exposure to new environments encourages students to integrate these skills into their understanding of engineering practice, strengthening preparation and competitiveness for an interconnected global profession.

Collectively, these studies emphasize experiential learning as a mechanism for developing global competencies; however, they offer limited guidance on how to intentionally structure these experiences to integrate leadership development into early-stage engineering curricula.

leadership development in early engineering curricula

Leadership education within engineering most often appears in upper-level coursework through capstone design experiences and team-based course projects. While these environments offer applied leadership opportunities, there is often an assumption that students possess a

foundational understanding of their leadership style and approach when working with others. However, research suggests otherwise, indicating that leadership development occurs earlier in undergraduate careers, shaped by exposure, reflection, and interaction rather than through formal positions [5]. Early leadership learning emphasizes teamwork, ethical decision-making, and self-efficacy among engineering students, reinforcing tandem learning of professional skills and technical knowledge through curriculum integration [10]. While prior work establishes the importance of early leadership development, fewer studies address how leadership learning can be embedded within technical curricula, particularly in global contexts.

Based on this research, prior studies collectively demonstrate a disconnect between leadership education and engineering coursework outcomes, creating a gap between traditional curriculum and leadership development initiatives [9]. This gap is more evident in the first and second years, when curricula prioritize foundational content. Early courses emphasize analytical problem-solving and mathematical accuracy, leaving students with limited opportunities to engage in leadership, teamwork, and communication in applied contexts. Employers consistently report the value of essential skills in applicants; however, coursework in the first two years often lacks structured opportunities for intentional application [8]. As a result, leadership development may be perceived as peripheral rather than integral to engineering education.

Early, structured international experiences introduce a strategy to close this gap. Exposing students to global contexts at a formative stage reinforces confidence, adaptability, and openness to continued international and leadership engagement throughout the undergraduate experience [6].

constraints in international engineering education

Interest in study away experiences among college students continues to grow exponentially; however, engineering students often encounter structural and logistical barriers, including credit transfer, limited curricular flexibility, financial costs, and separation from support networks. Mismatched academic calendars and accreditation requirements further complicate participation decisions and may discourage exploration [7]. These barriers are especially evident for early-stage engineering students, as prerequisite and foundational coursework rarely includes opportunities for study away experiences.

The literature also identifies scalability as a persistent challenge in implementing and sustaining engineering-specific study-away programs [7]. While direct exchange models offer immersive experiences (e.g., host family accommodations, integrated language courses), engineering students participate at lower rates due to reciprocity requirements and limited alignment with technical course sequences. In contrast, short-term, cohort-based models demonstrate greater scalability and expanded access within structured curricula [6].

rationale for modular, short-term models

When scaffolded and intentionally designed for reflection, short-term global experiences support meaningful competency development while lowering participation barriers. Programs of shorter duration offer a unique opportunity for students who may be constrained by financial or

curricular limitations, the latter most often encountered in structured engineering programs. For students early in their academic journeys, exposure to visible, hands-on engineering contexts, paired with cultural immersion, provides an entry point into global learning. Modular study away experiences use applied site visits and guided exploration to introduce international contexts without requiring advanced technical or professional acumen [6].

Research demonstrates that short-term study away experiences yield meaningful gains in intercultural awareness and student dispositions, reinforcing the value of intentionally designed programs despite their shorter duration [2]. However, few studies address the integration of leadership education with the development of professional skills as outcomes of engineering-specific study away experiences. Existing literature primarily examines global engagement and leadership development as parallel or independent components; few frameworks offer an integrated, intentionally sequenced approach that aligns leadership learning with short-term global experiences in engineering contexts.

Collectively, the literature underscores the need for global learning opportunities that align with structured engineering curricula while advancing leadership and essential skill development early in the undergraduate experience. Although prior scholarship highlights the value of short-term global engagement and early leadership exposure independently, few models intentionally integrate these approaches within early engineering coursework. This gap informed the development of a modular, short-term study away program that embeds leadership learning within a global context and remains accessible to students early in their studies. The resulting model offers a replicable approach to engineering leadership learning abroad.

program goals, student outcomes, and leadership domains

Leadership on Location is a high-impact, experiential learning initiative designed to develop globally minded, reflective student leaders through immersive, location-based curricular experiences. Informed by transformational learning theory, the program is structured to move students through a progression of experiences, critical reflections, and the establishment of meaning as they encounter unfamiliar cultural, ethical, and professional contexts. By integrating leadership theory, applied practice, and cultural engagement, the program helps students strengthen core competencies as they navigate real-world scenarios. Through the coursework, reflection, and on-site activities, *Leadership on Location* aims to cultivate students who are self-aware, adaptable, and prepared to lead both in and out of the classroom.

