Networked learning across contexts: University and Society collaboration for supporting sustainability and students' future work

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Abstract
Rapid societal changes, particularly those driven by digital technologies and AI, necessitate innovative solutions. Academia and society, therefore, share the responsibility of equipping students with the entrepreneurial and innovative skills essential for achieving a sustainable future. Developing such competencies requires diverse and flexible approaches. One promising pathway is interdisciplinary education, which integrates knowledge and skills from multiple subjects, enabling students to connect theory with practice for holistic understanding and real-world problem-solving. Students' prior knowledge and experiences are central to this process. Shaped by context, social interactions, and cultural elements, students' prior knowledge and experiences influence both opportunities for learning and motivation. Creating spaces that value collaboration across disciplinary, cultural, and institutional boundaries is therefore crucial. This study investigates how students perceive learning activities designed to develop entrepreneurial and innovative skills, with a particular focus on collaborations between academia and society. The paper explores how students perceive the effectiveness of such activities and in what ways collaborations across contexts affect students' motivation, future outlook, and readiness for work. The research draws on the BRiliant Innovation through DiGital Engagement (BRIDGE) project, in which three universities collaborated with strategic partners to design Digital Impact Day (DID) events. These events represent non-formal contexts for learning where students, university staff, and companies come together in networked educational settings to address authentic societal and organisational challenges. Findings show that DID events created a welcoming and stimulating space that encouraged engagement and collaboration. Although students faced challenges in working with unfamiliar peers, communicating across diverse backgrounds, and solving problems outside their expertise, they interpreted these difficulties as opportunities for learning, growth, and reflection. Students reported gaining confidence in teamwork, pitching, and problem-solving, as well as expanding their global perspectives on sustainability. Many students also expressed a stronger sense of preparedness for future careers and a commitment to taking meaningful action in their communities. This paper contributes to discussions on the future of teaching and learning by demonstrating how interdisciplinary and networked approaches can foster entrepreneurial and innovative skills across formal, non-formal, and informal contexts. It highlights the potential of DID events as a model for collaboration, preparing students for the complexities of future work and their role in contributing to society.

Keywords
Collaboration between University and Society, Entrepreneurial and Innovative Skills, Interdisciplinary Education, Motivation and Student Engagement, Networked Learning.

Introduction

Rapid societal changes, particularly those driven by digital technologies and AI, necessitate innovative solutions. Academia and society share the responsibility of equipping students with the entrepreneurial and innovative skills essential for a sustainable future (Fullan, 2007). Although entrepreneurial competencies are widely recognised as important across disciplines, there is still a lack of a theoretical framework for their systematic development (Wasim et al., 2024). To thrive in their future careers, students need abilities such as collaboration and innovative

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thinking, which require stronger connections between theory and practice (Dewey, 2008). Achieving these objectives calls for collaboration between universities and actors in society, such as companies and other stakeholders.

This study explores how higher education students perceive learning activities designed to develop entrepreneurial and innovative skills for a sustainable future, with a focus on the impact of collaborations between academia and society on learning, future outlook, and workforce preparedness. The research questions are:

- How do higher education students perceive the effectiveness of networked learning activities designed to develop entrepreneurial and innovative skills for a sustainable future?
- In what ways do networked collaborations between academia and society affect higher education students' motivation, future outlook, and readiness for the workforce?

In this context, the collaboration aimed to apply a networked approach to learning by bringing higher education students from different backgrounds and study programs together to create opportunities for innovation and skill development. Working across disciplines enabled students to combine perspectives, generate solutions, and build confidence in addressing complex problems.
This study is situated within the field of networked learning, which we understand as learning that is enabled and shaped by connections between individuals, across organisational boundaries, and through digital technologies (Gourlay et al., 2021; Networked Learning Editorial, 2021). The concept of networked learning encompasses interplay among people, technologies as artefacts, and collaboration that fosters a shared culture. It can be described as processes of collaborative, cooperative, and collective inquiry, knowledge creation, and informed action, all grounded in trusting relationships and driven by a sense of purpose (Gourlay et al., 2021). In this study, we explicitly explore how networked learning principles manifested in student collaboration, knowledge sharing, and engagement across disciplines and institutions. These multi-level networks form the basis for creating meaningful, practice-oriented learning experiences that support students' development of sustainable and future-ready competencies.

