TUS

Technological University of the Shannon

COMPENDIUM OF APPROACHES TO INTEGRATING DIGITAL COMPETENCIES INTO THE CURRICULUM



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Dr Noëlle O'Connor and Dr Geraldine McDermott

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Foreword



The Technological University of the Shannon (TUS) is deeply committed to embedding digital capabilities across all facets of university life. This TUS *Compendium of Approaches to Integrating Digital Competencies into the Curriculum* exemplifies this commitment by showcasing a wide range of innovative practices, pedagogical approaches, digital initiatives, and extra-curricular activities that are transforming how digital learning is taught, experienced, and applied across our campuses.

Rooted in the belief that digital capability is a key driver of educational innovation and institutional transformation, this compendium highlights how TUS integrates digital skills and literacies into programme design, teaching, and assessment, while also embracing the wider digital learning environment. It reflects national and international priorities in digital education, addressing areas such as digital inclusion, educator capacity-building, learning transformation, student engagement, and future-focused employability.

Section 1 explores the critical role of funded digital and pedagogical innovation projects in advancing digital capability development, enabling real-world impact through interdisciplinary collaboration and evidence-based practice. These initiatives support the embedding of digital competencies across curricula while enhancing community, industry, and global engagement.

Section 2 focuses on embedding digital capabilities into programme and module design, promoting active, learner-centred, and technology-enhanced learning that equips students with the knowledge, skills, and confidence needed to thrive in a digitally driven society. It emphasises the importance of aligning learning outcomes, content, and teaching methodologies with recognised digital competence frameworks and graduate attributes.

Section 3 highlights the dynamic landscape of extra-curricular and co-curricular initiatives that support digital capability development beyond the classroom. Through student societies, digital skills programmes, workshops, hackathons, and community-led projects, learners and staff alike are empowered to become innovative, digitally confident change agents.

Section 4 addresses the integration of digital capabilities into teaching and assessment strategies, showcasing how blended and online learning, authentic digital assessments, learning analytics, and student-led digital inquiry can foster critical thinking, creativity, adaptability, and lifelong learning.

By sharing best practices, case studies, and reflective accounts from across TUS, this compendium serves as both a practical guide and an inspirational resource for educators, students, and stakeholders. It reflects TUS's ambition to cultivate a university-wide culture of digital excellence, where every student is empowered to navigate, shape, and lead in an increasingly complex digital world.

Professor Vincent Cunnane
President, Technological University of the Shannon (TUS)


Where
Community
Deep

Foreword



Understanding 'why' we focus on building digital capabilities is underscored by TUS's educational philosophy. Our purpose as a Technological University is to provide leading student-centred higher education that is research-informed, regionally relevant, and accessible to all. We foster the development of innovative graduates who can make a tangible difference in society. In the context of knowledge distribution, TUS has focused on its own digital ecosystem to enable digital inclusion, student engagement, equitable access, and sustainability. Our TUS Graduate Attribute Framework informs all our academic design activities, leading to a broader understanding of the knowledge, skills, and competences students are required to develop in higher education. This is particularly relevant to address the demand for non-routine, creative problem-solving and the need to cooperate, collaborate, and communicate with others as global citizens in a digital world.

This compendium represents a major step in documenting and showcasing best practices in digital competences development across our academic community. It highlights innovative teaching approaches, curriculum design initiatives, and programme-level alignment with recognised digital competence frameworks and graduate attributes. We are also supporting staff professional development through targeted training programmes, communities of practice, and bespoke digital upskilling initiatives.

This work complements wider institutional activity, including programme mapping, technology enhanced learning, digital assessment strategies, and campus-wide projects focused on teaching, learning, research, and engagement.

TUS aspires to a truly whole-of-institution, integrated approach to digital capability development — one that nurtures interdisciplinary collaboration. TUS graduates are being equipped to live, learn, work and interact professionally and personally with others in a digital world. As part of the national and global higher education community, we at TUS have both a responsibility and an opportunity to shape that future together.

Ms Frances O'Connell
Vice-President, Student Education and Experience,
Technological University of the Shannon (TUS)



The TUS *Compendium of Approaches to Integrating Digital Competencies* directly responds to national and European digital education priorities by providing a comprehensive suite of case studies across diverse disciplines. These examples serve as a catalyst for the holistic embedding of digital capabilities across the curriculum and support the development of digitally confident graduates.

Aligned with TUS's strategic commitment to technological innovation, digital creativity, and student success, as outlined in its Strategic Plan and Performance Agreements, this compendium provides clear evidence of the University's commitment to advancing digital pedagogy in practice. It demonstrates how TUS is actively enhancing teaching and learning through meaningful and sustainable digital integration.

The compendium also illustrates the effective use of sectoral and institutional funding, including Strategic Alignment of Teaching and Learning (SATLE) and related initiatives, to support ongoing innovation in digital pedagogy. In doing so, it contributes not only to institutional enhancement within TUS but also to shared learning and capacity-building across the wider higher education sector.

I want to congratulate all those involved in the design and development of the TUS *Compendium of Approaches to Integrating Digital Competencies* for producing a valuable and timely resource. This publication will support educators in Ireland and internationally as they seek to strengthen digital capability development and enhance student learning in an increasingly complex digital landscape.

Mr Colin Lowry
Senior Manager, Teaching and Learning Enhancement and Digital Innovation,
Higher Education Authority


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Helpdesk
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#WeAreTU



Acknowledgements

The compendium team extend our sincere thanks to Professor Vincent Cunnane, TUS President; Ms Frances O'Connell, Vice-President for Student Education and Experience; and Dr Nuala Harding, Head of the Centre for Pedagogical Innovation and Development (CPID), for their invaluable leadership and support in making this initiative possible.

We also gratefully acknowledge the National Forum for the Enhancement of Teaching and Learning, whose support through the Strategic Alignment of Teaching and Learning Enhancement (SATLE) funding enabled the publication of this compendium.

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We are also grateful to our Graphic Designer, Mr Jules Hackett, for his professional expertise, creativity, and guidance in shaping the compendium's visual identity.

We want to thank Ms Lory Russo from CPID for her ongoing support and commitment throughout this project.

Finally, we extend our deepest appreciation to all members of the TUS community who generously contributed their work, insights, and expertise. Their collective efforts have made this compendium a truly collaborative, meaningful, and impactful resource.

Dr Trevor Prendergast, Dr Noëlle O'Connor and Dr Geraldine McDermott







Introduction

The Technological University of the Shannon (TUS) *Compendium of Approaches to Integrating Digital Competencies into the Curriculum* exemplifies the University's commitment to embedding digital capability development across teaching, learning, and assessment. It showcases how TUS integrates research-informed and practice-based approaches into programme design, pedagogy, and assessment, equipping students with the skills and confidence required to thrive in a digitally driven society.

Specifically, the compendium highlights innovative approaches aligned with national and international digital education priorities, focusing on learning environment transformation, educator capacity-building, digital inclusion, student engagement, and future-focused employability. It demonstrates how digital pedagogies and associated technologies are being used to enhance learning experiences, promote critical digital competences, and support active, collaborative, and flexible learning.

This compendium serves as a practical guide for educators, students, and stakeholders, presenting best practices, case studies, and insights into how digital capabilities can be meaningfully and sustainably embedded within higher education. By sharing these approaches, TUS aims to inspire and support a university-wide culture of digital excellence, ensuring that all students are empowered to participate with confidence, in an ethical manner and with creativity in an increasingly complex digital world.

> *I know we can still shape that world and make it into a place which reflects our humanity, our cultures and our cares. We have done so before, and we can do so again. It requires that we enter a conversation about the role of technology in our society, and about how we want to navigate being human in a digital world* (Bell, 2017).[1]

[1] Bell, G. (2017, October 24). *In our focus on the digital, have we lost our sense of what being human means?* The Guardian. Available at: https://www.theguardian.com/commentisfree/2017/oct/24/in-our-focus-on-the-digital-have-we-lost-our-sense-of-what-being-human-means



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Section 1

Information, Data and Media Literacies

Information, data, and media literacies are foundational components of digital capability. These literacies enable learners to access, evaluate, interpret, create and communicate information in an increasingly complex digital society. They also empower students and staff to navigate misinformation, manage and analyse data, engage critically with digital media, and make informed decisions in academic, professional and civic contexts.

This section explores how teaching, learning, and assessment practices at TUS support the development of these literacies across disciplines. It highlights innovative approaches that promote critical thinking, academic integrity, ethical data use, research literacy and digital citizenship. Through curriculum integration, active learning strategies and authentic assessment, educators are equipping learners with the skills required to engage confidently with digital ecosystems.

These initiatives strengthen institutional digital capability and academic excellence, ensuring that graduates are prepared to participate responsibly and effectively in data-rich, media-saturated and information-driven societies. By embedding these competencies within programmes and modules, TUS reinforces its commitment to developing informed, reflective and digitally resilient graduates.

1. Ethical Artificial Intelligence (AI): A Collaborative Initiative in Mathematics & Engineering

Dr Patrick Browne
Department of Electrical and Electronic Engineering

Project Lead, Partners and Participants

- Project leads - Dr Patrick Browne, Dr Mary Giblin (TUS) and Dr Padraig Ó Cathain (Dublin City University).

Alignment with United Nations Sustainable Development Goals

Goal 4: Quality Education aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Key Aims

- To integrate AI into Mathematics Education, using AI to solve problems from real-world scenarios and WebWork.
- To develop students' critical analysis of AI-generated solutions to identify the strengths and limitations of AI in mathematics.
- To enhance the students' ability to evaluate AI solutions and propose more efficient alternative solutions.
- To provide insights into effective AI integration in education and to emphasise the importance of combining technological literacy with mathematical understanding.

Project Description

This project investigated the efficacy of integrating AI tools into a third-year mathematics curriculum at TUS Midwest. Students were tasked with utilising AI to solve and explore a range of mathematical problems, encompassing both real-world scenarios and exercises derived from the online assessment software, WebWork. The primary objective was to foster a deeper understanding of mathematical concepts through AI-assisted problem-solving, while simultaneously cultivating critical thinking skills.

The study focused on students' ability to interpret, explain, and critique AI-generated solutions. Participants were required to analyse the AI's output, identify potential limitations, and propose alternative, potentially more efficient, solution pathways. This approach aimed to illuminate both the strengths and weaknesses of AI in mathematical problem-solving. By engaging with AI as a tool rather than a definitive answer source, students were encouraged to enhance their analytical and evaluative abilities.

The project documented the students' experiences, highlighting their evolving perceptions of AI's role in mathematics education. This study contributes to the ongoing discourse on integrating AI into educational frameworks, emphasising the need for pedagogical strategies that promote both technological literacy and robust mathematical understanding.

The rapid advancement of AI has permeated numerous fields, including education. Recognising the potential of AI as a tool for enhancing learning, this initiative sought to explore its application within a third-year mathematics curriculum at TUS Midwest. Traditional mathematics education often focuses on procedural knowledge, which can sometimes limit students' ability to engage with complex problem-solving scenarios. In response, this project aimed to introduce AI as a means of fostering deeper conceptual understanding and critical thinking.

The methodology employed was primarily experiential and qualitative. Students were introduced to various AI tools capable of solving and exploring mathematical problems. The theoretical framework drew upon constructivist learning principles, emphasising active engagement and knowledge construction. Students were not passive recipients of AI-generated solutions but active participants in analysing and evaluating them. The project also incorporated elements of cognitive load theory, aiming to utilise AI to reduce extraneous cognitive load and free up cognitive resources for higher-level thinking.

Key Outputs and Future Oppportunities

- Enhanced Problem-Solving Skills: Students demonstrated improved abilities in applying AI to solve complex mathematical problems.
- Critical Evaluation of AI: They developed skills to critically assess AI-generated outputs, identifying limitations and potential errors.
- Development of Alternative Solutions: Students successfully proposed more efficient or alternative solutions, showcasing their understanding of underlying mathematical principles.
- Increased Engagement: The use of AI tools fostered increased student engagement and interest in mathematics.
- Insights into AI in Education: The project provided valuable insights into the practical applications and limitations of AI in a mathematics education context.
- Longitudinal Studies: Conducting longitudinal studies to assess the long-term impact of AI integration on student learning outcomes.
- Development of AI-Driven Pedagogical Tools: Exploring the development of AI-driven pedagogical tools tailored to specific mathematical concepts.
- Investigation of Ethical Considerations: Investigating the ethical implications of AI use in mathematics education, including issues of bias and fairness.
- Integration with Online Learning Platforms: Exploring the integration of AI tools with existing online learning platforms like WebWork to provide personalised



Figure 1: Ethical Artificial Intelligence (AI): A Collaborative Initiative in Mathematics & Engineering

learning experiences.

- Investigating the Impact of AI on Mathematical Creativity: Does AI help or hinder students' creative problem-solving abilities within mathematics?
- Teacher Training: Researching and developing effective teacher training programs to support the integration of AI into mathematics curricula.

Student Perspective – Primary Impact of the Project

Students demonstrated improvement in higher-order thinking skills through their engagement with AI-assisted problem-solving. The initiative fostered a shift from procedural mathematical thinking to conceptual understanding, as students were required to interpret, analyse, and critique AI-generated solutions rather than simply accepting them. This approach enabled them to reflect on their own problem-solving processes and recognise when AI solutions might be incomplete or incorrect.

Participants also developed sophisticated skills in evaluating AI outputs, learning to identify common AI limitations such as computational errors, misinterpretation of problem contexts, and inability to explain reasoning steps clearly. Students gained practical experience in prompt engineering, learning how to formulate questions effectively to obtain more accurate AI responses.

The collaborative approach between human intelligence and AI tools led students to develop more diverse problem-solving strategies. They learned to leverage AI for initial exploration while applying their mathematical knowledge to verify, refine, and improve solutions. Many students reported increased confidence in tackling complex mathematical problems, knowing they had both AI assistance and the analytical skills to evaluate that assistance critically.

The integration of AI tools into the third-year mathematics curriculum created a model for technology-enhanced learning that other departments have begun to adopt. The project contributed to the development of new learning objectives that explicitly address digital literacy and AI competency alongside traditional mathematical skills.

The project established a sustainable framework for AI integration that can be adapted across different mathematical topics and year levels. The emphasis on critical evaluation and alternative solution development creates a template for responsible AI use in education that maintains academic rigour while embracing technological advancement.

The innovative approach to mathematics education resulted in increased student engagement, with participants reporting greater interest in both mathematics and technology. This enhanced engagement has implications for student retention in STEM fields and may help address skills shortages in mathematics and engineering.

Perhaps most significantly, the initiative cultivated ethical awareness around AI use in academic and professional contexts. Students developed understanding not just of what AI can do, but of what it should do, preparing them to be responsible users and developers of AI technology in their future careers.

2. Real-Time Influencer Marketing Analysis

Jennifer Lawler
Department of Marketing, Enterprise & Digital Communications

Project Lead, Partners and Participants

- Project lead – Jennifer Lawler (TUS).
- Participants – TUS students completing the Influencer Marketing module in the Bachelor of Business (Hons.) in Business Studies (Digital Marketing) Year 2.

Alignment with United Nations Sustainable Development Goals

This activity promotes digital literacy and critical thinking, aligning with the UN's Sustainable Development Goal 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. By equipping students with the ability to communicate and collaborate online and to critically evaluate digital content, this activity contributes to the goal of inclusive and equitable education. The project also uses Universal Design for Learning (UDL) principles to foster engagement and motivation. Students choose influencers and platforms, giving them agency and encouraging participation from diverse learners through a choice of representation, including audio, video, imagery, and text.



Figure 1: Lecture slide with introductory activity for students shown during the first practical class of the semester. Credit: Jennifer Lawler

Key Aims

- To provide students with practical, hands-on experience in navigating and understanding digital media, specifically marketing communications published by, or in collaboration with, social media influencers.
- To develop students' ability to critically evaluate digital content. By discerning between organic and sponsored posts, students enhance their information, data, and media literacies.
- To foster technical and analytical skills and support the development of adaptable, critically engaged graduates.
- To foster digital communication and teamwork skills with the collaborative nature of the project.

Project Description

The Influencer Marketing module is an important part of the digital stream of modules available on our Bachelor of Business (Hons.) in Business Studies (Digital Marketing) on the Midwest Campus of TUS. Students in the second year take this module to build on the topics they began exploring in their first year, including Business Technology, Interactive Applications and Content Marketing, and User Experience. The content is strongly rooted in real-world analysis and practice. The module enables learners to gain a deeper understanding of how influencers and brands operate and the subtle ways in which marketing messages are conveyed – desirable attributes for graduates beginning careers in digital content creation, marketing, or social media management. It is delivered through a combination of theory, practical labs, guest lectures from industry professionals (e.g., L'Oréal or The O'Callaghan Collection Hotel Group), and active tracking of social media influencers.

During this programme, it is essential for students to develop robust digital capabilities. The ability to critically evaluate online content, effectively manage digital tools, and collaborate in digital environments is a crucial skill for success in any field. These skills are cultivated in second-year students through a real-time influencer tracking project. The design of this project involves a structured, semester-long approach that integrates theoretical concepts with practical application. To begin, students are tasked with identifying and agreeing on two social media influencers to form the subject of the project. To ensure a thorough understanding of each channel's mechanics, algorithms, and strengths, students must also select from two of the following platforms: YouTube, TikTok, Instagram, and Facebook. This encourages participation and provides students with a sense of agency – drawing on UDL principles to recruit interest and shape motivated, purposeful expert learners.

Once agreed by consensus, the lecturer reviews and approves the choices, then creates a shared document called the Tracker, which is accessible via the class's digital Notebook. The lecturer identifies suitable key performance indicators (KPIs), such as interactions, views, follower count, posts published, and posts tagged with sponsors or brand

Table 1: Primary advertisement label – At least one must be present in all commercial posts

#**Ad** (or #**Fógra** for Irish language posts)
Platform provided label (e.g Paid partnership)
#**Gifted** (or #**Féirin** for Irish posts) - Use only when you receive unsolicated products or services, and the brand has not directly influenced your post

Table 2: Secondary advertisements labels – Only use in addition to (and following) primary label

#**Collaboration**	#**PressDrop**
#**BrandAmbassador**	#**OwnBrand**
#**Sponsored**	#**BrandInvestor**
#**Affiliate**	#**PreviousCommercialRelationship**
#**PRstay**	Custom labels (e.g #**IWorkWith[Company]**)
#**PRinvite**	

Figure 2: Lecture slide displaying the advertising labels from the Guidance - Influencer Advertising and Marketing (Advertising Standards Authority, 2023, p.6). Credit: Jennifer Lawler

collaborations. These KPIs appear as table headers for each influencer at the top of the Tracker. Thereafter, during each weekly practical class, students work in groups to meticulously review, collate, and log the activities of the chosen influencers from the previous week. Criteria required for analysis include the frequency of posting, content format and theme, interaction metrics, collaborations, transparency and disclosures, and the distinction between organic and sponsored content. In addition to recording metrics, students must write a brief description and reflection on the activity that week.

The shared Notebook serves as a digital workspace for screenshots, hyperlinks to published posts, and a table detailing the agreed KPIs. This facilitates collaborative data analysis, enabling students to engage in discussion. There is a strong focus on sponsored posts and/or any posts deemed to have commercial intent. A crucial element of the analysis is identifying the business models that underpin influencer marketing communications, including brand partnerships, affiliate marketing, and advertising revenue. Students are also required to demonstrate awareness of relevant regulatory frameworks, including the European Commission's Key Principles on Social Media Marketing Disclosures, and Irish national regulations and guidelines from the Competition and Consumer Protection Commission (CCPC), and the Advertising Standards Authority for Ireland (ASAI). In doing this, they gain a much higher understanding of the legal and ethical implications of influencer marketing. This will lead to more responsible digital practices and workplace-ready graduates.

During class discussions, participants are advised to "zoom out" and consider broader contextual trends that may affect the influencer's activity or inactivity. This involves reflecting on potential external factors, such as current affairs and events, social trends, economic shifts, and platform algorithm changes, that may impact influencer strategies and audience engagement. It encourages the class to think critically about the role social media may play in a wider context. Students are assessed at two stages: midway through the semester, with marks awarded for participation, content analysis, correct understanding of business models, and knowledge of required disclosures; and at the end of the semester, for participation and overall analysis.

The project is designed to align with the Joint Information Systems Committee (JISC) Individual Digital Capabilities Framework, addressing information, data, and media literacies, digital proficiency and productivity, and digital communication. The collaborative nature of the project enhances students' ability to communicate and work effectively in digital environments with colleagues both in person and remotely, the latter an essential in most contemporary workplaces. It ensures that students not only understand the theoretical aspects of influencer marketing but also develop their ability to critically analyse this form of marketing communication, an ability that is becoming increasingly relevant with the rapid advancement of generative AI technology. It provides an authentic and engaging context to facilitate active learning, foster both technical and analytical skills, and support the development of adaptable, critically engaged graduates, aligned with the TUS Graduate Attributes (Technological University of the Shannon, 2022).

Key Outputs and Future Opportunities

Both real-time tracking and data recording foster accountability and provide learners with a tangible output. The final Tracker document contains detailed KPIs over a 10-week period, post highlights from both influencers, and a list of identified sponsors.

Educators looking to embed digital capability development into their modules can benefit from adopting similar real-time, student-led data projects focused on a specific brand, retail outlet, restaurant, or leisure complex. These not only boost engagement but also provide authentic contexts for developing critical skills.

The use of collaborative digital tools, such as the shared Notebook, effectively promotes digital communication and teamwork skills.

There is also an opportunity to develop the creative aspect of the activity to inspire potential future content creators, social media marketers, or influencers. This would also allow greater confidence in multimodal AI generators, which are becoming commonplace across most industries.

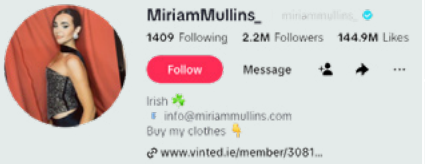	27th September - 3rd October	
	TikTok	**Instagram**
Any followers gained or lost?	No	Yes (155, 665k)
How many posts?	3	4
Does she have the same posts on both channels?	Yes	Yes
Content: What format of posts? (Reels, Story, Grid, Carousal)	Videos & carousal photos	Videos & carousal photos
Content: What is the theme? What are they posting about?	Get ready with me makeup ASMR, makeup giveaway, viral trend	GRWN, makeup giveaway, trending audio
Content: Are they using any viral elements? (trending audio, trending hashtags, trending content theme..)	"wake up, it's the first of the month" trend, get ready with me trend, ASMR trend	Trending audio #BeautyOnBudget #essencecosmetics Her caption 1st of October: "Wake up, it's the first of the month" trend Winter/ Halloween emojis. Trending location - Dubai
Content Performance: Likes/Views/ Comments/Shares/Saves	Low number of likes, comments, and shares. Around 3,000 to 4,000 likes in all her posts in the last 6 days	9,260 likes on a post & only 31 comments. She only gained 665 new followers
Best Performing Post (add the URLs)	Makeup giveaway *https://www.tiktok.com/@miriammullins_/video/7568615261574663446?lang=en*	A post from Dubai *https://www.instagram.com/p/DAWV8pHzf6R/?img_index=1*
Are the posts #Ads?	The makeup giveaway has #Ad	Ad giveaways
Have they used the correct disclosure methods?	Yes	Yes
Which brands are they advertising?	Essence cosmetics	Essence Ireland (cosmetics)
What tactics or methods do they use to influence you? (discount code, VIP access, loyalty programme, affiliate marketing URL)	Showing what brands she is using during the makeup ASMR video	"T&C's apply, entries from the ROI only" Tagging and mention the brand throughout the post
Do they use a CTA? (watch this, click here, sign up..)	Instruction how to enter the giveaway	To enter her giveaway: Follow her and Essence Ireland, like the post and tag your bestie
If relevant, what is the marketing objective?	To promote Essence cosmetics through the giveaway and by using Essence products in her videos	Promoting Essence cosmetics, looking for a community

Figure 3: Collaborative Influencer Tracker document, stored on the class MS Teams page, which students are tasked with updating on a weekly basis.

Student Perspective – Primary Impact of the Project
The lecturer continues with the same student group in semester two with a Mobile Marketing module. As there is a natural confluence between Influencer and Mobile Marketing, class discussions often focus on the Tracker and sometimes even lead to checking in with the influencers. It is a good opportunity to ask students to reflect on the project, and two students were happy to share their thoughts via email.

> “As a mature student, my understanding of, and proficiency with digital creative tools improved greatly during the Influencer Marketing module. Understanding productive social media use, in the context of the curriculum content, has been helpful in allowing me to use social media tools in a healthier way in my personal life. I’ve since pursued a part-time role as a social media manager, employing much of my learning in my work.”

Colm Burke, BBus (Hons.) in Business Studies (Digital Marketing) student

From undertaking and completing this project, students develop a sharp ability to discern between organic and sponsored content, thereby becoming more critical- and confident-consumers of digital media.

> “I felt the activity was interesting and informative, changing how I viewed the benefits of influencer marketing. Furthermore, once I began work placement as a content specialist, I saw the benefits of this activity as it enabled me with the skills to provide a comprehensive analysis for my supervisor. I think that this activity enhanced both my academic knowledge and my skill set in a relatively new area, influencer marketing, which will be of great benefit to me when working in the marketing industry.”

Gráinne Buckley, BBus (Hons.) in Business Studies (Digital Marketing) student

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3. Integrating Digital Strategies into Business Education

Dr Emma Carroll
Department of Business and Financial Services

Project Lead, Partners and Participants

- Project lead – Dr Emma Carroll.
- Participants - Jessica Dalton, Business Year 4 students, Bachelor of Business (Hons.) Business with Computing Year 4 students.
- Client - Stretch's Mobile Bar.

Alignment with United Nations Sustainable Development Goals

Goal 4: Quality Education aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Key Aims

- To provide students with practical experience in developing a digital marketing strategy based on a real client briefing.
- To enhance students' digital proficiency and productivity using digital marketing tools and online research methods.
- To develop students' problem-solving and innovation skills by requiring them to design strategic, data-driven marketing solutions.
- To bridge the gap between academic learning and industry practice, ensuring students can apply theory to practice.
- To strengthen students' employability and professional skills by simulating a consultancy-style project that mirrors workplace expectations.

Project Description

Digital marketing is an essential component of contemporary business strategy, requiring proficiency in digital tools and strategic communication. In response to the increasing industry demand for graduates with practical digital marketing competencies, this initiative was designed to bridge the gap between academic learning and professional application. The project was embedded within a final-year Digital Marketing, Analytics and User Experience (UX) module for Business and Business with Computing students. This continuous assessment integrated applied digital marketing consultancy into the curriculum by engaging final-year business students in developing a digital marketing plan for an external client. As part of their assessment, students responded to a live industry brief, conducting market research and formulating strategic recommendations to address the client's specific challenges. The project aligns with the Joint Information Systems Committee (JISC) Digital Capabilities Framework, which identifies key competencies needed for effective engagement in digital environments.



Figure 1: Example of student output for client

It required the application of industry-standard frameworks, the use of digital analytics tools, and the development of innovative digital marketing strategies. Students enhanced their digital proficiency and productivity by applying digital marketing techniques and online research tools in practice. They engaged in digital creation,

problem-solving, and innovation by designing data-driven strategies tailored to the client's needs. Furthermore, the assessment allowed students to enhance their digital communication, collaboration, and participation as they worked in groups and engaged professionally with the client through both digital and in-person interactions.

A key component of the initiative was industry collaboration with a start-up mobile bar business, during which the entrepreneur provided an in-class briefing outlining their marketing challenges and objectives. This real-world engagement encouraged students to develop practical digital marketing strategies while refining their analytical and problem-solving skills.

The initiative employed a problem-based learning (PBL) approach, where students actively worked on an authentic business problem, encouraging critical thinking and independent learning. Furthermore, the project was underpinned by the Situation, Objectives, Strategy, Tactics, Action and Control (SOSTAC) Planning Model, used to structure students' digital marketing strategies.

Students worked in teams to conduct a situation analysis, analyse digital engagement metrics and develop comprehensive marketing plans that incorporated Search Engine Optimisation (SEO), content marketing, paid advertising and social media strategies. The project also required the professional presentation of findings to the client, ensuring students developed essential communication skills.

Key Outputs and Future Opportunities

- Industry-Standard Report - Students presented their findings and recommendations in a professional report format.
- Client Engagement and Feedback - The client reviewed and provided feedback on students' proposals, enhancing the authenticity of the learning experience.
- Development of Digital Skills - Students gained hands-on experience with digital marketing tools, improving their proficiency in analytics, content creation and strategic planning.

This initiative presents several opportunities for further development, including the possibility of a longitudinal impact study that could track graduates to assess how participation in live digital marketing projects influences career readiness and employment outcomes. Furthermore, future iterations of the project could incorporate AI-driven marketing tools and data visualisation to enhance digital skill development. Finally, establishing ongoing partnerships with multiple businesses could provide a continuous pipeline of real-world projects for student engagement.

Student Perspective – Primary Impact of the Project

The primary impact of the initiative from a student perspective was the enhancement of digital marketing competencies through real-world application, bridging the gap between theoretical knowledge and industry practice. By producing industry-standard reports and presentations, students developed marketable skills that enhanced their job-readiness, particularly in roles requiring digital marketing expertise. The problem-based learning approach encourages independent thinking and decision-making skills, giving students greater confidence in their ability to apply marketing theories in professional settings. Receiving feedback from both the client and lecturers allowed students to refine their ideas and gain insight into industry expectations, improving their ability to iterate and respond to professional critique.



Figure 2: Example of student output for client

By integrating industry engagement into the curriculum, this initiative provided students with a structured opportunity to apply theoretical knowledge in a professional context. The experiential nature of the project contributed to the development of critical thinking and digital literacy, all of which align with TUS Graduate Attributes (Technological University of the Shannon, 2022). The initiative demonstrates an effective approach to embedding digital capabilities within business education, ensuring that graduates are equipped with the skills required for an increasingly digitalised professional environment.

4. Raising awareness, building knowledge and initiating action: Staff professional development on the use of generative artificial intelligence in Higher Education

Dr Geraldine McDermott
Centre for Pedagogical Innovation and Development

Project Lead, Partners and Participants

- Project leads – Dr Geraldine McDermott, Dr Denise Mac Giolla Rí and Catherine O'Donoghue (TUS).
- Participants – Academic and Professional Staff (TUS).

Alignment with United Nations Sustainable Development Goals

The project is underpinned by Sustainable Development Goal (SDG) 4 (Quality Education) through its commitment to engaging with and supporting staff in using Generative Artificial Intelligence (GenAI) in pedagogically sound, ethically informed, and socially responsible ways in their teaching. It also supports SDG 10 (Reduced Inequalities) by promoting inclusive pedagogical approaches and encouraging critical awareness of the bias and representational harm that disproportionately affect marginalised groups.

Key Aims

- To raise awareness among academic staff about the opportunities, risks, and ethical considerations of using GenAI in higher education.
- To build staff knowledge of how GenAI tools function, including their capabilities, limitations, and relevance to learning, teaching, and assessment.
- To initiate informed and responsible action by supporting staff in integrating GenAI meaningfully into their academic practice.
- To support students in developing clarity and confidence around the acceptable use of Generative AI in learning and assessment contexts.
- To enhance students' digital and artificial intelligence (AI) literacy through exposure to ethical, creative, and purposeful uses of GenAI within the curriculum.
- To promote academic integrity by fostering critical reflection on AI use and modelling transparent practices.
- To provide guidance for staff who prepare students for AI-integrated workplaces by embedding transferable skills and professional awareness of AI technologies.
- To build a collaborative, AI-informed academic community that supports ongoing dialogue, resource sharing, and co-learning between staff and students.

Project Description

As higher education continues to respond to the challenges of Generative AI, TUS has adopted a balanced approach, noting that alongside these challenges, there are considerable opportunities to engage with AI to support learning, teaching and assessment practice. This case study provides insight into the approach taken by members of the team in the Centre for Pedagogical Innovation and Development (CPID), to provide professional development opportunities for colleagues in TUS on the use of Generative AI in their academic and professional practice.

At CPID, we have engaged with staff across a range of disciplines and professional areas at TUS at different stages in their AI journey through accredited and non-accredited professional development. These activities provide a space for discussion, exploration, and discovery of how GenAI might be used in practice. They also provide colleagues with an opportunity to share their concerns about threats to academic integrity, copyright, misinformation, and AI detection, all of which are valid.

The creation of an AI Champion role has proven invaluable in providing a space for practice-sharing, innovation and openness. Through three key phases of raising awareness, building knowledge and initiating action, we support colleagues to make informed decisions about the role of Gen AI in their disciplines and professional practice.



Figure 1: Integrating Generative AI in Education (created with Napkin.ai)

In 2023, the CPID team embarked on a TUS-wide roadshow to explore AI and Academic Integrity with colleagues, seeking to provide a space to engage with GenAI tools and to voice their concerns as tools such as ChatGPT became ubiquitous. Since then, we have noted that although general awareness has increased, largely driven by public discourse, a significant number of staff remain wary of and resistant to engaging with GenAI. This continued hesitation is understandable and rooted in valid concerns, including AI detection, copyright, misinformation ('hallucinations'), algorithmic bias, environmental impact, and threats to academic integrity.

To support this reflective process, we continue to invite staff to participate in a range of activities designed to engage them in practical, context-specific dialogue. Through



Figure 2: AI and Academic Integrity Roadshow on the Moylish and Midlands campuses

interactive talks, workshops, and one-to-one sessions, staff are encouraged to consider how students might be using GenAI to support their own learning and to explore ways to maintain academic integrity in this evolving landscape. Moving the conversation from abstract anxieties to tangible pedagogical possibilities is proving especially impactful.

These facilitated sessions helped provide a permissioned space for innovation, creativity, and greater efficiency in teaching practices. For many, especially those new to GenAI, seeing the tools in action was transformative, revealing their immediate potential for lesson planning, activity design, rubric development, and more. As the implications of GenAI for assessment continue to emerge, these conversations have become vital touchpoints for surfacing both tensions and possibilities, fostering a culture of curiosity, openness, and informed experimentation.

In the building knowledge stage, staff begin to develop the confidence needed to make informed decisions about whether and how to integrate GenAI into their practice. This phase involves deepening their understanding of how AI and GenAI technologies function, while also recognising that these tools are rapidly evolving and will continue to increase in capability and complexity over time. The rapid development in this area means that staff must also stay abreast of ongoing changes, as these shifts will increasingly impact professional practice.

Taking action is built on a foundation of awareness and knowledge. By understanding both the possibilities and risks of GenAI, staff are better equipped to make informed decisions within their academic and professional contexts. This includes using AI in teaching, such as supporting lesson planning, designing learning scenarios, or creating engaging activities. It also involves using GenAI to enhance student learning, for instance, by helping students outline ideas, summarise content, or deepen their understanding of complex topics or concepts. Additionally, staff can apply GenAI in assessments by clearly identifying when and where its use is appropriate (or not appropriate) and by ensuring that assessments remain fit for purpose in an AI-enabled environment. Recognising that staff are at different points on this journey, we are fostering a culture of growth and building a community of AI-informed educators who are confident and capable of navigating this evolving landscape.

Key Outputs and Future Opportunities

Staff who have engaged with CPID's professional development opportunities report feeling more confident about their use of GenAI for teaching and assessment. CPID continues to support individuals and programme teams in using GenAI ethically, with academic integrity in mind. The project team also runs workshops for our Regional University Network (RUN-EU), engages at a national level with GenAI on higher education initiatives, and provides guidance and support to programme teams in TUS for assessment analysis and redesign.

