

The Development of an Inclusive Higher Education Framework for Learning Spaces

Katie Power, Fiona O'Flynn, Teresa Murphy, Michael J. O'Mahony
Munster Technological University
Ireland

Abstract

Inclusive approaches to learning have become a keen focus within Higher Education in recent years. The spaces where learning is accommodated are often overlooked as a necessary component of the university learning experience. New understandings of the importance of space for accessible and inclusive learning for all learners are coming to the fore. We argue that university leaders must be proactive in seeking early engagement with stakeholders to ascertain their views on learning spaces. Such engagement will ensure that the needs and wants of stakeholders, in relation to spaces, are documented and considered. A framework for learning spaces, founded on desk-based and empirical research, is proposed as a universally applicable scaffolding for space planning in Higher Education. The Framework is a stepped map for university decision-makers to follow, to embrace a consistent and inclusive approach to the design of learning spaces. This paper outlines the development of the Framework, as well as assessing the impact of the Framework in use.

1. Introduction

An interdisciplinary team of academic and professional services staff from within an Irish university, Munster Technological University (MTU) collaborated to create a quality framework for physical learning spaces within Higher Education institutions. The resultant Framework serves as a tangible guide for university leaders to engage stakeholders effectively in the planning and design of learning spaces, emphasising the significance of an inclusive process, and offering insights and universal guidance for Higher Education institutions seeking to establish similar practice frameworks. A concise version and a detailed version of the Framework were created. The former is presented in Figure 6. The detailed version is a guidance document for direct users of the Framework and is excluded from this paper due to its extensive nature.

The approach to learning spaces is changing, and greater awareness of the requirements of learners [1], including neuro-diverse learners [2], presents a

significant opportunity for higher education to make the experience of learning more engaging and successful for everyone. Learning spaces are not mere physical enclosures; they are dynamic environments that shape the educational experience, influencing how knowledge is acquired, shared, and applied [3]. The Framework provides a stepped approach to ensure that there is consistency across campuses for user engagement as existing spaces are re-furnished and new spaces are created.

The university in focus for the development of the Framework was MTU, a university comprising six campuses in Ireland. A review of local practices for learning space design indicated that a formal framework did not exist within MTU, and most learning space (re)developments had been ad-hoc with advice sought individually from a variety of sources.

To ensure development of a robust Framework which lays the foundations for a consistent approach to the design and enhancement of learning spaces, the research team identified some existing campus spaces which had been developed, and some spaces identified for future refurbishment/ development. Sample spaces, either recently redeveloped or earmarked for redevelopment, were chosen as venues for the interactions with stakeholders to serve two purposes: to gather views of participants in situ and to pilot the Framework in the draft phase.

A standout feature of engagement within the project was benchmarking of external higher education institutions to identify best practices. This involved desk-based research combined with national and international visits to view and benchmark against innovative learning spaces at other universities, and review approaches to engaging students and staff in decision-making for learning spaces. The aim was to research best practices with an objective to ensure that the MTU Learning Spaces Framework would align with national and international best practices.

2. Aims and Objectives

Educational practices and objectives are evolving

and changing, with new emerging pedagogies and technologies [4]. There is more of a focus on active learning, and on engagement of students in collaborative learning which places the student at the centre of the learning process [5]. Developing learning spaces that foster effective learning requires a holistic approach [6], including collaboration dialogue with all key stakeholders.

The project aimed to establish a framework for early engagement with stakeholders (internal and external) in the development and design of new, and the enhancement of existing learning spaces at MTU. The Framework provides a systematic approach to mapping consistent engagement with key stakeholders in the development and use of learning spaces at MTU. The Framework was developed and applied to and benchmarked against a sample space.

Ultimately, incorporating this Framework across the university seeks to ensure the development of learning spaces that are inclusive and flexible in the face of changing needs, motivating learners and promoting learning as an activity, while supporting collaborative as well as formal practice, providing a personalised environment.

The Framework was developed in a way to allow for use in new and different applications, both nationally and internationally. The Framework is devised to stimulate reflection and relate the curriculum to learning spaces ensuring they are inclusive, accessible, creative, future-proofed, supportive and flexible in the face of the ever-changing needs of a wide range of diverse users.

Inclusive learning space design addresses the diverse cognitive, cultural and physiological needs of learners [7]. Development of a framework that takes inclusive design into consideration which can be applied to physical spaces, needs to take account of key principles such as equitable use, flexibility in use, simple and intuitive use, low physical effort, perceptible information, and size and space for approach and use.

3. Methodology

The Framework was developed through a participatory, interdisciplinary and collaborative process, drawing on knowledge from all stakeholder groups. The process of developing the Framework followed a two-pronged approach; a review of international best practice and consultations with MTU staff and students. The latter identified or established current practices at MTU and included focus group sessions where feedback gathered would inform the Framework. These approaches provided both research and stakeholder informed pathways for the benchmarking process and Framework development.