Background

Rapid societal changes make it difficult to predict the labour market. Students must be prepared for a constantly changing world, requiring entrepreneurial and innovative skills. Susskind and Susskind (2022) argue that these changes are reshaping knowledge and skills across professions. Finne et al. (2022) distinguish between theory-oriented and practice-oriented knowledge, underscoring the need for approaches that connect both aspects of knowledge.

Interdisciplinary and networked approaches in education

Universities worldwide are adopting approaches that combine practice and theory to prepare students for the complexities of a globalised society. If such approaches embrace networked collaboration across university, professional, and societal contexts, they may be applied to strengthen innovation and engagement (Malone, 2020). In entrepreneurship education, for example, they are claimed to foster practice-oriented activities and collaboration (Schild et al., 2025; Seikkula-Leino, 2011). Collaboration across countries and with companies helps students gain cross-cultural perspectives, apply theory in practice, and broaden their worldview.
As the world undergoes rapid change, interdisciplinary and networked approaches to teaching and learning become crucial (Reis-Andersson, 2024; Susskind & Susskind, 2022). These approaches combine insights and skills from multiple subjects and social actors, enriching learning and addressing real-world challenges. They encourage students to link theory with practice, work across disciplines, and develop adaptability for complex problem-solving.
Through these approaches, students develop critical thinking, creativity, and adaptability by working across disciplinary, cultural, and institutional boundaries. This fosters engagement, relevance, and capacity for networked learning across formal, non-formal, and informal contexts (Toh et al., 2025), ultimately preparing students for the interconnected nature of today's world.

Essential skills for a rapidly changing world

As society and companies evolve rapidly, students need lifelong and networking skills that enable them to continually acquire new knowledge and apply it effectively in both professional and personal contexts. These include critical thinking, problem-solving, collaboration, and the creative use of information, often linked to entrepreneurial attitudes and intentions (Fayolle & Gailly, 2015). Communication across cultural and disciplinary boundaries is equally vital in a networked and globalised workforce.

Changes in society create a need for students to also develop entrepreneurial and innovative skills. To strengthen motivation, learning must bridge the gap between theory and practice (Dewey, 2008). Sustainable collaboration between universities and society is essential. Fayolle and Gailly (2015) emphasise that tailoring non-formal contexts to students' prior experiences can increase engagement and effectiveness. Students' prior knowledge and experiences, as emphasised by Vygotsky (1981) and Säljö (2009), shape opportunities to learn. A sociocultural perspective highlights that knowledge is acquired through interplay, contexts, and networks, where students connect new information with what they already know, making learning both meaningful and applicable.

Context of the study

To provide such opportunities, three universities from different countries collaborated in the project BRiliant Innovation through DiGital Engagement (BRIDGE), connecting universities and societal partners in a network to drive innovation and skill development. A total of 138 students worked in multidisciplinary teams, supported by strategic partners and experts contributing insights on innovation, sustainability, and collaboration. The project emphasised three values: student value, organisational value, and societal value, aiming also to support lifelong and networked learning (Jaldemark, 2021).

The Digital Impact Day (DID) events were designed to facilitate team-building exercises, introduction to challenges, collaborative group work, and final presentations evaluated by a panel of experts. This structure enabled interdisciplinary collaboration and interplay with company representatives, demonstrating the practical implementation of networked learning.

Digital Impact Day events

The DID events are learning, teaching, and training sessions where students, staff, and companies address real-world challenges together (Digital Impact Day, 2024). They create non-formal contexts for networked learning, connecting students across disciplines, institutions, and sectors. Conducted online or blended, DID events combine digital tools to enable collaboration and communication between participants.

Each event began with team building and an introduction to the challenge, such as *What will democracy look like with the progress of digitalisation*? Students collaborated in interdisciplinary groups, supported by staff and innovation advisors, to generate ideas and prepare pitches. The DID events were structured to include team-building exercises, introductions to challenges, collaborative group work, and final presentations, all of which were evaluated by a panel of experts. Company representatives actively participated throughout the event, providing feedback and engaging in discussions with the student teams. This structure enabled interdisciplinary collaboration and highlighted the practical implementation of networked learning.

Students were recruited individually and placed in teams to ensure diversity in terms of academic background, nationality, and prior experience, addressing challenges in team composition. At the end of the day, they presented their solutions to a panel of experts using the NABC method (Needs, Benefits, Approach, Competition) and received immediate feedback. Developed at Mid Sweden University, this methodology emphasises authentic problem-solving and collaboration across contexts. Company challenges remained confidential until the event began, in order to add realism.