Program goals, student learning outcomes, and leadership domains are framed below as distinct constructs. The program goals articulate the transformative learning pedagogical intent, while the student outcomes define the observable competencies students are expected to demonstrate, aligned with ABET and KEEN objectives. The leadership domains complete the framework by connecting theory to practice through real-life feedback and input on success metrics from engineering leaders and industry professionals. Collectively, *Leadership on Location* aims to lead learners through the transformation model from self-awareness to application to engagement to integration, while also accounting for ABET and KEEN outcomes.

The primary Program Goals for the *Leadership on Location* program are:

1. *Demonstrate self-awareness of personal leadership skills (via personal assessment tools such as CliftonStrengths, MBTI, EQ assessment, and reflective practice).*

This goal aligns with the transformational goal of self-awareness and critical self-examination. By engaging multiple leadership and personality assessments, students can confront their assumptions about their strengths, communication styles, and identity. Structured reflection on these assessments encourages students to question prior beliefs and myths, thereby developing a more nuanced self-assessment. Based on literature reviews, early engineering students often view leadership as positional or technical. This goal reframes leadership as identity-based and developmental.

2. *Apply leadership theories to cultural, ethical, and professional engineering contexts encountered abroad.*

This goal reflects the aim of creating perspective through experiential learning, where abstract leadership domains are tested against real-world challenges, case studies, and explored scenarios. Exposure to new cultural norms, ethical considerations, and industry environments challenges students' existing frame of reference and requires a new interpretation of leadership concepts explored through course materials. Transformational learning can then occur when students understand that leadership principles are context-dependent rather than universally applied.

3. *Engage in professional communication, networking, and teamwork in global contexts.*

This goal corresponds with the exploration of new skills and behaviors within transformational learning. Students actively engage in leadership behaviors, including networking, professional communication, and team building, as they navigate new environments. This reinforces and cements new leadership identities and mindsets through repeted intentional practice. Through this goal, students begin to move into application and engagement of leadership domains and objectives.

4. *Create and present a reflective Engineering Leadership portfolio highlighting growth and impact*

This goal represents the continued integration and reinforcement phase of transformative learning, where students synthesize their experiences, reassess their initial assumptions, and articulate how their leadership perspectives have evolved. This goal serves as a tangible artifact that helps connect self-awareness, application, and engagement into a contextualized Engineering Leadership identity. This process provides evidence of the full transformation and allows students to carry their learnings forward into future roles and responsibilities external to *Leadership on Location*.

Aligned with the program's design philosophy, we have outlined student outcomes that provide specific, observable indicators to assess learning impact. Each student outcome was assessed and mapped to both ABET and KEEN leadership development frameworks to validate relevance.

The primary student objectives of the *Leadership on Location* program are:

Student Objectives	ABET Outcomes	KEEN Principles
Effectively manage and lead project teams	5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Leadership
Adapt to changing situations and challenges	2. Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. 5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Curiosity & Learning from Failure
Understand your unique leadership strengths and abilities	5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Leadership & Self-Awareness
Manage your emotions through self-awareness	5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Self-Awareness
Understand cultures different from your own	4. Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic,	Collaboration & Empathy

	environmental, and societal contexts.	
Learn to develop and utilize professional networks	3. Ability to communicate effectively with a range of audiences	Collaboration & Communication
Understand how to utilize your individual strengths	5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Self-Awareness
Improve written and verbal communication skills	3. Ability to communicate effectively with a range of audiences	Communication
Effectively communicate in team environments	3. Ability to communicate effectively with a range of audiences 5. Ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.	Collaboration & Communication

The program's leadership domains were identified through input from industry partners, alumni, and program stakeholders. These domains were distilled from a broader set of competencies consistently identified by industry professionals as critical to leadership and career progression. Panelists, guest lecturers, program judges, and professors of practice repeatedly highlighted adaptability/agility, ethical leadership and trust building, personal strengths/leadership styles, and teamwork/interpersonal communication as areas of need among early-career engineering hires, which directly informed the inclusion of the primary leadership domains within the MODAL framework. With more than 30 industry professionals engaging with the college's cornerstone Engineering Leadership programs each semester, consistent themes emerged across firsthand accounts, establishing a clear through-line across professional experiences. The program intentionally leverages collective expertise to define leadership domains most relevant to students' personal reflection, professional readiness, and long-term career trajectories.