Student Perspective – Primary Impact of the Project

Students benefit from this initiative in several meaningful ways. They gain greater clarity and confidence around the acceptable and ethical use of GenAI in their learning and assessments, reducing uncertainty and supporting informed decision-making. Exposure to AI through staff-led teaching practices will enhance their digital and AI literacy, equipping them with transferable skills relevant to academic and professional settings. As staff use AI to design more responsive and inclusive learning experiences, students will experience more engaging and adaptable environments that cater to diverse needs. The initiative also fosters critical thinking and creativity, encouraging students to explore GenAI as a tool for idea generation and content development while learning to evaluate and build upon AI-generated material. By modelling transparent and responsible AI use, staff promote academic integrity and

empower students to do the same. Ultimately, these developments help prepare students for future workplaces where AI is increasingly prevalent, ensuring they are confident, capable, and ethical users of emerging technologies.

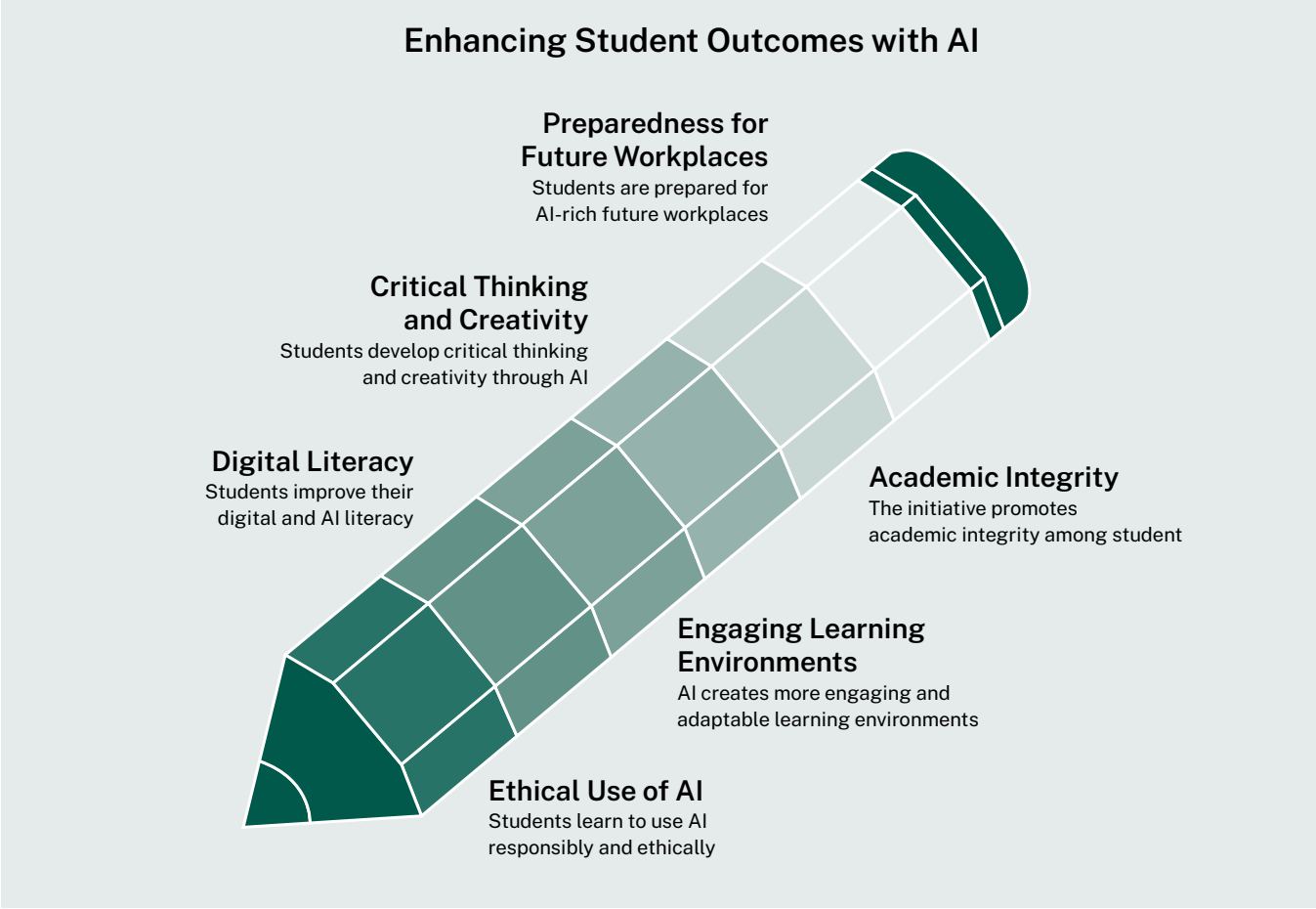

Figure 3: Enhancing student outcomes with Generative AI

Note: The writing in this case study is original; however, GenAI tools were used to support some aspects of the editing process, including spelling, grammar, sentence structure, and exploring alternative word choices for clarity and flow. Diagrams were made using Napkin.ai.

5. TUS Open Press – The university-wide publishing platform

Maura Flynn
Midlands Library

Project Lead, Partners and Participants

- Project Lead – Maura Flynn (TUS).
- Participants - Celine Peignen and Dr Nuala Harding (TUS).

Alignment with the United Nations Sustainable Development Goals

TUS Open Press supports the attainment of the UN Sustainable Development Goals (SDGs), including Quality Education (SDG 4), Reduced Inequalities (SDG 10), and Partnerships (SDG 17).

Key Aims

- To position TUS as a leader in Open Educational Practices (OEP) and Open Education Resources (OER) creation in Ireland.
- To embed digital at the heart of our work.
- To empower staff and students to maximise the impact and reach of their work.
- To provide a university-wide platform to create, publish and share high-quality TUS digital publications.
- To empower our community to better understand and utilise open licensing, including Creative Commons, in the creation of more sustainable and reusable learning resources.
- To support the ambition of our university to embed Universal Design for Learning (UDL) principles and enhance the accessibility of our teaching and learning materials.
- To reinforce our commitment to equity, diversity and inclusivity by offering opportunities to those who are underrepresented to share their experiences and perspectives.
- To leverage the value of knowledge sharing and peer support through the creation of a Community of Practice.
- To encourage collaboration amongst staff and students to develop and co-create OER.
- To provide detailed analytics, including user and page-level views, of Open Press publications.

Project Description

TUS Library has strongly advocated for Open Licensing and the utilisation, adaptation, and creation of OER since 2020. The library successfully secured funding from the National Forum for the Enhancement of Teaching and Learning in Higher Education (National Forum) to deliver the project.

This project is led by TUS in association with partners including Dundalk Institute of Technology (DkIT), Institute of Art, Design and Technology (IADT), Maynooth University, and SETU. The Developing Open Education Resources (DOERs) project aims to increase OEP awareness and OER utilisation, adaptation and creation. The project partners share knowledge and resources to synergistically empower their respective university communities.

TUS Library has resourced the creation of the TUS Open Press, which works in tandem with our guide, index and staffing to support Open Educational Practices. In October 2024, TUS Library launched TUS Open Press (The Press). The Press is a flexible and user-friendly platform which empowers our staff and students to publish their research, collaborative initiatives and innovative practices in an engaging digital format. This initiative provides a university-wide platform for creating and sharing high-quality interactive publications without the traditional print publication barriers, such as the costs of graphic design and printing. Press users can openly license their work as Open Access (OA) and OER. This service assists TUS staff and students in maximising the impact and reach of their work. The Press aligns with TUS values of inclusivity, ambition, collaboration and sustainability.

TUS Library utilises the Pressbooks platform within the Open Press. Pressbooks enable the inclusion of a variety of media, including text, audio, video and H5P content, which aligns with UDL principles.

TUS Open Press aligns with the recommendations of the N-TUTORR Sectoral White Paper Open Education Practices in Higher Education: Focusing on Responsiveness, Innovation & Inclusivity. The White Paper advocates adopting Open Educational Practices and OER to address current and future challenges in the sector.

The first TUS Open Press publication, Open Educational Resources for Teaching and Learning at TUS, was released in late 2024. This resource provides OER on areas such as Artificial Intelligence, UDL and immersive technologies. It complements our TUS OER Index by helping our community source high-quality OER. This Pressbook also serves as a training tool, demonstrating Pressbooks' capabilities to host a variety of media, including images, podcasts and audio files, videos, and H5P interactive activities. Creating a sample Pressbook, such as this one, has been instrumental in building both curiosity and confidence in our staff regarding the flexibility and user-friendliness of TUS Open Press.

All published Pressbooks are available in our TUS Open Press Catalogue and on the Pressbooks Directory. The experiences of active users are shared below.

"TUS Open Press empowers our university community to publish high quality, interactive and engaging resources. It supports staff and students to share their expertise and experiences which in turn will stimulate new conversations and collaborations. TUS Open Press aligns with the university's values of inclusivity, innovation and collaboration and will enable the advancement and sharing of knowledge. The development of Open Educational Practice (OEP) is enabled through funding from the National Forum."

Dr Nuala Harding,
Head of CPID

"Transforming my guide into an OER using Pressbooks has been a rewarding experience. Initially, I had no experience with the platform, but thanks to the excellent support from Maura, the OER librarian at TUS Athlone, I was able to quickly get the hang of it. The finished product is more professional, better aligned with TUS branding, and much more user-friendly compared to the previous platform I used. What I like most is how Pressbooks allows me to create a 'living document' that I can update and expand. It is a very versatile tool for anyone looking to create an engaging, accessible resource, and I wholeheartedly recommend it to anyone with material that could lend itself to an e-book format. I am excited to see the TUS Pressbook repository grow and be able to share my work with a wider audience."

Lisa Hanlon,
Disability Officer, TUS

Key Outputs
• A Community of Practice of TUS Open Press users was formed in May 2025, which aims to support peer learning.
• TUS OER Library Guide – which builds awareness of Open Licensing and OER.
• TUS OER Index – which provides high-quality, recent and relevant OER in alignment with our teaching and learning priorities to aid discoverability and utilisation.
• TUS OER Librarian position – this post is the first of its kind in Ireland.
• Open Educational Resources for Teaching and Learning at TUS.
• The TUS Sensory Awareness Guide on TUS Open Press. This publication was launched to complement the ALTITUDE Charter launch in TUS. The guide is a concise and pragmatic overview of sensory awareness issues and how impacted students can be supported.



Section 2

Digital Creation, Problem Solving and Innovation

Digital creation, problem-solving, and innovation are central to developing adaptable, creative and future-ready graduates in a rapidly evolving technological landscape. These capabilities enable learners to design, develop, and apply digital solutions and to think critically about complex challenges. In addition, learners will be able to use technology to drive positive change in academic, professional and societal contexts.

This section explores how teaching, learning, and assessment practices at TUS are fostering creative digital production, computational thinking, and innovation across disciplines. It highlights approaches that support interdisciplinary collaboration, design thinking, immersive learning, and the development of digital artefacts, applications, and solutions. Through authentic learning experiences and real-world challenges, students are encouraged to experiment, iterate, and reflect as part of the digital innovation process.

These initiatives contribute to a culture of creativity and continuous improvement, strengthening institutional capacity for digital transformation and entrepreneurial thinking. By embedding digital creation and problem-solving skills within the curriculum, TUS supports the development of graduates who are confident, resourceful and capable of leading innovation in an increasingly digital society.

6. 'Woofing and Wagging' Use of interactive online software for active learning of Veterinary Physiology

Dr Maeve O'Reilly MVB
Department of Bioveterinary and Microbial Science

Project Lead, Partners and Participants

- Project lead – Dr Maeve O'Reilly MVB.
- Partner - Mairead Dennehy (TUS).
- Participants - Year 1 Students in BSc in Veterinary Nursing and BSc in Bioveterinary Science Programmes (TUS).

Alignment with United Nations Sustainable Development Goals

The use of an online platform (Lt by AD Instruments©) reduces the reliance on paper-based exercises, which have traditionally been used in the Veterinary Anatomy and Physiology module. The large student cohort in Veterinary Nursing and Bioveterinary Science (70 students in total for the 2025-26 Academic Year) necessitates the printing of many activity booklets each year. The development of a paper-free software system will demonstrate the SDG 12 Responsible Consumption and Production in action.

Key Aims

- To replace some paper-based learning exercises, used in the teaching of Veterinary Anatomy and Physiology, with interactive lessons on a commercially available online learning platform.
- To encourage self-directed learning and active learning, among first-year undergraduate students, via case-based, visually appealing online exercises.
- To facilitate staff to improve digital skills and broaden their pedagogical approach.

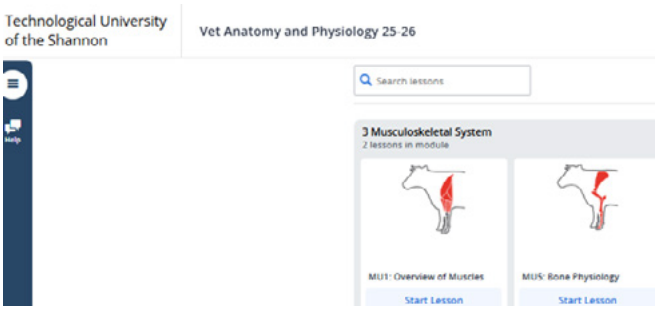

Figure 1: Homepage Vet Anatomy and Physiology Lessons from LT

Project Description

The Strategic Alignment of Teaching and Learning Enhancement (SATLE) funding was used to subscribe to online software, thereby supporting the teaching of Veterinary Anatomy and Physiology to first-year students in the BSc in Bioveterinary Science and the BSc in Veterinary Nursing. This online tool, provided by AD Instruments, complements a range of other teaching methods, including wet dissections, Vevox quizzes, videos from clinical cases, and other learning tools.

Veterinary Anatomy and Physiology is a vast and complex topic, and students sometimes struggle to see the relevance of specific theories to their future careers as veterinary nurses or bioveterinary scientists. The online software lessons apply veterinary physiological theory to veterinary cases, thereby linking theory to real-life scenarios. Students need to actively engage with the lesson materials and answer questions that relate to the specific case. The aim is to increase engagement and enhance higher-order thinking.

The case-based nature of this online learning tool fosters the development of lifelong skills, including critical thinking, problem-solving, and digital literacy. The technology used offers self-guided, interactive lessons that promote self-directed, active learning.

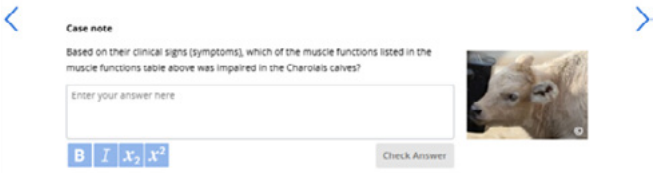

Figure 2: Example of student activity on the LT software platform

Student Perspective – Primary Impact of the Project

Students appeared visibly motivated by the online lessons and seemed highly engaged as they completed the activities during the allocated class time. However, student engagement at home without lecturer supervision was poorer. Some students completed all lessons and praised the technology highly when providing feedback. Others did not engage with the exercises at home, and some reported that the lessons were too detailed and complex. Engagement increased, however, when students were explicitly requested to complete a task by a specific deadline. The low engagement at home is understandable, as no module marks were awarded for completing the online classes, and first-year students have many demands on their time. This area will be explored further this year.

Student feedback revealed a varied perspective on the software. Most students reported that their motivation and interest increased while completing the online exercises compared to traditional paper-based exercises. However, some students were not as engaged, and some found the technology a little temperamental. A small number disliked the online lessons, finding them complicated and too detailed. Different opinions on the software reflect different learner styles, and it is unlikely that one modality will suit all students.

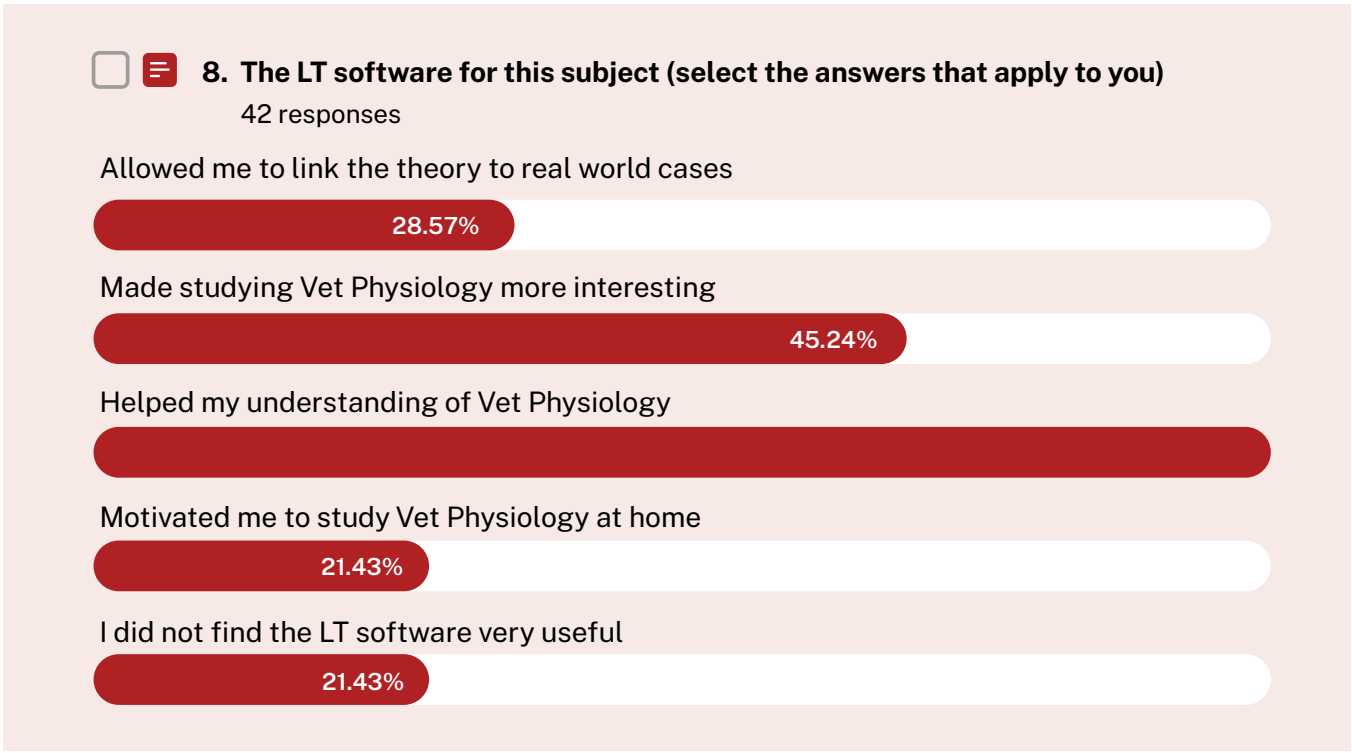

Figure 3: Sample of student feedback on the use of LT software in 2025

Key Outputs and Future Opportunities

The LT educational software provided by AD Instruments has been developed to support the teaching of veterinary physiology and other science subjects. The veterinary physiology collection has been professionally designed and utilises veterinary cases to illustrate key concepts. The technology offers self-guided, interactive lessons that promote self-directed, active learning.

This digital tool was trialled for Veterinary Anatomy and Physiology in Semester 2 of 2024-25, utilising a free subscription. A successful SATLE grant has enabled a full subscription for the 2025-2026 period. The plan is to use the software in Semesters 1 and 2 of the 2025-26 academic year and to utilise a broader range of lessons than the narrow range used in the trial.

The initial trial of the software and the perceived benefits/limitations reported by students leave considerable scope for the development of this project. The feedback provided to date will inform a slightly different approach this year. Methods will be trialled to improve student engagement at home. Additional lessons will be used, and edits will be made to address material that may demotivate some students. Theory from the digital lessons may be incorporated into the end-of-year practical exams to provide more extrinsic motivation for all learners. A full year's access to the complete software package will give a better insight into the uses and disadvantages of this digital tool.

Towards the end of Semester 1, the trial's findings were shared with relevant biology lecturers in TUS Midlands and with our collaborator at TUS Midwest. An impact report was presented to the SATLE funding body.

7. Evaluation of Pair Programming in a Hybrid Environment

Dr Mary Giblin
Department of Computer and Software Engineering

Project Lead, Partners and Participants

- Project lead - Dr Mary Giblin (TUS).
- Partners - Mohamad Abo Haileh, Eoin Beirne, Dylan Boylan, Dr Patrick Browne, Cathal Dawson Bolado, Stephen Curran, Scott Daly, Dr Sheila Fallon, Smitha Guijaru, Sanaya Gupta, Aaron Guirke, Qiuran Hu, Eoin Lawless, Velvizhi Mani, Ella McGlynn, Alan Mills, Kamini Negi, Aaron Ryan, Parveen Shaiksab, Laila Byadi Semia, Katerina Speranskaya and Tugce Yayman (TUS).

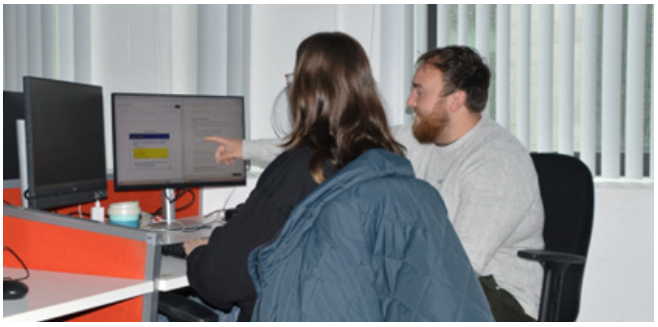

Figure 1: Students taking part in the In-person Pair Programming activity

Alignment with United Nations Sustainable Development Goals

- SDG9 - The use of digital tools and collaborative platforms in a hybrid environment promotes technological innovation and strengthens digital infrastructure in education and the workplace.
- SDG11 - By reducing the need for physical commuting and facilities, hybrid models contribute to lower congestion, pollution and resource use - supporting more sustainable communities.
- SDG13 - Less commuting means lower carbon emissions. Encouraging digital-first collaboration is a step towards more environmentally responsible practices.

Key Aims

- To introduce students to pair programming in both face-to-face and hybrid formats, reflecting modern industry practices.
- To enhance collaboration, communication, and technical skills through coding exercises with peers.
- To prepare students for hybrid work environments by developing their ability to collaborate both in person and remotely.
- To critically evaluate the effectiveness of pair programming in different settings, with an emphasis on identifying challenges in hybrid environments.
- To empower students to propose improvements that ensure hybrid pair programming is not only practical but also contributes to the long-term sustainability of hybrid work practices.

Project Description

Pair Programming is a software development technique in which two programmers work together on the same code, with one as the “driver” who writes code and the other as the “navigator” who reviews each line. This collaborative method not only enhances code quality and problem-solving but also supports knowledge sharing and mutual learning. Effective pair programming relies on continuous, real-time communication between two developers. In a hybrid scenario, communication gaps often emerge. Remote programmers frequently lack the benefit of in-person cues, such as body language. This project introduces students to pair programming in both face-to-face and hybrid formats, fostering collaboration, technical skill development, and real-world readiness in line with Agile industry practices. The COVID-19 pandemic significantly transformed how pair programming is practised. Remote work necessitated a shift to virtual tools, enabling code sharing and communication between team members in different locations. As organisations adopt hybrid work models, the ability to collaborate both in person and remotely has become an essential skill for software professionals.

This project includes participants enrolled in a graduate internship programme as part of their *MSc in Applied Software Engineering* and guides students through pair-programming tasks in both physical (face-to-face) and hybrid environments. More importantly, students critically evaluate their experiences through structured reflections and questionnaires, comparing in-person dynamics with hybrid challenges such as communication delays, screen-sharing issues, and the challenges of maintaining engagement remotely. Aligned with the SDGs such as SDG 9 (Industry, Innovation, and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action), the project promotes inclusive digital skill-building. Through these activities, students learn how to improve pair programming workflows and develop strategies to ensure its effectiveness in hybrid environments, an essential competency as the future of work becomes increasingly hybrid.

Traditionally conducted in co-located settings, Pair Programming faced a significant transformation during the COVID-19 pandemic, which forced software teams into remote and hybrid environments. This shift introduced new challenges, including communication gaps, a lack of visual cues, and technical constraints. Recognising the evolving landscape of work, this project is embedded within a Master ‘s-level graduate internship programme in Applied

Software Engineering. It is designed to prepare students for hybrid work environments by equipping them with both the technical and collaborative skills necessary for real-world software development roles.

The project is based mainly on experiential learning principles. Students undertake pair-programming tasks as part of their team-based project, initially in person and later in a hybrid format. Each pair evaluates their process through critical reflection and comparative analysis, supported by structured questionnaires. The hybrid pair programming exercise is also informed by the research study "Pair Programming Practised in Hybrid Work" (Tkalich et al, 2023), which encourages students to compare their experiences with published industry findings.

Opportunities for further research include:	• Expanding this model to other courses to embed hybrid collaboration as a core competency. • Collaborating with industry partners to validate student strategies and findings. • Contributing to academic research on hybrid Agile practices for novice programmers • Identifying and piloting other digital tools that support hybrid pair programming, including synchronous coding platforms.

Key Outputs and Future Opportunities

- Hands-on experience in both in-person and hybrid pair programming.
- Student-led evaluations of communication effectiveness, technical tools, and collaboration dynamics.
- Comparative insights into the strengths and limitations of hybrid vs. traditional pair programming.
- Practical strategies proposed by students for improving hybrid pair programming, including workflows, tools, and infrastructure.

Student Perspective – Primary Impact of the Project

From a student perspective, the primary impact centres on the development of real-world skills that are vital in today's software industry. Other impacts include:

- Industry readiness: Students gained hands-on exposure to Agile team practices, mirroring real-world software development environments.
- Reflection and critical thinking: Through structured reflection and comparative evaluation, students developed a deeper understanding of what makes pair programming effective. Students were analysing how they worked, why they succeeded or failed, and how to improve in the future.
- Empowerment to suggest improvements: Students were asked to suggest concrete improvements for hybrid environments. This helps build leadership and innovation skills.

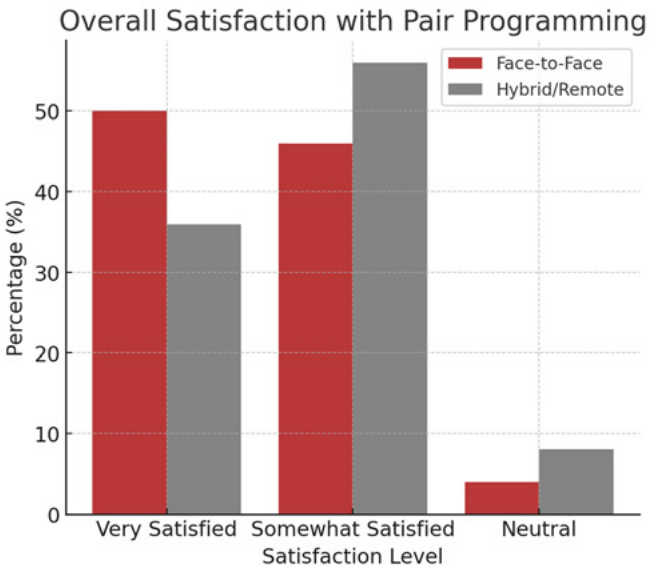

Figure 2: Overall Student Satisfaction with the Pair Programming Activity

Students found satisfaction was higher in in-person sessions than in remote/hybrid sessions, reinforcing the importance of direct communication and social interaction in Pair Programming. In-person sessions were slightly shorter, while hybrid/remote sessions had more breaks. This aligns with industry-based research suggesting smoother interactions in co-located settings and the need for intentional rest periods during remote collaboration.

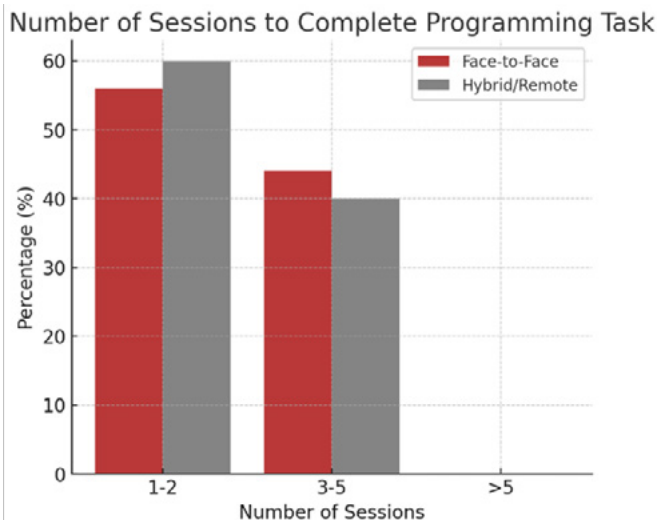

Figure 3: Number of Sessions for the Pair Programming Task

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8. Towards a better engagement for Flexible Learning students using Augmented and Virtual Reality

Brendan Dolan
Department of Flexible and Lifelong Learning

Project Lead, Partners and Participants

- Project leads - Seamus Hoyne, Dr Orlaith Borthwick and Brendan Dolan (TUS).
- Participants - Paul Vesey, Bernard Hayes, Ronan Walsh, Sean Conway (TUS), TUS Careers and TUS Employability Team.



Figure 1: Trying out VR headsets on the Midlands campus during NTUTORR week.

Alignment with United Nations Sustainable Development Goals

Introducing Virtual Reality (VR) headsets into the Department of Flexible Learning offers several sustainability benefits, both environmentally and pedagogically. One of the most significant advantages is the reduction in the need for physical travel. By allowing learners to engage in immersive, high-quality educational experiences remotely, VR significantly lowers the carbon footprint associated with commuting to campus, particularly for part-time or mature students who may live far from the institution. Additionally, reduced reliance on physical infrastructure, such as printed materials and classroom space, aligns with green education strategies by minimising waste and energy consumption.

From a long-term perspective, VR supports the development of reusable and scalable learning resources. Once a virtual environment or simulation is created, it can be reused repeatedly with minimal additional cost and environmental impact, unlike traditional classroom materials, which often require constant updating and physical replication. Moreover, VR enables more inclusive and accessible learning, allowing learners with diverse needs or time constraints to participate in high-quality, hands-on training without the limitations of time or location. This makes the educational experience more equitable while promoting a more sustainable model of flexible, lifelong learning.

Key Aims

- To enhance student engagement and motivation: Implementing new technologies to improve online learning experiences and student participation.
- To support the TUS Strategic Plan: Aligning with increased Flexible Learning enrolments and expanding online programmes.
- To leverage advanced technologies: Utilising Artificial Intelligence (AI)-powered tools, Augmented Reality (AR) and VR, and adaptive learning platforms to improve student outcomes.
- To meet international best practices: Ensuring TUS remains competitive in the online education space within Ireland and globally.
- To support investment in VR and AI: Acquiring VR headsets, learning software, and AI-driven teaching tools to create immersive and interactive learning environments.
- To enhance Lifelong Learning: Catering to working professionals by integrating platforms like LinkedIn Learning and IBM Watson for personalised learning.
- To collaborate and share knowledge: Engaging with the Higher Education Lifelong Learning in Ireland Network (HELLIN), regional partners (Limerick Clare Education and Training board, Mary Immaculate College, University of Limerick), and other Higher Education Institutions (HEIs) to share insights and best practices.
- To identify a structured Implementation plan: Using a phased rollout with key milestones throughout the course of the project, with hopeful future institutional-wide take-up.

Project Description

The project aims to enhance student engagement and motivation by improving the online environment through the adoption of new technologies. One of the objectives in the Strategic Plan for TUS is to increase the number of students in the Department of Flexible and Lifelong Learning and expand the portfolio of online programmes. The pivot to online, necessitated by the COVID-19 pandemic, has continued within the Department of Flexible Learning and is driving this change at TUS. In the Academic Year 2024/25, there were over 1,400 students enrolled in 74 programmes in the Department of Flexible and Lifelong Learning (Midwest), with the vast majority of these taking place online.

For TUS and Flexible Learning to be a leader in our online provision, which is an openly competitive market for students both within Ireland and internationally, we must ensure we are at the forefront of international best practices, leveraging technology to enhance the student learning experience. Currently, TUS is utilising our VLE (Moodle) to deliver synchronous and asynchronous content, facilitate collaboration, and enable connectivity and community building. Vevox has been adopted to allow for online polling and interactions. However, there are numerous technologies that TUS could adopt to enhance the student experience and ultimately their engagement and success in our online learning environment. A 2022 report, "How Technology is shaping learning in higher education" by McKinsey and Company, identifies several online learning tools that would enhance the TUS online learning environment.



Figure 2: Virtual Reality Roadshow during NTUTORR week

Students within the Department of Flexible Learning are typically employed and see their studies at TUS as part of an ongoing Lifelong Learning journey. They are already familiar with platforms such as LinkedIn Learning, which use intuitive tools to deliver adaptive and personalised content. Building on this expectation for flexible, technology-enhanced learning, our department is integrating AR and VR to create immersive, real-world educational experiences.

Not only do they provide tools for hands-on learning, but they also enhance soft skills training, a skill set in high demand. A report by PriceWaterhouseCooper (PwC) into the effectiveness of Virtual (V)-learning, which found (among other things) that V-learners were four times more focused than their e-learning peers, and 1.5 times more concentrated than their classroom colleagues. International Business Machines Corporation's (IBM) Watson Assistant is an example of an AI teaching platform that provides one-to-one support with chatbots or virtual assistants for students, offering additional explanations and guiding them through various learning experiences.

This project also aims to enable TUS and Flexible Learning to align with current sector practices while taking a leadership role in implementing the next generation of VR and AR technologies. This investment will enable the creation of dynamic, interactive, and responsive learning experiences for students.

The landscape of higher education is rapidly evolving, with a strong emphasis on digital transformation to enhance student engagement, accessibility, and learning outcomes. TUS has recognised this shift and is committed to strengthening its online learning environment to support its growing Flexible Learning student base. To remain competitive in the online education sector, both nationally and internationally, TUS must leverage emerging technologies that create engaging, effective, and inclusive learning experiences.

The COVID-19 pandemic accelerated the transition to online learning, and institutions worldwide continue to refine their digital education strategies. While Moodle and interactive tools like Vevox have been used to facilitate engagement, there is an urgent need to integrate immersive technologies and AI-powered learning tools to improve student experiences and outcomes. This initiative is guided by well-established learning theories and methodologies that support the integration of AI and immersive technologies in higher education:

Constructivist Learning Theory (Piaget, 1964)	Learning is most effective when students actively construct knowledge through experiences. VR and AR provide immersive, experiential learning environments that align with this theory.
Cognitive Load Theory (Sweller, 1988	AI-powered platforms like IBM Watson Assistant help personalise learning, reducing cognitive overload and improving information retention.
Experiential Learning Theory (Kolb, 1984)	Learning through experience fosters deeper engagement. VR-based simulations enable students to practice skills in real-world scenarios, enhancing both technical and soft skills.
Universal Design for Learning (UDL)	Ensuring accessibility, flexibility, and inclusivity in digital learning environments. AI-driven tools deliver adaptive content, improving engagement for diverse learners.

Key Outputs and Future Opportunities
The initiative will deliver critical enhancements to the TUS online learning ecosystem, including:

Comprehensive technological assessment	• Collaboration with external experts to evaluate the most effective AI and immersive technologies for student learning. • Analysis of existing research, including McKinsey and Company's 2022 report on digital learning trends.
Investment in immersive and AI-driven learning tools	• VR headsets and AR tools to create interactive, hands-on learning experiences across multiple TUS campuses. • AI-Powered Adaptive Learning tools (e.g., IBM Watson Assistant) to provide real-time student support and personalised learning pathways.
Knowledge Sharing and Collaboration	• Engagement with the Higher Education Lifelong Learning in Ireland Network (HELLIN), Limerick and Clare Education and Training Board (LCETB), University of Limerick (UL), and Mary Immaculate College (MIC) to share insights, best practices, and implementation strategies. • Development of training resources and workshops for academic staff to maximise the impact of these technologies.