The team contacted and engaged with expert colleagues across multiple disciplines in MTU which

were relevant to development of the Framework, including but not limited to: the Nimbus Research Centre, Technology Enhanced Learning and E-Learning Development and Support Unit regarding cutting edge technologies that can be used in learning spaces; Department of Architecture and Cork Centre for Architectural Education regarding the design perspective; the Access Office regarding accessibility and inclusivity issues.

The purpose of engagement with these colleagues was to collaborate with other experts in their discipline area for the development of the Framework. There are existing strengths in the university to support the design and configuration of learning spaces, this project sought to learn from and enhance the existing knowledge base.

A framework where students and staff were afforded a voice, informed of best practice by external stakeholders and agencies, in planning and design of learning spaces, embeds a people-centric approach to the use of university spaces. Inclusion of our MTU community in the design of learning spaces demonstrates that MTU provides opportunities for all to engage and belong. Creating a community within spaces, where spaces are designed and planned for different learners and learning needs creates a sense of pride, identity, and belonging amongst our internal community, welcoming diversity, and nurturing the well-being of students and staff.

Utilising the Framework to ensure provision of digital learning services are considered in design, enables inclusive access, removing barriers to learning. A holistic approach to designing/upgrading learner spaces supports and enhances learner development and experience [8].

3.1 International Best Practice

An examination of international best practice began with a comprehensive desk review of learning spaces focusing not only on the different types of learning environments, but also on guidelines and the design process itself. Research in this area was identified at the following higher education institutions; Delft University of Technology, Yale University, Massachusetts Institute of Technology, Simon Fraser University, University of British Columbia and University College Cork. A detailed process for creating learning spaces entitled “The UK Higher Education Learning Space Toolkit” [9] was identified. Online consultation with the University of Surrey outlined the process of space management and stakeholder engagement, demonstrated through the design of a pilot space and workshop.

As part of the international benchmarking process to benchmark innovative spaces and practices on developing new spaces, members of the research team visited several universities in the Netherlands, namely, Eindhoven University of Technology, University of

Amsterdam, Utrecht University and Wageningen University. Visits to other European universities included KU Leuven in Belgium, the Royal College of Surgeons in Ireland (RCSI), and the University of Extremadura in Spain.

Valuable insights were gained which informed the development of the MTU Framework, which we suggest is universally applicable. The visiting research group from MTU were allowed to take photographs of relevant spaces, which were stored in a central repository for reference when refurbishing existing or developing new spaces in line with the developed Framework. It was informative to meet colleagues from other institutions who hold positions which are specifically dedicated to space development from the education perspective. These visits created new collaborative networks for MTU and ensured an evidence-informed approach to the project.

Other external agencies such as AHEAD, Enable Ireland, National Disability Authority and Inclusion Ireland were contacted for best practice advice to ensure additional input from the external evidence base.

3.2 Consultations with MTU Staff and Students

Preliminary discussions with Building and Estates on two campuses, one in Cork and one in Kerry, provided information on how refurbishment and development of learning spaces has taken place at MTU. Consultations with other functional units and departments including the library, the Learning Resource Centre and student service provision, known as An SEO, further emphasised the importance of developing a framework.

The research team identified two existing spaces for detailed analysis; an outdoor classroom, shown in Figure 1 and multipurpose room Figure 2, both on the Kerry Campus, which have recently been developed, and an automotive technical learning space currently being developed (Cork Campus).

The research team received ethical approval from the University Research Ethics Committee to undertake a study entitled “Development of a framework for



Figure 1. Outdoor classroom space at MTU



Figure 2. Multipurpose room at MTU

stakeholder engagement in the design of Learning Spaces at MTU” which essentially comprised a series of three questions to be proposed to the focus group participants namely:

1. *What is your experience of learning spaces at your institutions?*
2. *What improvements would you like to see made to learning spaces at your institution?*
3. *What input would you like to have in the creation/design of learning spaces at your institution?*

Focus group sessions were organised on Cork and Kerry campuses to illicit feedback from stakeholders of the identified spaces. Three focus group sessions took place on the Bishopstown campus, Cork with student and staff participants representing business, software development, engineering (automotive, mechanical and electrical) and tourism and hospitality.

In the Cork campus focus groups, students participated in a think, pair, share activity, whereby students considered a series of questions relating to learning spaces: what spaces facilitate learning, what spaces were a challenge to learn in, and positive features and improvements needed to spaces within MTU. Students also evaluated one room as an exemplar of a newly refurbished learning space. Finally, student participants considered what role students should have in the creation and design of a learning space framework.

The common themes highlighted by participants across the three sessions in Cork were department spaces, input, technology, infrastructure/furnishings, and availability of space. As an exemplar of a recently refurbished learning space, students evaluated and considered what was positive about the space and any improvements or changes that were needed. The positive feature were infrastructure/furnishings and ambience.