The primary Leadership Domains explored in the *Leadership on Location* program are:

- Purpose (Strengths, Beliefs, Core Values, Passions)
- Visioning & Strategic Planning (Roadmapping)
- Interdisciplinary Teamwork & Development of Team Strengths
- Ethical Leadership & Building Trust
- Networking & Communicating

- Adaptability, Agility, and Resilience

A key priority in designing the *Leadership on Location* program was ensuring replicability across multiple destinations as the initiative scales and industry partners engage, while maintaining a compressed timeline aligned with the academic constraints of engineering students. The design also prioritizes integration of the transformational learning curriculum in a way that is both repeatable and tailorable to varied program sites.

Based on student feedback and college-level global engagement data, a 7-10-day, 3-credit short-term immersion model was identified as both attainable and impactful for engineering students. The program incorporates pre- and post-travel modules aligned with phases 1 (self-awareness) and 4 (integration) of the transformational learning model, allowing onsite experiences and focus on application and engagement.

MODAL framework: modular development for applied leadership

The Modular Development for Applied Leadership (MODAL) is a module-based program structure grounded in the transformational learning progression. The framework is designed to intentionally guide students through each stage of transformation in alignment with the *Leadership on Location* itinerary, course timeline, and logistical structure. The following section provides an overview of each phase and its alignment with a global program itinerary.

Each phase is designed to move students from passive or theoretical leadership awareness to applied, practiced leadership through demonstrated reflection, experiential learning activities, and deliberate synthesis. This approach ensures leadership learning is explicit rather than assumed.

phase 1 – pre-departure cognitive framing (self-awareness)

This module establishes the cognitive and reflective skills required for transformational learning. This phase surfaces individual beliefs, assumptions, and self-perceptions rather than assuming students already have a shared understanding of leadership development or a developed sense of self-awareness.

Key Learning Components	Leadership Theory Foundations Finding Your Why The Call to Leadership Exploring Beliefs & Assumptions Global Readiness & Travel Preparation
Leadership Domains	Purpose (Beliefs, Core Values, Passions), Visioning & Strategic Planning (Roadmapping)

Activities & Assignments	Personal Self-Assessments (CliftonStrengths, MBTI, EQ) Core Values Guided Activity Identifying your Passions Activity Personal Strategic Plan Activity
Assessment	Pre-Departure Survey: measuring self-awareness and confidence
Program Structure	2 weeks prior to departure

phase 2 – in-country experiential learning (application)

This module introduces productive contextualization to challenge and grow students' existing frame of reference. This phase prompts an adaptive response to ambiguity, added complexity, and cultural interpretation, leading to shifts in perspective and mindsets.

Key Learning Components	Exploring Strengths-Based Leadership Ethical Engineering Case Studies Working in Interdisciplinary Teams Simulations Exploring Adaptive/Agile Leadership Styles
Leadership Domains	Interdisciplinary Teamwork, Development of Personal and Team Strengths, Ethical Leadership & Building Trust, Networking & Communication, Adaptability, Agility, and Resilience
Activities & Assignments	In-class Case Study Activities Industry & Site Visits Guest Lectures & Guided Professional Interactions Alumni Networking Dinner Skillset Based Workshops & Seminars Cultural Excursions
Assessment	In-class discussions Participation artifacts
Program Structure	In-Country (7-10 days)

phase 3 – real-time reflective synthesis (engagement)

This module intentionally structures real-time reflection with the synthesis of key learnings and leadership domains. Immediate reflection supports cognitive processing, while delayed synthesis enables students to move beyond surface-level understanding toward deeper insight. Ongoing synthesis beyond the in-country experience reinforces reflection as a continuous developmental process.