To assess outcomes, students completed pre-and post-event surveys on relevance, engagement, and collaboration. Digital tools such as Teams and Zoom were used to support communication, idea generation, and teamwork during the events, illustrating the technological facilitation of collaboration. The results showed how DID events enhanced entrepreneurial skills, motivation, and the value of networked learning in non-formal contexts.

Method

This study seeks to contribute knowledge about how collaborations between academia and society enhance students' understanding of sustainable development, shape their perspectives on the future, and support their preparation for the workforce. The data were collected within the framework of the BRIDGE project.

Collected data

The data were collected through surveys of higher education students before and after each DID event, providing feedback on workshop relevance. Additionally, a recorded panel discussion was conducted.

Survey

The surveys offered valuable insights into students' perceptions and emphasising the significance of collaboration in education. A total of 52 higher education students completed the pre-workshop survey. Of these, 38 students completed the survey at the end of the day. Only these 38 students were included in the analysis of post-workshop outcomes. A scale between 1 and 6, where 1 = not so much and 6 = very much, was employed, and the survey contained five open questions. The questions were: (Q1) Do you feel that you have a better understanding of how you can contribute to the future? (Q2) Do you feel that Digital Impact Day is a good way of collaborating with other international students? (Q3) Do you have a better understanding of the Global Sustainable Development Goals? (Q4) Do you as a student feel more prepared for jobs after your studies? (Q5) Did your group use any digital tools to support your work? If you did, please name some.

Recorded panel discussion

A recorded panel discussion, lasting approximately 1 hour, 18 minutes, took place in Brussels. It featured feedback from students, challengers and organisers, focusing on the potential of digital tools to foster student inclusion in innovative actions within the Digital Impact Day methodology. The video panel discussion was thoroughly analysed to gather insights on the effectiveness and challenges of using digital tools in enhancing participation and collaboration during the DID events (Rosdahl, 2024).

Data analysis

The data analysis was inspired by the six phases of the thematic analysis (Braun & Clarke, 2021). After reading and rereading the notes taken, in the first phase of the analysis, the data were organised and structured, allowing the generation of initial codes and potential themes, as in phases two and three, allowing the clustering and the sorting processer in phases four and five. The thematic derivation integrated survey data (both open-ended and closed questions), panel discussions, and student reflections, considering the relative contributions of each data type in forming overarching themes. Open-ended responses provided rich qualitative insights, while closed questions offered quantifiable measures of perceptions. This triangulation ensured that the three themes reflected multiple dimensions of student experiences. At the end of this analysis process, the themes emerged and were presented.

Students who took part in the evaluation are identified as Digital Impact Day, day that the student participate, and student number (DID1S1, DID1S2, DID1S3 etc.). The data were divided into datasets, including data before and after the workshop.

Result

This section presents the results of this study. Three themes emerged: Relevance of activities for future careers, Motivating aspects of collaborative opportunities, and Impact on broader global understanding.

Relevance of activities for future careers

This category focuses on how students perceived the importance of the networked activities in terms of their future career development.

After the DID event, about 34 students reported feeling more capable of contributing to the future in an innovative and collaborative way due to the development of entrepreneurial and innovation skills, according to the survey. Many students also expressed an increased sense of readiness for employment. At the beginning of the event, some students found the task unfamiliar, particularly when focused outside Europe or on a topic far from their expertise. However, it proved valuable, as students had the opportunity to consider ideas from different contexts and collaborate with people from diverse areas and countries. This collaboration fostered mutual understanding and fresh perspectives, including the recognition that problem-solving often requires context-specific approaches. Students gave examples of how their understanding of contributing to the future had improved. They emphasised the importance of innovation and creative thinking in generating ideas and envisioning solutions. Some reported that they now had a clearer picture of issues such as ocean pollution and environmental challenges, which were connected to specific tasks, and felt motivated to contribute ideas and actions to address them. Suggestions

included developing new solutions to protect ecosystems and economies and sharing knowledge with peers to foster collaboration.
Students also expressed a strong determination to act, whether by continuing product development, pursuing sustainable practices, or guiding future generations. As one student put it,

> I will do my best to save the environment and guide future generations to protect the Earth. (DID3S19)