All student participants agreed that it was imperative the student voice is included in the design and development of a learning space framework. As the primary consumer of learning spaces, it was noted that representation of students was key in identifying the

needs of students when designing effective learning spaces. It was suggested that this could be achieved by surveying students and including student representatives on consultation panels.

Additionally, students identified a need for common departmental spaces where they can collaborate within their class groups on projects, interact with other year groups, and that would in turn create a sense of belonging and identity for students. Finally, representation of students and inclusion of students in determining their learning needs was also important to students, for the design of learning spaces.

Four focus groups took place on two Kerry campuses; two with staff and two with students who use an outdoor classroom (Figure 1) or a multipurpose room (Figure 2). A thematic analysis of information obtained from the focus group sessions was employed to help identify relevant parameters and topics for inclusion in the Framework.

The main themes at the Kerry campuses focus groups were Benefits, Improvements and Input with the Benefits theme having three sub-themes, Design, Space and Learning. Additional feedback included the need for funding to be available from the start and linking spaces to SDGs/UD/UDL principles that MTU operates under.

The focus group sessions at MTU gained insights from staff and students from the outdoor learning space and the multipurpose room. Key benefits highlighted the multifunctional, innovate designs that promoted engagement and different learning approaches. Both staff and students expressed a desire to be involved in designing of learning spaces and staying informed throughout the process. Overall, the input from the focus groups was highly valuable for the development of the Framework.

4. Main Outcomes of the Project

Best Practice in Learning Spaces

The development of learning spaces has gained momentum since the development of the Pedagogy, Space, Technology (PST) Framework by Radcliffe [10] and more recently due to the hybrid/blended teaching environments. The approach to learning spaces is changing, and greater awareness of the requirements of learners, including neuro-diverse learners, presents a significant opportunity for higher education to make the experience of learning more engaging and successful for everyone [11]. Learning spaces are not mere physical enclosures; they are dynamic environments that shape the educational experience, influencing how knowledge is acquired, shared, and applied [12]. Many higher education institutions have developed principles and guidelines for the design of learning spaces.

Ratcliffe [10] reviews new approaches to the design of learning spaces in higher education institutions

culminating in the development and proposal of a Pedagogy-Space Technology (PST) Design and Evaluation framework. This process invites stakeholders including administrators, faculty, architects, students, equipment, and technology providers at each stage of the conception, development, realization, and use of a new learning space to reflect on what they are doing and why. Temple [13] considers “Learning spaces in higher education: an under-researched topic” and in a review indicates that higher education spaces can be considered in various ways: in terms of campus design, in terms of how space can support the development of a university community, the needs of specialist spaces, and the impact of technology on space use.

Further research considered prior frameworks such as PST and proposed a combined framework called Pedagogical, Environmental, Content, Technological, and Social affordances (PECTS). The Higher Education Design Quality Forum HEDQF ‘as part of the future of learning environments’ project [14] identified six key themes for research into future learning environments in university estates.

The ‘learning-space compass’ framework and toolkit has been devised to help diverse stakeholders understand and discuss learning needs and provides guidance on how to integrate it into the different stages of a learning space project. Dalsgaard and Ryberg [15] present a theoretical framework for digital learning spaces. The University of British Columbia provides guidelines [16] for the planning and design of learning spaces specifically targeting new constructions and renew and renovation projects. Aashna Khurana [17] provide a framework to design inclusive learning spaces by deriving insights from the work of various groups of architects internationally that have explored the relationship between physical spaces and Universal Design for Learning UDL.

Wilson and Cotgrave [18] developed a framework for learning space design for built environment students identifying eight important learning space factors such as access to space, convenient workspaces, environment, layout, sense, integrated space, aesthetics, and identity. The Future Learning Spaces - Space, Technology and Pedagogy Case Study Series report [19] identifies a sector-wide shift in emphasis from an ‘instruction paradigm’ to a ‘learning paradigm’ has meant that higher education institutions must now think about what it means to be a learner in these spaces.

A 2023 report for the Centre for Education Teaching Innovation, University of Westminster [20] quote prior research “There appears to be a lack of research carried out on the design of buildings, let alone the spaces within them or how these spaces can impact student success”. The report focusses on structured and semi-structured spaces from lecture theatres to social learning places and is extensively illustrated with figures and photos and considers designing ‘sticky

campuses' including redesigning spaces in corridors, gathering spots, and dispersal areas to encourage students to meet and talk informally. The UK HE Learning Space Toolkit [9] provides an overview of learning space design in a higher education context, from the point of view of the professional support services who play a key role in such projects.