This initiative serves as a foundation for future research, development, and scaling of AI-powered and immersive learning at TUS and across the broader higher education sector.

- Longitudinal studies to assess the long-term impact of VR/AR and AI-driven learning tools on student engagement, learning outcomes, and retention.
- Development of sector-wide frameworks for best practices in AI-enhanced and immersive education, informing policy and pedagogy across institutions.
- Exploration of AI-driven assessment models, ensuring academic integrity while providing real-time, formative feedback to students.
- Expansion of immersive learning applications to fields such as healthcare, engineering, and business education.

Student Perspective – Primary Impact of the Project

- Improved soft skills development with Virtual Speech.
- Students can practice public speaking in a simulated audience environment, receiving real-time AI-driven feedback on eye contact, tone, and delivery.
- The platform offers virtual mock interviews, allowing students to build confidence and refine responses in a low-pressure setting.
- Interactive scenarios simulate real-world business and academic networking, helping students develop confidence in professional interactions.
- Access to otherwise inaccessible Learning Environments through VR-based simulations. Students can experience high-risk environments, such as high-voltage electrical rooms, construction sites, or laboratory settings, in a safe, controlled manner. This provides valuable hands-on training that was previously impractical or unsafe, ensuring better preparation for real-world industry settings.
- Many students are balancing education with employment and personal commitments. This initiative ensures that they can practice essential skills remotely, at their convenience.
- AI-driven adaptive learning ensures content is personalised, meeting individual learning needs and providing targeted feedback.
- Engaging, real-world learning experiences. The immersive nature of VR/AR enhances traditional e-learning, making it more interactive and engaging than standard online courses. Students can experience real-world job scenarios from business meetings to high-risk operational tasks, preparing them for professional environments.
- A recent report on Virtual Learning found that students trained in VR-based environments were four times more focused than their e-learning peers (PriceWaterhouseCooper, 2020). By experiencing immersive training scenarios, students retain information more effectively, increasing their confidence and preparedness for real-life situations.

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9. Training a Generative Pre-training Transformer (GPT) to Generate High-Quality User Stories

Dr Mary Giblin
Department of Computer and Software Engineering

Project Lead, Partners and Participants

- Project lead – Dr Mary Giblin (TUS).
- Partners – Dr Amit Hirway, Mohamad Abo Haileh, Eoin Beirne, Dylan Boylan, Dr Patrick Browne, Cathal Dawson Bolado, Stephen Curran, Scott Daly, Dr Sean Kennedy, Dr Sheila Fallon, Smitha Guijaru, Sanaya Gupta, Aaron Guirke, Qiuran Hu, Eoin Lawless, Velvizhi Mani, Ella McGlynn, Alan Mills, Kamini Negi, Aaron Ryan, Parveen Shaiksab, Laila Byadi Semia, Katerina Speranskaya and Tugce Yayman (TUS), Diane O'Brien (Atlantic Technological University).

Alignment with United Nations Sustainable Development Goals

- SDG 4: Quality Education: The initiative promotes inclusive, equitable, and high-quality education by embedding real-world software development practices into a Master's programme.
- SDG 8: Decent Work and Economic Growth: This initiative supports the development of digital competencies (Generative Artificial Intelligence- GenAI) that are in high demand in the global economy, promoting innovation and productivity.
- SDG 9: Students are encouraged to engage with industry practices and Artificial Intelligence (AI)-based tools. This fosters innovation and helps build digital skills.

Key Aims

- Develop a customised Generative Pre-trained Transformer (GPT) based assistant to generate user stories and acceptance criteria for software projects.
- Understand and apply the Independent, Negotiable, Valuable, Estimable, Small, Testable (INVEST) principles to evaluate the quality of user stories.
- Design and refine effective prompting techniques to improve the quality, structure, and clarity of AI-generated user stories.
- Validate AI-generated stories against established criteria and acceptance test formats (e.g., Given–When–Then template, INVEST principles).

Project Description

This assignment explores the use of a customised GPT to assist in creating user stories for software development projects. User stories are concise, straightforward descriptions of a software feature, told from the end user's perspective. They are essential components of Agile development, helping teams understand user needs, plan features, and break down work into manageable pieces. Well-formulated user stories follow the Independent, Negotiable, Valuable, Estimable, Small, and Testable (INVEST) Principles, ensuring that each story contributes effectively to project clarity, planning, and delivery.

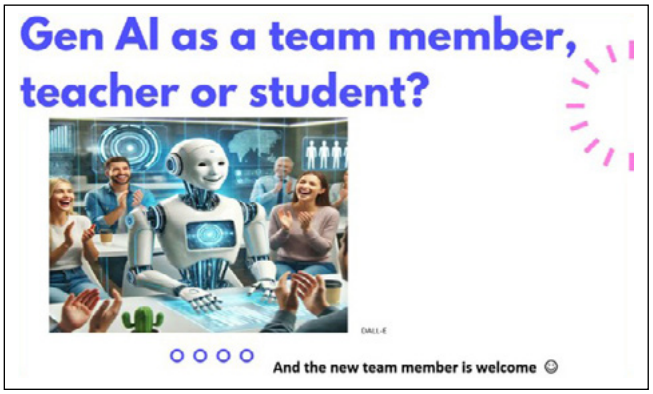

Figure 1: User Stories

In this project, students select a software application domain and define a concise project brief. A user persona (a fictional yet realistic representation of a user) is developed to guide the GPT's outputs, and prompting techniques are designed to generate structured user stories with acceptance criteria. Students iteratively test and refine the GPT-generated stories to improve quality, checking adherence to the INVEST framework and evaluating how well the acceptance tests follow the "Given–When–Then" format.

By engaging with current research, including Zhang et al.'s (2024) study on Large Language Model (LLM)-based agents, students compare their practical outcomes with academic insights into how AI tools can support Agile teams. The assignment challenges students not only to apply prompting strategies but to critically assess the quality, clarity, and usability of AI-generated content. The project supports the development of digital fluency, critical thinking, and practical knowledge of both Agile methods and AI-enhanced workflows. It reflects the growing relevance of generative AI in software engineering. It encourages students to consider how such tools might augment, but not replace, human decision-making and collaboration in software projects.

User stories are a foundational element of Agile software development. They describe features from the end-user's perspective and guide teams in planning and delivering value. A well-written user story aligns with the INVEST principles — it is Independent, Negotiable, Valuable, Estimable, Small, and Testable. Writing compelling stories, however, can be time-consuming and inconsistent across teams. With the rapid growth of generative AI, particularly Large Language Models (LLMs) like GPT, there is increasing

interest in how these tools might support or automate parts of the Agile workflow. This initiative was developed within the context of a Master's programme in Applied Software Engineering. Students were tasked with customising and testing a GPT-based assistant capable of generating high-quality user stories, including acceptance criteria, for a sample software project.

The initiative applies a prompt engineering approach, where students iteratively develop and refine input prompts to guide GPT in generating relevant, structured outputs. Students begin by defining a project brief and creating a user persona to simulate a real-world use case. The quality of the GPT-generated stories is then evaluated against the INVEST model and the Given–When–Then format for acceptance criteria. Students reflect on the model's performance and make informed adjustments to their prompt strategy, drawing on principles of experiential learning and insights from academic research, particularly Zhang et al. (2024) on LLM-based agents in Agile settings.

Key Outputs and Future Opportunities

Key outputs include:	• Custom GPT prompt templates tailored to software project briefs. • Sets of user stories and acceptance criteria generated by Artificial Intelligence. • Iterative refinements demonstrating prompt effectiveness. • Critical reflections comparing AI performance with Agile standards, INVEST principles and recent literature.
Opportunities for further work include:	• Conducting longitudinal studies on the integration of GPTs in real Agile teams. • Developing intelligent prompting interfaces. • Evaluating GPT's usefulness in other Agile artefacts (e.g., epics, task definition). • Researching ethical and reliability concerns of AI-generated project documentation.

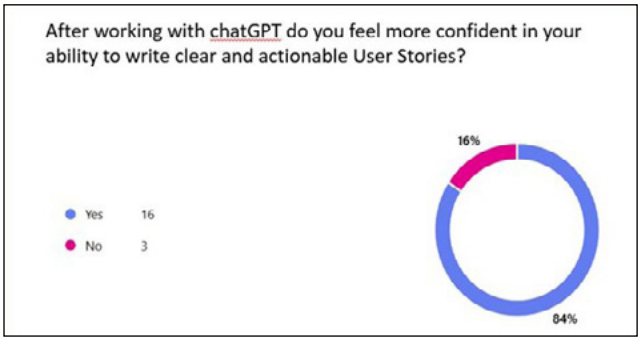

Figure 2: Confidence Level After Assignment

Student Perspective – Primary Impact of the Project

Students engaged directly with Gen AI to solve a practical problem: generating compelling, Agile-aligned user stories. This gave them insight into how AI can be applied meaningfully in software development. It enhanced their understanding of User Stories and the INVEST principles. They built skills in prompt engineering, critical thinking and evaluation. They reflected on the limitations and potential of Generative AI. All these are vital skills in industry roles. After completing the assignment, sixteen out of nineteen students reported an increase in confidence in their ability to write clear, actionable User Stories. The Generative AI agent was viewed as a new and valuable team member, assisting students while also serving as a peer who reviewed and critiqued their work.



Figure 3: A New Team Member

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10. Student Voices - A Critical and Contextual Studies Film Diary: Pedagogical Innovation in a History and Theory Class

Dr David Brancaleone
Department of Fine Art and Education

Project Lead, Partners and Participants

- Project lead – Dr David Brancaleone (TUS).
- Partners – Barry Holian, Dr Robert Kilroy (TUS) and Dr Thomas Carroll (Mary Immaculate College).
- Participants – Undergraduate film seminar students Limerick School of Art and Design (LSAD) with active participation of all years.

Alignment with United Nations Sustainable Development Goals

Furthering SDG 4 Quality Education through experimentation.

Key Aims

- To elicit deep learning by turning the classroom vertical space into the horizontal space of "lost knowledge" which learning outcomes fail to capture.
- To involve students in genuine dialogue, in acting, filming, scripting, and film editing, in a film theory and history seminar.
- To observe the impacts, offering evidence for genuine conversations about experiential learning.

Project Description

The documentary "Student Voices" was made in collaboration with students during a Critical and Contextual Studies (CCS) seminar. From a teaching perspective, action research investigated whether a conventional chalk-and-talk seminar could be transformed into a collaborative seminar, enabling students to combine film practice with theory to replace surface learning with deep learning, in line with research on transformative education (Agyeman, 2024). The benefits of the blended format are well known (Shabani et al., 2010). But this intervention added another digital element: the digital camera. The camera became a catalyst for parallel activities within the seminar, including writing scripts, acting out unscripted situations, conducting interviews, filming and projecting live, student filmmaking, and group discussions.

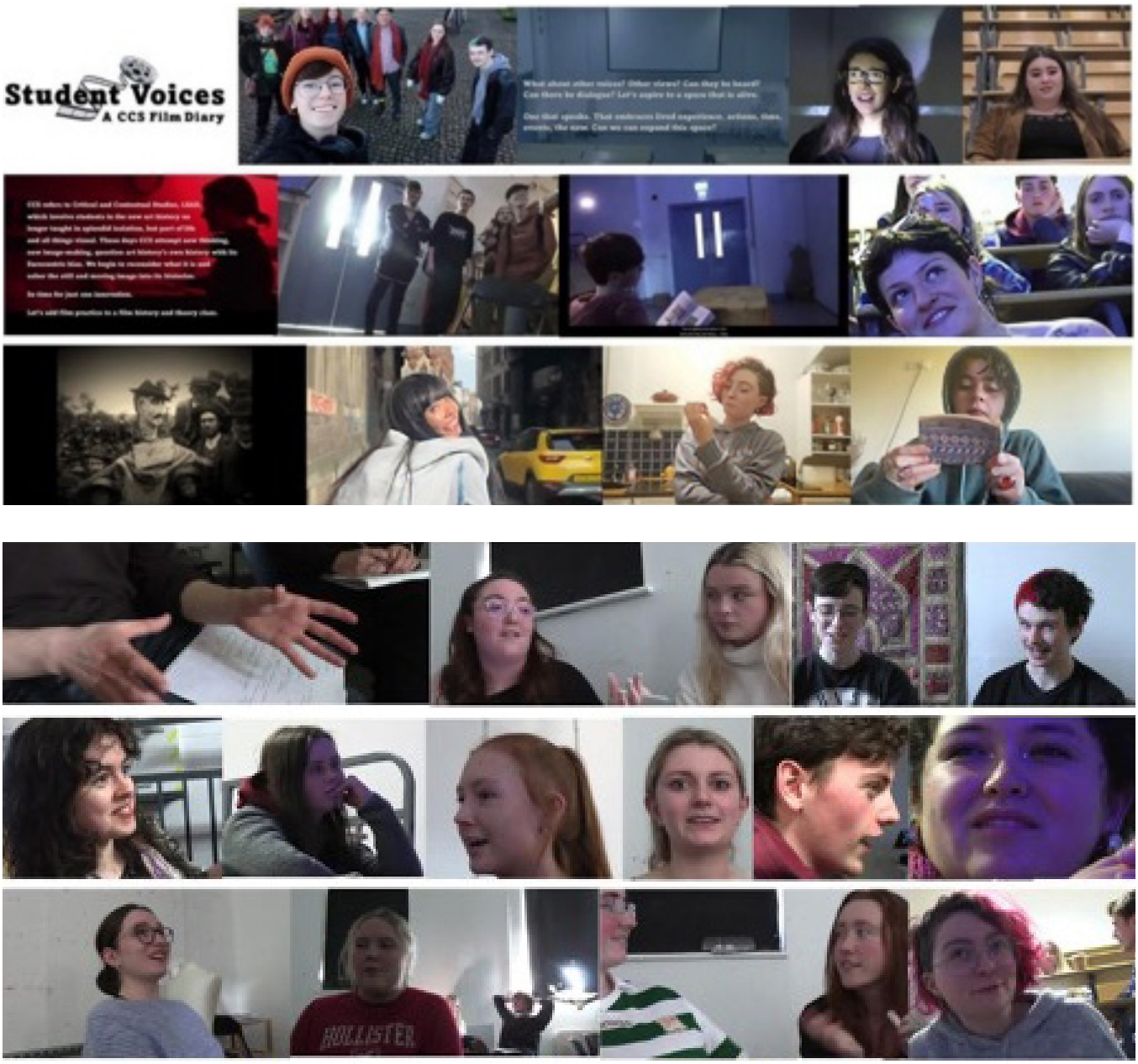
This experiment sought to go beyond the "flipped classroom" (Laurillard, 2001), while adopting problem-based learning, collaborative learning, and peer-assisted learning (Bishop et al., 2013). To make the shift from theory to practice and effect change, we enacted the theory of "spatial practice" and conscious, free, social action (Lefebvre, 2009b, p.100). Wherever social intercourse takes place, especially in a purpose-built area, we face recurring 'adapted' expectations and responses – seemingly obvious, but never articulated (Lefebvre, 2009b).

From Lefebvre's perspective, the classroom, as a physical and architectural space, is not a neutral institutional space. However, as in any institutional spaces, we naturalize hierarchy, whereas Lefebvre's theories point to its production" (Lefebvre, 1971).This requires refusing the reproduction of our habitual social relations and normalised classroom interactions and reconceptualising the classroom as a social space subject to change, potentially "counter-space", "appropriated space", thus rejecting the norm, "the reproduction of social space through domination" (Lefebvre, 2009b, pp. 185-195, 189, 191).

Lecturers work within parameters set by policymakers. Courses are still designed around learning outcomes (Rauhvargers et al., 2009). A critical view of learning outcomes (Brancaleone et al., 2011a) found that the theory justifying the introduction of learning outcomes still relied on Bloom's taxonomy (Bloom et al., 1956) which failed to value learning as a discipline. It also failed to consider Vygotsky's concept of situated knowledge or Vygotsky's zone of proximal development (ZPD), which highlights the interrelationship and value of working with others in shared learning communities of practice in transformative and critical perspectives (Vygotsky, 1978).

This critical intervention sought to counter Bloom's taxonomy, a mode of imparting knowledge that views students as 'receptacles' to be filled by the teacher (Freire, 1996a, 53). Freire's critical pedagogy rejects the notion of knowledge outcomes as a measure of intellectual attainment of predefined learning objectives, since the *what* and the *how* of learning are overlooked, disregarding how knowledge is conceptualised, given meaning, and enacted. As to the ubiquitous delivery mode, Freire found that "authentic education is not carried on by 'A' *for* B' or by 'A' *about* 'B', but rather by 'A' *with* 'B', mediated by the world" (Freire, 1996b, 73-74). Freire's offers a broader perspective than the 'flipped classroom', skills-based approach, which is blind to "conscientization", the critical consciousness that stimulates the critical faculties (Freire, 1996a, pp. 54-55).

Lefebvre helps ground Freire's revolutionary shift of focus in concrete physical space by considering space not as an abstract, geometric or mathematical concept, but something you can *produce*, producing social action. To transform "spatial relations" into "social relations" which occur *in* space (the space of the classroom) and achieve a production *of* space (Lefebvre, 2009a, 191) also involves a shift away from the "delivery" mode of production, where the physical classroom remains a vertical space for vertical learning and one-way traffic.



Figures 1 and 2: Student Voices. A CCS Film Diary, 2025



Figure 3: Some student short films. Link to video: CCS_FILM_DIARY_David Brancaleone.mp4

This film hinged on the possibility of co-creating lived experience, a space "of the physical body", in the classroom, a centre of production of intellectual activity – subject to prevailing ideas – to produce instead a *social space*, featuring "cohabitation"; as filmmaker and screenwriter Cesare Zavattini called it, theorizing a close contact between knower (filmmaker) and object of enquiry, in our context, the focus of cinematic activity (field), and interact with people in a given situation (Zavattini, 2021, pp. 193-194).

Student Perspective – Primary Impact of the Project

This project, introducing the making of a film into an art history and theory seminar, gave a voice to the students and the feature-length film "Student Voices: A CCS Film Diary" provides ample proof of how they responded to this innovation. This final section conveys their views as expressed in their reflective journals, their film scripts, and in short films, five of which appear in the film, and is communicated directly on screen, with actors talking to the camera and discussing the screenings in class. They were free to speak their minds.

Sarah noted:

> "David assigned us to write a script, but with a twist, it had to be one-minute long, and we had to plan out the scene. The task was to write something about miscommunication, so my script focuses on how similar words have different meanings in different countries."

Rachel reflected on her acting in her journal:

> "Learning about and understanding these camera angles allowed us to create a movie of our own which I was fortunate enough to star in."

Key Outputs and Future Opportunities

Results, in writing and on film, probably speak for themselves. This innovation, building on Freire's dialogue and Lefebvre's production of critical space, was a catalyst for deep learning. Potential developments might include TUS collaborative projects, possibly, working with Film and TV Broadcasting, further screening, eliciting further discussion among colleagues, including TUS Teaching and Learning, further papers, symposia, and submitting "Student Voices" to film festivals.

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11. Digital pedagogy in action: The role of a Digitally Enhanced Learning, Teaching and Assessment (DELTA) module in professional development

Seamus Ryan
Centre for Pedagogical Innovation and Development (CPID)

Project Lead, Partners and Participants

- Project leads – Seamus Ryan, Dr Geraldine McDermott and Dr Sarah O'Toole (TUS).
- Participants – Academic and Professional Staff (TUS).

Alignment with United Nations Sustainable Development Goals

The project is underpinned by Sustainable Development Goal 4 (Quality Education) through its commitment to exploring digital technologies to enable inclusive and equitable education. By developing educators' digital pedagogical competencies, Digitally Enhanced Learning, Teaching and Assessment (DELTA) enhances learning design, assessment literacy, and learner engagement. DELTA also encourages reflective, learner-centred, and ethical uses of technology aligned with Target 4.7.

Key Aims

- To enable the critical evaluation of theories and frameworks relating technology to learning.
- To compare and contrast a range of technologies for individual and group learning, teaching and assessment activities.
- To develop skills in the use of specific technology tools to create learning and assessment artefacts which engage learners.

Project Description

Digital learning is ubiquitous; however, while COVID-19 forced many educators to adapt to an online teaching and learning environment, there was no time for reflection and discussion on the affordances of different educational technologies and what enhancements, if any, these could bring to a teaching and learning context. DELTA (formerly Technology Enhanced Learning - TEL) has been offered for over 15 years in various guises in Athlone Institute of Technology/Limerick Institute of Technology, now the Technological University of the Shannon (TUS), and this is a timely opportunity to reflect on the role of practitioner-focused professional development of digital skills.

DELTA is informed by international frameworks and reports such as the European Framework for the Digital Competence of Educators, the Educause Horizon Reports, and the European Strategies for a Digital Age, as well as publications from the National Forum on Teaching and Learning in a Digital Age. It reflects the environment of its participants, who come from the distributed TUS campus and beyond, and include both early-career and experienced staff members, involved in teaching or training roles. Through a blend of synchronous (online and in-person) and asynchronous teaching, the DELTA team supports colleagues at various stages in their careers to engage with a digital pedagogy aligned with the TUS Learning, Teaching and Assessment Strategy.

One of the underlying characteristics of professional development programmes in digital pedagogy is an openness to change. Disruptive technologies are mapped across the DELTA timeline, from the adoption of Learning Management Systems (LMS) to Massive Open Online Courses (MOOCs) to Online and Blended Learning and most recently, the advent of Generative AI. However, the foundations on which DELTA is built include a commitment to a pedagogy-first approach, followed by a practice-focused implementation. In his book *The Diffusion of Innovations* (2003), Rogers explored how educational technologies were adopted, arguing that there were five stages: innovators, early adopters, early majority, late majority, and laggards. As the DELTA teaching team explored new digital technologies, it became clear that pedagogy needed to come first, a mantra that has become the cornerstone of DELTA professional development in TUS. Given the proliferation of digital tools available to DELTA practitioners, it is appropriate to anchor Edtech choices in sound pedagogical principles, periodically interrogating them to ensure they are fit for purpose.

This guiding principle for DELTA is supported by Instructional Design principles and a commitment to Universal Design for Learning, where resources are created and curated by TEL practitioners. The timeline in Figure 1 shows the introduction of some of the most disruptive technologies, including Learning Management Systems, Massive Open Online Courses (MOOCs), online education and Artificial Intelligence (AI).

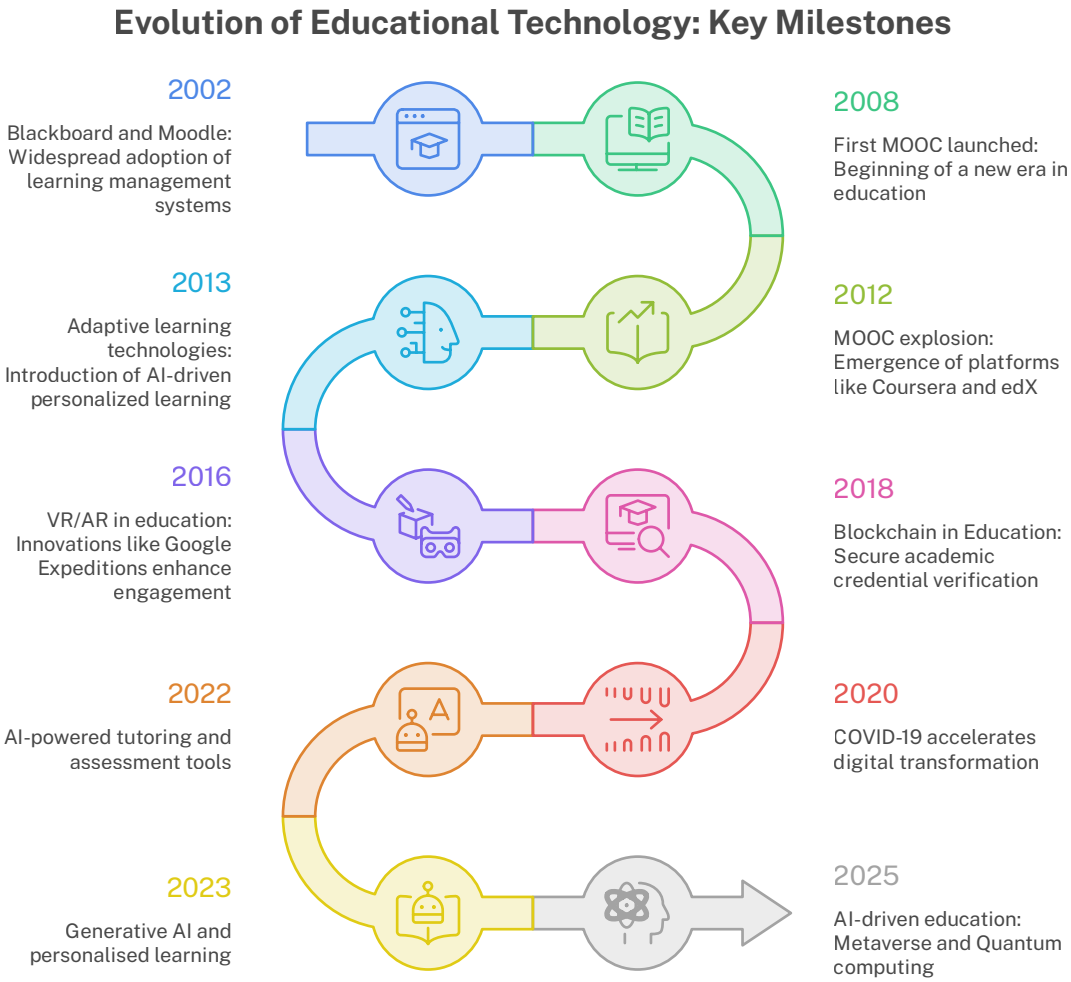

Figure 1: A timeline of disruptive technologies in education (created with Napkin.ai)

However, many of these technologies relate to access to education, rather than teaching and learning. While it seems that the model of education may have changed or become more flexible, the Edtech tools have remained relatively constant to date, as illustrated in the Top 10 tools for Learning from 2014 to 2024 (extracted from Hart, 2024), listed below:

Table 1: Top 10 Tools for Learning

2014	2018	2022	2024
Twitter	YouTube	YouTube	YouTube
Google Docs/Drive	PowerPoint	PowerPoint	ChatGPT
YouTube	Google Search	Google Search	Google Search
PowerPoint	Twitter	MS Teams	PowerPoint
Google Search	LinkedIn	Zoom	Zoom
WordPress	Google Docs & Drive	Google Docs & Drive	Microsoft Teams
Dropbox	Word	LinkedIn	Word
Evernote	WordPress	Word	LinkedIn
Facebook	Slack	Canva	Canva
LinkedIn	Zoom	Wikipedia	Wikipedia

Given the increase in informal learning, facilitated greatly by YouTube as indicated above, the role of accredited learning might legitimately be called into question. However, Postareff et al. (2007) argue that short training programmes may lead to "uncertainty and reduced self-efficacy" (p. 568), whereas more extended periods of engagement, of at least one year, show positive effects. The DELTA teaching team consistently observes that interdisciplinary conversations about teaching, learning, and assessment offer benefits beyond access to new digital tools. Garrison's Community of Inquiry framework (2018) considers the success of blended education through the prism of Teacher Presence, Social Presence and Cognitive Presence. Some of the noted benefits of engaging with peers from a broad range of disciplines in a formal learning setting are situated within the social presence sphere and include sharing practice, considering new perspectives, collectively reflecting on the educator's role, and collaborating on funded projects. In essence, participants become part of a professional learning community of DELTA practitioners.

Key Outputs and Future Opportunities

DELTA practitioners teach and support students; therefore, we hope to help shape digital education in TUS. As Generative AI and other digital technologies are adopted in higher education, the focus on pedagogy becomes even more important to enable learners to live and work in this digital world. As DELTA practitioners, we should continue to engage with new digital technologies through a critical lens, mindful of the challenges but curious about the opportunities. The DELTA team will continue to support educators in this exciting space.

Student Perspective – Primary Impact of the Project

The primary purpose of DELTA is to encourage participants to engage with digital technologies in their practice, to support and enhance the student experience, and to provide a more inclusive, engaging environment for learning. While the focus was primarily on acquiring digital skills, we hope that DELTA participants considered the 'why' of choosing a digital tool for their practice, linking it to their pedagogical approach. However, beyond this, we noted that cross-pollination of perspectives from colleagues in different disciplines and at different career stages has led to the organic development of professional learning communities and, subsequently, collaborative digital education research projects.



Figure 2: Educational technology in use – the Lightboard

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12. Enhancing Live Sound Education Through Digital Mixing and Remote-Control Technologies

Michael Gavin
Department of Digital Arts and Media

Project Lead, Partners and Participants

- Project lead – Michael Gavin (TUS).
- Participants - Students of the Live Sound Production module, BSc. (Hons.) Music Production and Technology, Year 2.



Figure 1: Students working on a live event

Alignment with United Nations Sustainable Development Goals

- This initiative supports SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure) by integrating digital live sound technologies into the curriculum, making industry-relevant learning more accessible and sustainable.
- SDG 4: By incorporating digital tools, students can develop essential live sound skills beyond the limitations of physical equipment availability. This ensures equitable access to high-quality education, regardless of financial or logistical constraints.
- SDG 9: The initiative reflects industry trends toward digital and networked audio systems, helping students adapt to modern, software-driven workflows. It also encourages resource-efficient learning, reducing the need for physical mixing consoles and promoting the adoption of sustainable technologies in live sound production.

Key Aims

- To enhance accessibility to digital mixing tools for students by integrating remote-control applications, allowing practice outside of the classroom.
- To develop technical proficiency in digital signal flow, routing, and audio processing through hands-on, software-driven learning.
- To enable students to troubleshoot and solve real-world problems related to digital audio systems, including networking and system optimisation.
- To provide flexible, remote learning opportunities, ensuring consistent access to practice and learning tools despite physical console availability.
- To promote sustainable learning practices by reducing reliance on physical hardware and leveraging digital technologies for more resource-efficient education.
- To prepare students for industry-relevant workflows, including the use of networked audio systems and remote/live sound production setups.
- To foster collaboration and communication by teaching students to use digital tools for multi-user control and teamwork in digital audio environments.
- To support continuous professional development by providing students with the skills and knowledge needed to adapt to evolving live sound and broadcasting technologies.
- To align with the SDGs, specifically SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure), through inclusive and innovative learning methods.

Project Description

This initiative integrates digital mixing technologies and remote-control workflows into the Live Sound Engineering module to enhance students' understanding of signal flow, routing, and audio processing in modern live sound production. By incorporating software-based control interfaces, students can engage with digital mixing consoles beyond the constraints of physical access, reinforcing key technical concepts and improving learning outcomes. The initiative draws on constructivist and experiential learning theories, emphasising active engagement and hands-on practice.

One of the primary challenges in live sound education is limited access to professional mixing consoles, which are expensive and often shared among multiple students. To address this, the initiative introduces remote-control applications that allow students to interact with digital audio workflows on their own devices. This provides more hands-on learning opportunities, enabling students to develop skills in signal routing, gain structure, effects processing, and troubleshooting in a flexible and accessible way.

In addition to technical proficiency, the initiative promotes problem-solving and critical thinking, as students learn to configure and optimise networked audio systems. It also aligns with sustainability goals, particularly SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure). By reducing reliance on physical mixing desks, the initiative makes learning more inclusive and resource

efficient while also preparing students for modern industry workflows, including remote and hybrid live-sound setups.





Figures 2&3: software used on the Live Sound Production module

Through this initiative, students gain a stronger foundation in digital live sound production, equipping them with the skills and adaptability required in today's evolving audio industry. The approach also opens opportunities for further research and curriculum development to explore how digital tools can enhance hands-on learning experiences in technical education.

Key Outputs and Future Opportunities

- Digital system familiarity: Students gain practical experience with software-based mixing, enhancing their technical skills in signal routing and audio processing.
- Flexible learning: The initiative allows students to practice and review concepts outside class, reinforcing their learning and providing consistent access to tools.
- Improved troubleshooting skills: Students develop abilities in troubleshooting networked audio systems, preparing them for real-world challenges.
- Sustainability: By reducing the reliance on physical consoles, the initiative promotes resource-efficient and sustainable learning practices.
- Expansion to more advanced tools: Future initiatives could integrate additional digital platforms to further enhance learning opportunities.
- Hybrid learning research: The initiative opens possibilities for research into hybrid teaching models combining physical and remote learning.

This initiative provides students with equitable access to digital live sound tools, helping them develop key technical skills and adapt to modern industry practices. Future development will focus on expanding the tools and exploring hybrid learning models in this type of technical education. The primary impact of this initiative from a student perspective was increased access and flexibility in learning key live sound engineering skills. By using digital remote-control applications, students could engage with real-world mixing systems on their own devices, enhancing their technical proficiency in signal flow, routing, and audio processing without being limited by the availability of physical consoles. This flexibility allowed them to practice outside the classroom, reinforcing hands-on learning and building problem-solving abilities in a realistic, digital environment.

Additionally, the initiative gave students the opportunity to develop critical thinking skills by troubleshooting and optimising digital audio systems - skills essential to the modern live sound industry. The initiative also promoted sustainable learning practices by reducing reliance on physical equipment, making the learning process more resource efficient.

Overall, the initiative empowered students to take more control of their learning, better preparing them for industry workflows and fostering a deeper understanding of digital audio systems in live sound production.

13. Community of Practice in Digital Asset Co-creation: Building a Shared Audio Sample Library with Scientific Tools

Patrick Mark Duffy
Department of Digital Arts and Media

Project Lead, Partners and Participants

- Project lead - Patrick Mark Duffy.
- Participants - First Year TUS Students in the BSc in Music Production and Technology programme (Soundscape Design and Composition Module) and BSc in Creative Broadcast and Film Production programme (Creative Sound Design module).



Figure 1: Student using a reference microphone

Alignment with United Nations Sustainable Development Goals

- SDG 4: Quality Education (Targets 4.4 & 4.7) - The project enhances practical skills in audio recording, environmental sound measurement, and noise measurement, as well as an understanding of environmental noise and its detrimental effects on both people and animals (Theakston, 2011; United Nations, 2015a).
- SDG 9 – Industry, Innovation, and Infrastructure (Target 9.5) - The project promotes industry-relevant audio measurement and analysis techniques, which contribute to an understanding of environmental monitoring (United Nations, 2015b).
- SDG 11 – Sustainable Cities and Communities (Targets 11.6 & 11.7) - The project utilises two diagnostic tools to assess environmental noise and examines how noise pollution can be mitigated, thereby improving living conditions (World Health Organisation, 2011; United Nations, 2015c).

Key Aims

- To co-create digital audio assets for music composition.
- To use scientific measurement tools to assess environmental factors and record audio material.
- To assess noise levels and the sonic quality of the sounds in the environment.
- To develop technical and creative proficiency using measurement tools and creative thinking.
- To develop an understanding of sound and its effects on people.
- To understand different decibel weightings and their application in ergonomics.

Project Description

Environmental noise poses serious risks to public health, as recognised by the World Health Organisation (WHO), which uses the Disability-Adjusted Life Year (DALY) metric to quantify its impact. Prolonged exposure to excessive noise has been linked to sleep disturbances, cardiovascular disease, and cognitive impairment. This project introduces a student-centred learning strategy that combines sound measurement, environmental awareness, and digital music production. Using reference microphones and decibel meters, students learn to monitor, analyse, and record environmental sounds, developing both technical skills and a heightened awareness of noise pollution.