Key Learning Components	Debunking Leadership Assumptions Connecting Theory to Practical Application Personal Self Reflection
Leadership Domains	Purpose (Beliefs, Core Values, Passions) Visioning & Strategic Planning (Roadmapping) Networking & Communicating Adaptability, Agility, Resilience
Activities & Assignments	Case Study Activities Peer-to-Peer Conversations Independent Cultural Exploration High Value Questions Workshop

Assessment	Daily Reflection Journaling
Program Structure	In-Country (7-10 days) Post-trip reflection window (1 week)

phase 4 – post-trip meaning making & mindset reinforcement (integration)

This module extends leadership beyond the program to sustain transformation, emphasizing reintegration of newly formed leadership perspectives across academic, personal, and professional contexts.

Key Learning Components	Leadership Confidence & Competence Public Speaking & Pitching Personal Self Reflection
Leadership Domains	Purpose (Beliefs, Core Values Passions), Visioning & Strategic Planning (Roadmapping), Networking & Communicating
Activities & Assignments	Final Portfolio Reflective Presentation
Assessment	Post-Trip Survey: reflective analysis of outcomes
Program Structure	2 weeks after returning

The central design principle of the MODAL framework is its ability to maintain pedagogical continuity while adapting to varying program lengths, locations, and delivery modalities. This structure supports adjustments to emphasis and application of the learning experiences without compromising developmental progression. Each phase is defined by purpose rather than specific activities or leadership domains, allowing the framework to scale across short- and long-term international programs as well as adapt to domestic experiences. Shorter programs can emphasize pre-departure cognitive framing and post-experience reflective synthesis to offset reduced in-country time, while longer programs allow for expanded experiential engagement and on-site reflection. In both cases, the full transformational sequence is preserved.

MODAL sequencing benefits early-stage engineering students who often face limited scheduling flexibility, highly structured curriculum requirements, and varying levels of leadership acumen and global readiness. The framework lowers barriers to entry through a condensed, high-impact design. Engaging students earlier in their academic trajectory creates a longer developmental runway for continued leadership engagement throughout their degree program and beyond.

implementation logistics & operationalization

Recruitment and student selection for the pilot *Leadership on Location* program were intentionally designed to balance curriculum alignment with exploratory feedback across class standing. While the Engineering Leadership minor sequencing positions early-stage students as an optimal demographic for long-term impact, initial recruitment efforts remained broad to assess program fit. Selection decisions centered on student maturity, curiosity, openness to

growth, and interest in self-exploration. The resulting cohort included 18 first-year students and 6 upperclassmen. Although some upper-level participants were unable to complete the full minor progression, post-program feedback indicated strong perceived value. These insights informed subsequent recruitment strategies, with later iterations targeting students in years one and two to maximize the leadership development runway.

Curricular integration with the Engineering Leadership minor has proven to be an important implementation consideration; however, flexibility for students to apply program credits toward elective requirements within their existing degree programs has also driven participation. Student feedback consistently indicated that offering leadership programs for academic credit increased both financial feasibility and perceived value. At the same time, the MODAL framework and program structure are not limited to credit-bearing formats. Future implementations may include shorter, non-credit experiences, such as domestic programs, for high-achieving students seeking targeted leadership development outside traditional coursework.

To support strong experiential integration, the program partners directly with onsite organizations to coordinate logistics across locations. This approach allows faculty and staff to focus fully on curricular delivery and leadership applications. Significant value has emerged through location-specific partnerships with international organizations, sustained relationships with higher education institutions abroad, and engagement with alumni and University partners. These collaborations enable the design of a more tailored experience aligned with leadership domains, offering a level of relevance and contextualization that is difficult to achieve through fully external coordination.

Insights from the pilot also identified essential competencies for faculty facilitators delivering this type of curriculum. Effective facilitators combine strengths in leadership and talent development and a strong understanding of team and organizational operation, alongside experience in the engineering industry. This ensures students engage with leadership in ways that both applied and industry aligned. Within the MODAL framework, faculty and facilitators primarily serve to connect theory to practice through relevant examples, case studies, and discipline-specific activities.