From a nationally perspective, University College Cork [21] in 2015 identified that three major trends inform current learning space design: Support for active learning, human-centred design and increasing ownership of mobile devices. In 2020 a Conceptual Framework of Universal Design for Learning (UDL), incorporating 3 key stages, for the Irish Further Education and Training Sector [22] was reported by Solas. The National Forum for the Enhancement of Teaching and Learning in Higher Education [23] recognises that everybody's journey in higher education is unique, and that the higher education system needs to embrace this understanding and all stakeholders interacting with higher education need to reflect on their responsibilities in contributing to student success.

Best Practice in Learning Space Design

Involving stakeholders at the planning and development stage gave them a sense of pride and ownership. Enabling students to develop a sense of belonging to learning spaces and how students use learning spaces, can impact their academic and social engagement. It highlights the need for understanding how the design of learning spaces may affect how students use these spaces for better collaboration and learning. It is imperative to be mindful of the conditions that impact the quality of the learning spaces experience and the requirement for learning spaces to be adaptable and changeable to the needs of students as well as teaching and learning activities. Imaginative spaces can engage learners and facilitate new learning approaches.

The design and use of learning spaces can provide support for experiential approaches to learning and are of particular importance in establishing a sense of belonging. Multifunctionality and flexible possibilities of space use, location, accessibility, connectivity, and ambience of learning spaces is important to the overall dynamics of how students engage with the university and with one another. The diversity and complexity of the types of activities spaces can accommodate can enhance the potential for informal learning and interaction.

Learning spaces provide an opportunity to enhance the skills acquired by working, socialising, and learning in such a space, enable a richer learning experience and have a positive effect on the perception of the university environment. The design of these spaces needs to simultaneously account for a variety of uses and perceptions across different users and groups as well as

a wide range of engagements and interactions. It needs to be infrastructurally flexible to change as the learning culture evolves. Well-designed learner spaces give students increased autonomy, enabling them to participate successfully in a globalised knowledge economy, through creativity, knowledge sharing and teamwork, using the skills and competencies they develop.

Learnings from International and National Visits

Generally, extensive stakeholder engagement was an intrinsic element within higher education institutions visited in terms of learning space design and development. Both historical and protected buildings were equally likely to be developed into learning spaces as well as custom built spaces. There were many examples of spaces for individual, group study, collaborative meetings, with different arrangements of seating and accommodation ranging from individual chairs, study booths, benches, in addition to "town hall" venues, where appropriate learning spaces employed the latest technologies. There were different dedicated quiet and non-eating drinking spaces along with study spaces with food and drink permitted, social engagement spaces with games and jigsaws and spaces or meeting rooms that could be booked or reserved for meetings and for student projects. Figures 3 and 4, show examples of exemplary spaces visited.

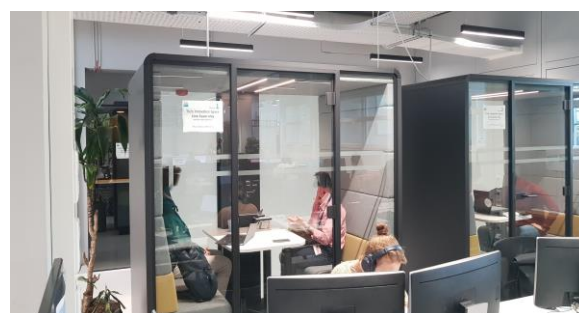


Figure 3. Quiet pods for meeting and study, located at Eindhoven University of Technology

It was clear that the learning spaces were attractive to students, being fully occupied, and in some cases managed by the students themselves, and were places students wanted to be. In terms of formal classrooms or laboratory spaces, emphasis was on flexibility to accommodate or work with groups. Examples included easily moveable seating and desks/benches on wheels/chairs and hybrid rooms.

Within the Future Learning Spaces project, Utrecht University is working on a vision of the physical learning environment. This reflects the core elements the university puts forward in pursuing good quality education. Personal, intensive, flexible, activating, and small-scale education form the basis for how education is organised.

The TU/e innovation space was developed to enable students to learn through Challenge-Based Learning (CBL), by solving real-world challenges in an interdisciplinary team.

The design of their space was co-created with students with many chillout areas available. It is as open as possible in order to enable connections and unplanned conversations and to stimulate serendipity while also facilitating events, presentations and other activities. There are workshops and labs to execute interdisciplinary prototyping, as well as meeting spaces for collaborative work with different stakeholders. There are lots of screens, digital tools and whiteboards for students, staff and industry partners to visualize and share ideas.

The word cloud of how the community of users see the space emphasises the words Community, Innovation, Creative, Open, Fun, Inspiring. The Director emphasised the need for someone to have a very clear vision and to drive the development of such a learning space.