Designed for first-year undergraduate students in the BSc in Music Production and Technology, specifically in the Soundscape Design and Composition module, and for students in the BSc in Creative Broadcast and Film Production, in the Creative Sound Design module, this approach reimagines traditional audio sampling. Rather than relying on pre-made sample libraries, students engage directly with their surroundings, capturing and analysing real-world sounds to create a shared, collaborative sample library. This process encourages co-creation, critical listening, and interdisciplinary learning, bridging artistic expression with scientific inquiry in the study of sound. It also develops technical proficiency and creative collaboration while reinforcing awareness of environmental soundscapes (Krause & Payne, 2016).

Environmental noise is a significant public health concern, as outlined by the WHO. Using the Disability-Adjusted Life Year (DALY) metric, WHO quantifies the health impacts of noise exposure, linking it to conditions such as sleep disturbance, cardiovascular disease, cognitive impairment, and tinnitus. In Europe alone, environmental noise contributes to 61,000 DALYs lost for ischaemic heart disease, 45,000 for cognitive impairment in children, and 903,000 for sleep disturbance (WHO, 2011). Noise differs from music in its structure; while musical pitch is based on consistent, repeated sound waves, noise consists of irregular or random vibrations (Everest, 2001). The amplitude or loudness of sound, measured in decibels (dB), also plays a role in determining its impact. Significant sources of noise pollution

include transport systems, industrial activity, and human activities (Cowan, 2016). To understand and mitigate noise pollution, measuring and analysing sound environments is essential. This project engages students in an active learning approach, where they utilise microphones and dB meters to assess, record, and manipulate environmental sounds, thereby fostering both scientific awareness and creative expression in digital music composition.

This teaching strategy was developed for first-year undergraduate students enrolled in Music Production and Technology and in Creative Broadcast and Film Production. Traditional digital music composition often relies on sampling, a process in which pre-recorded sounds are used in new compositions (Said, 2015). These samples typically come from commercial sample libraries or existing recordings.

Relevant methodologies include:

- Students follow a structured environmental sound measurement and recording process using professional equipment, the Superlux ECM 999 condenser microphone and the Digital Sound 8922 dB meter.
- Students first assess the decibel levels of their surroundings using the dB meter, identifying loud and quiet zones within a given space. The measurement microphone enables students to listen objectively to environmental sounds by capturing audio with a flat frequency response, ensuring accurate results.
- Students select an object or environmental sound to record, using their knowledge of sound properties to make intentional choices.
- Students often choose to record instruments, spoken word poetry, and sounds around the campus. They then upload their recordings to Moodle, where they are added to the digital sample library. Each student must incorporate at least one peer-recorded sample into their own composition, ensuring a connected, collaborative workflow.

Key Outputs and Future Opportunities

Key outputs include a unique, student-generated sound library and a collection of compositions that incorporate shared audio assets. Students gain a tangible understanding of acoustic ecology, sound design, and digital composition while contributing to a broader discourse on noise awareness and environmental sustainability. Future research aligns with the SDGs by exploring urban noise pollution, environmental acoustics, and community-driven sound mapping. This project highlights the potential for sound recording methodologies to bridge creative expression, technological literacy, and public health awareness, offering a transformative model for music and media education.

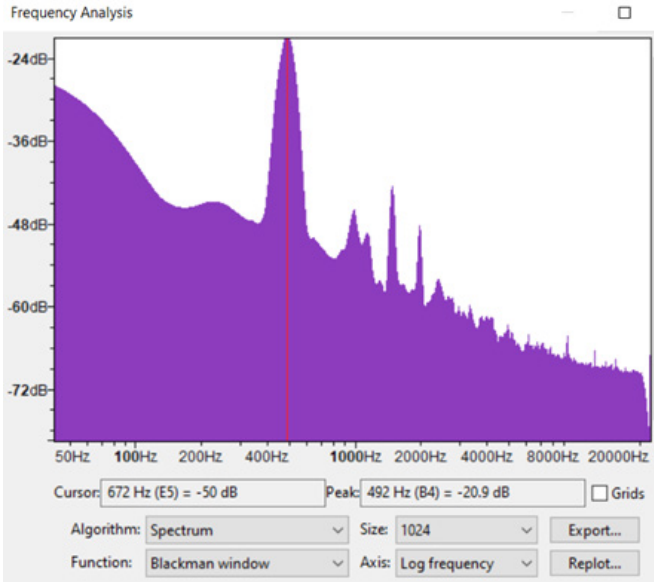

Figure 2: Fast Fourier Transform analysis showing the peak frequency of a guitar note at 492 Hz

The peer group produce a sample library of recorded audio clips. This output consists of a library of audio material unique to their group, as well as a suite of soundscape compositions that integrate their shared assets. The key output of this project is the tangible understanding of noise and sound in the environment that students gain using appropriate measurement and monitoring tools.

Currently, there are calls for noise pollution to be more thoroughly considered for its health impacts and the detrimental effects of noise exposure on individuals (Cowan, 2016; King, 2022; United Nations, 2015c). Further development of this research would see students employing the measurement and recording methodology outside of the classroom to evaluate noise in other environments. These recordings could be used as material for further compositions.

Student Perspective – Primary Impact of the Project

The primary impact of the project from a student perspective is its practical, immersive, and interdisciplinary approach to learning. This method not only enhances technical skills and critical thinking, but it also develops an accurate awareness of sound in various contexts, as well as creative co-creation processes for audio. This project

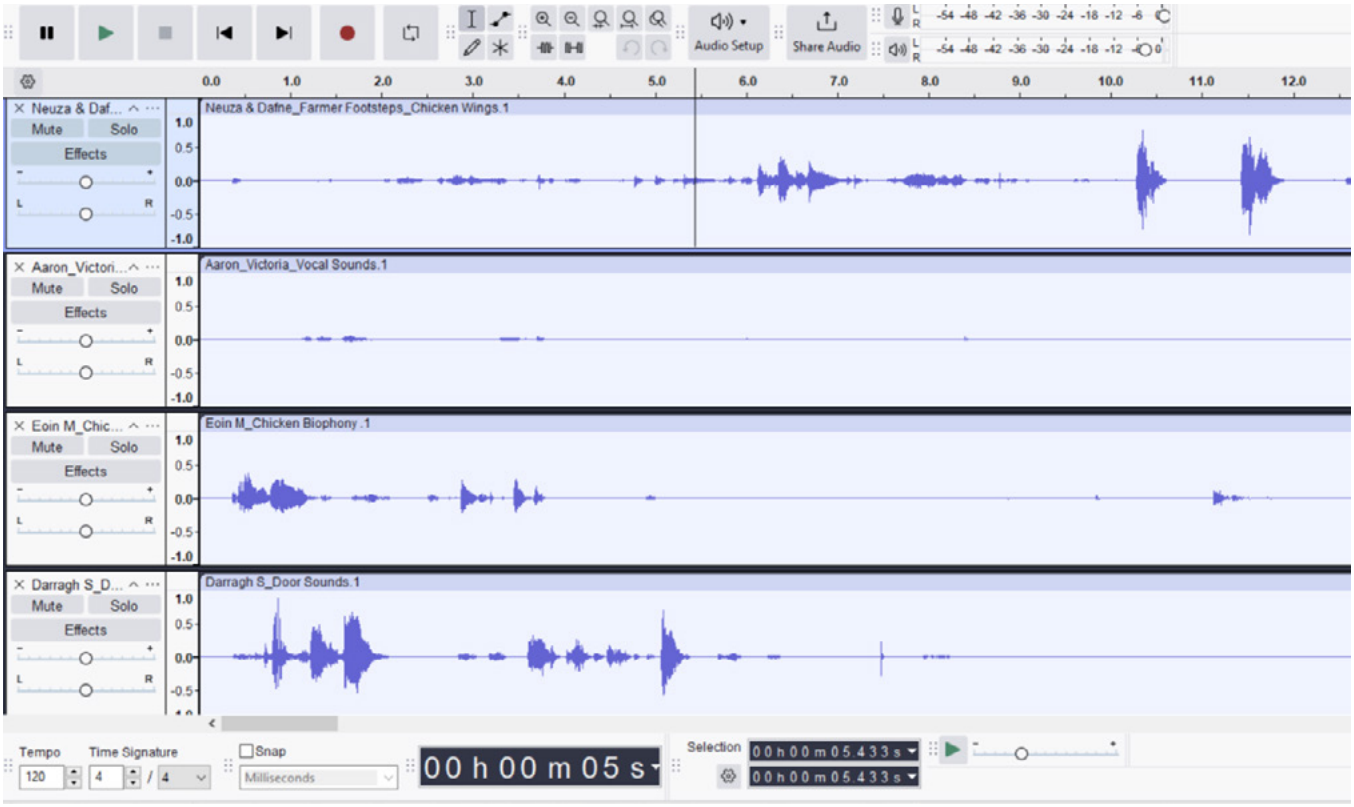

Figure 3: Audio data from an audio sample recording session

bridges theory and practice as students learn about noise pollution and detection, utilise appropriate measurement tools to assess these aspects of their environment, and ultimately produce a tangible output with their peers, which they can use to enhance their personal compositions.



Figure 4: Student using decibel meter

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Section 3

Digital Learning and Development

Digital learning and development are central to creating inclusive, flexible, and engaging learning environments that support student success and lifelong learning. These capabilities enable learners to take ownership of their learning, adapt to changing technologies, and continually develop the digital skills required for academic progression, professional practice and personal growth.

This section explores how teaching, learning, and institutional practices at TUS support the ongoing development of digital learning competencies. It highlights approaches that promote effective engagement with virtual learning environments, online and blended learning, digital collaboration tools and personalised learning technologies. Through scaffolded support, reflective practice and skills development initiatives, students are empowered to become confident, independent, and resilient digital learners.

These initiatives enhance learner engagement, accessibility and academic achievement, while also strengthening institutional capacity for innovation in digital education. By embedding digital learning and development within programmes and support structures, TUS reinforces its commitment to nurturing adaptable, motivated, and future-ready graduates in an increasingly connected world.

14. The integration and application of H5P as an interactive online teaching tool

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Department of Lifelong Learning

Project Lead, Partners and Participants

- Project lead - Jim Gilchrist (TUS).

Alignment with United Nations Sustainable Development Goals

The project is underpinned by Sustainable Development Goal (SDG) 4 (Quality Education) through its commitment to:

- Digital resource reusability: The creation of a repository of reusable content reduces the need for repeated development, aligning with principles of sustainable resource use in education.
- Scalable and asynchronous delivery: By supporting asynchronous learning, H5P allows students to learn at their own pace and reduces reliance on live sessions, which can contribute to lower institutional energy use and commuting-related emissions if learners are studying remotely.
- Inclusive and accessible learning: Enhancing access to quality education through diverse and engaging digital tools promotes educational equity, a social sustainability goal.
- Long-term skill development: The tool fosters autonomy and higher-order thinking, which is an investment in sustainable human capital development.

Key Aims

- To enhance student engagement: To address the challenge of keeping students engaged in an asynchronous online environment by introducing interactive and varied content.
- To promote active and independent learning: To encourage students to interact with core economic concepts actively, supporting independent exploration and deeper understanding.
- To improve formative assessment: To provide students with opportunities for immediate feedback and self-assessment through tools like multiple-choice questions, drag-and-drop activities, and branching scenarios.
- To support diverse learning styles: To cater to different learners by using a range of content types (videos, quizzes, activities) that appeal to visual, auditory, and kinaesthetic preferences.
- To scaffold complex concepts: To break down and simplify complex economic theories and models using interactive tools that aid comprehension.
- To increase accessibility and flexibility: To make learning materials more accessible across devices and available for self-paced study, allowing students to revisit content as needed.
- To build a sustainable digital learning resource: Though not stated explicitly, the creation of reusable H5P content implies an aim to build a sustainable, scalable resource base for ongoing and future teaching.

Project Description

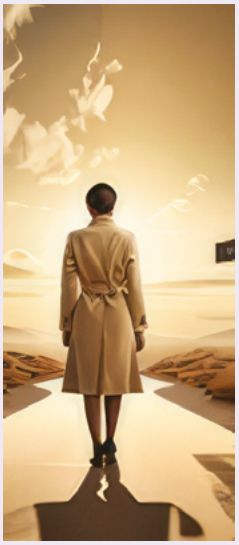
This account details the integration of H5P (an interactive, open-source content tool) into a Level 7 Micro and Macro Economics module within the Faculty of Continuing, Professional, Online and Distance Learning at the Technological University of the Shannon (TUS). The aim was to enhance student engagement, interactivity, and formative assessment in an asynchronous online learning environment. Interactive Elements included:

Interactive Videos:	Featuring embedded questions, explanations, and reflective pauses.
Drag-and-Drop Activities:	Used for matching terms and labelling economic models or graphs.
Multiple-Choice and Fill-in-the-Blank Questions:	Designed for self-paced, formative assessment.
Branching Scenarios:	Simulated policy decisions to explore economic cause-and-effect relationships.

These tools were purposefully selected to scaffold learning, boost content retention, and support independent exploration of course material. By embedding H5P activities within Moodle, the university's Virtual Learning Environment (VLE), the course delivery evolved to support active learning and immediate feedback. This initiative aimed to make economic concepts more accessible, accommodate diverse learning styles, and promote greater student autonomy. The approach also highlighted both the benefits and challenges associated with implementing interactive tools in online education.

Key Outputs and Future Opportunities

- A suite of interactive H5P activities fully embedded in the economics module on Moodle.
- Increased student engagement and satisfaction, as reported in informal feedback. Enhanced formative assessment through self-paced quizzes and instant feedback.
- Reusable digital learning assets that can be adapted for future modules or disciplines.



Scenario 1: The Bribe

You are a manager in a company bidding for a lucrative contract with a government agency. The government official in charge hints that a sizeable bribe would "expedite the process." The scenariopresents a clear ethical dilemma, as bribery is illegal and unethical. You must choose between the potential financial gain for your company and upholding ethical principles.

1. Report the official to the appropriate authorities.

Reporting the official is required for a bribe in the ethical choice, as it upholds the law and demonstrates a commitment to integrity and transparency.

2. Politely decline and continue with the regular bidding process.

Declining the bribe and continuing with the regular bidding process is the ethical choice, as it avoids engaging in illegal and unethical behaviour.

3. Pay the bribe to secure the contract for your company.

Paying the bribe would be unethical, as it involves engaging in illegal and corrupt practices, even if it may benefit the company financially in the short term.

Scenario 2: Environmental Impact

Your company produces a popular product, but it has a significant negative impact on the environment. You have the authority to make changed to the production process to reduce this impact, but it will increase production costs. This scenario presents a conflict between financial considerations and environmental responsibility.

1. Implement the changes, despite the increased costs.

Implementing changes to reduce the environmental impact, even at a higher cost, demonstrates a commitment to sustainability and corporate social responsibility.

2. Maintain the current production process to keep costs low.

Maintaining the current production process prioritizes short-term financial gains over environmental concerns, which could be seen as unethical and irresponsible.

3. Ignore the issue and continue production as usual.

Ignoring the environmental impact and continuing production as usual is the least ethical choice, as it disregards the company's responsibility to minimize its negative impact on the environment.

Scenario 3: Discrimination in Hiring

During interviews for a new position, you notice that one of the candidates is being discriminated against because of their gender. The discriminatory comments are made by one of your colleagues who is also involved in the hiring process. This scenario highlights the issue of discrimination and the ethical responsibility to ensure fair treatment and equal opportunity.

1. Confront your colleague privately and address the discriminatory behavior.

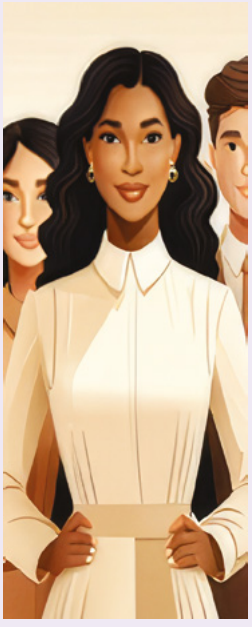
Confronting your colleague privately and addressing the discriminatory behavior is an ethical approach, as it aims to resolve the issue and promote fairness in the hiring process.

2. Remain silent and let the hiring process continue.

Remaining silent and allowing the discrimination to continue would be unethical, as it perpetuates unfair treatment and goes against principles of equality and justice.

3. Advocate for the discriminated candidate and ensure fair treatment.

Advocating for the discriminated candidate and ensuring fair treatment is an ethical choice, as it upholds the principles of equal opportunity and non-discrimination.



Figures 1-3: A range of scenarios developed for the module.

Opportunities for Further Development

Peer and collaborative learning:	Future iterations could incorporate tools that allow for group-based interaction and peer feedback.
Accessibility and device compatibility:	Continued improvements are needed to ensure full access across all platforms and for all learners.
Empirical research:	A formal study evaluating the impact of H5P on learning outcomes and student satisfaction could contribute valuable data to the field.
Cross-disciplinary application:	Expanding the use of H5P into other subject areas could test its versatility and broader educational impact.

Student Perspective – Primary Impact of the Project

Student feedback was overwhelmingly positive. Learners found the interactive components to be enjoyable and helpful in maintaining focus. Many appreciated the instant feedback and the opportunity to revisit activities at their own pace multiple times. However, challenges did arise, most notably the initial learning curve associated with creating H5P content and ensuring cross-device accessibility. Over time, these hurdles became more manageable, allowing for the development of a reusable content repository. In conclusion, the use of H5P significantly enriched the learning experience by encouraging deeper engagement, supporting inclusive learning practices, and offering practical tools for formative assessment. Future iterations of the course will expand H5P to include group collaboration and peer feedback activities.

The transition to online and blended learning environments has underscored the need for innovative teaching tools, particularly in traditional lecture-based disciplines such as economics. This project set out to integrate H5P into the delivery of a Level 7 Micro and Macro Economics module to meet this demand. The course was delivered through a blend of synchronous and asynchronous methods within a Virtual Learning Environment. Students engaged with content independently, which posed challenges related to motivation, active participation, and ongoing assessment. To address these issues, a more dynamic, student-centred approach was required; one that could accommodate various learning preferences while reinforcing complex economic theories.

The integration of H5P was underpinned by constructivist learning theories, which emphasised interaction, active engagement, and knowledge construction. The design also drew from Bloom's Taxonomy (Bloom, 1956), aiming to move students from basic knowledge recall to higher-order cognitive skills such as application, analysis, and evaluation. The primary effect of this initiative on students is a significant enhancement of engagement and active learning in an asynchronous online environment.

Specifically, the effect includes:

Increased engagement:	Students found the interactive elements more stimulating than traditional lecture content, helping them stay focused and motivated.
Deeper understanding:	The use of H5P tools scaffolded complex economic concepts, making them more accessible and easier to digest, which supported higher-order thinking skills.
Improved autonomy:	The asynchronous and repeatable nature of H5P activities empowered students to learn at their own pace, revisit content, and take greater ownership of their learning.
Instant feedback:	The formative assessment features allowed students to test their understanding in real time and receive immediate feedback, reinforcing learning and promoting reflection.
Support for diverse learning styles:	The varied content types (videos, quizzes, drag-and-drop, scenarios) cater to visual, auditory, and kinaesthetic learners, promoting inclusivity and improved outcomes.

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15. Enhancing Learning Through Virtual Reality in Tourism and Event Management Programmes

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Department of Hospitality, Tourism and Wellness and Centre for Pedagogical Innovation and Development (CPID)

Project Lead, Partners and Participants

- Project leads - Dr Noëlle O'Connor, Dr Geraldine McDermott, Assumpta Byrne, and Sandra Griselain (TUS).
- Partners - Dr Sinead O'Leary and Sara-Jane Kickham (TUS).
- Participants - BBus Business Studies with Event Management and BBus Business Studies with Travel and Tourism Management (TUS).



Figure 1: BBus - Business Studies with Travel and Tourism Management students using Virtual Reality to explore virtual visitor attractions.

Alignment with United Nations Sustainable Development Goals

This project supports SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure).

Key Aims

This research examines the role of Virtual Reality (VR) in enhancing education in travel and tourism and event management at TUS.

Project Description

As higher education continues to embrace digital transformation, VR technology is emerging as a powerful tool to enhance experiential learning. This Strategic Alignment of Teaching and Learning Enhancement (SATLE) funded research examines the integration of VR in tourism and event management education at the TUS in Ireland, using two case studies that explore VR's impact on student engagement, industry readiness, and practical learning experiences.

The first case study, "Virtual Reality in Visitor Attractions: A Dark Tourism Journey" (https://www.youtube.com/watch?v=Wa-mZbU7-BA), introduced the BBus - Business Studies with Travel and Tourism Management students to VR applications in special interest tourism. Using the Secret Annexe VR app, students explored the Anne Frank House (Amsterdam), analysing visitor motivations, ethical considerations, and the role of VR in heritage tourism (O'Leary & O'Connor, 2025). The second case study (Kickham & O'Connor, 2025) engaged the BBus - Business Studies with Event Management students in an immersive 360° experience of the *Tomorrowland* Music Festival in Belgium (https://www.youtube.com/watch?v=y0k8Akk1yN0&t=9s). The activity allowed students to explore event site design, décor, and entertainment management, offering real-world insights into large-scale event planning without the need for physical travel.

Key Outputs and Future Opportunities

The findings offer practical insights for higher education institutions seeking to integrate innovative digital tools into their tourism and event management curricula. This research revealed several key findings regarding the integration of VR technology in tourism and event management education. VR enhanced student engagement and retention by bridging the gap between theory and practice through immersive, experiential learning. Students also developed digital competency and industry readiness, gaining confidence in using VR technology, a tool that is increasingly relevant in both the tourism and event industries. The research highlighted how VR provides alternative ways to experience tourism sites and events, making learning more interactive and accessible. Additionally, lecturers emphasised the scalability and future integration of VR in tourism and event education, recognising its potential to expand learning opportunities and deepen student engagement.
In addition to the publications listed above, this research contributed to the 2025 European Distance Education Network (EDEN) annual conference's theme, "Shaping the Future of Digital Education," by showcasing the role of VR in immersive, technology-enhanced learning.

Student Perspective – Primary Impact of the Project

- This research revealed several key findings regarding the integration of VR technology in tourism and event management education.
- VR enhanced student engagement and retention, bridging the gap between theory and practice through immersive and experiential learning.
- Students also developed digital competency and industry readiness, gaining confidence in using VR technology, a tool that is increasingly relevant in both the tourism and event industries.
- The research highlighted how VR provides alternative ways to experience tourism sites and events, making learning more interactive and accessible.
- Additionally, lecturers emphasised the scalability and future integration of VR in tourism and event education, recognising its potential for expanding learning opportunities and deepening student engagement.









Figure 2,3,4: Dr Geraldine McDermott and students on the BBus - Business Studies with Event Management in a VR onboarding session. Figure 5: Dr Noëlle O'Connor presenting at the annual EDEN conference in Bologna, Italy, in 2025.

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16. Digital skills for Business students: Creating industry-ready graduates

Dr Emer Connolly
Department of Business and Management

Project Lead, Partners and Participants

- Project lead - Dr Emer Connolly (TUS).
- Participants – students in the Department of Business and Management Studies.

Alignment with United Nations Sustainable Development Goals

Amid a shift in the job market, it is essential to ensure that our learners and graduates are industry-ready and equipped to take advantage of future opportunities. Digital skills are becoming increasingly important across many industries and are prominently featured in job advertisements. As part of this project, students are trained in interviewing techniques and audio and editing skills (UN Sustainable Development Goal – SDG 9 – Industry, Innovation and Infrastructure).

Key Aims

- To support learners in developing interviewing techniques.
- To provide students with key digital skills (audio and editing).
- To focus on developing a range of skills for industry-ready graduates.

Project Description

Digital skills are imperative in the workplace (Audrin et al., 2024), particularly for graduates, who are currently in high demand among employers (Rêgo et al., 2023). The EU-wide Digital Competence Framework for Citizens (2022) focuses on enhancing digital skills, including information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (see Figure 1).

Students desire learning which focuses on "real-world" relevance (O'Neill & Short, 2023, p. 27). Many job postings across various careers, including digital marketing, media, social sciences, law, and technical communication, place a strong emphasis on digital, audio, and voice skills among the required qualifications. Therefore, it is essential to ensure that students are industry-ready, and digital skills should complement academic programmes at the third level.

While the academic content provided by third-level institutions is crucial in laying the foundations for ensuring graduates are industry-ready, in areas where digital skills are essential, training should be a priority. In addition to their taught modules, students are offered workshops that provide individual tuition and guidance in interviewing techniques and voice training, including interview preparation, conducting interviews, post-interview techniques, podcast creation and editing, and Adobe Creative Suite. Students who choose to avail of this option are taken through the entire process, from generating an idea to developing it and ensuring a project is completed to a professional standard. The benefits for learners are threefold: they can publish content to a high standard, create a portfolio, and enhance their employment prospects. Feedback from industry and job advertisements clearly indicates the importance of practical skills, particularly digital, for graduates.

While academic content lays the foundations for third-level institutes, a strong focus on digital skills should also be a priority in a range of areas, including digital marketing, media, social sciences, law and technical communication. In this initiative, learners receive training in interviewing techniques, voice training and editing skills. These skills complement academic programmes, and the opportunity is provided as an option for learners. It is an area that could potentially be embedded in relevant academic programmes going forward.

Key Outputs and Future Opportunities

Students are given the opportunity to develop and publish high-quality digital content whilst acquiring relevant skills that enhance their employment prospects, thereby complementing academic content. Students who avail of this option compile a portfolio of work completed during the workshops and in their own time. This is invaluable when students are applying for jobs in this sector, as the production of a portfolio demonstrates that learners are complementing their academic achievements and tailoring them to opportunities that arise in their industry. It is a competitive field, and learners who take advantage of this initiative will find themselves in a strong position to submit a solid portfolio when expressing interest in a relevant opportunity.

Student Perspective – Primary Impact of the Project

Students provide positive feedback on the work completed, indicating that those who engage in the training enhance their portfolios. Not only do learners state that the experience enhances their curriculum vitae, but it also boosts their job prospects when they are pursuing work experience and job opportunities. Initially, some students are reluctant to engage as they fear their peers may judge their initial efforts, but the realisation of the importance of completing the work – and the three-fold benefits – contributes to a more positive attitude. Practice brings about confidence, and the more work students complete as part of the initiative, the more confident they become. What initially may appear cumbersome ultimately becomes a positive experience that learners come to embrace.



Information and data literacy

- To articulate information needs, to locate and retrieve digital data, information and content.
- To judge the relevance of the source and its content.
- To store, manage and organise digital data, information and content.

Communication and collaboration

- To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity.
- To participate in society through public and private digital services and participatory citizenship.
- To manage one's digital presence, identity and reputation

Digital content creation

- To create and edit digital content.
- To improve and integrate information and content into an existing body of knowledge while undrestanding how copyright and licences are to be applied.
- To know how to give understandable instructions for a computer system.

Safety

- To protect devices, content, personal data and privacy in digital environments.
- To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion.
- To be aware of the environmental impact of digital technologies and their use.

Problem solving

- To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments.
- To use digital tools to innovate processes and products.
- To keep up-to-date with the digital evolution.

Figure 1: EU-wide Digital Competence Framework for Citizens (2022)

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17. TUS Starter Pack: Digital Resources supporting the transition to Higher Education

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Project Lead, Partners and Participants

- Project lead - Clara Keevey (TUS).
- Participants – Sarah La Cumbre, Sineád Denby, Dora Curley and Dáire Taylor (TUS).



Alignment with United Nations Sustainable Development Goals

The Starter Pack aligns with national higher education sustainability priorities by promoting equitable access, digital inclusion, and resource efficiency, ensuring that all students, regardless of location or background, can access consistent, high-quality support in a cost-effective and environmentally responsible way.

Key Aims

- To ensure equitable access to essential pre-arrival and induction information for all first-year students across TUS's multi-campus environment.
- To enhance the student experience by reducing anxiety, improving preparedness, and fostering a sense of belonging from pre-entry onwards.
- To streamline and integrate administrative and communication processes through a cohesive, digitally enabled one-stop platform.
- To support institutional Digital Transformation goals and promote inclusive, accessible, and sustainable student support practices.
- To develop digital confidence and literacy by encouraging students to navigate university systems, platforms, and online resources.
- To reduce information overload by consolidating essential guidance, links, and media into one accessible digital environment.
- To align onboarding processes with institutional digital transformation goals, contributing to a more connected and student-centred university experience.

Project Description

The TUS Starter Pack represents a significant step in digital transformation, enhancing the onboarding experience through clear information, engaging design, and a holistic approach to student success and wellbeing.

The TUS Starter Pack was developed as part of a digital transformation initiative in response to national and institutional priorities, aiming to deliver equitable, accessible, and consistent student support. The need for such an initiative was identified through the Quality and Qualifications Ireland (QQI) Student Support Services Evaluation Report (2024), the QQI CINNTE Institutional Review Report (2024), and the HEA System Performance Framework 2023-2028, all of which highlighted the importance of improved communication and consistent support across TUS's seven regional campuses.

Enabled by SATLE funding, the TUS Starter Pack was created as a virtual one-stop shop, providing a comprehensive, centralised platform for student onboarding. The initiative aims to ensure that all incoming students can access essential information, guidance, and support before arrival and throughout their transition into university life.

The platform includes links to registration and timetabling guides, on-campus orientation information, IT access instructions and guides, video introductions to student support services staff, and interactive campus maps – all designed to enhance accessibility, engagement, and consistency of information. Dedicated sections highlight key student supports, including disability and access services, mental health and counselling services, and information about societies, the Students' Union and wellbeing initiatives.

The project team employed the ADDIE instructional design model (Analysis, Design, Development, Implementation, Evaluation) to ensure a structured and iterative development process (InstructionalDesign.org, 2026). A detailed needs analysis identified key content areas, accessibility requirements, and communication gaps. The design and development phases were informed by Universal Design for Learning (UDL) principles and best practices in instructional design, ensuring that the content was inclusive, accessible, and engaging for diverse student needs.

The TUS Starter Pack was a cross-institutional, multidisciplinary collaboration aimed at enhancing the student experience and leveraging digital technologies to effectively communicate with students at the pre-arrival stage of their journey. Members of the Student Resource Centre Team were responsible for developing content and liaising with all service areas to ensure accuracy, relevance, and an appropriate tone. An instructional designer created the platform's structure and interactivity, while a graphic designer developed visual elements, icons and branding consistent with TUS's visual identity.

This collaborative approach ensured that the final product was visually cohesive and institutionally aligned. Additional stakeholders included Registry, Admissions, Faculties, Computer Services, Library, the Centre for Pedagogical Innovation and Development (CPID), Equality, Inclusion and Diversity (EDI), Timetabling, Campus Services, the Students' Union and the Marketing and Communications teams.

The final platform went live on the TUS website in August 2025, and early feedback indicates improved student preparedness, reduced information overload, and stronger engagement with university supports. Student feedback indicates a strong impact: a survey of 1,230 first-year students (42% response rate) found that 82% rated the Starter Pack very or extremely helpful, with an average score of 4.26/5. Internal staff reported fewer pre-arrival queries and smoother registration processes, reflecting improved efficiency and communication.

Developed using Articulate Rise 360, a platform that enables ongoing updates and streamlined content management, the resource can be maintained and refreshed annually without requiring redevelopment, ensuring that information remains current and accurate. The platform was adapted for international students, in consultation with the TUS Global Department, and elements of the resource could be repurposed for similar projects, such as postgraduate student onboarding or staff induction. Building on the Starter Pack's success, the team is developing a Student Support Pack to provide guidance and resources throughout the academic year. Both platforms will be updated annually for each CAO intake, requiring minimal maintenance and ensuring sustainability while supporting continuous engagement.

Key Outputs and Future Opportunities

- Enhancing accessibility and inclusivity across campuses.
- Promoting student confidence, preparedness, and digital literacy.
- Reducing cognitive load and transition anxiety.
- Strengthening engagement, connection, and belonging within the TUS community.

By centralising these materials within a single, interactive digital platform, the Starter Pack promotes consistency, accessibility, and inclusivity across campuses. It reduces information overload for new students, enabling them to explore and revisit content at their own pace and according to their individual needs. The initiative has also strengthened communication between the university and its incoming cohorts, creating a more connected and informed student community.



Figure 1: TUS Starter Pack Navigation

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18. Vevox for peer instruction – Virtual collaboration in the classroom

Billy Madden
Department of Applied Science

Project Lead, Partners and Participants

- Project lead – Billy Madden (TUS).
- Partners – Dr Peter Downey, Dr Ann Murphy and Dr Josephine Treacy (TUS).
- Participants – TUS students in 2nd year BSc in Applied Biology, 2nd year BSc (Hons) in Biotechnology with Biopharmaceutical Science, 2nd year BSc (Hons) in Drug & Medicinal Product Analysis, and 2nd year BSc in Forensic & Pharmaceutical Science.

Alignment with United Nations Sustainable Development Goals

The anonymity of Vevox polling gives all students the opportunity to be heard in group activities, regardless of gender, first language, or any other factor that might otherwise preclude their voices from being heard. This aligns with the UN Sustainable Development Goals (SDGs) 5 and 10, which aim to "achieve gender equality and empower women and girls" and "reduce inequality within and among countries" (United Nations, 2015). The anonymity of this activity allows everyone's voice to be heard by everyone else without anyone being aware of other contributors' gender or race, leading to more inclusive interactions and a better-quality educational experience.

Key Aims

- To encourage collaborative engagement with in-class activities.
- To encourage discussion and deeper learning when using online polling apps.
- To take advantage of the anonymous nature of online polling apps to elicit candid peer feedback.

Project Description

This study is part of a broader PhD research project on the use of digital tools and their impact on student engagement when combined with collaborative pedagogies. This work looks at the use of Vevox, a digital tool, to support a Peer Instruction activity based on Eric Mazur's ConcepTest (Crouch et al., 2007), a collaborative pedagogy, and how this impacts student engagement.

Second year students in the Department of Applied Science carried out an in-class Peer Instruction activity on analytical chemistry case studies concerned with what technologies are most appropriate for specific real-world applications. This was carried out using the Vevox app.

Students had no issues accessing Vevox via a QR code. Once in the app, students were first asked to individually answer a Multiple-Choice Question (MCQ) on a case study related to their analytical chemistry module. When responses showed 35-70 per cent of students selecting the best answer, they were asked to form small groups and discuss their answers before resubmitting a collective answer. Finally, each group was asked to provide a short, written answer explaining why they selected the option they chose.

Results from both rounds of MCQs and text responses were then shared on screen with the entire class. This process

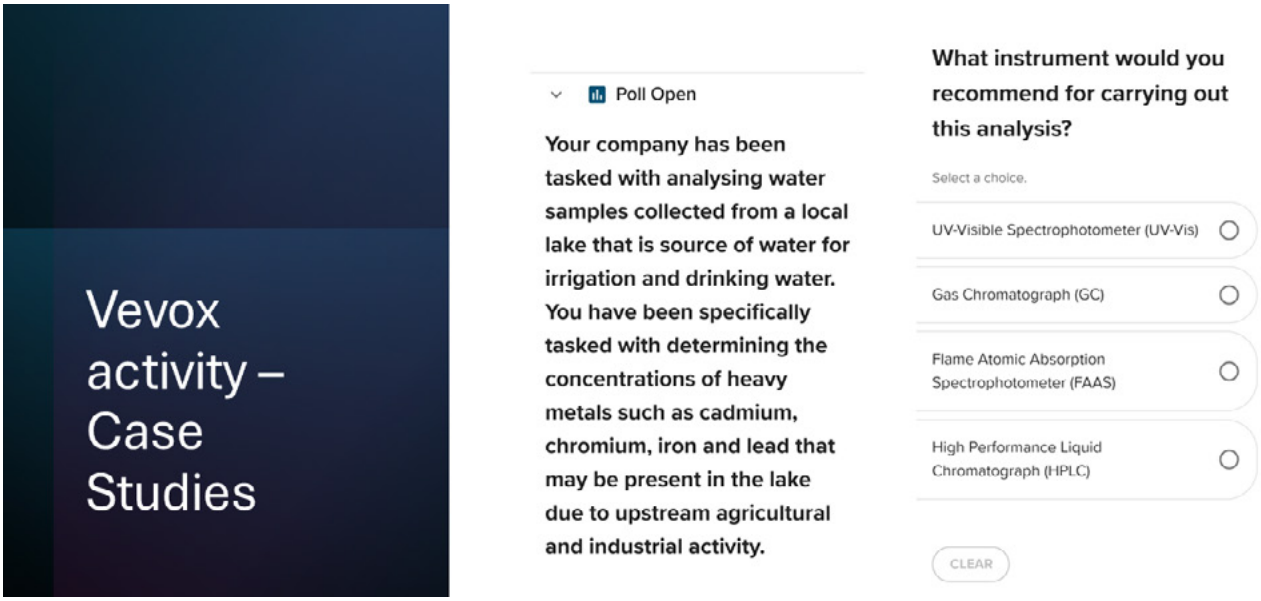

Figure 1: Sample MCQ question asked in Vevox as part of Peer Instruction activity.

