



Technology, Belonging and Partnership: The Emerging Technologies Centre at Lancaster University Ghana as a Community of Practice

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Abstract

The Emerging Technologies Centre (ETC) at Lancaster University Ghana (LUG) is a shared technological hub designed to provide students across disciplines, community members and corporate partners with access to emerging technologies while promoting collaborative learning, partnership and a sense of belonging. This study explores how the ETC promotes inclusion, skill development and collaboration beyond the provision of technological infrastructure.

Using a qualitative case-study approach, data were obtained through observations, semi-structured interviews with students, corporate professionals and community participants, and programme records. Guided by the Community of Practice framework, the findings indicate that the ETC functions not only as a technological facility but also as an interactive learning ecosystem where academia, industry and the wider community participate in shared learning and innovation. Such participation contributes to skill development, inclusion, belonging and partnership across diverse groups.

The study demonstrates how universities can leverage emerging-technology infrastructure not merely as a technological investment, but as a strategic platform for inclusive learning, community engagement and partnership. Drawing on the experience of the ETC at Lancaster



University Ghana, the paper offers lessons that may inform the design and use of emerging-technology spaces across higher education institutions in diverse contexts.

Introduction

Universities globally are investing in dedicated spaces for emerging technologies such as artificial intelligence (AI), robotics and additive manufacturing. Yet an important challenge for higher education is understanding whether such spaces can serve purposes beyond providing access to technology by also fostering inclusion, a sense of belonging and meaningful partnerships among groups that might not otherwise interact. This paper examines that challenge through the Emerging Technologies Centre (ETC) at Lancaster University Ghana (LUG), exploring how a shared emerging-technology space can support these wider social and educational outcomes.

The Emerging Technologies Centre (ETC) is designed as a shared, multidisciplinary technology environment serving the wider Lancaster University Ghana community rather than a laboratory dedicated to a single academic discipline. Its activities are organised around five interconnected areas: student employability and future skills development; staff capacity development and research enablement; outreach and community engagement; corporate and industry partnerships; and innovation, research and entrepreneurship.

The Centre provides practical access to emerging technologies including artificial intelligence, data analytics, robotics, Internet of Things (IoT), Virtual Reality (VR), Blockchain technologies, 3D printing and related digital tools. Its role extends beyond technology demonstration to support practical learning, skills development, applied research, prototyping, innovation, industry engagement and community outreach. This integrated model enables the ETC to connect technology education with employability, research, innovation and wider University–industry and community engagement. Figure 1 illustrates the ETC as a shared learning environment, where participants engage directly with emerging technologies through hands-on robotics, Virtual Reality and collaborative project activities.



Figure 1: The Emerging Technologies Centre (ETC) at Lancaster University Ghana as a shared learning space

The Centre houses tools for hands-on work in AI, robotics and related fields, including a Unitree Go2 EDU quadruped robot, a Mercury X1 humanoid robot, high-performance computing systems, printed-circuit-board equipment and 3D printing facilities.

Against this context, the study asks: *Beyond providing access to technology, does the Centre help to build inclusion, belonging and partnership, and if so, how?*

Conceptual Framework

The study is read through the lens of the community of practice. Lave and Wenger (1991) argued that learning is not only an individual, cognitive act but a social process in which newcomers move gradually from the edges of a group towards fuller participation. Wenger (1998) developed this into an account of communities of practice, in which learning, meaning and identity are built up as people take part in a shared activity over time. A community of practice has three elements: a domain, or shared area of interest; a community or set of people who interact around it; and a practice, or repertoire of shared activities, tools and ways of doing things (Wenger, McDermott, & Snyder, 2002). Crucially, in this account belonging is not a by-product of learning; it is part of how learning happens.



This framing is useful for the ETC because the Centre is organised around a shared domain of emerging technologies that brings together people who would ordinarily belong to separate institutional worlds, including undergraduate students, high-school pupils, teachers, community members and corporate professionals. Reading the centre as a potential community of practice directs attention away from the equipment and towards what people do together around it, and towards whether that shared activity produces a sense of belonging.

Two further bodies of work inform the analysis. First, research on students' sense of belonging in higher education defines belonging as a student's feeling of being accepted, valued and connected within the academic community, and links it to engagement, confidence and persistence (Strayhorn, 2018). Second, work on technology and innovation hubs in Africa suggests that such spaces can act as boundary-spanning organisations, drawing together diverse stakeholders and supporting community participation in ways that traditional, discipline-bound laboratories often do not (Atiase, Kolade, & Liedong, 2020). The idea that universities increasingly work alongside industry and other partners, rather than in isolation, is captured in the triple-helix model of university-industry-government relations (Etzkowitz & Leydesdorff, 2000), which provides a way of thinking about the partnership dimension of the centre's work.