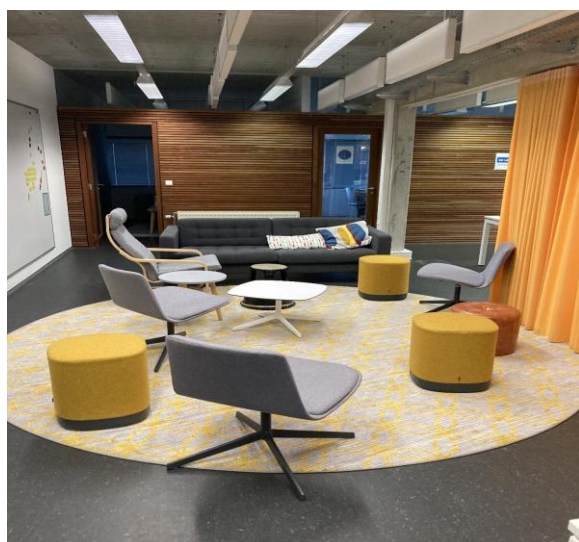


Figure 4. Flexible social space located at KU Leuven in Belgium

Agora is KU Leuven's student learning centre which supports all forms of social and activating learning. It has spaces to support various type of learning – group facilities, individual study spaces, quiet spaces, social spaces.

Wageningen University had a wide variety of learning spaces, allowing for team centric activities, facilitating students and staff to exchange ideas and co-create from different perspectives. Physical spaces offer extensive didactic opportunities, stimulate learning processes and many areas are rich in technology.

Classrooms were designed in such a way that there were multiple screens along each side wall to allow for

breakout sessions per table, ensuring collaborative interaction with those logging in remotely. Room dividers were multipurpose as lecturers and learners could write on them allowing for interactive engagement in classes and workshops. Multiple breakout spaces for shared working or relaxation were available in each building and the colours and materials chosen were colourful and enticing, making the spaces very welcoming.

The FabLab has co-working spaces which are used for various activities from curricular lectures to student challenges to student startup incubators. The joint use of common spaces with companies facilitates collaboration and co-creation leading to opportunities for inspiration, ideation, and incubation.

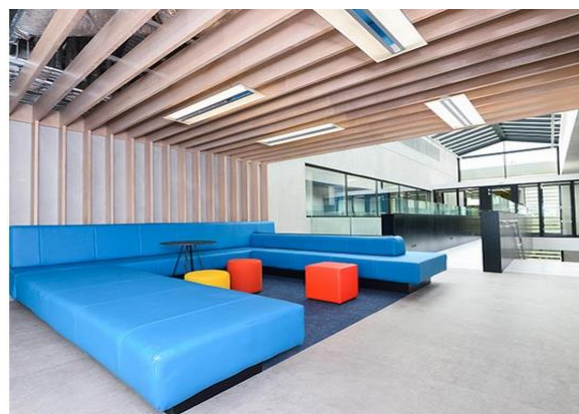


Figure 5. Chillout space, located at Royal College of Surgeons Ireland (RCSI)

Students and staff play significant roles in RCSI's Construction Projects Governance Structure which includes a project steering committee. In addition, RSCI have extensively reviewed the effects of campus spaces and places on student engagement, quality of life, student satisfaction, student attainment and student retention. These facets are evident in the design of the rebuild of 26 York Street, a ten-storey education building in the heart of Dublin city centre. The building has received several awards for education, healthcare and universal design.

As experiential learning is a critical part of RCSI's learning and teaching strategy, the top three floors are dedicated to simulation-based education including a world-class surgical and clinical training suite containing a flexible wet lab, mock operating theatre, clinical training wards, standardised patient rooms and task training rooms.

MTU Stakeholder Feedback

The experience of existing learning spaces by MTU stakeholders indicated that there were considerable differences in feedback from users of older versus newer learning spaces. Examples of the latter included

an outdoor classroom and several multipurpose rooms. These spaces received positive feedback in terms of collaboration, décor, fit out, technology, engagement and interactive as opposed to the former which were described as outdated with poor infrastructure and technology, overcrowded and non-collaborative.

Students indicated a sense of ownership and responsibility for programme specific areas such as project rooms. It becomes their space to communicate, learn and work with fellow students and academic staff. This is more reflective of the collaborative working environment in future employment. These type of learning spaces become important as students' progress through their programme of study, specifically in final year when completing projects and other capstone activities.

Feedback from stakeholders provided insightful recommendations for future spaces. Stakeholders who use an outdoor classroom which has already been developed advised that it is multifunctional, it gives students a different perspective on university learning, takes them out of formal learning and leads to more social learning. It allows for more collaborative learning and individual exploration.

The relationship between students and staff is different, as it is a different type of engagement, it helps to change the way students are taught and how they learn. Stakeholders of a developed indoor space advised that it is a multi-purpose, fluid, and mobile space. There is more engagement by students, more stimulation and it gives them more ownership. It leads to better communication, is more interactive, less formal and a relaxed space in which to learn and study.