In addition, students described feeling more prepared for their careers. Many highlighted gaining confidence, particularly in pitching skills developed through hands-on practice. This experience also improved their ability to present innovative ideas and engage in creative work. Some emphasised the value of initiative-taking and problem-solving, recognising that continuous practice is required to further strengthen these abilities. Others mentioned gaining broader knowledge and new skills, which boosted their confidence and capacity to generate ideas.
For students transitioning from different academic backgrounds, the journey was both challenging and rewarding. One participant reflected,

> I am new to this course as my previous studies were in maths and computer background, so it's a bit tricky for me to get knowledge about the course, but I am giving my 100% to this, and this will definitely prepare me for jobs. (DID3S20)

Some students had already envisioned themselves on entrepreneurial paths and planned to continue developing their innovative and networking skills. Overall, participants expressed a commitment to gaining knowledge across disciplines, engaging in opportunities to grow through interplay, communication and collaboration, and applying their learning to future careers.

Motivating aspects of collaborative opportunities

This category examines the networked elements that students found motivating and impactful in terms of collaboration and teamwork.
In the survey, about 32 students rated this approach as either good or very good, noting that the methodology used in DID enhanced their ability to collaborate with international peers. The collaborative and networked nature of the event, which involved working with students from diverse backgrounds, was seen as motivating and enriching, even though some students found speaking in front of others challenging.
Students gave several examples of how DID serves as a motivating platform for collaborative opportunities. They highlighted activities such as pitching new ideas and engaging in group work, which fostered networking skills, teamwork, creativity, and problem-solving. Many students appreciated the change to connect with others and, in some cases, to continue the relationships afterwards through platforms like LinkedIn. While collaboration with unfamiliar peers could be difficult, students viewed these challenges as part of the learning and growth process.
The event provided a unique opportunity to learn from different perspectives and approaches. Students noted that working in diverse groups enriched their understanding of various topics. One participant reflected,

> It was fun getting to know new people and learning new ways of thinking, even though some in my group were shy and didn't say much. (DID3S10)

Others emphasised the importance of teamwork, presentations, and the exchange of feedback, as well as exploring innovative and technological networked solutions. Students also valued the opportunity to address sustainability goals using methods like NABC, while learning to manage diverse viewpoints in multidisciplinary and multinational educational settings. As one student noted,

> It's always great to collaborate in such teams, as it provides a good learning opportunity for gaining diverse opinions. (DID3S21)

Overall, DID was described as a highly motivating experience that encouraged knowledge exchange, creative problem-solving, and relationship building. As one student summarised,

> I learnt a lot about teamwork, presentations, and feedback. (DID3S11)

Impact on broader global understanding

This category focuses on how the networked activities impacted students' broader understanding, particularly in relation to global issues such as sustainability.

At the beginning of the DID, a few students demonstrated limited understanding of the Global Sustainable Development Goals (SDGs). After the DID, many students felt that their understanding of the SDGs had improved, although some chose not to complete the post-survey, which may have influenced the results. These results suggest potential to further develop this activity, even though its main focus was on entrepreneurial and innovation skills.

Students explained that strengthening their abilities in pitching, problem-solving, and innovative thinking also contributed to a broader perspective on sustainability. Several participants highlighted the need for a functioning platform to sustain collaboration beyond the event, demonstrating interest in extending networked learning into informal contexts.

The process of selecting the winning team was also viewed positively, with participants describing it as fair and transparent. While Themes 1 och 2 capture career relevance and motivational aspects, Theme 3 emphasises broader societal and global perspectives, explicitly linking the winning team selection to SDGs. Although some overlap exists, the themes collectively illustrate students' experiences across individual, collaborative, and societal dimensions. One student expressed,

> Really appreciate the decision for selecting winning team. (DID3S13)

This reinforced students' appreciation of networked features such as teamwork, creativity, and communication as central to addressing entrepreneurial and global challenges.

In summary, students expressed high levels of satisfaction with the course and felt that it positively impacted their preparedness for future careers. They described the networked activities as contributing to readiness for the workforce through entrepreneurial and innovative skill development, while also enhancing collaboration across cultures. However, some students did not report a significant increase in their understanding of sustainability, suggesting opportunities to integrate global perspectives more consistently. Overall, the results show how DID fosters entrepreneurial learning while advancing networked learning in formal, non-formal, and informal contexts.