Methodology

The study uses a qualitative, single-site case study design. This approach was chosen because the aim was to understand how a particular space works for the people who use it, rather than to measure effects across many settings. Data collection was informed by the study's conceptual framework. Drawing on the community-of-practice perspective, observations during training sessions, demonstrations and visits focused on who participated, how participants interacted, how they engaged with the technologies and whether they moved from observation towards more active participation. Semi-structured interviews with LUG students, corporate professionals and community participants explored their experiences of access, learning, interaction, inclusion and belonging, as well as opportunities for collaboration and partnership. The Centre's 2025 programme records were examined for evidence of participation, completion, participant feedback, engagement across different stakeholder groups and activities involving external partners. Together, these three sources enabled the study to examine the ETC not only as a technological facility, but as a potential community of practice in which participation, belonging and partnership could develop.



The interview and observation material was examined thematically, with the conceptual framework providing a lens for identifying and interpreting recurring patterns. The community-of-practice framework directed attention to shared activities, interactions and movement from observation towards active participation; the concept of belonging focused the analysis on experiences of inclusion, connection and being valued within the space; and the boundary-spanning and partnership perspectives guided attention to interactions across students, community participants, industry and other external stakeholders. These framework-informed categories were considered alongside recurring themes emerging from the data, particularly access, skill development, collaboration and belonging. Figures reported in the findings are drawn from the Centre's programme records.

Findings

The findings are presented across four interconnected themes: access and inclusion, skill development and confidence, community participation and belonging, and partnership with industry and external funders. Together, these themes reflect the study's conceptual framework by examining how access to a shared technological domain develops into participation and learning, contributes to belonging, and creates opportunities for collaboration and boundary-spanning partnerships.

Figure 2 illustrates participants engaging collaboratively in ETC activities, providing visual context for the four interconnected themes discussed below.



Figure 2: Collaborative participation in Emerging Technologies Centre activities

Access and inclusion

The most distinctive feature of the ETC is who uses it. Over the course of 2025 the same physical space was used by undergraduate students, high-school pupils, ICT teachers, community members and corporate visitors. These are groups that rarely share institutional space. Observation suggested that the centre's open design that is not restricted to one department or to LUG students was central to this mix. Rather than access being rationed by membership of a particular course, entry was organised around interest in the shared domain of emerging technologies.

One participant described how the programme reduced a previous barrier to accessing technology:

"I always wanted to learn how to code, but apps do not give full access. This bootcamp gave me free access and understanding..."

This experience illustrates how access involved not only entry into the physical space but also opportunities to engage practically with technologies that participants had previously found difficult to access.



Skill development and confidence

Between January and March 2025, more than 35 Year 2 Computer Science students completed AI, robotics and Python training that culminated in a mini capstone project applying these skills to a practical problem. The programme records a full completion rate across the training modules, and 90 per cent of participants reported increased confidence in applying AI tools both academically and in real projects.

Skill development was not limited to degree students. A weekend immersive programme run over four weekends in July and August 2025 trained 60 high-school students in robotics, microcontrollers and 3D printing, with a project completion and presentation rate above 80 per cent. A separate weekend programme equipped 30 ICT teachers with foundational programming skills, beginning with an introduction to Python, in response to a shortage of teachers confident in emerging-technology subjects.

One participant captured this shift in confidence particularly clearly:

"I'm not really a tech person, so moving from that to building a software is crazy."

Such accounts suggest that confidence developed alongside technical capability, particularly where participants were able to produce tangible technological outputs themselves.

Community participation and belonging

The centre's work with the wider community shows the clearest link between a shared space and a sense of belonging. In February 2025, 25 students from Akosombo International School spent time at the ETC receiving hands-on AI and machine-learning support for a British Council "Your World" sustainability project. Girls made up 55 per cent of that cohort. The group went on to win the national stage of the competition and to advance to the international stage. The Centre's records report a 92 per cent satisfaction rating from participants.

Other community activity followed a similar pattern. More than 100 senior high-school students attended the Centre for hands-on demonstrations in robotics, AI and 3D printing, many visiting a university campus for the first time. The ETC also supported an external school's science and makers fair, providing microcontroller training and serving as moderators and judges, and it hosted a student robotics competition that engaged more than 30 participants.