A purpose-built collaborative space was described as a modern space where students want to study allowing for creativity and collaboration. The décor and furniture of another flexible classroom was said to provide students with a sense of belonging.

MTU stakeholders also highlighted the importance of Universal Design, Universal Design for Learning, User Experience Design and the United Nations Sustainable Development Goals (SDGs) in the design of learning spaces. The awareness of the latter has become significant across the higher education sector. During a benchmarking visit to the Royal College of Surgeons (RCSI) in Dublin, SDGs were prominently displayed in a student/staff canteen.

The recent development of a multipurpose room at MTU has the SDGs displayed on boxes around the room. There is an opportunity for this to be expanded across MTU campuses, and within other Higher Education institutions, as learning spaces are refurbished and developed. The mapping of the SDGs to learning outcomes and assessment strategies has become an important component of course development and MTU has developed a toolkit to facilitate the process which identifies key SDGs that align with a programme. The display of these key SDGs in programme specific areas such as project rooms and

laboratory spaces will increase awareness and relevance to curricula.

Similarly, the delivery of the programme curriculum has been designed in line with Universal Design for Learning (UDL) core principles Multiple Means of Engagement, Multiple Means of Representation and Multiple Means of Action/Expression. Academic staff engage in training to ensure programme content is presented in different ways to 'stimulate motivation and enthusiasm' and facilitate understanding by learners 'with different styles / abilities. Likewise, it is essential that these principles are an integral part of the design of learning spaces. Framework participants may require the knowledge and training in UDL to inform the design process that will provide options for all types of learners.

Wider stakeholder engagement and consultation, especially inclusion of students was a prominent theme from all focus groups sessions. Participants suggested surveys and comment boxes were recommended. However, the data highlighted that direct consultation with students is key to having a greater input and being informed throughout the design process. A student advisory panel was also suggested within the data.

The focus group sessions allowed for stakeholder feedback where insights were gained from MTU staff and students for a range of diverse learning spaces. Key findings for incorporation into the Framework include a steering committee with representatives from each stakeholder group and EDI, UDL and SDGs principles. Both staff and students expressed a desire to be involved in the designing of learning spaces and stated a desire to be kept informed throughout the process. The Framework (Figure 6) ensures this engagement and consultation with stakeholders playing an active role in eight of the nine steps. Overall, engagement with stakeholder groups was highly valuable for the development of the Framework.

5. Development of the Framework

Collins dictionary [24] defines a framework as a particular set of rules, ideas, or beliefs which you use in order to deal with problems or to decide what to do. The primary objective of this project is to "To establish a framework for student, staff and industry early engagement in the development and design of new and the enhancement of existing learning spaces at MTU".

The Framework for Stakeholder Engagement in the Development of Physical Learning Spaces at MTU was developed following a review of best practice nationally and internationally, consultation with Buildings and Estates staff, Senior Technical Staff, Academic staff and students. Team members reviewed existing literature relating to learning spaces and visited seven universities in the Netherlands, Spain and Ireland.

The Building and Estates Offices on the MTU Cork campus provided detailed information on the current procedures in relation to in-house and capital projects. There is a set of very detailed and prescriptive requirements for the management of capital projects as outlined in the Capital Works Management Framework (CWMF) which is an integrated set of contract forms, guidance notes and standard templates that are required to assist in the satisfactory delivery of public sector capital works projects. The developed Framework seeks to complement this technical and detailed CWMF Framework with an approach that follows the PLQ (Plain Language Questions) method of the CWMF but in no way seeks to replace the requirements detailed in the CWMF.

The Estates Manager on the MTU Kerry campus highlighted the existing differences in the procedures across the MTU campuses. The necessity of stakeholders having “informed ideas” before they can meaningfully contribute to the development of learning spaces was highlighted. The Framework seeks to address this by means of the best practice and case study repository (initial and final steps respectively). Meetings with Senior Technical Officers highlighted the need for project sponsors to “know what you want, come with a big brief”.

Focus group sessions were conducted with staff and students (23 students, 9 staff, 4 sessions, MTU Kerry, 18 students, 9 staff, 4 sessions, MTU Cork). Thematic Analysis (TA) of the collected data was completed using NVivo. The consistent and clear message from these focus groups was a strong desire by staff and students to contribute to the design of learning spaces as they were the primary consumers and ultimate users of the developed spaces. Two versions of the Framework were developed – a Concise Framework (Figure 6) comprising of a high-level view of the recommended steps of engagement with stakeholders, and a Detailed Framework. The latter is a guidance document of the steps to be taken for early engagement with stakeholders.

The first three steps of the Framework (Concept Development, Establishment of a Steering Committee and Stakeholder consultation) address these requirements by having clear project strategic definition, involvement of representatives of key university stakeholders in project steering and stakeholder consultations with staff, students and industry.