Student feedback from participants with prior study abroad experience also revealed a recurring gap in many STEM-focused programs: limited contextualization and structured support for synthesizing learning, or “connecting the dots.” While students described engaging in cultural exploration, technical coursework, and site visits, these components often occurred in isolation. As a result, insufficient reflection was given to how these experiences intersect and contribute to broader leadership development. In contrast, Leadership on Location intentionally integrates structured leadership framing, facilitated reflection, and engineering-specific professional contextualization throughout the experience to target Engineering Leadership competencies.

assessment methods

Given the exploratory nature of this pilot implementation and its preliminary program status, a mixed-method assessment strategy was deployed to evaluate both perceived developmental growth and thematic evidence of leadership learning across participants.

To capture a broad range of data, multiple evaluation methods were used with the pilot cohort. Quantitative measures include pre- and post-program self-assessment surveys assessing student confidence, competence, and growth relative to the learning objectives. Complementary qualitative methods included thematic analysis of daily written reflections, in-class activity submissions, and portfolio artifacts. The course culminated in a final student presentation synthesizing individual growth and learning, offering additional insight across assessment measures.

This multi-method approach enabled interpretation of quantitative data alongside qualitative reflections and artifacts, providing a more holistic picture of student leadership development. Triangulation across self-perception measures and reflective demonstration artifacts (e.g., leadership portfolios and reflection activities) offered broader insight than survey data alone.

preliminary results (pilot cohort)

Comparison of pre- and post-survey confidence ratings shows a clear upward trend across measured student outcomes and leadership domains. Students entered the program with moderate confidence in areas such as self-awareness, communication, and teamwork, and reported increased confidence following the experience. These results suggest that a short-term, compressed international experiential learning program can positively influence student self-efficacy across targeted leadership domains, supporting overall program goals. Notably, these increases align with student expectations captured in the pre-experience survey, where participants most frequently identified communication, self-awareness, and teamwork as desired areas for growth. This alignment suggests that the program effectively met stated leadership development goals. Early, scaffolded exposure to these domains, particularly in immersive, unfamiliar environments, may accelerate student confidence and readiness to engage in continued leadership development.

Survey results also indicate that students place a high value on structured leadership and academic experiences tied directly to defined learning outcomes and leadership domains. Across both ranking and rating questions, the most consistently valued experiences included strengths-based leadership workshops, relevant cultural excursions, and industry engagement focused on real-world challenges. These experiences shared common characteristics, including clear learning objectives, explicit leadership framing, and structured facilitation. Together, these findings highlight the importance of intentional alignment between global experiences, leadership development, and learning outcomes, rather than relying on implicit skill development or unstructured connections between tactical application and purpose.

Post-survey responses further emphasize leadership as a collective and relational process. Students highlighted the importance of interdisciplinary teamwork, leveraging individual strengths to bolster team success, and demonstrating adaptability, trust, and ethical decision-making. These themes emerged consistently across multiple open-ended responses, indicating a shared understanding of leadership as a relational, strengths-based process rather than an individual trait. These observations align with pre-survey expectations, demonstrating strong curricular coherence.

Survey feedback also revealed an important design insight regarding the balance between technical content and leadership framing within experiential components. While industry visits were widely valued, some students noted that discussions focused on technical detail without clearly connecting to leadership domains. This feedback informed refinement of the modular framework, with increased emphasis on structured reflection and guided synthesis to translate technical exposure into leadership learning. This insight continues to shape program design moving forward.

Preliminary results from the *Leadership on Location* program demonstrate clear growth across multiple dimensions of leadership development, with outcomes aligning with the MODAL framework. Students initially identified communication, confidence, self-awareness, and teamwork as key areas for development, themes that emerged consistently in pre-survey qualitative data. As shown in Table 1, post-survey confidence ratings (measured on a 1-10 scale) indicate meaningful gains across these competencies, reinforcing that the program successfully moved students from awareness to integration.