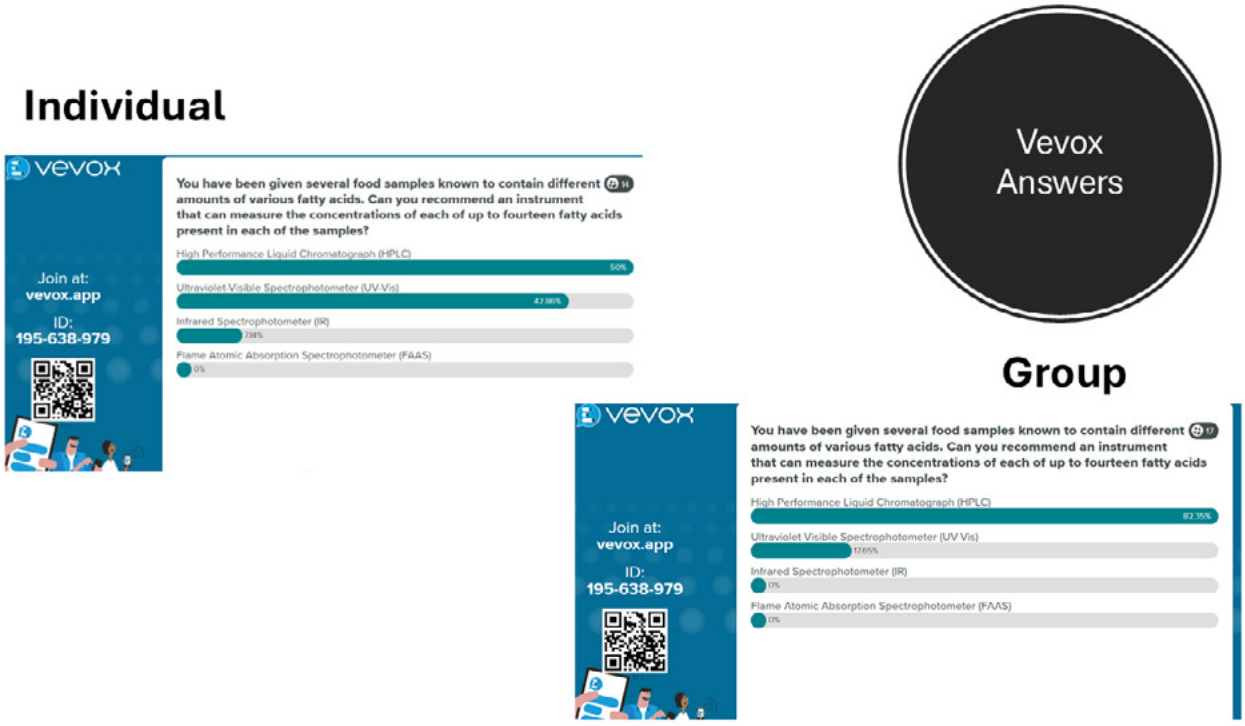

Figure 2: Sample individual & Group responses to MCQ question asked in Vevox as part of Peer Instruction activity.

was repeated for further case studies, and a summary document with all the results was shared later on Moodle or by email.

Case studies for MCQs were constructed to encourage students to draw on their knowledge of analytical chemistry to select the instrument they believed was best suited to the required analysis. Distractors for the MCQs were selected so that there was not necessarily one right answer but rather a best answer, a worst answer and some answers that, although not the best choice, had some merit in their selection. This was done so that group discussions after answering could address the relative merits of the answers chosen.

Vevox was used for this activity, as digital tools of this type provide an anonymous way to share feedback with peers. Students who participated in the activity were invited to volunteer for an interview about their experience using Vevox for Peer Instruction. Student interviews were conducted on MS Teams, and the transcripts generated there were anonymised and edited before being imported into NVivo, a data analysis software, for thematic analysis (Braun & Clarke, 2022) to examine how using Vevox in this context impacted student engagement.

Key Outputs and Future Opportunities

Thematic analysis of interview data yielded the thematic map shown in Figure 3.

As in a previous study on the use of digital tools for student engagement, the combination of anonymity and peer feedback offered by a digital tool within a collaborative pedagogy creates a virtual space in which students can collaborate (Madden et al., 2024). In this instance, the combination of Vevox and Peer Instruction affords students the opportunity to pause and reflect on the feedback they receive in this virtual space. Taking existing knowledge on board, they can build new knowledge as they consider how best to address the case studies presented in the Peer Instruction exercise.

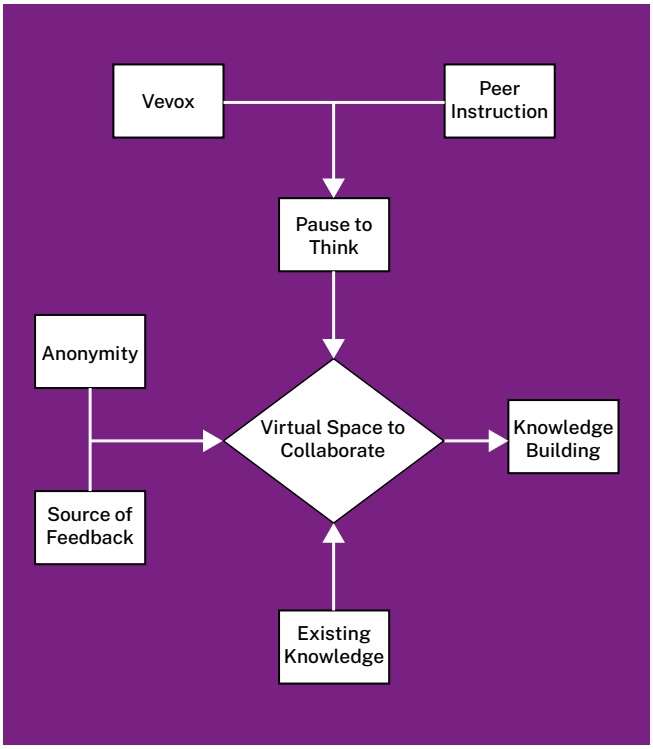

Figure 3: Thematic Map of Vevox-supported Peer Instruction activity

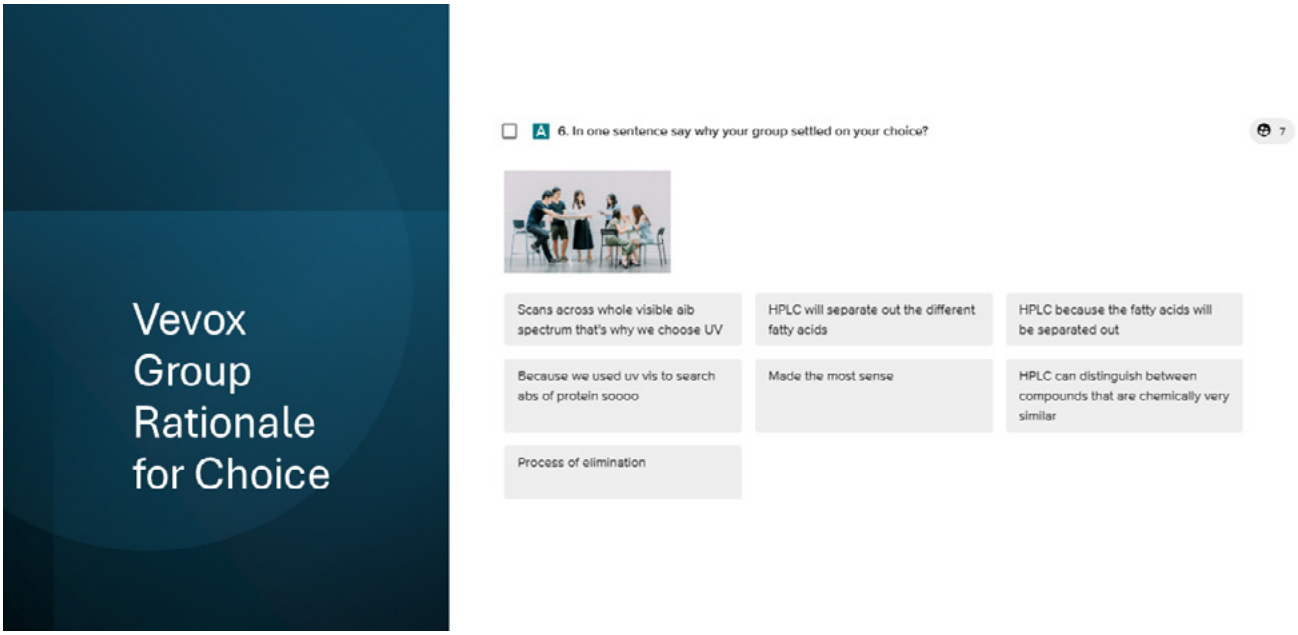

Figure 4: Group rationale for choice.

Coding as part of thematic analysis has shown that student engagement domains (Brown et al., 2022) overlap strongly with the themes in Figure 1, indicating that a variety of engagement domains are activating one another during this activity (Philp & Duchesne, 2016). The role of Vevox in creating a virtual space for collaboration demonstrates that utilising digital capabilities in the classroom can enhance student engagement and learning.

This work is part of a broader PhD research project, with future work planned to investigate how academic design intent aligns with students' experiences using digital tools.

Student Perspective – Primary Impact of the Project

Students were receptive to an initiative that used Vevox in the face-to-face lecture environment. Thematic analysis of interview data showed that students felt that using Vevox for Peer Instruction allowed them to build new knowledge rather than just check their existing knowledge, unlike their previous experience with quizzing apps. While individual students may have benefited to varying degrees, for the most part, they appreciated the insight they gained into what peers were thinking during the Peer Instruction activity.

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19. Enhancing critical reading and representing knowledge through AI-supported multimedia projects in social care education

Dr Denise Mac Giolla Rí
Department of Social Studies

Project Lead, Partners and Participants

- Project lead – Dr Denise Mac Giolla Rí (TUS).
- Participants – Year 3 students on the Creative Approaches to Social Care module, B.A. (Hons.) in Social Care Practice.

Alignment with United Nations Sustainable Development Goals

This initiative aligns with Sustainable Development Goal 4 (Quality Education) 4 by fostering inclusive, creative, and accessible learning through Universal Design for Learning and ethical AI integration, promoting lifelong learning and equitable academic success.

Key Aims

- To embed ethical and critical Artificial Intelligence (AI) literacy into teaching and learning practices, enabling students to engage with generative technologies thoughtfully, responsibly, and with awareness of academic integrity.
- To apply Universal Design for Learning (UDL) principles to create inclusive, responsive, and flexible learning environments that support diverse student needs, preferences, and strengths through multimodal expression.
- To foster techno-relational pedagogy that integrates technological tools with relational and emotional dimensions of learning, promoting human-centred, creative, and reflective engagement with complex themes.
- To support the development of creative, metaphoric, and symbolic literacies by integrating generative AI into arts-based assessments that align with Sustainable Development Goal 4 (Quality Education), encouraging lifelong learning and equitable access to academic success.

Project Description

The arrival of ChatGPT in 2022 marked a pivotal shift in higher education, prompting widespread reflection on academic integrity, particularly in relation to student writing, while also opening new possibilities for reimagining pedagogy. As an educator in creative arts and social care education, I recognised both the challenges and transformative potential of generative AI (GenAI). The modules I teach, underpinned by creative practice, reflection, and social justice, were well-positioned to respond to this shift. Rather than prohibiting the use of GenAI, I chose to engage with it as a learning partner, embedding AI literacy into my pedagogy while maintaining a strong focus on ethical standards.

My process-oriented approach (Mac Giolla Rí, 2020), developed over several years, supports diverse learners in engaging equitably with creative methodologies, visual meaning-making, and emerging technologies. I also draw on threshold concepts theory (Meyer & Land, 2006) to help students navigate the 'troublesome knowledge' often inherent in social care themes and digital transformation.

Together, these frameworks form the foundation of an inclusive pedagogical approach that integrates critical, creative, and ethical engagement with both content and technology. To further support this integration, I developed a techno-relational pedagogy, a framework that weaves together the technological, emotional, and relational dimensions of learning (Cousin, 2006; Ramsden, 1979). This approach encourages students to use GenAI tools to assist, rather than replace, core aspects of human learning, such as collaborative knowledge-building, ethical reasoning through critical evaluation, and emotional intelligence, ensuring that the human remains firmly in the loop.

This case study outlines the integration of GenAI into a third-year social care education module, grounded in UDL and the techno-relational pedagogical approach. The initiative sought to embed AI literacy and creative pedagogies into the curriculum, offering multimodal opportunities for authentic learning and assessment that foster ethical, critical, and reflective competencies.

Students were assessed on their engagement with a chapter from *Golem Girl: A Memoir* (Lehrer, 2020). The assessment required them to critically read and evaluate the text, maintain a process log, and produce a multimodal artefact. The first stage involved students brainstorming collaboratively to explore themes from the book, such as identity, reclamation, and medicalised disability. The brainstorming process combined traditional pen-and-paper methods with generative AI tools. Students explored the themes via prompts using ChatGPT, Co-Pilot, and Snapchat AI and recorded the outputs on their collective brainstorming sheet.

Following the group brainstorming sessions, each student worked individually, selecting a theme to interpret through a multimodal lens (Jewitt et al., 2016; Kustini et al., 2020), translating their conceptual insights into visual, performative, or digital formats. GenAI tools, along with resources like Pinterest, supported their ideation and creative development of these ideas. Students documented their process throughout with photos and notes and presented their final work in an audio-visual PowerPoint. For many who did not consider themselves creatively inclined, GenAI acted as a catalyst for taking creative risks, learning new skills such as animation, poster making and 3D artwork, and expressing complex ideas in an original and personalised way. The



Figure 1: Recreated version of original student work, generated independently for illustrative purposes. Image generated using ChatGPT with the prompt 'Generate a realistic sad girl face with ear-length hair about 12 years'. Black scar marks were added in Canva. Shared under Creative Commons Attribution 4.0 International (CC BY 4.0). https://creativecommons.org/licenses/by/4.0/

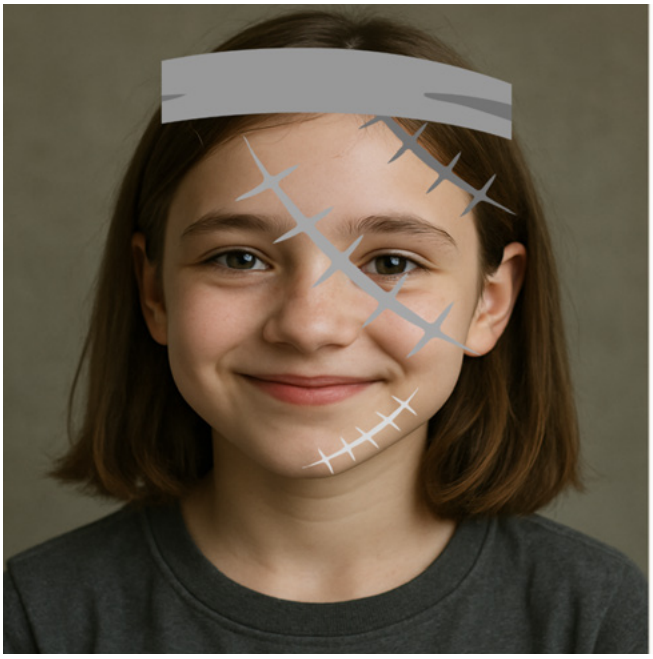

Figure 2: Recreated version of original student work, generated independently for illustrative purposes. Image generated using ChatGPT with the prompt 'generate the image above with a happier face'. Silver scars marks and head band were added in Canva. Shared under Creative Commons Attribution 4.0 International (CC BY 4.0). https://creativecommons.org/licenses/by/4.0/

approach was firmly rooted in Universal Design for Learning (UDL) (Novak & Rose, 2016), promoting choice, accessibility, and diverse forms of expression.

One student produced a stop-motion animation to symbolise the reclaiming of identity from medicalised narratives of disability. The visual journey transitioned from bold black scars (see Figure 1) on a young girl's face to shimmering silver scars, culminating in a decorative headband that represents personal transformation and self-empowerment (see Figure 2). Although some students initially found the open-ended nature of the task challenging, integrating collaborative mind mapping, GenAI tools, and multimodal learning strategies significantly enhanced their engagement and confidence. Rich discussions naturally emerged around the use of AI-supported content, sparking lively debates on how to critically evaluate and validate digital tools. Overall, the project demonstrated how the thoughtful use of generative AI can foster AI literacy, spark creativity, build confidence, and support alternative forms of academic expression, contributing to a more inclusive, equitable, and future-focused educational experience.

Key Outputs and Future Opportunities

The outputs included both process-based artefacts such as reflective PowerPoints and final products of student learning, including short films, posters, and other creative artworks. The project will be further expanded next year through an exhibition of student work, shared with peers across the programme. Future modules will continue to explore the intersection of generative AI, creativity, and critical analysis to support diverse learning needs and promote sustainable, inclusive teaching practices.

Student Perspective – Primary Impact of the Project

From the student perspective, the initiative had a significant impact on confidence, empowerment, and the ability to express learning in personalised, creative, and accessible ways. By aligning with students' strengths, interests, and developing AI, digital, creative, metaphoric, and symbolic literacies, the project supported meaningful and authentic engagement. The structured, ethically guided use of GenAI enabled students to experiment with ideation tools, gaining AI literacy while maintaining ownership of their work. This balance supported both creative exploration and critical thinking. The multimodal project offered students autonomy and choice, fostering a deeper connection to the material, particularly through narrative themes such as identity and reclamation drawn from *Golem Girl*.

The Universal Design for Learning (UDL) framework ensured that students with varying cognitive styles, confidence levels, and learning preferences could fully participate. Those who might find traditional written assessments challenging were able to engage through visual, audio, or performative forms, developing alternative modes of academic expression and building confidence.

Collaborative brainstorming and in-class creative processes further strengthened peer interaction and relational learning, offering emotional support as students explored complex and sensitive social care themes. The integration of emotional, creative, and technological elements, central to the techno-relational approach, contributed to a more holistic, human-centred learning experience.

Overall, the initiative fostered:

- Increased engagement and creative confidence.
- Deeper understanding of course content through multimodal learning.
- A safe environment for experimentation with GenAI tools.
- Greater inclusion and accessibility in expressing learning.

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20. Encouraging class engagement through digital polling and collaborative tools

Marguerite Murphy
Department of Business and Management

Project Lead, Partners and Participants

- Project lead – Marguerite Murphy (TUS).
- Participants – 1st year Fundamentals of Marketing students and 2nd year Operations Management students on the Bachelor of Business (Hons) programme.

Alignment with United Nations Sustainable Development Goals

Using digital technologies in the classroom aligns with the United Nations Sustainable Development Goals, particularly SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities) (United Nations, 2025). By using accessible digital tools to encourage active participation, this practice supports inclusive and engaging learning for all students. The use of anonymous polling and collaborative whiteboards reduces barriers for shy students and students who speak languages other than English. Care is also taken to be mindful of digital access and ease of use, as not all students have the same level of access to devices or digital skills (OECD, 2021).

Key Aims

- To encourage active engagement from students during lectures.
- To reduce barriers to participation for shy students and students who speak languages other than English.
- To promote inclusivity and collaboration in both small and large class contexts.

Project Description

Both student cohorts were predominantly from Generation Z; people born between 1996 and 2010, who are often characterised as digitally fluent but more hesitant to engage verbally in large learning environments. The first-year cohort (approximately 34 students) was often reluctant to contribute verbally during lectures. The second-year cohort (approximately 75 students) was culturally diverse, including students from Italy, Ireland, Ukraine and Poland. Many were new to the TUS campus, and some did not speak English as their first language. These factors combined to create additional barriers to verbal participation for several students.

In response, I chose to introduce live polling (Vevox) and a collaborative digital whiteboard (Moodle Whiteboard) to support inclusive participation. As I was also new to these tools, I invested time in practising with both platforms in advance and prepared simple instructions and a short demonstration for use in class. Being new to this specific technology myself helped me to empathise with students who might also feel uncertain, so I took care to explain each tool clearly and reassured students that it was acceptable to make mistakes while learning to use them.

Research on Generation Z students suggests that they tend to respond well to interactive digital tools and value quick feedback and low-risk opportunities for engagement (Alruthaya et al, 2021). Live polling has been shown to increase student engagement and to be viewed as both enjoyable and supportive of learning and revision (Phelps & Moro, 2022). This evidence supported my decision to integrate Vevox into the lectures.

Vevox polling was used consistently throughout the modules, rather than as a once-off activity. Polls were used at the start of lectures to assess prior understanding, during lectures to check comprehension, and at the end to recap key concepts. Question types included multiple-choice knowledge checks, short opinion questions, and simple application-based questions linked to the lecture content. After each poll, I shared the results with the class and facilitated discussion. This enabled me to address misunderstandings immediately and to reinforce key ideas through timely, formative feedback, which is recognised as a core feature of effective learning (Dawson et al., 2019).



Figure 1: Formative Feedback output with students from Operations Management

For collaborative activities, the Moodle Whiteboard was used during group tasks. Students worked in small groups to discuss a question or problem before adding their ideas to the shared space. To scaffold this process, I first explained the task clearly, demonstrated a simple example, and allowed time for group discussion before asking students to write. This structured, step-by-step approach helped build student confidence and reduced the pressure associated with immediate written contribution. Students experienced very few technical issues and adapted quickly to both tools.

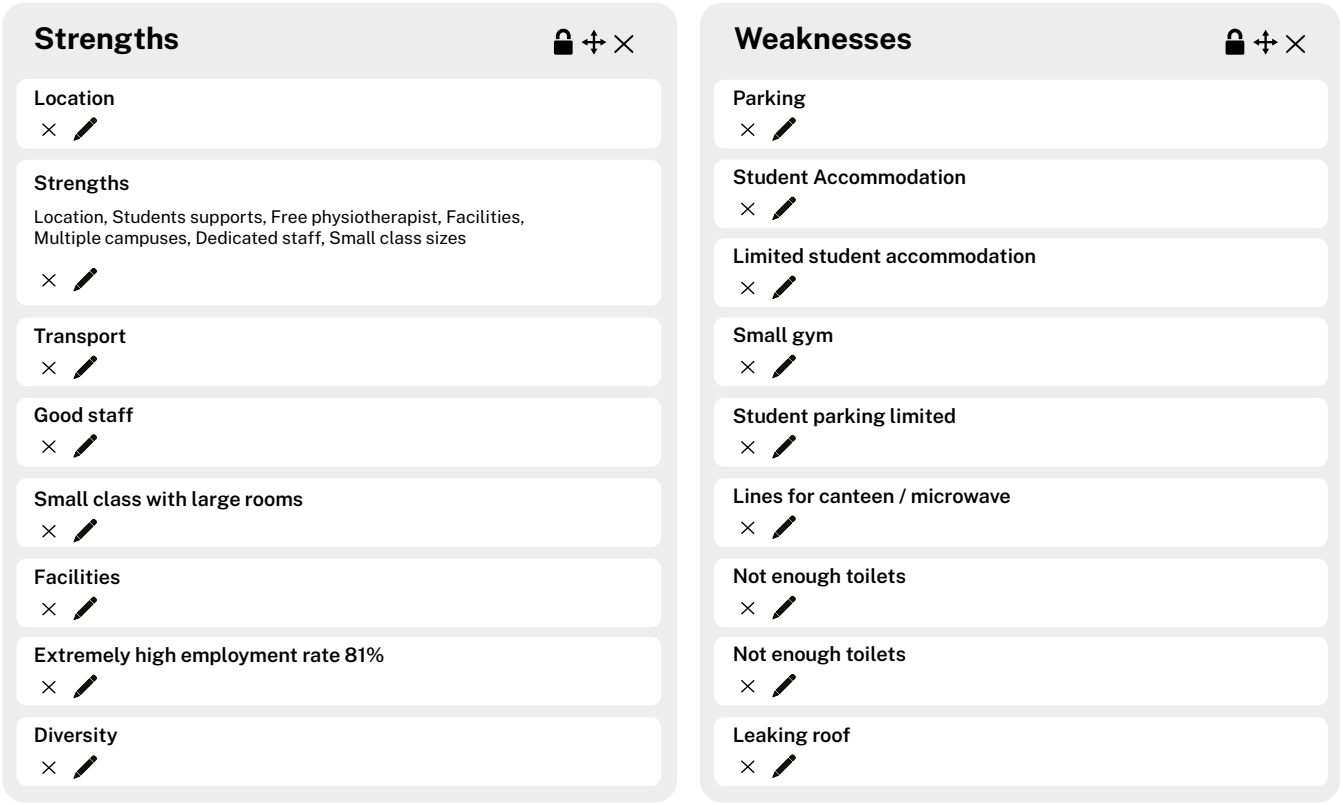

Figure 2: Sample individual & Group responses to MCQ question asked in Vevox as part of Peer Instruction activity.

Key Outputs and Future Opportunities

- Increased student interaction, particularly among quieter students and those for whom English is not their first language.
- More balanced participation across the class, with a wider range of students contributing.
- Visible improvement in students' confidence when using digital tools for learning.



Figure 3: Feedback on the group project from students in Operations Management

Student Perspective – Primary Impact of the Project

Observations indicate that using Vevox polling and the Moodle Whiteboard resulted in significantly higher participation than traditional questioning. When questions were posed verbally to the class, only a few students typically responded. However, when delivered digitally, responses increased substantially, with most students contributing. This was particularly noticeable among students who were quieter in class or whose first language was not English. The digital tools created an environment that better represented more voices, leading to a richer pool of ideas and perspectives during lessons.

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21. Measuring the effectiveness of a Classroom Response System in craft apprenticeship education

Michael Murphy
Department of Trades (Plumbing)

Project Lead, Partners and Participants

- Project lead - Michael Murphy (TUS).
- Participants – 16 students from the Phase Four Plumbing Craft Apprenticeship Programme at TUS Midlands.

Alignment with United Nations SustainableDevelopment Goals

This initiative supports Sustainable Development Goal 4: Quality Education by embedding a teaching approach that is responsive, inclusive, and adaptable over time. By using Vevox to promote active participation, the project cultivates enduring learner autonomy and reflective habits that extend beyond individual lessons. The iterative Action Research process ensures continuous improvement of teaching practice, making the approach sustainable for future cohorts. Additionally, the accessibility features, visual supports, varied question formats, and reduced participation anxiety help create a learning environment that remains equitable and effective for diverse apprentice groups year after year.

Key Aims

- To measure the effectiveness of a classroom response system (Vevox) for student engagement.
- To employ action research as a method to gain feedback and reflect on each cycle.
- To involve students in the process of trying to improve learning in the classroom environment.

Project Description

This project explored how a Classroom Response System (CRS), specifically Vevox, could enhance engagement among Phase 4 plumbing apprentices at the Technological University of the Shannon. Apprentices often return to theory classes after extended periods of hands-on work, and many come from diverse educational backgrounds, sometimes with hidden learning difficulties (Department of Further and Higher Education, Research, Innovation and Science, 2021). Traditional theory delivery can feel disconnected from practical learning, making sustained attention and participation challenging. Because today's apprentices are increasingly comfortable with technology, CRS tools offered a promising opportunity to make theory sessions more interactive, inclusive, and responsive to learners' needs, an approach supported by research showing that active, formative questioning promotes deeper learning and engagement (Black & Wiliam, 1998; Hattie & Timperley, 2007).

To investigate this, an Action Research approach was adopted, allowing teaching strategies to be introduced, evaluated, and refined through continuous cycles of planning, action, observation, and reflection (McNiff & Whitehead, 2011). Sixteen Phase 4 plumbing apprentices participated voluntarily. The intervention occurred across three cycles over six weeks, each shaped directly by student feedback and insights gathered from Vevox responses, Microsoft Forms reflections, and the lecturer's reflective diary. This cyclical, practitioner-led approach aligns well with Action Research principles and emphasises the improvement of practice through iterative inquiry (Bloxham & Boyd, 2007).

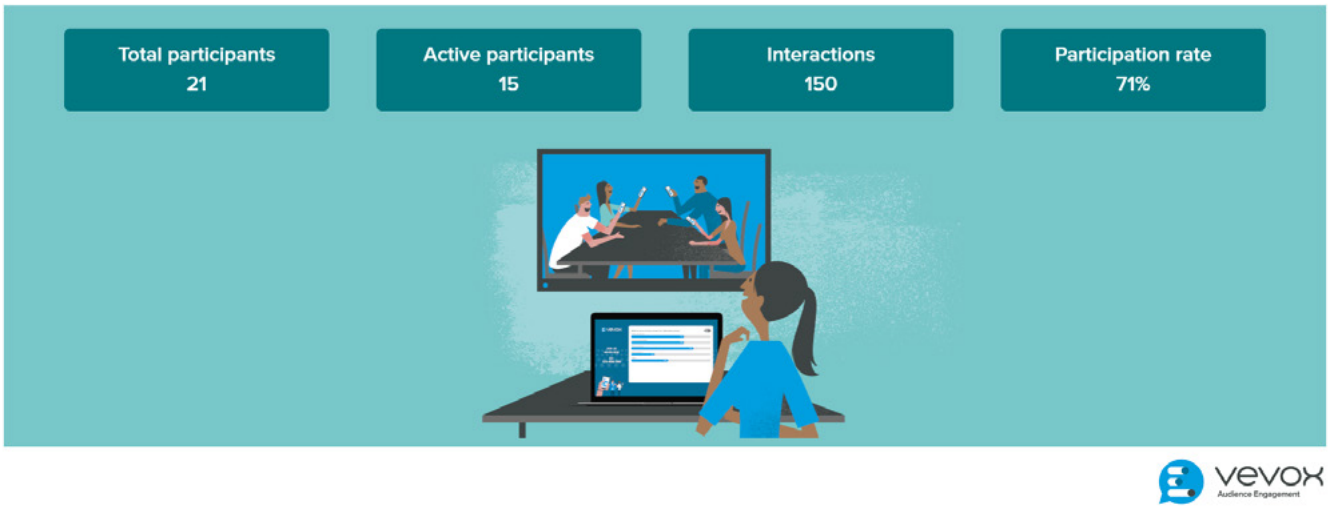

Figure 1: A summary of the first Vevox session

In Cycle 1, Vevox was introduced using simple multiple-choice questions at the end of class. Students quickly suggested using Vevox at the start of the next class to test what they remembered from the previous week, and they also asked for more challenging, varied questions. This aligns with research indicating that student voice and participation enhance engagement and ownership in higher educational learning environments (Fuller & Unwin, 2003).

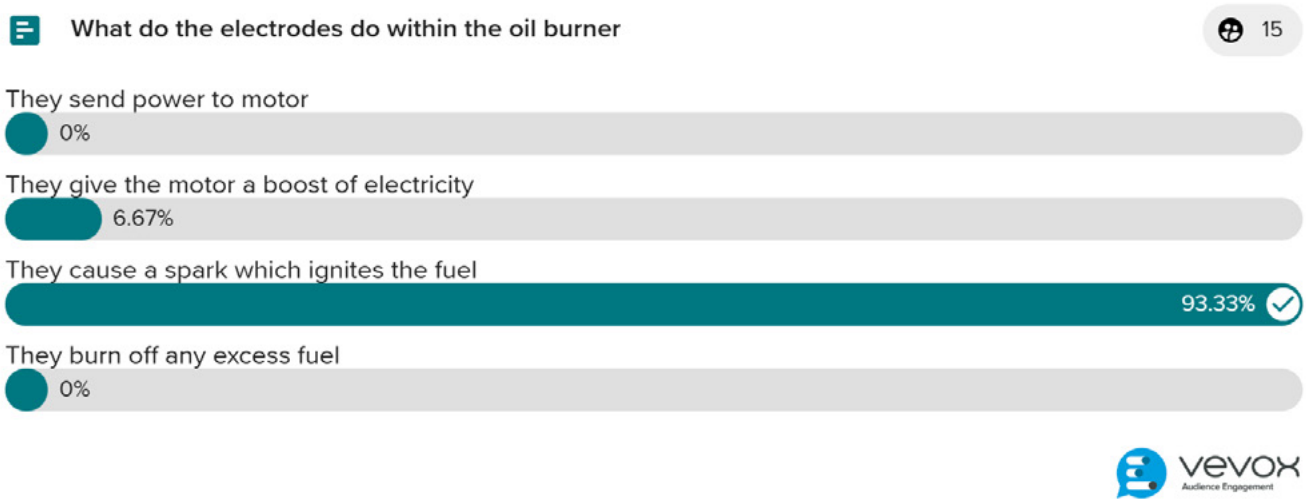

Figure 2: Cycle 1 Vevox Poll result (text-based MCQ question)

In Cycle 2, these suggestions guided the redesign. Vevox activities were moved to the start of class, written questions were introduced, and one visual prompt was added. Students found that written responses required deeper thinking, while visuals helped trigger memory, consistent with evidence that multimodal materials support cognitive processing and recall (Mayer, 2009). Students requested a wider variety of questions and access to the questions for revision.