Discussion

This study explored how students perceive networked learning activities designed to develop entrepreneurial and innovative skills for a sustainable future, with a focus on the impact of collaborations between academia and society on learning, future outlook, and workforce preparedness. In revisiting the research questions, the first question provided insight into how students perceive the effectiveness of networked learning activities designed to develop entrepreneurial and innovative skills for a sustainable future.

The results showed that the networked DID events provided an easy and welcoming opening, allowing participants to engage meaningfully. They offered a welcoming introduction that facilitated meaningful engagement, in line with Fayolle and Gailly (2015), who highlighted the importance of designing educational settings that enhance learning. Although the majority of students in this study reported feeling capable of contributing to the future after the DID event, this does not necessarily mean that the feeling was caused by the event itself. The results reflect how the activities directly supported students in enhancing key skills relevant to their future careers. However, a few of the students expressed that they had little to no understanding of how they could contribute to the future in an innovative way, highlighting a gap in the experience for a small group. At the same time, they identified the opportunity to engage with ideas from a completely different context and collaborate with individuals from diverse areas and countries as a key aspect of the event. This experience was seen as essential for broadening perspectives and enhancing the overall learning process in their lives (Jaldemark, 2021).

Also, about two thirds of students in this study had increased their understanding of the Global Sustainable Development Goals, suggesting that while focusing on entrepreneurship and innovation, the activities also contributed to students' awareness of global challenges. However, one third of the students felt that their understanding of the SDGs had either not increased or had increased very little. This reflects a gap in the experience for a few students who may not have fully engaged with the global sustainability aspect of the activities in the events

The second research question provided insight into ways in which networked collaborations between academia and society affect students' motivation, future outlook, and readiness for the workforce.
The networked DID events enhanced students' problem-solving skills by fostering cross-cultural collaboration. The experience, as expressed by students, proved valuable as they collaborated with individuals from diverse regions and fields. This broadened their perspectives and highlighted the need for context-aware solutions, considering regional challenges. Overall, the collaboration enriched their problem-solving approach and contributed to their professional development, which expanded their problem-solving capabilities. At the same time, the students emphasised the need for a functional platform that enables continued communication and collaboration beyond the DID events, supporting lasting connections and ongoing networked learning opportunities, in line with Malone (2020).
Students most likely found the opportunity to work with peers from different backgrounds motivating and enriching, contributing to their overall networked learning experience. The opportunities to collaborate with peers from different cultures and backgrounds were highly valued, as they allowed them to develop collaboration skills in a global context.
In addition to highlighting student experiences, it is important to note some challenges observed, such as varying engagement with sustainability topics and difficulties in cross-disciplinary collaboration. These findings suggest practical implications for future DID events, including the potential to strengthen global sustainability integration, provide clearer guidance for unfamiliar tasks, and enhance networked technology-mediated collaboration.

Conclusion

In conclusion, the DID events appear to be beneficial for the relationship between experiences and reflections, as an important element of learning. DID is designed to bridge the gap between academia and society, fostering a shared understanding of future needs and qualitative processes that drive innovation, enhance higher education student engagement, expand networks, strengthen the innovation landscape, and support the development of a sustainable future society. It fosters a creative and entrepreneurial culture among students while solving societal and business problems. This practice offers a networked learning method to foster collaboration and communication between students and societal stakeholders, which is needed in today's education. Some students did not significantly enhance their understanding of sustainable development or their ability to contribute innovatively to the future, which suggests the need to more strongly integrate global sustainability topics. Strengthening collaboration and innovative thinking skills is crucial, as these abilities support entrepreneurial growth and are essential for future career success for students

Limitations and future research

This study has some limitations that should be considered. The results are based on students' self-reported perceptions, which may have been influenced by individual interpretation or expectations. Additionally, not all students completed the post-survey, which may have affected the findings.
This first study of the DID methodology shows promise for future development and research. Building on this, a broader implementation of the methodology in a larger group of students might give a stronger statistical foundation for the results. More research about the potential benefits and pitfalls of the DID methodology is also needed. Such research should also benefit from a larger sample of students. Future research could also explore how the networked DID events bridge the gap between academia and society, fostering innovation and sustainable development. Additionally, studies could investigate ways to better integrate sustainability and enhance students' innovation skills within such networked learning methodologies.

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