	Average Response Value		Percent
	Pre Survey	Post Survey	Change
Effectively communicate in team environments	7.480	8.000	6.95%
Managing and/or leading projects	7.480	7.636	2.09%
My ability to adapt to changing situations and challenges	6.960	8.812	17.55%
My own leadership abilities	7.480	7.818	4.52%
My own self-awareness and how to manage my emotions	7.160	8.364	16.81%
Understanding cultures different from my own	7.840	8.182	4.36%
Understanding how to develop and utilize professional networks	6.800	8.000	17.65%
Understanding how to leverage my unique strengths	7.240	8.091	11.75%
Written and verbal communication skills	8.320	7.818	-6.03%

Table 1: Comparison of Pre- and Post-Experience Survey Confidence Ratings

One unexpected finding was a slight decrease in self-reported confidence in written and verbal communication (-6.03%). This shift may reflect increased self-awareness following exposure to real-world networking and communication-intensive environments, where students developed a deeper understanding of professional expectations and identified communication as an area for continued growth.

Experiential components most directly tied to mindset, observation, and action produced the strongest perceived value. The CliftonStrengths Workshop (average rating of 8.9/10) and Oxford University Historical Leadership Visit (8.6/10) ranked highest among participants. Post-survey reflections reinforce these trends, with students citing improved ability to leverage individual strengths, adapt to ambiguity, and collaborate effectively as key areas of growth—indicators of learning integration. Nearly all respondents indicated they would recommend the course to a peer.

Consistent with these findings, student qualitative feedback further illustrates the impact of the *Leadership on Location* program:

> *"Leadership as an engineer means playing to your team's strengths. When everyone's strengths are used well, the whole team becomes stronger and more effective,"* - First-year civil engineering student

> *"I learned how to identify and leverage my leadership style in a way that promotes collaboration and efficiency. I am excited to apply these leadership skills to my engineering roles and throughout my career,"* - Third-year biomedical engineering student

These developmental gains align with both the leadership literature and the competencies identified by industry partners as foundational for emerging engineering professionals.

limitations

Key limitations of this study include the small pilot cohort (24 students) and a limited set of assessment responses (11 students) from pre- and post-surveys. While feedback from subsequent program offerings is beginning to emerge and may help validate or challenge these early findings, the current analysis reflects only initial pilot data. In addition, several location-specific program design elements have been implemented exclusively in a single location. Although secondary locations are being scoped, and early itinerary development shows promise, current findings provide limited insight into program adaptability across destinations.

The findings also rely primarily on self-reported perceptual data. While valuable for capturing participants' experiences, confidence, and perceived impact, these measures do not provide objective evidence of leadership competency development. Future iterations of this work aim to incorporate more robust assessment methodologies capable of evaluating demonstrated skill acquisition and leadership aptitude beyond perception-based feedback from participants, faculty, and program partners. Planned methods include validated leadership assessment instruments such as behavioral rubric evaluations and scenario-based performance assessments. In addition, future cohorts will include pre- and post-administration of established tools, such as the Student Leadership Practices Inventory, to better quantify competency growth over time.

Future assessment efforts will also explore the longitudinal persistence of leadership identity formation and competency development by tracking participants across subsequent Engineering Leadership coursework, co-curricular involvement, and advanced engineering experiential learning opportunities, including capstone design projects, applied leadership case studies, and early career experiences such as co-ops and internships, where feasible.

conclusion

The *Leadership on Location* program is well-positioned for continued growth, with additional cohorts in development following early success. Planned sustainability efforts include expanding cohort offerings and the potential to operate multiple cohorts concurrently, extending program

reach while enabling greater customization by affinity group, class standing, department, or focus areas. Expansion into additional international locations aligned with the University's strategic partnerships and global presence is also underway, with early student interest concentrated in regions offering strong industry connections. This growth will support more robust statistical comparisons and larger assessment sample sizes over time. As Engineering Leadership initiatives evolve across institutions, *Leadership on Location* provides a mechanism for longitudinal tracking of student competencies from first year through graduation. Future iterations will further evaluate the MODAL framework, program outcomes, and leadership domains across engineering disciplines and student populations to support increasingly tailored design.

This work presents a set of actionable resources and evidence supporting a replicable, modular framework (MODAL) designed specifically for engineering global learning experiences for early-stage students. Findings indicate that the framework offers a scalable approach adaptable across institutions and contexts. As engineering education continues to evolve, this model offers a scalable and adaptable pathway to expand access to global engagement while intentionally developing leadership competencies among engineering students.

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Material Type	Works Cited
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