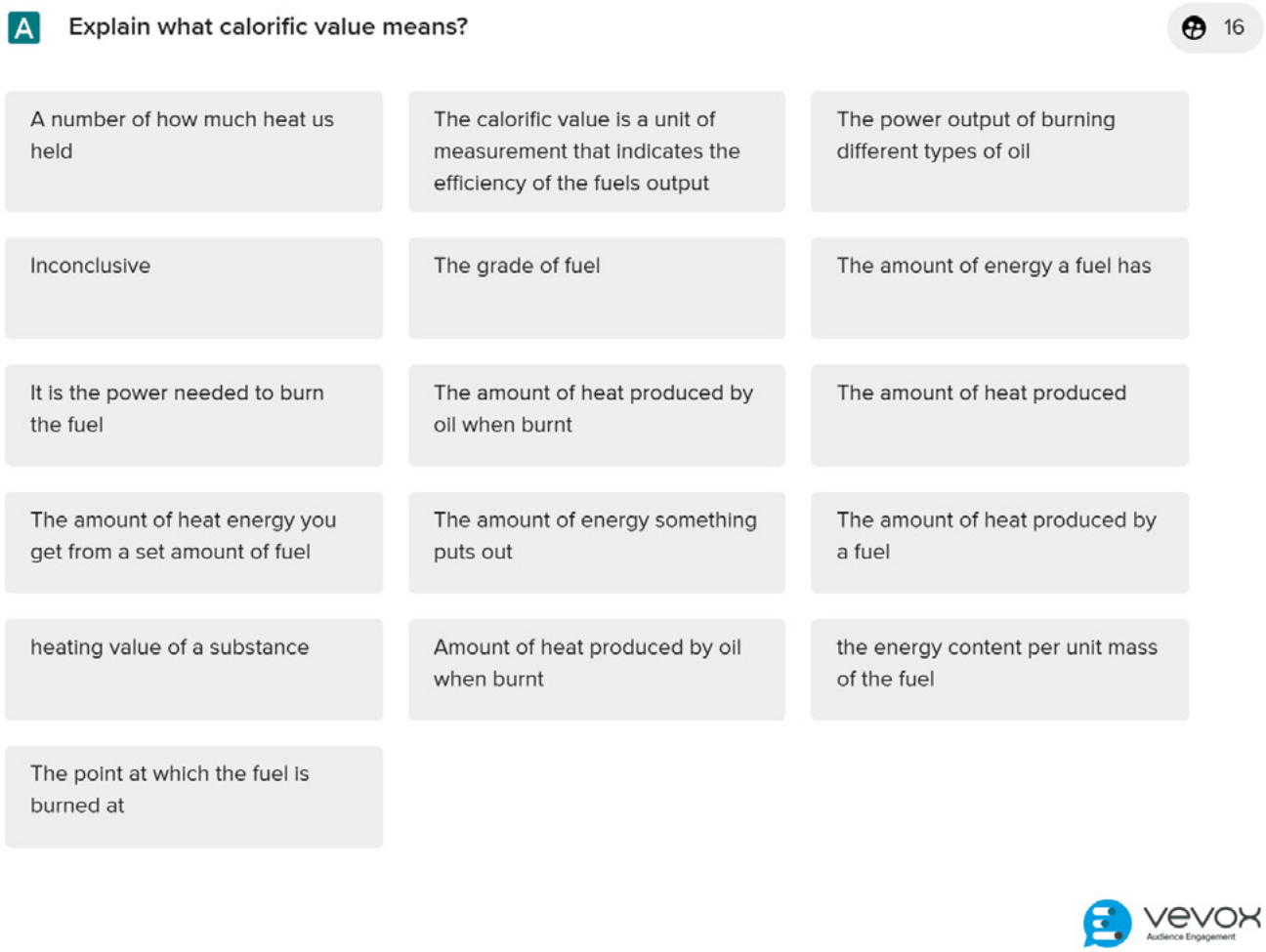

Figure 3: Cycle 2 Vevox Poll result (open text question)

In Cycle 3, all refinements were incorporated: visuals, written responses, challenging multiple-choice questions, and a fully mixed-format design. This cycle produced the strongest engagement, focus, and learner satisfaction. Students recognised that the design changes were a direct response to their feedback, which increased their ownership and motivation, a dynamic noted in CRS literature emphasising the motivational impact of responsive instructional design (Kay & LeSage, 2009).

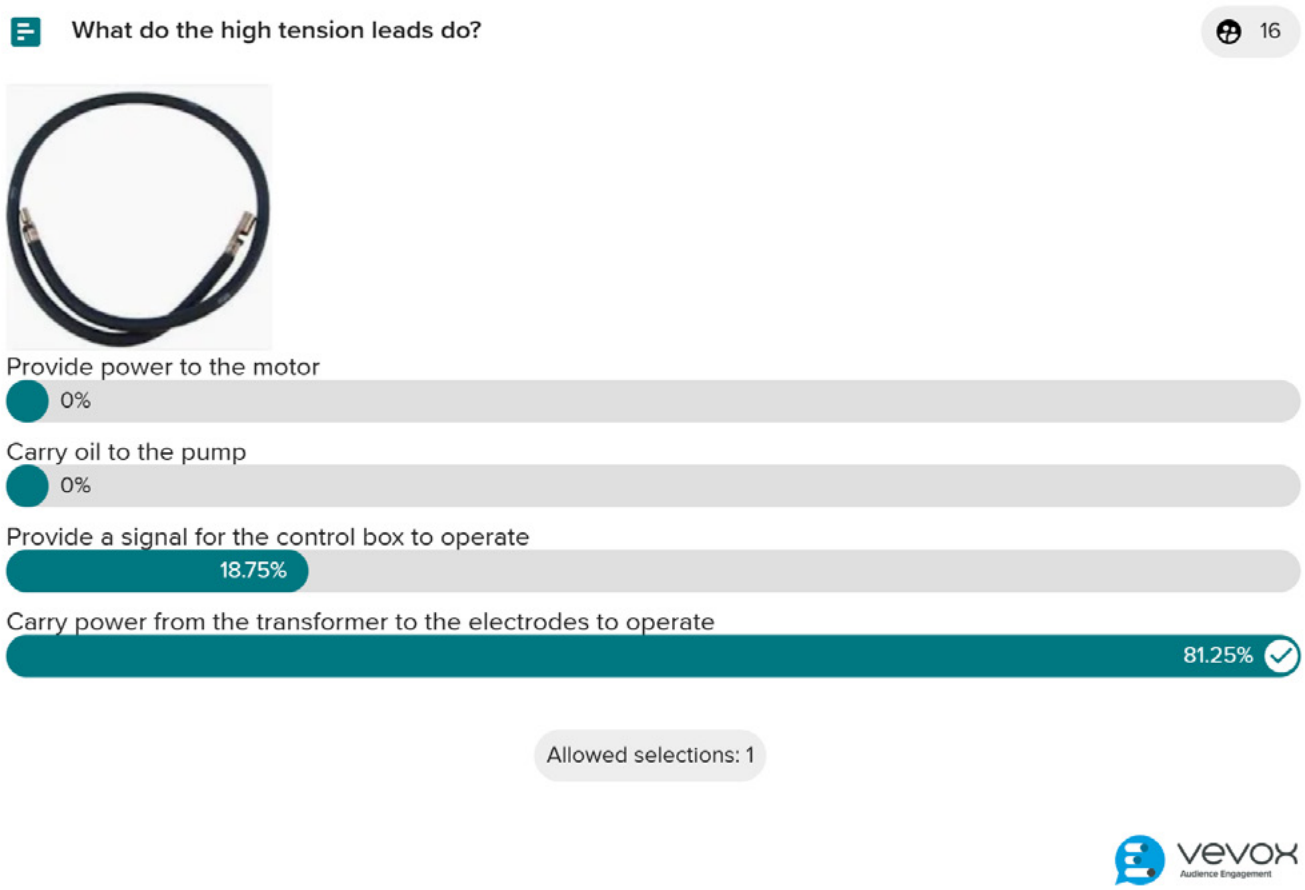

Figure 4: Cycle 3 Vevox Poll result (text-and image-based MCQ question)

Data from all cycles were analysed using a three-stage thematic analysis (initial coding, focused coding, and theme development) following a structured, rigorous process to ensure findings were grounded in apprentices' voices (Braun & Clarke, 2006). This approach helped capture how engagement evolved over time and highlighted the teaching design decisions that had the greatest impact.

Across the three cycles, apprentices increasingly valued Vevox as a tool for reviewing and reinforcing theory content. They emphasised that using CRS questions at the start of class, which were on a topic from the previous week, created a more honest test of what they truly remembered. Delayed questioning provided a more accurate picture of retention, consistent with formative assessment research showing that timing influences the quality of feedback and reflection (Hattie & Timperley, 2007).

Students also reported that Vevox made theory learning more inclusive. Quieter apprentices or those anxious about getting answers wrong felt more comfortable participating because the system protected them from embarrassment, mirroring findings that anonymity can increase participation in technology-enhanced learning environments (Kay & LeSage, 2009). At the same time, some students felt that seeing scores could motivate them, revealing a natural tension between anonymity and accountability.

The introduction of written responses and visual prompts in Cycle 2 significantly improved cognitive engagement. Students explained that written questions encouraged deeper thinking and that visuals triggered recall, again echoing principles of multimedia learning theory (Mayer, 2009). These benefits became even more pronounced in Cycle 3 when all formats were blended.

Cycle 3 produced the highest levels of engagement, confidence, and accuracy. Students reported that "there was something for everybody," noting that the variety of question types supported different learning preferences. One apprentice with dyslexia noted that using visuals and typing responses with spell-check made learning more accessible and less stressful, reinforcing the value of inclusive learning design (Fuller & Unwin, 2003).

Overall, the findings showed a clear progression:

Cycle 1:	Familiarisation, positive reactions, and desire for more challenge
Cycle 2:	Deeper thinking, visual support, increased motivation
Cycle 3:	High engagement, inclusivity, stronger retention, and students recognising their role in shaping the process

The iterative action research design allowed engagement to grow organically as students' insights were continuously incorporated into each new cycle (McNiff & Whitehead, 2011).

Key Outputs and Future Opportunities

This project demonstrated that even small, thoughtful design decisions, such as when CRS questions are asked, the inclusion of visuals, or the choice of question types, can significantly influence how apprentices engage with theory learning. When used responsively, Vevox becomes more than just an engagement tool; it creates opportunities for active participation, immediate feedback, and meaningful reflection (Black & Wiliam, 1998).

Future work could extend this research by examining long-term retention, exploring whether CRS use impacts exam performance over time, or comparing results across different trades or disciplines. A larger, longitudinal study could also examine how CRS tools influence confidence, digital literacy, and self-regulated learning among apprentices.

CRS could be explored in other apprenticeship programmes to determine whether similar engagement benefits are observed in electrical, carpentry, and motor mechanics. Comparing different CRS platforms could be used to evaluate whether tool design (e.g., Kahoot, Vevox) influences engagement differently.

Student Perspective – Primary Impact of the Project

At the beginning of the project, student engagement with Vevox was slow, but this changed quickly as apprentices became more involved in both the activities and the design of the learning process itself. Because students were asked for feedback at every cycle and could see their suggestions implemented two weeks later, their ownership, motivation, and confidence grew steadily.

Students reported that Vevox helped them remember information more effectively, reduced the pressure of speaking out loud, and made theory classes feel more active and relevant. Many noted that the increasing variety of question types helped them stay focused, while the addition of visuals and written responses supported different learning needs. By the final cycle, students described the sessions as more inclusive, more engaging, and more reflective of how they learn.

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22. Using Inspiration Mind Mapping Software to Support Academic Integrity and Promote Active Learning and Engagement

Elaine Kelly
Disability Support Services

Project Lead, Partners and Participants

- Project lead - Elaine Kelly (TUS).
- Partners - Lisa Hanlon, Broze O'Donovan, Dr Chris McDermott, Mary Mulrooney and Peter Chen (TUS).

Alignment with United Nations Sustainable Development Goals

The project has the potential to promote sustainable, high-quality education. By embedding Inspiration software into teaching and learning practices, it supports the development of digital capabilities that could continue beyond the funded period. Project outputs may be shared as Open Educational Resources (OERs) created using Pressbooks, ensuring ongoing access for both staff and students. Long-term sustainability could be further strengthened through integration into programme design, continued cross-campus collaboration, and potential support from TUS CORE funding.

Key Aims

- To provide all TUS students with access to Inspiration Mind Mapping Software.
- To pilot and evaluate its use in Social Care and Disability Support contexts.
- To gather student feedback to assess its educational impact.
- To create an accessible Open Educational Resource (OER) resource using Pressbook.
- To promote digital competence, inclusivity, and academic integrity across TUS.

Primary Focus of the Project

This initiative explores integrating Inspiration Mind Mapping Software to promote academic integrity, digital transformation, and inclusive learning across TUS. The initiative provides students with a digital platform to visually organise their thoughts, structure ideas, and evidence their learning in ways that align with active and process-based pedagogies. By making the stages of thinking visible, the software supports a more authentic and transparent approach to demonstrating learning progress and achievement.

Working collaboratively with students in Applied Social Care and Disability Support Services, the project pilots mind mapping as a tool to enhance comprehension, engagement, and digital literacy. Students are encouraged to use the software to brainstorm, connect concepts, and present their understanding in dynamic and meaningful ways. The visual and interactive features of Inspiration cater to diverse learning preferences, particularly benefitting visual and kinaesthetic learners, while also fostering creativity, problem-solving, and peer collaboration.

The project is closely aligned with the TUS Learning and Teaching Strategy (2022–2025), particularly Pillar 1 (Pedagogies of Engagement) and Pillar 5 (Technological Innovation and Digital Creativity), as well as the principles of Universal Design for Learning (UDL). These frameworks emphasise flexibility, inclusivity, and digital competence as core to modern higher education. The initiative also responds to current challenges posed by generative AI by shifting emphasis from outcomes to learning processes, thereby strengthening academic integrity through visible evidence of students' independent thinking and idea development.

Student feedback provides valuable insights into how digital tools can be meaningfully embedded into teaching and assessment practices. The project highlights the potential of visual learning technologies to transform curriculum design, enhance learner engagement, and build digital capabilities that extend beyond the classroom, supporting TUS's commitment to innovation, inclusion, and lifelong learning.

Project Description

This initiative explores integrating Inspiration Mind Mapping Software to promote academic integrity, digital transformation, and inclusive learning across TUS. The initiative provides students with a digital platform to visually organise their thoughts, structure ideas, and evidence their learning in ways that align with active and process-based pedagogies. By making the stages of thinking visible, the software supports a more authentic and transparent approach to demonstrating learning progress and achievement.

In addition, recent advances in generative AI have intensified the need to evidence learning processes rather than just outcomes. This initiative responds to current challenges posed by generative AI by shifting emphasis from outcomes to learning processes, thereby strengthening academic integrity through visible evidence of students' independent thinking and idea development. By exploring how digital mind mapping can make student thinking visible, it enables lecturers to track idea development and ensure authenticity in assessment.

Along with direct support, a wealth of supplementary resources is available through the Inspiration website, including Inspiration Explanation Videos, detailed How-To Videos, and a comprehensive Help Manual. These materials provide step-by-step guidance and practical examples, allowing



students to explore the software independently and revisit specific features as needed. Together, these resources ensure that learners at all levels can develop confidence in using Inspiration effectively.

Key Outputs and Future Opportunities

Students reported increased clarity in organising ideas, stronger engagement, and greater confidence using digital tools for learning. The visual approach helped diverse learners process information effectively and articulate their understanding. The project highlights the potential of visual learning technologies to transform curriculum design, enhance learner engagement, and build digital capabilities that extend beyond the classroom, supporting TUS's commitment to innovation, inclusion, and lifelong learning.

Student Perspective – Primary Impact of the Project

Student feedback provides valuable insights into how digital tools can be meaningfully embedded into teaching and assessment practices. Data is collected through surveys and focus groups with participating students to evaluate the usability of Inspiration software, levels of engagement, and the perceived benefits for learning and academic integrity. This approach provides valuable qualitative and quantitative insights into how digital tools can enhance active learning and inclusivity. The findings will inform the development of an accessible OER created using the Pressbooks platform. By publishing the OER within the TUS community, the project aims to share good practice, encourage wider adoption of digital tools, and support staff in embedding educational technology effectively. Ultimately, these outputs contribute to building a digitally confident learning community that empowers both students and educators.


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23. Design Heuristics for integrating digital capabilities into undergraduate design education

Eoin Heffernan
Department of Midlands Media and Design

Project Lead, Partners and Participants

- Project lead - Eoin Heffernan (TUS).
- Partners - Department of Midlands Media and Design (TUS).

Key Aims

To cultivate not only digital skills but also a digital presence: the learner's ability to engage their tools and environment with situational fluency and awareness, incorporating physical and digital media as context demands.

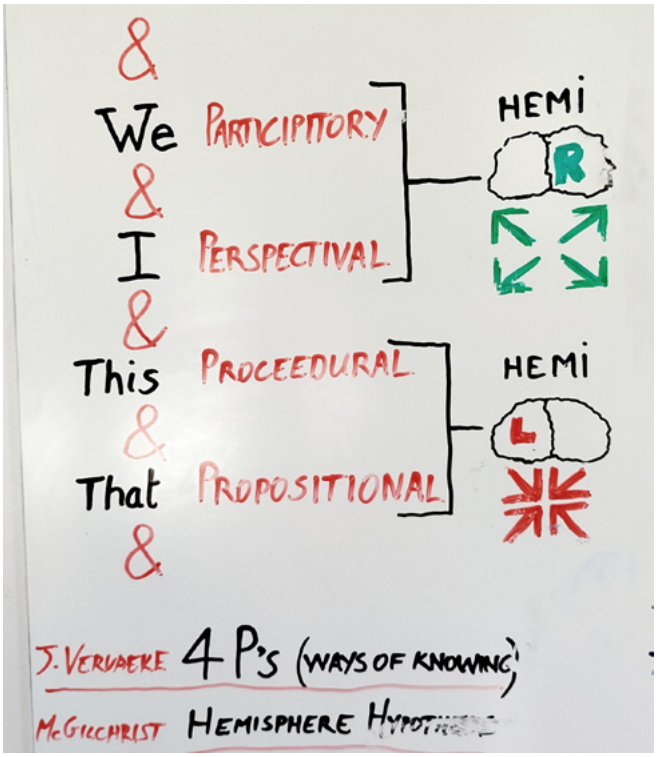

Figure 1: 4 P verbs (Ways of Knowing)

Project Description

In an educational era defined by rapid digital transformation, we see a need to integrate digital capabilities into creative curricula, beyond tool acquisition, to address learners' cognitive posture and epistemic confidence.

Graphic Design exists at the interface between a need to communicate meaning and the technologies available to facilitate. The evolving interactions between design problem-solvers and their technological aptitude, as we see in studio practice, characterise the design studio component of a design programme. The design studio functions as an embodied problem space that the learner uses while they navigate toward design solutions. Within the B.A. (Hons.) in Graphic and Digital Design at TUS Athlone, a three-year studio practice module strand has been developed to weave digital capability into the student journey using heuristic-based, process-light methodologies.

This article presents a model that combines the clarity of simple behavioural heuristics with the depth of established epistemological theories. It aligns with the Joint Information Systems Committee (JISC) Digital Capabilities Framework (2024) and integrates insights from McGilchrist's (2009) hemisphere hypothesis and Vervaeke's model of knowing (Vervaeke & Ferraro, 2013). The goal is to cultivate not only digital skills but also digital presence: the learner's ability to engage with their tools and environment with situational fluency and awareness, incorporating physical and digital media as context demands.

Primary Focus of the Project

This project presents a cognitively streamlined, studio-based model for integrating digital capabilities into undergraduate design education, grounded in pedagogical theory. The approach reconfigures design thinking as a light, repeatable heuristic process to reduce cognitive load and enhance learner presence. It outlines a visual and verbal framework, structured around simple verbs and the ampersand symbol, to support learner fluency across digital practices and mindsets.

Key Outputs and Future Opportunities

Digital learning and development are supported through reflective activities, critique structures, and metacognitive framing. At this stage, learners engage in epistemic exploration (driven by analysis of the project brief) in both visual and informational modes, using desk and experiential research methods.

Digital creation and problem-solving are cultivated through iterative design tasks and a balance of divergent and convergent thinking. Throughout the module suite, learners engage in defining their professional self-awareness and in effectively communicating their talent and value. This requires the learner to engage with an array of digital software and platforms/communities throughout the module suite curriculum, such as Adobe Creative apps and social platforms like Instagram, LinkedIn, and Pinterest.

Digital identity and well-being are addressed through heuristic simplification, process confidence, and awareness of cognitive posture. This is fully aligned with the above 'digital creation & problem-solving' aspect as central to the identity of a digitally capable creative, but to maintain a balance between the left-hemisphere dominated aspects of creating (things) and solving (identified problems) and

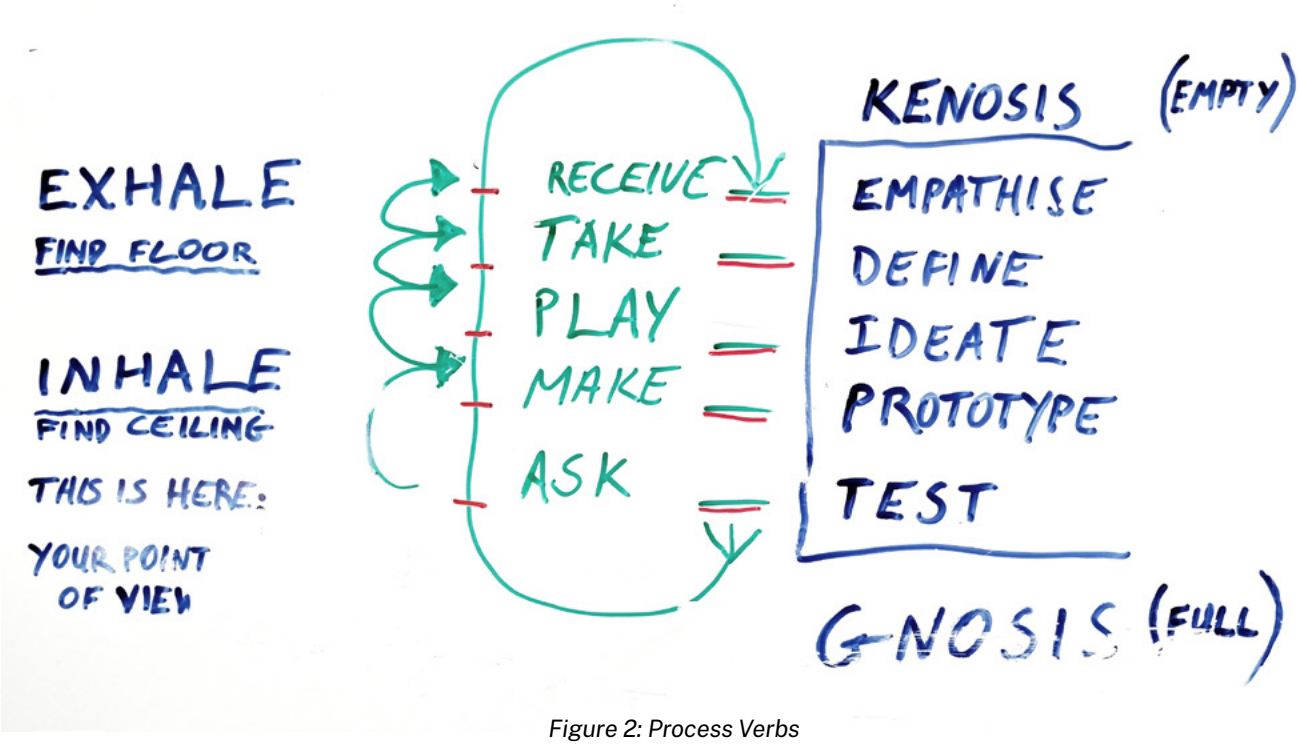

Figure 2: Process Verbs

the right-hemisphere aspects of experiencing, relating to what presents in-process so that the learner might better meta-cognise toward clarity and creative perspectives that emerge. This more attitudinal component is emerging as more relevant to Artificial Intelligence (AI) use as learners engage with generative AI and need to maintain and document their authoritative agency and presence in any aspect of agentic AI inclusion in their creative process.

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24. Humanising the Digital: Realising SDG 4 through Educators' Digital Competence and a Technology-Enabled Pedagogy of Care

Dr Jude Lohan
Department of Lifelong Learning

Project Lead, Partners and Participants

- Dr Jude Lohan (TUS).

Alignment with United Nations Sustainable Development Goals

The initiative is closely aligned with Sustainable Development Goal (SDG) 4: Quality Education. It promotes sustainable, inclusive and equitable digital teaching methodologies by integrating relational pedagogies into digital contexts. The integration of educators' digital competencies is positioned not only as a technical skillset but also as a humanising force that sustains quality education in diverse online settings.

Key Aims

- This initiative is grounded in the findings of a master's research study titled "Enhancing the Student Online Learning Experience: Exploring the Efficacy of a Pedagogy of Care".
- The research highlights the centrality of the Pedagogy of Care (PAC) in online higher education and establishes that its effective delivery is inseparable from the educator's digital competence.

Project Description

The study employed a qualitative methodology, drawing on data from five student focus groups and 12 educator questionnaires. A thematic analysis was conducted to ensure the findings were meaningfully grounded in the lived experiences of both stakeholder groups. This grounding in the voices of both educators and students not only informed the study's conclusions but also strengthened their applicability to real-world online learning environments. It highlights how the convergence of care-based pedagogical intent and digital know-how creates a meaningful, inclusive, and sustainable learning environment.

Key Outputs and Future Opportunities

Care and Digital Competencies: A Combined Approach	• The students frequently emphasised that their sense of care, connection and engagement within online programmes was influenced by how and to what extent educators employed digital tools to facilitate relational teaching. • Technology, when deployed in tandem with empathy, becomes a conduit for relational care. • The educator's digital competence facilitated consistent, adaptive, and individualised interactions that are essential for learning.



Student Perspective – Primary Impact of the Project

Consistent digital communication:	Predictability and stability were fostered through timely and structured weekly communications. Standardised Moodle layouts, short-recorded messages, and clear signposting support both individual navigation and shared understanding of the course, reinforcing a cohesive and supportive learning experience.
Personalised engagement:	The use of tailored video and audio feedback, combined with one-to-one interactions, helped students feel seen and supported. For example, educators recorded short videos and audio responses to individual assignments, using individual students' names and offering emotionally supportive comments.
Interactive collaboration tools:	Tools like Padlet, discussion forums, and formative quizzes encourage active participation and peer learning. These platforms provided students with a low-pressure space to exchange ideas, reflect on content, and assess their progress, thereby strengthening both engagement and the classroom community.
Mental health and support signposting:	Student wellbeing was embedded as a core value throughout the module. Weekly Moodle reminders directed students to a range of supports, from counselling and mental health services to academic and disability supports, making care a visible and routine part of the learning environment. These regular prompts went beyond basic information-sharing; they actively encouraged help-seeking and normalised conversations around mental health. It also reflected a wider message underpinning the module: emotional well-being is an essential part of learning, and that care and connection matter just as much as academic content.
Trust and presence:	A consistent and emotionally responsive educator presence helped to build trust and reduce feelings of isolation. Through timely communication, personalised feedback, and informal check-ins, students felt that their educators were genuinely available and attentive. Rather than treating online education as a purely transactional exchange, this approach created space for relational trust to grow. As a result, students felt more confident participating, asking for help, and acknowledging when they were struggling, all of which are hallmarks of a learning environment where care is not only felt but actively practised.

The uniformity of educator-led digital competencies across all modules within the department proved to be a significant facilitator and indicator of relational pedagogy. The students noted that the consistent application of digital methods brought cohesiveness and clarity to the online learning experience. This consistency of application not only strengthened the emphasis on teaching and learning but also facilitated the development of pedagogical care, thereby enhancing students' sense of belonging and community throughout the modules. Within the Studio Practice modules, digital capability is fostered by developing adaptive, situated engagement with digital environments and media. Across the three-year strand:

Digital Learning and Development:	Organised digital materials, prompt feedback, and self-directed learning tools were identified as enhancing student engagement and reflective practice. These components promoted students' ongoing development and fostered a self-directed approach to digital learning.
Digital Identity and Wellbeing:	Students emphasised that the digital behaviour and tone shown by educators significantly influenced their academic digital identity. This modelling fostered students' confidence, professionalism, and emotional stability in online environments.
Digital Communication, Collaboration, and Participation:	A strong and caring digital presence by educators facilitated meaningful interaction and trust with students, strengthening a friendly online learning community. These relationship characteristics were important in fostering collaboration and active student engagement.

Digital Competence and Efficiency:	The efficient and consistent use of digital platforms, such as Moodle and Microsoft Teams, facilitated a seamless, cohesive, and accessible learning experience. This efficiency in digital communications reduced students' cognitive burden and improved their performance.
Digital Creation, Problem-Solving, and Innovation:	Incorporating creative and problem-solving tasks into digital environments enabled educators to nurture students' autonomy and critical thinking. These methods, when aligned with innovation-driven pedagogies, facilitated learners' exploration and meaningful engagement with information.
Information, Data and Media Literacies:	Several findings highlighted the need for increased support in accessing and evaluating digital content, particularly in terms of ethical data use and academic integrity in online environments.
Inclusive Learning Environments:	Learning design that prioritises emotional wellness, clarity, and engagement plays a key role in promoting equal access and participation, which are core aims of the Sustainable Development Goals (SDGs), particularly SDG 4. This emphasis on structured, emotionally supportive, and accessible digital environments has been especially beneficial for neurodiverse students, who have reported feeling more secure and better able to engage in learning when clear routines and predictable formats are in place.
Sustainable Digital Pedagogy:	Integrating a Pedagogy of Care (PAC) into professional development is a method integral to achieving sustainable transformation in digital teaching practices, encouraging ongoing cultural change rather than merely temporary solutions.
Improved Institutional Infrastructure:	Robust and resilient IT systems are crucial for delivering care-oriented teaching methods, particularly during periods of high demand. This infrastructure supports every aspect of sustainable, inclusive digital education.

The combined effect of care and digital fluency shaped students' perceptions of educators' effectiveness, academic confidence, and personal connection to learning. Educators who communicated trust and provided structure using digital tools significantly improved students' emotional well-being and persistence in online education. In survey responses, over 80% of students described their educators' digital presence as "supportive" or "very supportive," and 76% reported increased confidence in navigating their online programmes. The study shows that digital competence is not merely technical — it is a critical enabler of pedagogical care.

By combining emotional intelligence with digital skills, educators can deliver transformative learning experiences that foster students' growth and development. This synergy ensures that students are supported not only cognitively but also emotionally and socially, which is vital for inclusive, equitable, and effective online education. While new challenges inevitably arise throughout the evolving landscape of online teaching and learning, such as advances in technology and emerging digital practices, the provision of strategic and consistent professional development, combined with a robust continuum of digital support, has enabled staff to build confidence, adapt effectively and maintain high levels of digital competency across the teaching team. While this approach is firmly grounded in Noddings' (2015) ethics of care, future iterations of this pedagogical model may benefit from further integrating complementary frameworks such as Universal Design for Learning (UDL) or the Community of Inquiry model to broaden its relevance and applicability across diverse digital learning environments.

Embedding digital care practices into educators' training and ongoing professional development.

Integrating relational pedagogy into curriculum design through digital channels.

Establishing systemic structures and institutional policies that ensure technology and care can co-exist meaningfully and sustainably. Future iterations of this initiative should provide greater support for developing students' digital literacy skills.

References

Noddings, N. (2015). Care ethics and 'caring' organizations, in D. Engster & M. Hamington (eds.), *Care ethics and political theory* (pp. 72–84). Oxford: Oxford University Press.

25. Using Accessible Virtual Reality for Interdisciplinary Teaching, Learning and Collaboration

Dr Martina Cleary
Department of Fine Art and Education

Project Lead, Partners and Participants

- Project Lead - Dr Martina Cleary (TUS).
- Participants - Dr Aislinn O'Keeffe, Dr Sarah O'Toole, Lorraine Neeson, Annette Bowman (TUS) and students from Year 4 B.A. (Hons.) Photography & Moving Image (2021) and Year 3 B.A. (Hons.) Painting (2023).

Alignment with United Nations Sustainable Development Goals

Goals 4 'Quality Education' and 9 'Industry Innovation and Infrastructure'.

Key Aims

- To explore the potential and use of Virtual Reality (VR) to enhance the teaching and learning experience for students engaged in fine arts studio-based learning during the COVID pandemic, when traditional real-world learning and dissemination spaces were unavailable.
- To test the accessibility and ease of use of this technology for Fine Art students and lecturers not trained in computer programming.
- To build bridges to industry partners and offer authentic professional development opportunities for students.
- To integrate a range of online digital platforms into the learning experience, to ensure regular module aims and outcomes could be met, using digital enhancements when real-world opportunities were inaccessible.

Project Description

In the Creative Arts, where studio and materials-based learning have traditionally been the foundation of the student experience, the COVID-19 pandemic brought many unprecedented challenges for educators. Internationally, Fine Arts programmes responded by quickly adopting a variety of web-based solutions to present alternatives to the end-of-year Degree Showcase. A sudden demand for accessible, user-friendly, technologically enhanced solutions accelerated the emergence of a new presence in cultural production. Since 2020, Virtual Galleries, events, and marketplaces have become a growing reality, presenting new challenges and opportunities for practitioners and educators alike. In 2021, Facebook also relaunched as Meta, with the expanding Metaverse as a new space for the production of technologically driven creative practices. This SATLE-funded initiative explored the use of VR in Fine Arts Education, initially as a crisis response during the pandemic and later as an approach to extend the realisation of studio practice. This article for the compendium will present a case study of working with Year 4 students on the Photography Moving Image programme in the Department of Fine Art at Limerick School of Art and Design (LSAD)/ TUS during COVID, to realise and present their final year project in VR. This included integrating immersive technology and online platforms in the final semester to facilitate the realisation of module learning objectives and outcomes. This initiative inspired a follow-on project with students on the Fine Art Painting programme to explore the use, relevance and potential of VR to extend studio practice in the post-COVID context. This article will discuss the use and potential of VR to enhance the teaching and learning experience, informed by this research.

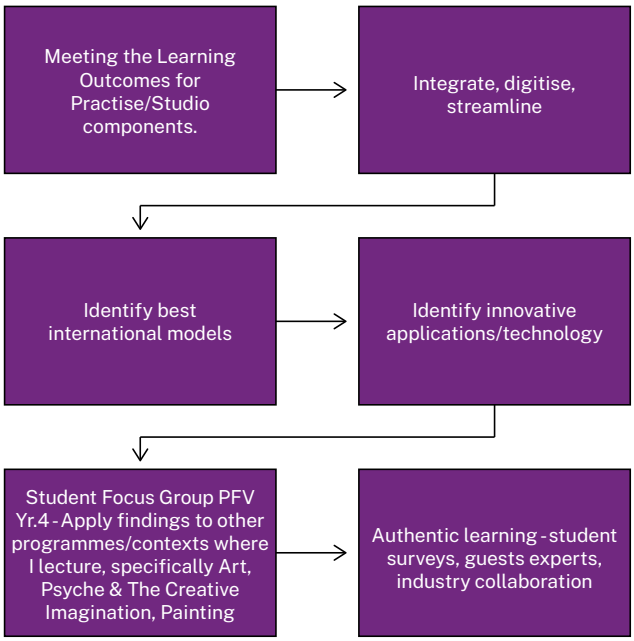

Figure 1: Project phases

This initiative involved redesigning certain module content during the Spring semester of 2021 to enable students to engage with learning experiences associated with the final year project during the COVID lockdown. Traditionally, this would involve preparing studio-based learning outcomes for presentation in a public art exhibition. Associated learning tasks include group work and collaboration, outreach to industry experts/curators, technical installation of a professional show, fundraising, catalogue production, PR and marketing. An alternative to the flat online teaching and learning experience using Zoom had to be found to keep students engaged while ensuring they had the opportunity, by digital means, to realise all of the above.



Figure 2: Participants

The methodologies included the use of :

- Student-led research into the use of VR and immersive technologies to showcase Degree Shows during the pandemic.
- Student surveys to identify relevant digital platforms and means to design an exhibition experience.
- Authentic collaboration with a local SME as an industry partner, including the use of a digital 3D twin of the model of the Moylish campus produced by a previous SATLE project in the Department of the Built Environment.
- Testing and use of integrated online platforms to simulate digitally real-world learning aims and outcomes.
- Development of findings from this first initiative to test the use of accessible VR platforms with a follow-on group, for viability, ease of use, relevance and learning potential.

Key Outputs and Future Opportunities

Enhancement of the teaching and learning experience and sustained engagement during COVID. Demonstration of the potential of immersive technologies to enhance studio practice, particularly when studio space isn't available. In the follow-on project, the use of immersive technology proved valuable for virtually testing exhibition and work-realisation ideas, visually thinking, learning, planning, and accelerating real-world studio outcomes.