The next five steps (co-creation with the design team, design development, developed design and procurement, contract, tender and construction) require expert input from specialist building design and project management personnel but the Framework also requires pedagogical input in steps four, five and six.

The penultimate steps (eight and nine) require reengagement with the key stakeholders on the physical manifestation of the learning space to ensure that it meets the requirements as developed in step three while

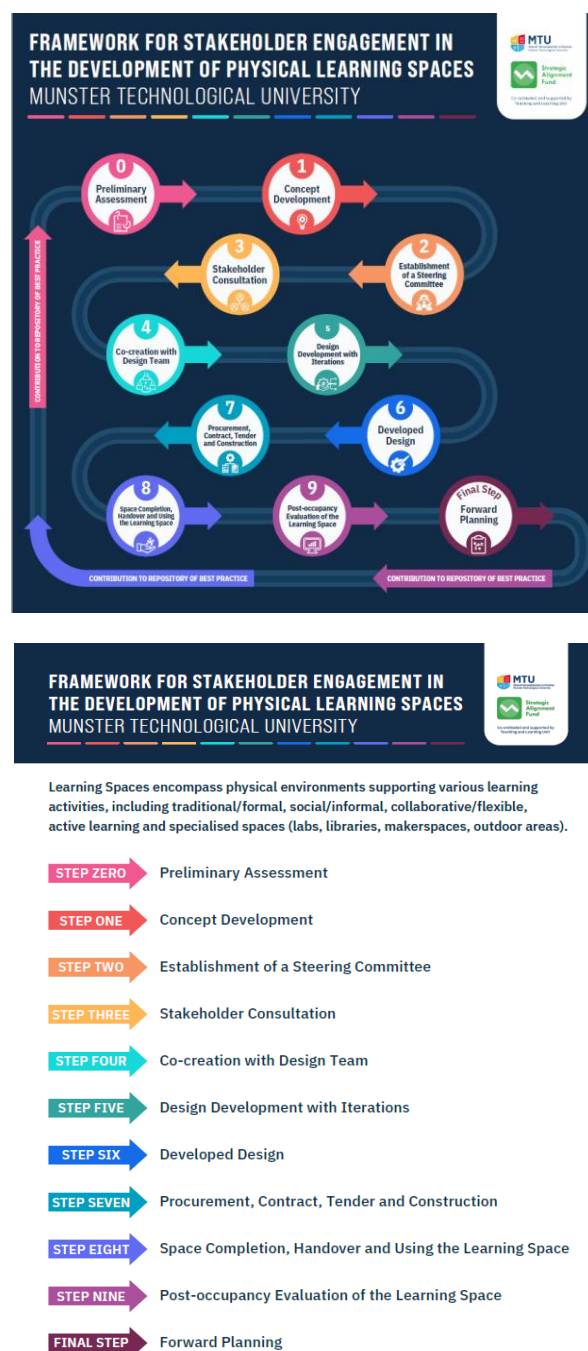


Figure 6. Concise Learning Spaces Framework

step nine involves stakeholders in the evaluation and possible improvements in the developed space.

6. Key Impacts of the Project

Short-Term Impacts

The Framework incorporates Equality, Diversity and Inclusion (EDI), Pedagogy, Space, Technology (PST) Framework Universal Design for Learning (UDL) and the UN Sustainability Development Goals (SDGs). Stakeholders play an active role in eight of the

nine stepped processes. The project initiated the development of the Learning Spaces Repository with material from the data collection element as well as benchmarking visits.

Step Zero requires reference to the evolving MTU Learning Spaces Repository for existing Case Studies and best practice followed by a needs analysis, funding sources and budgeting, project feasibility and proposed project timelines. This will have an immediate impact of ensuring alignment, consistency and collaboration across the university when planning learning spaces projects.

Another short-term impact is the establishment of a Steering Committee per project to compile a Case Study concise report to the MTU Learning Spaces Repository and copy to Buildings and Estates to capture learning for future projects. Thus, best practice is reinforced and constantly updated by each new learning spaces project. The spiral graphical representation of the Framework reinforces this idea of constantly evolving best practice. Through strategic stakeholder engagement, benchmarking, and a commitment to Universal Design principles, this framework embodies an inclusive approach, acknowledging the indispensable role of students and faculty in the evolution of learning environments [25]. As this project takes its place within the narrative of higher education innovation, the researchers urge institutions to embrace collaborative practices and prioritise stakeholder engagement in the planning and design of learning spaces.

Long-Term Impacts

The Framework supports development of a learning landscape where dynamic learning takes place with students fostering collaboration, critical thinking and creativity and the ability for independent and collaborative learning. Ongoing feedback from the piloting and use of the Framework will inform the evaluation of the effectiveness of new and refurbished spaces from a pedagogical perspective. The Framework itself will remain a flexible document subject to iterative adaptation in response to the needs of Higher Education going forward.