One participant emphasised the social connections developed through participation:



"Connections, I got to work with and meet new people, which has led to new bonds."

This suggests that participation generated social connections alongside technological learning, supporting the interpretation of the ETC as a developing community of practice.

Partnership with industry and external funders

From April 2025 the centre hosted more than 50 corporate representatives, including from MTN, Advans and IPMC, for guided tours of its AI and robotics facilities. The programme records a 92 per cent satisfaction rating from these visits, and notes that the tours opened discussions about co-designed training and future collaboration rather than ending as one-off visits. A guest lecture series during Computer Science Week brought practitioners from local firms into contact with students and faculty.

Two externally funded initiatives illustrate partnership at a larger scale. A cybersecurity capacity-building programme, funded through the UK Foreign, Commonwealth and Development Office and the Chevening Alumni Programme Fund and hosted at LUG, equipped more than 35 undergraduate students with practical, industry-led training, including a capture-the-flag challenge and preparation for professional certification. A separate emerging-technologies bootcamp, funded by the KGL Foundation and running from December 2025 into January 2026, was designed to reach more than 30 senior high-school students.

Discussion

The experience of the ETC also highlights a few challenges. These include the need to move beyond individual programmes towards sustained university-wide integration; the continuing requirement for investment in equipment, digital tools and computational capacity; the need to develop sufficient staff and industry expertise to support an expanding programme portfolio; and the challenge of sustaining external partnerships and funding. These challenges are particularly important as participation expands beyond Computer Science to students across disciplines and to high school teachers, professionals and corporate partners.

The Centre's emerging strategy responds to these challenges by positioning the ETC as a university-wide platform rather than a collection of standalone programmes. The proposed student technology experience progressively introduces students to digital and AI foundations, discipline-specific technology applications, innovation and problem-solving, and industry-linked challenges and capstones. Alongside this, the Corporate Academy and



corporate partnership model are intended to create more sustained engagement with employers through training, mentoring, sponsorship, industry challenges, recruitment and research collaboration. Capacity is also being addressed through planned investment in additional robotics accessories, VR/AR headsets, 3D printers, Raspberry Pi boards, drone development kits, GPU workstations, machine-vision equipment and simulation software. The intention is not simply to increase the quantity of equipment, but to establish a more integrated design-to-prototype environment that can support teaching, research, student innovation and industry collaboration.

In terms of the community-of-practice framework, the ETC has a clear domain (emerging technologies), a community that spans students, teachers, community members and industry, and a practice built on hands-on projects, competitions and demonstrations. Learning at the Centre was, in Wenger's (1998) sense, a social process: people moved from watching to doing, and in several cases from doing to representing their work publicly.

What is striking is the convergence across very different groups. Undergraduate students reported greater confidence; a community school cohort trained and then competed nationally and internationally; corporate visitors moved from tours towards conversations about collaboration; and the institution's own administrative staff took part in AI training. These groups came to the Centre for different reasons, but each describes some version of the same experience, taking part in, and feeling part of, a shared technological space. This is consistent with Strayhorn's (2018) account of belonging as a feeling of being valued within a community, and it extends that account beyond the enrolled-student population to community and industry participants.

The partnership dimension fits the wider literature on technology hubs and on university-industry relations. The ETC behaved less like a closed departmental laboratory and more like the boundary-spanning hubs described in African innovation research, which draw together diverse stakeholders and invite community participation (Atiase et al., 2020). Its engagement with firms and external funders reflects the triple-helix idea that universities increasingly create value by facilitating interaction among partners rather than working alone (Etzkowitz & Leydesdorff, 2000).

The ETC case suggests that emerging-technology infrastructure can be used not only to support technological learning and research, but also as an instrument of inclusion, community engagement and partnership.



Conclusion

This study demonstrates that the Emerging Technologies Centre at Lancaster University Ghana functions beyond a space for accessing technological resources. By bringing together students, community members and industry partners through shared learning and practical activities, the Centre provides opportunities for skill development, inclusion, belonging and partnership. Its development as a shared learning and engagement space illustrates how emerging-technology infrastructure can acquire wider educational and social value over time.

The findings should, however, be interpreted within the study's single-site context and its reliance partly on internally generated programme records and short-term participant experiences. As the ETC continues to develop, planned university-wide student technology experiences, expanded corporate partnerships and investment in additional emerging-technology facilities provide opportunities to extend its reach and deepen engagement with students, communities and external partners. Future longitudinal and multi-site studies could examine how these outcomes develop over time and whether similar approaches can be transferred across different institutional settings.

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