Figure 3: A virtual exhibition space

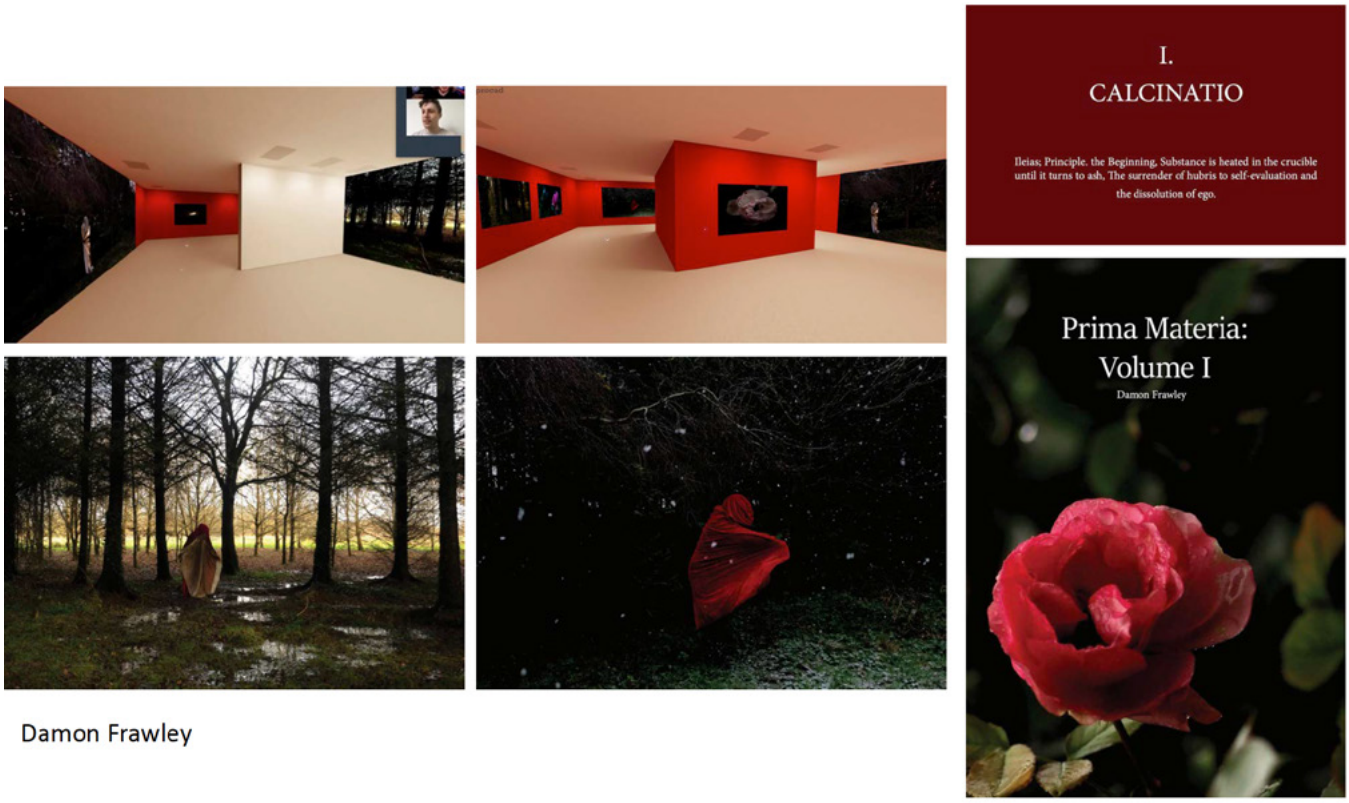

Figure 4: Prima Materia: Volume 1 by Damon Frawley

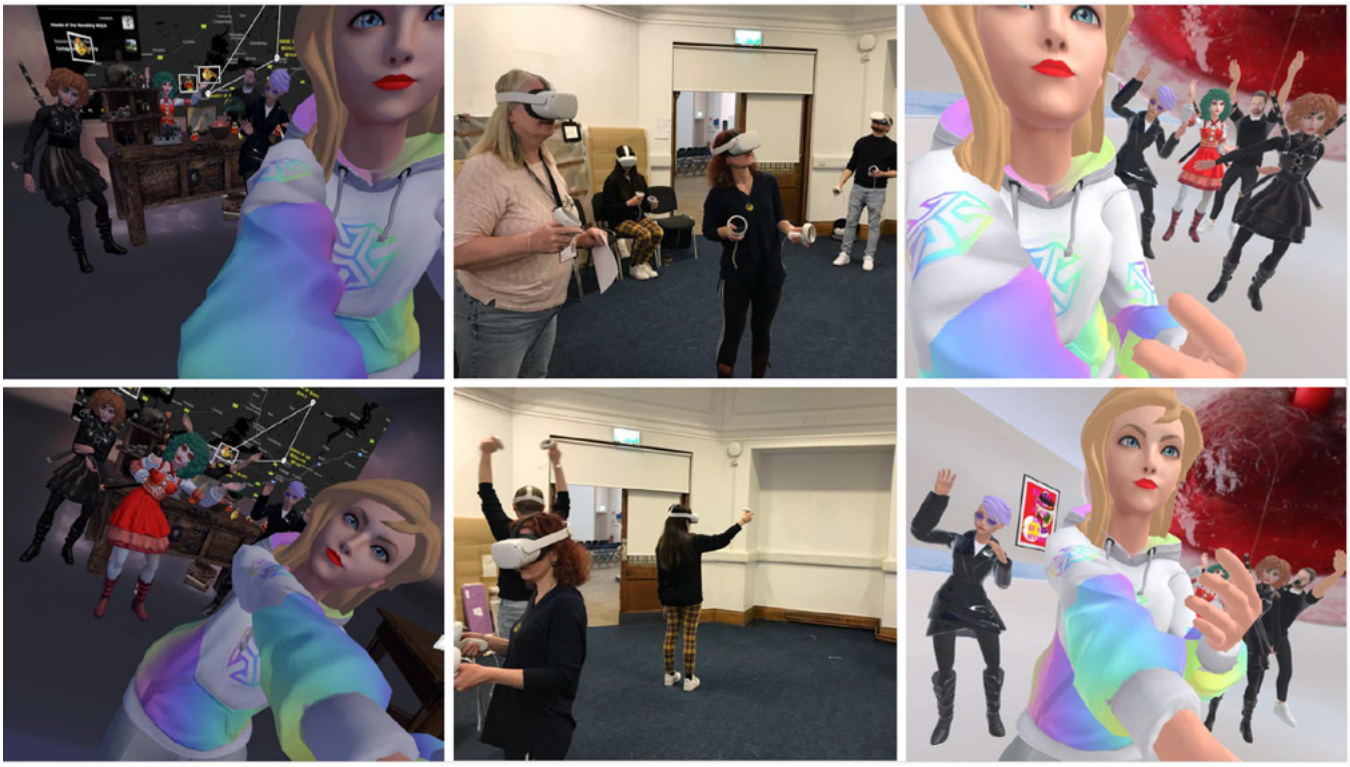

Figure 5: Using Virtual Reality to enhance studio learning



Section 4

Digital Communication, Collaboration and Participation

Digital communication, collaboration, and participation are essential capabilities for effective engagement in contemporary academic, professional, and civic environments. These skills enable learners to communicate clearly and ethically, work productively in digital teams and participate actively in online communities and networks across local, national, and global contexts.

This section explores how teaching, learning, and assessment practices at TUS are supporting the development of digitally mediated communication and collaborative skills across disciplines. It highlights innovative approaches that promote teamwork, peer learning, online discussion, virtual project work, and co-creation of knowledge using digital platforms and tools. Through structured collaboration, reflective practice, and authentic communication tasks, students are encouraged to develop confidence, professionalism, and intercultural awareness in digital spaces.

These initiatives contribute to inclusive learning communities, enhanced student engagement, and stronger partnerships within and beyond the University. By embedding digital communication and collaboration within the curriculum, TUS supports the development of graduates who are socially connected, digitally fluent, and equipped to participate responsibly and effectively in an increasingly networked world.

26. Improving Access to Higher Education through Digital Induction Strategies

Anna Murphy
Access Service

Project Lead, Partners and Participants

- Project lead – Anna Murphy (TUS).
- Partners – Dr Carolann Bargary and Nathan O'Connor (TUS).
- Student Partners - Richard Butler, David Doherty and Christina Haugh, BA (Hons.) Social Care Work, Sandra Miller, BBus (Hons.) Accounting and Finance, Donna Hogan, BA (Hons.) Community and Addiction Studies (TUS).



Figure 1: Promotional literature on the programme

Alignment with United Nations Sustainable Development Goals

The TUS *Certificate in Transition to Higher Education* programme and the digital resources developed through this initiative closely align with several SDGs, particularly SDG 4 - Quality Education, SDG 10 – Reduced Inequalities, and SDG 17 - Partnerships for the Goals, by promoting equitable and inclusive education opportunities. The programme is a concrete example of how an educational initiative can directly contribute to achieving these key SDGs, particularly in the areas of quality education, reduced inequalities, and partnerships.

This programme addresses SDG 4.5 by providing a pathway to higher education for individuals from underrepresented backgrounds, including mature students, people with disabilities/specific learning difficulties, Irish Travellers, and those from socio-economic groups experiencing educational, economic, and social disadvantage.

Key Aims

The 'Improving Access to Higher Education through Digital Induction Strategies' aims:

- To create relevant and accessible digital resources that will support the promotion of the programme within communities that experience marginalisation and educational disadvantage.
- To make Higher Education more accessible by providing students, especially those from underrepresented or non-traditional backgrounds, with the information, guidance, and support they need to transition successfully into university life.
- To positively impact the student experience and retention of students who undertake the Certificate in Transition to Higher Education programme.

Project Description

Partnership and strong bi-directional relationships (Bronfenbrenner, 1979) are at the core of this digital initiative and have been a fundamental component of the programme's success to date. Aligning with SDG 17, the *Certificate in Transition to Education* programme is underpinned by a strong ethos of partnership. The establishment of the programme in 2017 was the result of a collective effort between the Department of Flexible and Professional Learning and the Access Service. This programme aims to provide education opportunities for adults living in areas of severe economic disadvantage in Limerick, particularly in regeneration areas. The Review of the Limerick Regeneration Implementation Plan (RLRFIP) outlined the stark reality that existed in Limerick's regeneration areas. The RLRFIP highlighted that "A key contributing factor to supporting economic development is educational attainment. Early school leaving rates are particularly high in the regeneration areas, with the proportion of the population who left school with just a primary education between two and three times higher than the national average" (RLRFIP, p.7).

At the core of this educational offering, robust collaborations with students, education partners, communities, families, and funding bodies are an integral component of the programme strategy. By promoting and providing accessible pathways for underrepresented groups, the programme aligns with SDG 10.2 and SDG 17 - Partnerships for the Goals.



Figure 2: Promoting TUS Access with Vice President Student Education and Experience Frances O'Connell.

The Improving Access to Higher Education through Digital Induction Strategies initiative focused on collaboration between members of the Certificate in Transition to Higher Education academic team and programme graduates to improve programme design by developing community resources and digital induction tools. The students identified key resources to enhance the programme's promotion, support, and induction. Consequently, a suite of resources was developed with support from the National Technological University.

Transformation for Recovery and Resilience (N-TUTORR). Significant results included:	• Short videos featuring programme graduates sharing their experiences • Student Ambassador Programme • Audio-Visual resource - Demystifying the Language of Higher Education. • E-booklet of Student Stories • *Certificate in Transition to Higher Education* Showcase Event

Key Outputs and Future Opportunities

- A redesigned induction programme through the creation of a suite of audio/visual resources.
- Sharing of learnings through presentations at numerous national and international conferences, such as the European Access Network, Student Affairs Ireland, and two N-TUTORR Showcases.
- In March 2025, the *Certificate in Transition to Higher Education* programme was selected as the overall winner of the AONTAS STAR Award in the Third-level Access and Engagement category for making an outstanding contribution to adult learning.
- Continuing to work with the Department of Flexible and Professional Learning to develop module-specific digital resources.
- Investigating research opportunities with students and community partners to further explore digital enhancement possibilities.

Student Perspective – Primary Impact of the Project

- Students have shared their views outlining that if they had received an opportunity to benefit from video clips from role models who had undertaken the higher education journey, it would have significantly eased their concerns about their ability to succeed.
- Students noted that future participants will have a more informed understanding of the Transitions programme through the lens of a peer who may have experienced similar challenges.
- Students have identified that their participation in this digital initiative aided the development of personal and professional skills and increased confidence.
- Students were actively involved in the design and production of the digital resources, creating an environment of collaboration and engagement.

The project team have also identified the wider-reaching impacts of this programme. Anecdotally, we have evidence of the "hidden footprint" within families and communities that this programme enables, with reference to the importance of lifelong learning and the overall journey of learning and education. In addition, participation in this digital initiative by students reflects TUS's commitment to preparing graduates to contribute to "communities and society in which they live, work, and learn" (Technological University of the Shannon, 2022, p.2). Graduate student and community partner testimonials attest to the importance of providing such a programme to communities and individuals who previously have had little or no opportunities to progress to higher education.



Figure 3: Receiving the Aontas Star Award

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Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Limerick City and County Council. (2016). Review of the Limerick Regeneration Framework Implementation Plan. https://www.limerick.ie/sites/default/files/limerick_regeneration_framework_implementation_plan_review.pdf.

Technological University of the Shannon (2022). Graduate Attributes Framework. Available at: https://tus.ie/app/uploads/AcademicServices/CPID/AC_Standing_Com_TUS_Graduate_Attributes_Framework_2022_-_2025_FINAL.pdf

27. Using classroom response systems to assess student learning during Peer Assisted Student Support sessions

Aoife Walsh
Centre for Pedagogical Innovation and Development (CPID)

Project Lead, Partners and Participants

- Project lead – Aoife Walsh (TUS).
- Partners – Dermot Freehill, Olufemi Emmanuel Olaniyi and Victoria Mozejko (TUS PASS Leaders).
- Student participants - Three second-year students administered Classroom Assessment Techniques (CATs) to 26 first-year students during Social Care Practice, Nutrition and Health Science, and Microbiology PASS sessions on the Athlone campus during the 2024/25 academic year.

Key Aims

- To enable PASS Leaders to use classroom response systems (CRS) to assess what first-year students have learned during PASS sessions.
- To empower first-year students to choose the topics for PASS sessions.
- To inspire and empower PASS Leaders to create excellent plans for their sessions based on feedback from first-year students.
- To validate the work PASS Leaders are doing in sessions and affirm that the first-year students are learning from sessions and enjoying them.
- To assist PASS Leaders in reflecting on the impact of their role and the skills that they develop.

Project Description

PASS fosters cross-year support through weekly, timetabled sessions run by second-year students for first-year students. It aims to ease the transition for first-year students into TUS. Digital capabilities have been integrated into the learning strategies of the PASS Leadership module, which second-year students take. The module aims to enhance students' leadership, communication and professional development skills. PASS Supervisors model CATs using classroom response systems (CRS), thereby encouraging PASS Leaders to use CRS during their sessions with first-year students. This work incorporates several key themes related to building digital capability. Leaders assess various software options and choose the most appropriate for their needs and abilities. They use software to determine what students learned during sessions and to create subsequent session plans based on the feedback received. They reflect on feedback to determine students' preferred learning activities and adapt their sessions accordingly, while also supporting students in using technology. Leaders are proficient in information and data literacy as they reflect on the questions they have asked (in addition to reflecting on the feedback they receive) to refine their questions and maximise the benefits of the input.

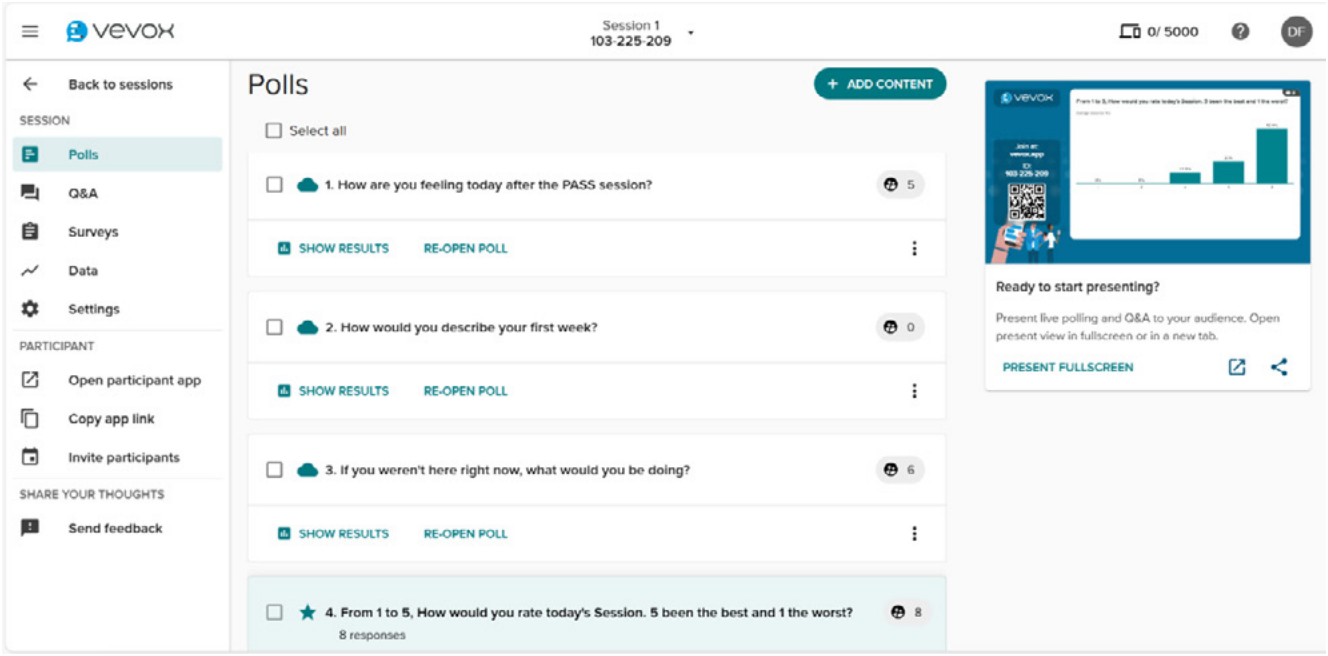

Figure 1: Screenshot from MS Forms of questions for PASS for Nutrition and Health Science.

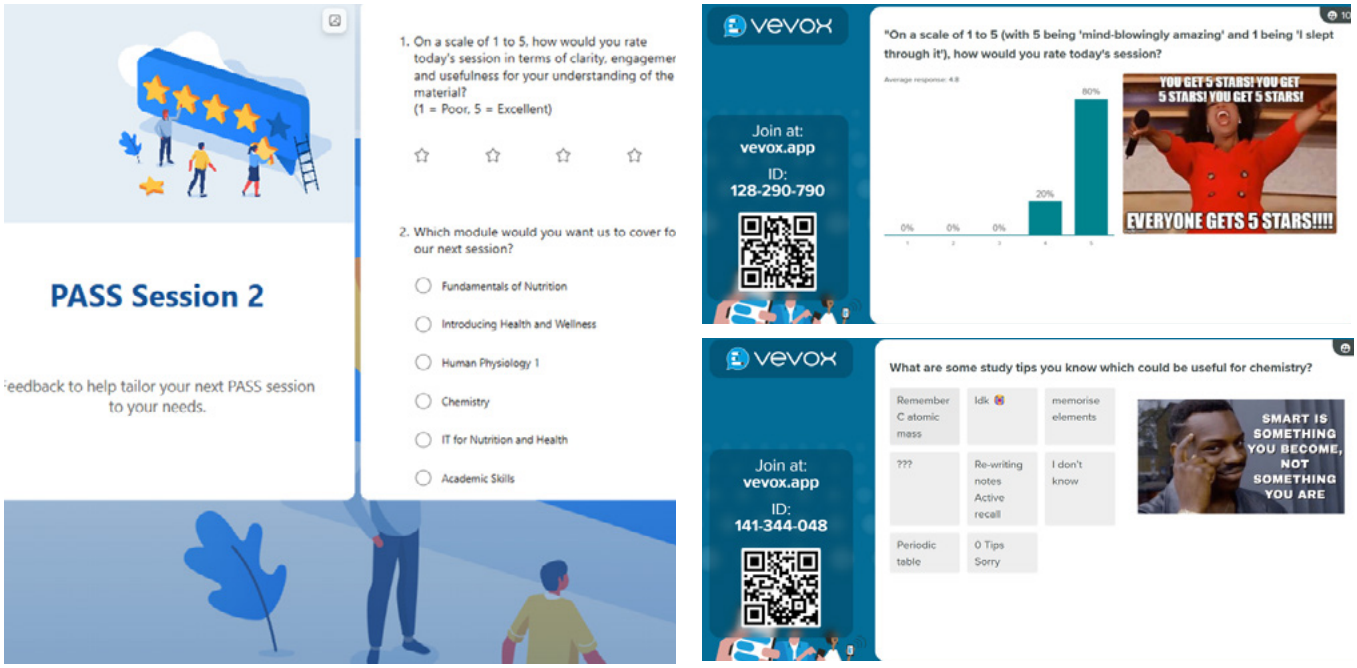

Figure 2: Screenshots from Vevox of responses for PASS for Nutrition and Health Science.

The PASS Leadership module is a 5-credit optional module offered to second-year students. The PASS Leadership module aims to develop students' leadership, communication, and professional development skills by facilitating weekly PASS sessions with first-year programme groups. Once they have completed training, PASS Leaders facilitate weekly, timetabled sessions with first-year students during Semester One to help ease their transition to TUS, their chosen course, the local town, and ultimately, higher education.

Classroom response systems, such as Vevox or Microsoft Forms, enable the posing of interactive questions with immediate feedback (Waugh, 2024). These systems can be anonymous or identifiable, synchronous or asynchronous, and accessed via links or QR codes, allowing participants to use their personal devices to provide their responses.

Key Outputs and Future Opportunities

One of the learning outcomes of the PASS Leadership module is to evaluate and reflect on the impact of the role and the development of transversal skills in line with the TUS graduate attributes. This initiative aims to empower PASS Leaders to use classroom response systems to assess what first-year students have learned during PASS sessions. PASS Leaders utilise CATs to gather anonymous feedback from first-year students about the impact of PASS on their learning/understanding (Angelo & Cross, 1993). PASS Leaders are encouraged to adopt technology that enables respondents to submit their ratings/opinions easily. This ensures results are recorded. Leaders can share the responses in class, refer to them when reviewing sessions, and assist with planning subsequent PASS sessions.

Student Perspective – Primary Impact of the Project

Utilising CATs formed part of the extensive summer training in preparation for the role of PASS leader. The summer training provided clear and practical guidance on the possibilities and benefits of CATs. This knowledge was further enhanced by the in-person training facilitated by the Centre for Pedagogical Innovation and Development. Past PASS leaders provided valuable insights during the in-person training on how they had utilised CATs in their roles as PASS leaders (p. 88).

PASS involves a PASS Leader supporting students as they settle into third-level education by providing resources and encouragement. PASS is underrated for its fulfilment for leaders and the multiple doors it opens, from enhancing communication skills to participation in professional events.

CATs are the key to each PASS session and the future of PASS. The feedback from CATs informs future PASS sessions and suggests ways to enhance their effectiveness. The most effective and efficient CAT was the "Start, Stop, Continue" approach, which allowed students to inform leaders about what they would like to start, stop, and continue doing in future sessions, ranging from initiating new activities to continuing to encourage the students. This CAT was incorporated into multiple sessions due to its excellence and openness, which came from the students' side. Students expressed a sense of belonging and that their opinions are valued, which is incredibly important for continually elevating the quality of PASS sessions.

References

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). Jossey-Bass Publishers.

Waugh, B. (2024, May 20). *What are classroom response systems, and what are the best CRS tools?* Vevox Blog. https://www.vevox.com/blog/what-are-classroom-response-systems.

"With the benefit of the knowledge gained from the training, the Vevox polling and Q&A platform was the preferred method of CATs chosen in collaboration with my PASS leader colleague. The CATs enabled us to assess our own performance as PASS leaders and tailor the next session to meet the learning objectives set by the PASS participants. The benefit of real-time feedback allowed us to discuss the findings with the PASS participants before the end of the session. This further enhanced the experience for both leaders and participants. CATs were a valuable tool in delivering the PASS sessions."

Dermot Freehill,
PASS Leader for Social Care Practice

"Becoming a PASS Leader in my second year of Nutrition and Health Science has been one of the most rewarding parts of my college experience. Supporting first-year students as they adjusted to university life gave me a genuine sense of purpose, and planning sessions tailored to their needs helped me grow in ways I did not expect. Each week, I worked to design engaging and helpful sessions, often in collaboration with lecturers, where students could explore challenging topics in a relaxed and supportive environment. This motivated me to develop key skills, including communication, adaptability, and creative problem-solving. I learned how to utilise creative techniques to keep students engaged, facilitate discussions, and adjust in real-time to accommodate students' questions and learning styles."

Olufemi Emmanuel Olaniyi,
PASS Leader for Nutrition and Health Science

"One of the most meaningful parts of the experience was working alongside other PASS Leaders from different courses. Sharing ideas, socialising, planning together, and seeing the impact of our work across disciplines gave me a broader perspective on what it means to lead and support others. What stood out most was seeing first-year students grow more confident each week. I watched them transition from being unsure and quiet to engaged, collaborative learners who shared ideas, asked questions, and used academic tools more effectively. That sense of growth and connection made every session feel worthwhile."

Victoria Mozejko,
PASS Leader for Microbiology using MS Forms

28. Peer Feedback and Graded Forum Discussions in The Special Purpose Award in Certificate in Supervisory Management and Team Leadership

Jim Gilchrist
Department of Lifelong Learning

Project Lead, Partners and Participants

- Project lead - Jim Gilchrist (TUS).



Figure 1: Participants on the SPA Certificate in Supervisory Management and Team Leadership

Alignment with United Nations Sustainable Development Goals

The peer feedback and graded forum strategy aligns with SDG 4 by:

- Promoting inclusive and equitable education: Structured prompts and rubrics ensure fairness and give all students a voice in learning.
- Fostering lifelong learning: Encourages self-directed learning, critical thinking, and real-world leadership reflection.
- Building digital literacy: Enhances key digital skills like communication, collaboration, and digital identity through active Moodle engagement.
- Ensuring relevant learning outcomes: Links leadership theory with practice, supporting effective, applied learning.

Key Aims

- To enhance leadership learning through reflective practice and real-world application.
- To encourage peer-to-peer learning by integrating structured feedback into weekly forum discussions.
- To develop students' digital competencies, including communication, collaboration, and digital identity.
- To promote critical thinking and deeper engagement with leadership concepts.
- To support inclusive, flexible learning via an accessible online platform (Moodle).
- To integrate assessment with learning by grading participation, feedback quality, and conceptual understanding.
- To foster a collaborative learning environment aligned with professional communication standards.

Project Description

This project examines the integration of peer feedback and graded forum discussions within the Special Purpose Award (SPA) Certificate in Supervisory Management and Team Leadership, with the goal of enhancing student engagement, reflective practice, and digital competency. Using Moodle as the learning platform, students participated in weekly leadership scenario discussions and provided structured feedback to peers, guided by a clear rubric. Grounded in constructivist and collaborative learning theories, the approach promoted critical thinking, real-world application of leadership concepts, and professional digital communication. The assessment for the SPA Certificate in Supervisory Management and Team Leadership was aligned with the quality of participation, depth of feedback, and conceptual understanding. The initiative led to increased student interaction, enhanced leadership insight, and improved digital literacy. It offers a scalable and inclusive model for developing leadership skills and digital competencies in higher education, with potential for further research and cross-disciplinary applications.

Students' participation in the forum contributed to their final grade for the SPA Certificate in Supervisory Management and Team Leadership.

Grading criteria included:	• Quality of initial post (clarity, depth, relevance). • Engagement with peers (constructive feedback, depth of response). • Application of leadership concepts (real-world relevance, critical thinking). • The lecturer provided weekly summary feedback to highlight key insights and best contributions.

In response to the evolving demands of leadership education and the increasing importance of digital literacy, a structured peer feedback and forum-based learning model was introduced in the SPA Certificate in Supervisory Management and Team Leadership at TUS. The initiative aimed to foster collaborative learning, develop real-world leadership skills, and align with the institution's decentralised TUS Learning Gates model, which supports accessible and student-centred learning.

The initiative drew on constructivist learning theory, emphasising that knowledge is best constructed through active engagement, social interaction, and reflection. It also aligned with principles of collaborative and peer learning, where students learn effectively by reviewing and responding to each other's work.

Key features included:	• Weekly forum prompts focused on real-world leadership scenarios. • Structured peer feedback using a rubric to ensure constructive and consistent commentary. • Graded participation based on clarity, depth, critical thinking, and quality of peer engagement. • Use of the Moodle learning platform to facilitate online interaction, feedback, and assessment. • This method not only supported leadership development but also enhanced digital competencies in communication, collaboration, and digital citizenship.

Key Outputs and Future Opportunities

Improved student engagement:	Active weekly participation and peer interaction encouraged reflection and critical analysis.
Development of leadership thinking:	Students applied theory to practice, discussing real challenges and leadership styles.
Digital skills growth:	Students became proficient in professional digital communication and respectful online engagement.
Enhanced feedback culture:	Peer review improved students' ability to give and receive constructive feedback.
Research impact:	Future studies could assess the long-term effect of peer feedback on leadership confidence and competence.
Scalability:	The model could be adapted to other disciplines that benefit from reflective and peer-supported learning.
Technology integration:	Incorporating AI tools or enhanced analytics could support more targeted feedback and learner insights.
Faculty development:	Training educators in effective digital facilitation and feedback methods could further strengthen implementation.

Student Perspective – Primary Impact of the Project

Empowered, reflective learning in a supportive community. Students gain a deeper understanding of leadership through:

- Active reflection on real-life challenges.
- Constructive peer feedback that enhances learning from multiple perspectives.
- Confidence building by expressing ideas in a respectful, low-pressure digital environment.
- Stronger digital and communication skills are essential for both academic and professional success.




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29. Integrating digital capabilities into the live digital marketing capstone project for final year digital marketing students

Louise Murray
Department of Business and Management Studies

Project Lead, Partners and Participants

- Project lead - Louise Murray (TUS).
- Partner - Tom O'Donoghue (TUS).

Alignment with United Nations Sustainable Development Goals

SDG 9 Industry, Innovation and Infrastructure and SDG 12 Responsible Consumption and Production.



Figure 1: Students participating in the Live Digital Marketing Capstone Project (2025)

Key Aims

- Manage real-life industry capstone project with the support of the digital marketing lecturing team that is at the cutting edge of best practice in the marketplace.
- Guide students through the challenging development and implementation phases of the project, utilising the most relevant and current digital capabilities available.
- Learn and reflect on the challenges at each stage in the project process.
- Correctly assess this unique project.
- Constantly evaluate, monitor, improve and future-proof this unique project.

Project Description

The live digital marketing capstone project is a multiple award-winning practice-based, experiential learning module in the 4th Year of the BBus (Hons.) in Digital Marketing at TUS Midlands (Athlone), where each student is tasked with developing and implementing a comprehensive digital marketing strategy for a real-life company over the course of one academic year. Every student works with a different business facing unique strategic digital marketing challenges. The modules that comprise the digital capstone project include the live project proposal in Semester 1 and the live digital capstone project in Semester 2. The students have acquired the digital marketing knowledge needed to complete this project through modules studied in the years leading up to the final year. They include digital marketing strategy, social media marketing, branding, search engine optimisation (SEO), and data analytics, among others. The live capstone project provides them with the opportunity to apply all of those skills in practice.

This live project proposal module and the live digital capstone project module promote applied learning, supported by the digital marketing academic team. It requires creating an authentic learning environment that helps students acquire the myriad digital capabilities needed to stay up to date with industry best practices, including presentation tools, project management tools, social media management software, email marketing software, graphic design tools, and many AI tools. The students already have a firm grasp of the digital world; yet their ability to adapt quickly to maintain digital expertise in tools that continue to emerge has guided their learning process.

The project emphasises scaffolded, student-centred learning that aligns with Vygotsky's Zone of Proximal Development (ZPD) (Vygotsky, 1978; Herrington et al., 2014). It includes guided mentorship through twice-weekly feedback class lectures, followed by individual meetings where students analyse the strategic performance of their companies based on insights from company feedback or analytics generated from testing new campaigns.

Collaborative learning is also used, where students engage in peer discussions to encourage knowledge sharing and diverse perspectives on the development of digital marketing strategy and tactics, both one-on-one and in groups. The Moodle forums are used alongside informal communication channels, such as class WhatsApp groups, to support collaborative learning.

As real-world scenarios challenge students, current digital tools and trends support a creative, innovative approach to problem-solving. Students use real-time campaign performance metrics to track campaign analytics using Google Analytics, Meta Business Suite and email marketing dashboards. The use of these digital tools helps students refine their strategies using data-driven insights.

Students utilise digital tools to enhance their professional skills and refine their client communication, reporting, and presentation skills, leveraging software tools such as Microsoft PowerPoint and Canva. Digital Technology Integration tools, such as Asana Project Management, Trello, and Hootsuite, help students interpret campaign performance, fostering data-driven decision-making, while also enabling









(Clockwise) Figure 2: Louise Murray (Senior Lecturer), Leah Fletcher (Founder deDANU) & Dearbhla Kelly (student). Figure 3: Louise Murray with the Marketing Society of Ireland Lepere Elevate Award Winner Molly Carleton for her work with DNG McGill. Figure 4: Winner of Digital Student of the Year at the Digital Media Awards 2025, Lisa Castro with Louise Murray & Dean of the Faculty of Business & Hospitality, Seadna Ryan. Figure 5: Project Team - Tom O'Donoghue & Louise Murray.

them to project manage and communicate progress with the lecturer and the client alike.

Mezirow (1997) discusses the power of transformative learning, and the module aims to foster critical thinking and self-awareness by encouraging students to challenge assumptions and reflect on their learning experiences through reflective journaling, including video and written reflective diaries. This fosters transformative insights into both their personal and professional development throughout the project.

Wiggins & McTighe (2014) emphasise backward design and the importance of planning curriculum with end goals in mind. They also advocate for authentic assessments that reflect real-world tasks and activities. In designing the assessments for these modules, we considered the skills students needed based on industry feedback and worked backwards to ensure they had the complete skill set.

To enhance student engagement and authenticity, assessments were designed to reflect the challenges and expectations of a dynamic digital marketing industry. By incorporating technology, peer collaboration, and real-world challenges, these assessments ensure students remain actively engaged and develop industry-relevant competencies. Key assessment components include live client projects, milestone presentations, reflective videos and written diaries, and a final strategy implementation and analysis report.

Key Outputs and Future Opportunities

Over the course of the 8 years this project has been in existence, students have worked with over 100 companies of all sizes and from all sectors in the region and nationally, and the demand for lecturer-supported live projects has never been greater. Some of the key results achieved for the companies with the most recent cohort of students were:

- DNG McGill won a €4 million contract because of a dedicated brand awareness campaign executed by the students.
- deDANU Skincare achieved 40 national media impressions because of a digital public relations campaign around product placement in Bridget Jones: About a Boy.
- Donegal GAA increased social media impressions to 54 million over the course of the student's project implementation.
- Artessa Coffee saw ecommerce sales increase by 25% thanks to a dedicated SEO and email marketing campaign by the students.

We continually review and improve our project execution by evaluating our pedagogical approaches alongside industry developments. Future opportunities for the project include:

- Exploring AI-driven assessment tools and adaptive learning technologies to enhance student engagement further and reflect current industry standards.
- Strengthening partnerships with marketing professionals and leveraging regional networking events to provide students with cutting-edge industry insights and to extend our database of companies to work with our students.
- Expanding interdisciplinary collaboration and working with expertise beyond the Faculty of Business and Hospitality to offer the industry an even broader, cross-functional project offering.
- Extending project collaboration across our wider European network through RUN-EU and ERASMUS partners by working with companies across Europe.
- Looking at opportunities for developing these projects into potential research master's and PhD pathways.

This is a unique project that is continually evolving to adapt to the shifting digital landscape in which the industry operates. It embraces the advances in digital capabilities that help students to maximise the impact they can achieve with the company at both the development and implementation stages of their strategies. These tools also allow the academic team to support the students in their learning. However, most critically, it enhances students' employability upon graduation, with many companies offering full-time digital marketing positions to students who have worked with them.

Student Perspective – Primary Impact of the Project

Students gain real-life experience with a company, offering the opportunity to work at a high level of digital marketing expertise that a final year student would typically be exposed to during a work placement or internship. Companies are willing to take a calculated risk on students developing and implementing a comprehensive digital marketing strategy because of the bespoke support network that digital marketing academics can provide to students throughout the project's implementation phase. This project has been recognised by the industry, as we have won the Digital Marketing Student of the Year Award for the third time this year for a live capstone project with ASERVE Investigators (DPD Ireland and Wanderly Wagon won in previous years). This year, for the first time, a student won a prestigious academic and educational accolade, securing the Lepere Elevate Award for marketing excellence from the Marketing Society of Ireland, a first for TUS. In conclusion, this unique industry project continues to enable us at TUS to offer students transformative educational experiences that prepare them for successful careers in the rapidly evolving digital marketing industry.

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30. Foundations for Success course in TUS Midlands

Marta Johnston
ReSHAPE Project

Project Lead, Partners and Participants

- Project lead - Marta Johnston (TUS).
- Partners - Access Service, Faculty of Business and Hospitality, ReSHAPE.
- Contributors - Jenny Burke, Anthony Connor, Dr Caroline Coyle, Ray Duke, Olivia Feehan, Carmel Halligan, Deirdre Hanamy, Pearce Harney-Nolan, Dr Tony Johnston, Sarah Le Cumbre, Jarlath Nolan, Dr Miriam O'Connor, Seadna Ryan, Dr Alison Sheridan (TUS).



Figure 1: Foundations for Success Training Schedule

Alignment with United Nations Sustainable Development Goals

F4S initiative aligns with several UN Sustainable Development Goals (SDGs), particularly:

- SDG 4 – Quality Education: Promotes inclusive and equitable access to lifelong learning.
- SDG 8 – Decent Work and Economic Growth: Builds skills relevant to future employment in a changing economy.
- SDG 10 – Reduced Inequalities: Targets individuals facing barriers due to economic, social, or digital disadvantage.
- SDG 11 – Sustainable Communities: Encourages local collaboration and digital resilience in Just Transition regions.

Key Aims

Foundations for Success (F4S) commenced in Spring 2024 within the Access Service in TUS Athlone. The programme initially began as an access-to-education initiative funded by the HEA College Connect project, with the aim of supporting adults furthest from higher education access, including those with low digital literacy and socio-economic barriers. F4S has since transitioned to operate under the EU Just Transition-funded ReSHAPE Project, becoming a community-focused digital inclusion and upskilling initiative for the Midlands region.

- To bridge the digital divide by equipping adults in the Midlands (Counties: Offaly, Laois, Longford, and Westmeath) with essential computer and online skills.
- To boost confidence and motivation to re-engage with education, training, or employment in a supportive environment.
- To integrate digital skills with personal development, combining practical IT learning with teamwork, communication, and problem-solving.
- To promote inclusion and lifelong learning for individuals affected by economic and social change in Just Transition communities.
- To strengthen regional collaboration between TUS, community organisations, and the ReSHAPE project to create sustainable pathways for further upskilling.

Project Description

F4S is a six-week digital skills and confidence-building programme delivered by the EU Just Transition-funded ReSHAPE Project in collaboration with the Department of Business and Management and the Access Service in TUS Athlone. It supports adults in the Midlands with limited or no digital experience who face barriers to education, training, or employment due to economic or social changes in their communities.

F4S offers an accessible and empowering introduction to digital skills through weekly sessions that combine 2 hours of hands-on computer training (including Microsoft Office, email, and online safety) with 1 hour of personal development activities focused on confidence, communication, creativity, and planning next steps.

The course model is intentionally learner-centred and inclusive: small class sizes, multi-staff support, and practical measures such as free transport and refreshments help participants feel welcome and engaged. Participants often describe the course as a "wonderful, friendly experience" and "a great step forward."



Figure 2: Foundations for Success Celebration Day Autumn 2025

Since its inception in 2024, F4S has evolved from an access-to-education initiative under College Connect to a community-focused digital inclusion programme under ReSHAPE, expanding its reach to adults affected by the transition to a low-carbon economy. Each iteration incorporates feedback from participants and community partners to improve accessibility and progression pathways into further learning. By bridging the digital divide and strengthening confidence, Foundations for Success demonstrates how collaboration between a university, EU projects, and local community services can promote inclusion and sustainable upskilling in the Midlands Just Transition region.

From the outset, F4S was a collaboration between the Access Service, the Department of Business and Management, and TUS Student Support Services (Counselling, Academic Writing, and Disability Support). The programme combined digital literacy training with personal development and academic-focused workshops to build confidence, connect participants with university supports, and prepare them for further study. Two successful runs of the College Connect programme were delivered.

In 2025, with the continuation of the programme under the EU Just Transition-funded ReSHAPE project, F4S evolved into a broader digital inclusion and upskilling initiative for the Midlands. It now focuses on supporting adults impacted by economic transition, unemployment, or shifts linked to the low-carbon economy.

The learner-centred methodology prioritises small groups, accessible facilities, one-to-one support during computer sessions, and collaboration with local organisations. Community partners, including Intreo offices, Longford Community Resources CLG, Co: Worx TUS Learning Gate, EDI Centre Longford, Brothers of Charity, EmployAbility, Esker House, Offaly Local Development Company, have played a key role in identifying and referring participants, ensuring wraparound support and inclusion.

Key Outputs and Future Opportunities

- Over 70 learners have completed the programme.
- High retention and satisfaction rates.
- Improved digital skills, confidence, and progression into further training or education.

Future opportunities include embedding digital inclusion practices across TUS and community services, as well as expanding regional partnerships to sustain learning pathways and promote lifelong learning in Just Transition communities.

Student Perspective – Primary Impact of the Project

1 INCREASED DIGITAL CONFIDENCE AND NEW TECHNICAL SKILLS

Learners gained practical computer skills in Microsoft Office, email, and online safety. Many overcame anxiety around using technology and now feel more capable of managing digital tasks.

> Before attending this course, I thought there wouldn't be anything more for me to learn, and thankfully I was wrong... I learnt new tips and skills that make my work cleaner and more professional.
>
> Student 1

2 MOTIVATION TO CONTINUE LEARNING AND UPSKILL

Participants reported feeling inspired to continue learning or pursue new career paths.

> It has encouraged me to go forward and open up my career path... As they say, knowledge is power.
>
> Student 2

3 FEELING SUPPORTED AND ENCOURAGED IN A WELCOMING ENVIRONMENT

The programme's friendly, inclusive atmosphere helped participants overcome fears of returning to learning and using technology.

> Everything was great: kind, responsive teachers, an accessible way of presenting materials, a pleasant team, a friendly coffee break, and the opportunity to get to classes by bus.
>
> Student 3

> I liked working in a modern computer lab. Everything was clear to understand.
>
> Student 4

4 IMPROVED SOCIAL CONNECTIONS AND SENSE OF BELONGING

Meeting new people, sharing experiences, and learning together helped reduce feelings of isolation and foster a sense of community.

> I enjoyed the social aspect and refreshing some skills on the computer.
>
> Student 5

> I liked communicating with new people, sharing life stories.
>
> Student 6

5 NEW PATHWAYS INTO EDUCATION AND EMPLOYMENT

Learners gained the confidence to explore new opportunities in education and the workforce.

> Meeting supportive professionals and gaining practical skills that helped boost my confidence and prepare me for work.
>
> Student 7

6 ENJOYMENT AND PERSONAL GROWTH

Participants found the learning engaging, enjoyable, and meaningful.

> I enjoyed the learning experience and the follow-up activities, especially the strengths test — very informative.
>
> Student 8

> The pace of learning was fast and constant... very cool to learn the new stuff that I've never done before.
>
> Student 9

31. Leveraging Virtual Reality and Artificial Intelligence to Enhance Employability Skills in Undergraduate Accounting

Dr Noëlle O'Connor
Department of Hospitality, Tourism and Wellness and Centre for Pedagogical Innovation and Development (CPID)

Project Lead, Partners and Participants

- Project leads - Dr Noëlle O'Connor and Dr Trevor Prendergast (TUS)
- Participants - Students from the B.A. (Hons.) in Accounting and Finance programme and the B.A. (Hons.) in Accounting and Finance with Placement (TUS Midlands).



Figure 1: Dr Trevor Prendergast and Dr Noëlle O'Connor at the annual EDEN conference in Bologna, Italy, in 2025

Alignment with United Nations Sustainable Development Goals

This project supports SDG 4 (Quality Education).

Key Aims

This study aligns with growing literature on immersive technologies in education, expanding the discourse beyond Science, Technology, Engineering, and Mathematics (STEM) to include business and career development.

Project Description

Recent publications have added to the literature on immersive technologies in education, such as Yang et al. (2024) and Cooper et al. (2024), who focus on STEM; Liu et al. (2023), and Saab et al. (2023), who researched the use of Virtual Reality (VR) in Nursing and Elsayed (2023), who explored student use of VR in Tourism-related disciplines. The present study contributes to the literature by examining the application of such technologies in an undergraduate accounting context.

During the most recent cyclical review of an undergraduate programme in accounting at the TUS Midlands (B.A. Hons. in Accounting and Finance), part of the feedback from industry highlighted a greater need to develop soft skills in graduates. A multi-pronged approach was implemented, one strand of which was a career-development 5 ECTS module titled "The Evolving Professional," created in Year 2 of the programme that preceded the year-long placement in Year 3 of the programme. A novel feature of the module was the utilisation of Meta Quest Virtual Reality (VR) headsets in conjunction with Virtual Speech software and an Artificial Intelligence (AI) agent to develop student interview skills. Each student (n = 26) was assigned a headset and a license to use the software, and a series of introductory sessions was held with the Centre for Pedagogical Innovation and Development (CPID) to familiarise both staff and students with the devices and the associated software.

During class time, students undertook three 1-hour simulated interview sessions using the hardware and software, after which the AI agent provided feedback. This information was saved to a student's account and could be accessed outside of class time. Furthermore, students had the opportunity to borrow a headset from the library and, using the previously saved feedback, take additional simulated interview sessions to improve their competence. Student feedback was elicited through a focus group (n = 26), with emerging data suggesting that the novelty of the VR headsets was a significant factor in students' positive perceptions of the technologies. Students deemed the ability to access feedback from the AI agent outside formal class time particularly useful. It was considered a low-stakes opportunity to develop competence in interview techniques.

Key Outputs and Future Opportunities

- AI-generated feedback and self-directed practice interviews increased perceived readiness for real-world employer interactions.
- Study extends immersive learning research beyond STEM and healthcare into business and career development.



Figure 2: Dr Noëlle O'Connor conducting the focus group with 2nd year Accounting and Finance students

- Future module iterations will refine content delivery, assessment, and industry collaboration to maximise VR and AI effectiveness in bridging academic learning and professional practice.
- Conference paper - Prendergast, T. and O'Connor, N. (2025). Leveraging Virtual Reality and AI to Enhance Employability Skills, A Case Study from the Technological University of the Shannon, Ireland, *European Distance and E-Learning Network (EDEN) Annual Conference: Shaping the Future of Education in the Age of AI*, Bologna, Italy.

Student Perspective – Primary Impact of the Project

The implementation of VR in the "The Evolving Professional" module enhanced student engagement, skill development, and professional confidence. The integration of VR technology and AI agents in career development education presents a novel approach to enhancing graduate employability skills. Findings from the implementation of VR in the "The Evolving Professional" module suggest that immersive learning environments can significantly improve student engagement, skill acquisition, and confidence in professional settings. The ability to access AI-generated feedback and practice interviews in a low-stakes, self-directed manner contributed to students' perceived readiness for real-world interactions with employers. This study aligns with growing literature on immersive technologies in education, expanding the discourse beyond STEM and healthcare fields to include business and career development. Future iterations of this module will explore refinements in content delivery, assessment methods, and industry collaboration, ensuring that VR and AI remain practical tools in bridging the gap between academic learning and professional success.

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32. TUS student engagement platform – Artificial Intelligence virtual assistant

Anne Naughton
Office of the Vice President, Student Education and Experience

Project Lead, Partners and Participants

- Project leads - Frances O'Connell, Anne Naughton and Eileen Murray (TUS).
- Partners - Brendan Dolan, James Clifford, Owen Dunne (TUS).

Alignment with United Nations Sustainable Development Goals

This project aligns with Goal 4: Quality Education and Goal 10: Reduced Inequalities. The Student Engagement Platform reduces inequalities by providing students with the sufficiency and relevant advice they seek, addressing their needs, preferred formats, and channel usage in a timely, self-directed, and effective manner.

Key Aims

- To further enhance and increase student engagement, especially for new or remote students, through 24/7 access to personalised information and support, using a single digital access point for queries with an anonymous and user-friendly interface.
- To generate insight-led data to enhance decision-making and enable forward-planned responses and real-time communication to students based on data insights.
- To promote digital inclusion by providing multilingual support and accessibility features to cater to diverse student populations.

Project Background and Context

The aim of the project is to implement an AI-driven virtual assistant to enhance communication, accessibility, and operational efficiency within the university. Our first objective was to become a first-stop information point for students. With multiple campuses and numerous information channels, navigating available support can be challenging especially for new entrants. The digital platform will amalgamate data from information centres and service support areas, serving as a universal digital information support centre for students.

The second objective of the project is to utilise the platform to increase student engagement and improve operational efficiency by automating level one type queries that can be deemed repetitive support tasks. The platform will assist with and address repetitive student queries more quickly and efficiently. In turn, it has the potential to improve efficiency, deliver support, and ultimately enhance the student experience.

In line with the Higher Education Authority (HEA) System Performance Framework 2023-2028, which defines pillar areas of activity, transversal impact dimensions and sector-wide commitment to digital transformation, the VP of Student Education and Experience Office at TUS embarked on a strategic initiative to enhance digital service delivery and student engagement through Artificial Intelligence (AI).

Irish universities are increasingly challenged to support diverse student populations, hybrid learning models, and rising expectations for accessible, 24/7 support. Simultaneously, administrative and academic teams face increasing workloads and the need to maintain efficiency, accuracy, and responsiveness in service delivery.

This project, "Student Engagement Platform – Virtual AI Assistant", focused on addressing these needs, designed to provide real-time information, streamline administrative processes, and improve the overall learning and campus experience.

The initiative supports the Higher Education Authority's (HEA) System Performance Framework 2023 – 2028, particularly in the areas of:

- Enhancing student experience and inclusion through technology-enabled support.
- Improving operational efficiency and reducing administrative burden.
- Embedding a culture of digital innovation across academic and professional services.
- Using data responsibly to inform decision-making and continuous improvement.

The Student Engagement Platform is an AI-powered virtual assistant initiative developed as a proof-of-concept pilot at TUS. Designed with a digital-first approach, the platform aims to enhance student engagement by providing personalised, accessible, and responsive digital support. It serves as a central connection point between students and university services, offering real-time assistance, answering frequently asked questions, and encouraging active participation in campus life. The pilot focused on three primary service areas — Student Support Services, Student Societies, and Library — with an additional test case underway in the Department of Flexible and Lifelong Learning (Midwest). By integrating AI-driven conversational technology, the platform simplifies access to information, streamlines student service interactions, and supports learner engagement across diverse modes of study, including remote and part-time students.

Guided by the *"Engage – Understand – Support – Manage"* framework, the initiative is designed to extend the

Enhancing Student Journeys through AI:

Digitally connecting students to services, supports, and campus life

Anne Naughton, Brendan Dolan, Eileen Murray, James Clifford, Owen Dunne
Technological University of the Shannon (TUS)

Project Aim & Scope

To create a unified, digital, service-oriented information point that enhances the student experience and simplifies day-to-day navigation of university life.
Pilot Areas: Student Support Services, Societies, Campus Life

Challenge & Opportunities

Students at TUS are part of a multi-campus, cross-regional technological university, engaging within a network of campuses, information sources, and support services throughout their academic journey. **Enhancing access** to clear, timely, and personalised information—particularly for new entrants—presents an opportunity to strengthen their experience through digital connectivity to real time information.

In response to growing demand for **digital-first, on-demand support**, a Virtual Assistant provides a **responsive, scalable, and student centred solution** to service delivery and engagement.

Engagement Model Approach
Engage → Understand → Support → Manage → Insight

This structured model ensures the assistant is human centric, not only responding to student queries but actively guiding students towards the most appropriate services and follow-up pathways.
This enables TUS to respond more efficiently and effectively to student needs, identifying emerging information requests, strengthening service coordination, and continuously improving the overall student experience.

The AI-Powered Solution

TUS virtual assistant - extending our reach

Core Capabilities

- 24/7 conversational access,
- Anonymous, student-friendly interaction
- Multi-lingual functionality
- Built-in sensitive support workflows
- Real time insights and sentiment analysis

Innovation

- Transitions from static webpages to dynamic, personalised guidance
- Automates repetitive queries
- Creates a scalable digital ecosystem that can grow with student needs
- Moves from reactive to proactive student support
- Uses AI to understand and identify patterns and emerging trends.
- Establishes a unified digital entry point for TUS

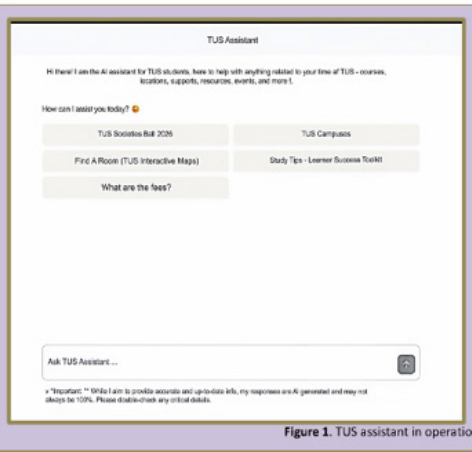

Figure 1. TUS assistant in operation (LearnWise)

Governance, Impact, Insights, and Future Steps

Responsible AI governance

To ensure responsible deployment of the AI virtual assistant, governance considerations were embedded throughout the pilot design and implementation including:

- Student privacy risk assessment during the design phase
- GDPR-aligned data protection controls and limited storage of user data
- Clear data governance policies for logging and anonymising interactions
- Human oversight and escalation pathways for complex or sensitive queries
- Transparency so users know when they are interacting with AI
- Ongoing monitoring and review to identify errors, bias, or misuse

Impact

- Supports all stages of the student journey
- Fosters a sense of student belonging through a familiar always available digital presence
- Provides a consistent experience across platforms and services
- Removes barriers of location and language
- Enables boundaryless, 24/7 access to information and support
- Improves accessibility, inclusion, and ease of use for all students

Insights - Usage for Semester 1 2025/2026

2025	AI Answers	Conversations	User Messages
*Aug Sept	1436	596	763
Oct	447	174	248
Nov	391	144	208
Dec	197	62	106
Sem 1 TOTAL	2471	976	1325

***From 21 Aug 2025**
Go Live Date 21 August - pilot areas (soft launch)

Table 1. Semester 1 – ***Pilot*** area usage

Supporting all stages of the Student Journey

Transition Experience | ***Academic Experience*** | ***Administrative Experience*** | ***Well-being Experience*** | ***Social Experience***

Conclusion and Future Steps

The pilot demonstrated how an AI powered virtual assistant can transform student engagement, streamline access to services and deliver actionable insights to continuously enhance the student experience. The next step for TUS is to expand across all TUS.ie locations and develop a clear, engaging personality for the assistant.

WHERE CAN I FIND THE DETAILS? Check out: www.tus.ie

Figure 1: Enhancing the student journey through AI

university's reach, particularly to students who may have limited or no interaction with traditional in-person services. The platform not only enhances responsiveness and efficiency but also generates valuable insights into student needs and engagement patterns, informing future service delivery improvements.

This initiative demonstrates the transformative potential of artificial intelligence in higher education to enhance inclusivity, communication, and scalability in student engagement. Beyond improving access to services, the platform fosters a more connected and responsive university community. By analysing anonymised interaction data, it can identify emerging student needs, enabling proactive interventions and data-informed decisions that strengthen service delivery and personalise engagement.

The initiative also establishes a strong foundation for future growth and integration across wider university functions. As digital transformation continues to reshape higher education, this proof-of-concept positions TUS as a leader in innovative and inclusive practice.

The AI-powered virtual assistant not only modernises student engagement but also demonstrates how technology can be used ethically and effectively to strengthen the human connection at the centre of the university experience.

Project Description

The Virtual AI Assistant represents a key step in the TUS student journey toward a more connected, intelligent, and student-focused digital campus. The assistant serves as an interactive, conversational interface available through the university website.

Leveraging Natural Language Processing (NLP) and machine learning, the virtual assistant enables users to engage in natural, human-like dialogue to access accurate information, guidance, and support across academic and administrative domains. The Learnwise™ platform is designed not only to answer common queries but also to anticipate user needs, streamline access to key services, and reduce staff administrative workload.

Core Features and Functions

24/7 Student Support:	Instant responses to queries related to registration, student support services, timetables, campus services and locations.
Data-Driven Insights:	Collection of anonymised data on common queries and interaction patterns to inform service planning and improve communication strategies.
Accessibility and Inclusion:	Multilingual capability and accessibility compliance to ensure equitable digital access for all users.

Expected Outcomes

- Enhanced student experience through fast, accurate, and 24/7 digital support.
- Greater operational efficiency with reduced routine workloads for staff.
- Improved decision-making using insights from anonymised interaction data.
- Strengthened digital capability and readiness for future AI-driven initiatives.
- Alignment with national digital transformation goals across Ireland's higher education sector.

Student Perspective – Primary Impact of the Project

The primary impact of introducing this initiative from a student's perspective is improved accessibility and efficiency in communication and support services. In addition:

- Faster Access to Information: Students can instantly get answers to common questions about registration, timetables, IT setup queries, campus services and locations without waiting for staff responses. This saves time and reduces frustration, especially during peak times.
- 24/7 Availability: Providing convenience for students who study or work at different hours, enabling continuous academic and administrative support.
- Personalised and Consistent Assistance: AI chatbots tailored to respond to individual enquiries based on campus location.
- Enhanced Student Engagement: By providing an interactive communication channel, the virtual assistant made it easier for students to connect with the university, seek help, and stay informed about events or deadlines.
- Multi-Campus 24/7 access to personalised information and support all year round.
- Single digital access point for queries.
- Increased engagement, especially for new or remote students.
- Anonymous and user-friendly interface.
- Ubiquitous, self-directed information and communication tool.
- Functionality to direct complex questions to human staff for further intervention.
- Multilingual support.

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NIKE

33. TUS talks: digital communication in practice through the lens of community health and wellbeing

Dermot Maleney
Department of Sport and Early Childhoods

Project Lead, Partners and Participants

- Project lead – Dermot Maleney (TUS).
- Partners – Dr Stacey Cannon-Cahill (TUS).
- Participants – Students on the Master of Arts in Strategic Health and Wellbeing Leadership, and the BA (Hons.) in Business Studies with Sports Management Year 4 (TUS students).



Alignment with United Nations Sustainable Development Goals

This assignment aligns with the third United Nations Sustainable Development Goal (SDG) as it centres on 'Good Health and Wellbeing' topics. Students explore the key pillars of wellbeing, including physical, mental, emotional, social, spiritual, environmental, financial, and sexual dimensions. In doing so, learners contribute to the wider discourse on creating healthier, more inclusive communities. It supports SDG 4 (Quality Education) by embedding inclusive, digitally enabled learning practices that foster critical thinking, reflective engagement, and the development of transferable digital skills. The assessment empowers students to take ownership of their learning through self-directed topic selection and multimodal content creation.

The initiative also contributes to SDG 8 (Decent Work and Economic Growth) by prompting students to consider the conditions that support safe, fair, and healthy workplaces. Many TUS Talks presentations explicitly address organisational culture, work-life balance, and psychological safety, all of which are key components of sustainable employment practices. Finally, it reinforces SDG 10 (Reduced Inequalities) by foregrounding inclusive wellbeing topics and diverse learner perspectives. Students frequently focus on marginalised populations and underrepresented wellbeing issues, helping to raise awareness of structural inequities and advocate for more equitable environments.

Key Aims

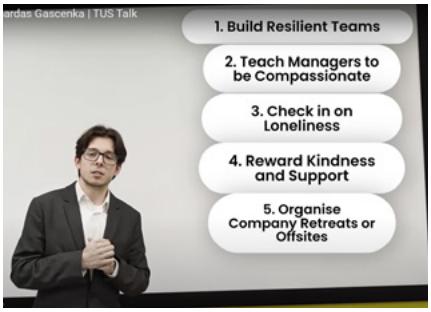
- To develop digital presentation, communication, and video editing skills.
- To promote critical thinking and student-led inquiry on community health and wellbeing.
- To support inclusive, reflective learning through authentic, sustainable assessment.
- To replace written reports with engaging, paperless digital submissions.
- To build confidence in public-facing communication using real-world formats.
- To foster transferable skills for digitally mediated, modern workplaces.

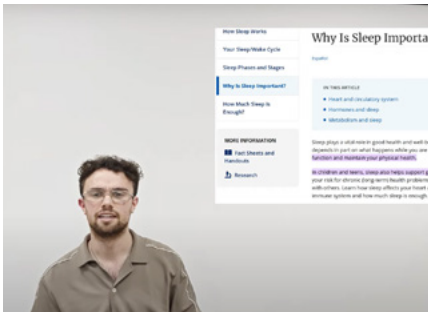
Project Description

This assessment develops students' digital communication skills while deepening their critical engagement with contemporary wellbeing issues. Implemented across postgraduate and undergraduate programmes at TUS Midwest, the initiative replaces traditional written assignments and live presentations with a dynamic, multimodal task: a pre-recorded TED-style talk accompanied by a fully referenced script. TUS Talks responds to the evolving digital and professional landscape by combining digital media creation, critical thinking, and applied wellbeing content in a format aligned with real-world communication practices.

Students select a topic from a curated list of health and wellbeing issues, research it, and produce a 1000–1500-word script for a 6–12-minute talk. An assessment rubric is provided alongside a detailed assignment brief to ensure clarity of expectations and grading criteria. Weekly tutorials scaffold the assessment through exemplars, formative feedback, and research skills development, including the evaluation and citation of academic and grey literature, as well as multimedia sources. Tutorial support also covers all stages of production, including recording using tools such as Microsoft Teams or Zoom, editing with Microsoft ClipChamp, and practical guidance on camera settings, positioning and eye-line, background and lighting, sound quality, transitions and animations, and the use of browser-based teleprompters to support delivery and pacing. Once finalised, the video is uploaded to YouTube as an 'unlisted' file to ensure privacy, and the URL is submitted via Moodle in the accompanying document.

TUS Talks is grounded in the TUS Learning, Teaching and Assessment Strategy (2022–2025), particularly its emphasis on active and applied learning and pedagogies of engagement. The initiative aligns with the Joint Information Systems Committee (JISC) Digital Capabilities Framework, supporting student development across all six domains of digital proficiency and productivity; digital creation, problem solving and innovation; digital learning and development; digital identity and wellbeing; information, data and media literacies; and digital communication,







(Clockwise) Figure 1: Gerchardas Gascenka presenting on Workplace Loneliness. Figure 2: Laura Keane giving a TUS TALKS presentation on Remote Working. Figure 3: Tyrek Dannoun gives a TUS TALKS presentation on Work Life Balance.

collaboration and participation. It also reflects key TUS Graduate Attributes, including digital fluency, communication, critical thinking, and self-awareness. This assessment model offers scope for further development through cross-programme collaboration, industry engagement, peer review, and research into the impact of digital storytelling on engagement, assessment equity, and graduate readiness.

Key Outputs and Future Opportunities

Key outputs include greater student confidence in digital content creation, more authentic and personal engagement with wellbeing topics, and stronger integration of academic theory with real-world challenges. The format has proven flexible, inclusive, and adaptable across disciplines.

Future development opportunities include cross-programme and industry collaboration, integration of peer review and AI-supported drafting tools, and formal research into the impact of digital storytelling on student engagement, graduate preparedness, and assessment equity.

A sample TUS Talk, presented by former student Gillian Bane on the topic Communication for Positive Workplace Relationships, is available to view here: https://youtu.be/-qSk7ljUvLo?si=d4huOFLYl0sGaBxc. The exemplar demonstrates the standard, structure, and professional tone fostered by the assessment.

Student Perspective – Primary Impact of the Project

For students, the primary impact of TUS Talks lies in its authenticity and career relevance. Many students noted that the format felt familiar and engaging, as it mirrors the type of content they regularly consume. This real-world connection made the task feel more purposeful and relevant than traditional assessments. Students also valued the fact that the finished product could be retained as a digital artefact to showcase their communication and technical skills to prospective employers, thereby enhancing their employability.

The assignment's novelty was also frequently highlighted. As an alternative to essays or live presentations, it offered a more creative and enjoyable experience. At the same time, it challenged students to move beyond scripted PowerPoint delivery and adopt a more confident, reflective, and professional presentation style. For many, this pushed them outside their comfort zone, but in doing so, helped build real communication competence in a safe, supported environment.

34. Building capacity through sharing practice: growing the TUS Virtual Reality Special Interest Group (SIG)

Dr Geraldine McDermott
Centre for Pedagogical Innovation and Development (CPID)

Project Lead, Partners and Participants

- Project lead – Dr Geraldine McDermott (TUS).
- Partner – Brendan Dolan (TUS).
- Participants – Staff interested in and engaging with Virtual Reality for Education and Training (TUS staff).



Figure 1: Figure 1: 2025 EduXR Symposium on Shaping the Future of Immersive Technology in Education and Training.

Alignment with United Nations Sustainable Development Goals

The project is underpinned by Sustainable Development Goal 4 (SDG) (Quality Education) through its commitment to exploring how virtual reality can enable inclusive and equitable education. The Special Interest Group (SIG) supports continuous, practice-based professional development to strengthen educator capacity (Target 4c) in the field of immersive learning. It also supports SDG 9 (Industry, Innovation and Infrastructure) by strengthening institutional innovation capacity through collaboration and shared infrastructure.

Key Aims

- To broaden the knowledge base within TUS on immersive technologies, in particular, Virtual Reality (VR).
- To identify and respond to the challenges associated with immersive teaching and learning in TUS.
- To connect researchers and educators with similar interests in the immersive technologies domain.
- To provide opportunities for professional development through workshops, seminars, invited speakers and shared practice events.
- To engage with the student body by promoting awareness, participation, and innovation in immersive technologies through events, projects, and experiential learning opportunities.

Project Description

The potential of Extended Reality (XR) technologies and virtual worlds has been included in reports such as the Educause Horizon Report (Pelletier, 2023) and the European Innovation Council Tech Report (2024). It is a growing innovation space in both industry and education. Gartner's top 10 technology trends for 2025 (Alvarez, 2024) list spatial computing, and "digitally [enhancing] the physical world using technologies like augmented and virtual reality to offer immersive experiences" as one to watch. This prompted a collaborative, small-scale research project at TUS, funded by the Strategic Alignment of Teaching and Learning (SATLE) and designed to explore the use of virtual reality to enhance the student experience, in collaboration with colleagues from Hospitality, Tourism, Event Management, Science, and the library (McDermott et al., 2025). Following this, a larger project in virtual healthcare training and soft skills development for employability using VR was funded by the National Technological University Transformation for Recovery and Resilience (N-TUTORR) fund.

It is against this backdrop that we set up the TUS Virtual Reality (VR) Special Interest Group (SIG) in January 2024. Communities of Practice (CoP) are popular in educational contexts, made up quite simply of "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2011, p.1). We hoped to bring together a community interested in or actively engaged with immersive technologies across the TUS campuses to share their vision for working with and in virtual reality. Communities of Practice are widely recognised as a way for members to grow knowledge through sharing resources, skills and experiences and the SIG currently includes novice and experienced VR educators, developers and researchers from Computer Services, Flexible and Lifelong Learning, CPID, TUS Athlone Library, Engineering, Limerick School of Art and Design (LSAD), Science and Health, Social Care and Business, with our membership continuing to grow.









(Clockwise) Figure 2: Brendan Dolan (Flexible Learning) and Dr Geraldine McDermott (Centre for Pedagogical Innovation and Development) organise a VR Roadshow at TUS Thurles during NTUTORR week. Figure 3: N-TUTORR week VR Roadshow on the Moylish campus. Figure 4: Dr Maeve O'Reilly using Virtual Reality with Veterinary Nursing Students. Figure 5: XR Special Interest Group Connect and Share event in TUS Moylish.

The initial focus of the monthly meetings was to discover the work happening at TUS, share existing XR projects and initiatives, and identify areas of interest within the group. Members of the SIG presented work they were involved in, including the development of training in the built environment, asset creation for the immersive tech space, VR exhibitions, and options for incorporating out-of-the-box VR apps into the curriculum. As we became more familiar with each other's projects, we looked for other opportunities to expand our knowledge base. Demonstrations from companies and opportunities for professional development are shared on our Teams channel. As part of N-TUTORR week in February 2024, we organised a Virtual Reality Roadshow across the Athlone, Moylish, Thurles and Clonmel campuses, calling it: "Virtual Reality Education in TUS: A journey of discovery" and together with members of the SIG, we provided staff and students with an opportunity to try out some of the simulations, 360-degree videos and discipline-specific VR apps in use in TUS.

Our focus during Spring 2025 was the organisation of #EduXR25 - a one-day symposium on immersive technologies in education and training, sponsored by ReSHAPE. This event was organised in partnership with Munster Technological University, South East Technological University, University College Dublin, Dunboyne College of Further Education, and Louth Meath Education and Training Board. It included academics, researchers, industry representatives, and students, bringing together a wider community passionate about immersive experiences.

This social learning space is evolving, and as shared goals are achieved, the sense of community will grow. According to Wenger (2011), three key elements must be developed for a community of practice to flourish. These are the domain (immersive technologies), the community (and a sense of belonging) and the practice (stories, resources, experiences and opportunities). As the immersive technologies sector continues to grow, we hope that our members will benefit from the SIG's knowledge, expertise and networks.

Key Outputs and Future Opportunities

Knowledge, skills, and competency-building amongst staff are key outputs of the SIG to date. Our plans for the future of the newly renamed XR SIG include expanding our membership, meeting in VR, identifying professional development and funding opportunities for members, and supporting those who wish to teach with VR. However, one of the key features of a successful CoP is shared goals, so a needs assessment at the beginning of each academic year will provide an opportunity to discuss the SIG's activities for the year ahead. Other future opportunities include expanding VR use across other disciplines and identifying potential research and development avenues.

Student Perspective – Primary Impact of the project

Students are benefiting from the use of immersive technologies for a personalised learning experience in a virtual world. Immersive learning also provides students with an opportunity to engage with contexts and environments they may not otherwise have access to. Students can interact with simulations to understand complex information by increasing their sense of being there. They can also use Immersive Virtual Reality to develop skills and competencies using a multi-modal, active learning approach. As more companies move towards using VR for training, we are familiarising our students with immersive hardware and software that may become standard practice in the workplace of tomorrow.

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“The world-altering powers that technology has delivered into our hands now require a degree of consideration and foresight that has never before been asked of us”

(Sagan, 1994, p.179)[2]



[2] Sagan, C. (1994). Pale Blue Dot: A Vision of the Human Future in Space. New York: Random House.













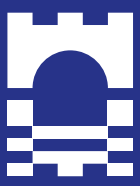

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