One element which requires further attention is to ensure the Framework and the learning spaces developed support digital transformation in higher education to enable students to effectively engage in a rapidly evolving, increasingly digitally mediated workplace and society. Ensuring provision of digital learning services are considered in design, will promote inclusivity as well as team-based, transformative and authentic learning. It is anticipated that the Framework developed within the project will have a long-term impact on the planning and design of learning spaces at MTU, with a key focus on stakeholder engagement from the outset of planning and throughout refurbishment and new builds.

The team will share the Framework with other Higher Education Institutions with the anticipation of:

- Inspiring the development of similar frameworks in other Irish universities;
- Creating a Network of Colleagues in Higher Education Institutions taking an educational approach to the design of learning spaces.

Strategic Benefits for Staff and Students

The Framework requires early and ongoing engagement with key stakeholders, including staff and students, as learning spaces are planned, designed and refurbished. This engagement gives opportunities for staff and students to have a voice in respect of the layout and design of learning spaces. The Framework promotes the support of staff development and encourages innovation in teaching practices within learning spaces.

Learning spaces are a critical component of the teaching, learning dynamic and enabling both staff and students to have an input into design of spaces achieves a more positive relationship between staff and students, thereby enhancing learning. A central repository of information on best practice and sample learning spaces from other HEIs will be created from the project and will be available to staff, to inform and influence their practices.

Placing students as a central part to the decision-making on learning spaces, empowers them as they learn in spaces. This early engagement gives opportunities for students to have a voice in respect of the layout and design of learning spaces. The Framework promotes the enhancement of student engagement, increased student success and improved student experience.

7. Conclusions and Recommendations

A key recommendation emanating from this research reinforces the need for the development of a step-by-step guide on the process for engagement of a learning space development project, ensuring collaboration, consultation, and communication with stakeholders, including students. Our research, and the resulting Framework, represent a significant contribution to the evolving landscape of higher education. The Framework has been developed through a collaborative, interdisciplinary and participatory process, drawing on knowledge from all the stakeholder groups.

The Framework not only addresses the physical aspects of learning spaces but also embeds a people-centric approach by involving students and faculty in decision-making processes. As universities continue to adapt to changing educational needs, this Framework stands as a model for fostering innovation and

inclusivity in the design and configuration of physical learning spaces. A key recommendation of the project is that MTU establish a position dedicated to learning space design from an educational perspective. As this project takes its place within the narrative of higher education innovation, the researchers urge institutions to embrace collaborative practices and prioritise stakeholder engagement in the planning and design of learning spaces.

Learning spaces should allow everyone to participate on an equal basis and feel welcome and included. To foster creative, flexible, and adaptable minds, the university needs to look more critically at the extent to which learning space designs promote pioneering ways of learning and thinking. Learning space designs with technology-rich environments such as collaborative spaces, flexible classrooms and labs can encourage student-centred interactive and collaborative learning experiences, supporting active participation and rich engagement. Integration of technology helps to create an immersive learning environment, helping to promote experiential learning and stimulate critical thinking.

A clear, shared vision of what learning spaces need to look like to support better outcomes for learners and teachers needs strong leadership and continuous conversation. Changing the learning environment requires both transformational leaderships to shape the shared vision, and instructional leadership to lead the change in practice.

8. References

- [1] Doyle, T. (2023). Helping students learn in a learner-centered environment: A guide to facilitating learning in higher education. Taylor and Francis.
- [2] Dwyer, P., Mineo, E., Mifsud, K., Lindholm, C., Gurba, A., and Waisman, T. C. (2023). Building neurodiversity-inclusive postsecondary campuses: recommendations for leaders in higher education. *Autism in Adulthood*, 5(1), pp.1-14.
- [3] McCrone, L., Kingsbury, M. (2023). Combining Worlds: A mixed method for understanding learning spaces. *International Journal of Qualitative Methods*, 22.
- [4] Guardia, L., Clougher, D., Anderson, T., and Maina, M. (2021). IDEAS for transforming higher education: an overview of ongoing trends and challenges. *International Review of Research i Open and Distributed Learning*, 22(2), pp.166-184.
- [5] Qureshi, M.A., Khaskheli, A., Qureshi, J.A., Raza, S.A., and Yousufi, S.Q., 2023. Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments*, 31(4), pp.2371-2391.
- [6] Streule, M., McCrone, L., Andrew, Y., and Walker, C., (2022). Engaging with students as partners in education space design. *International Journal for Students as Partners*, 6(2), pp.79-90.
- [7] Oleson, K.C., (2023). Promoting inclusive classroom dynamics in higher education: A research-based pedagogical guide for faculty. Taylor and Francis.
- [8] Sanger, C.S., (2020). Inclusive pedagogy and universal design approaches for diverse learning environments. *Diversity and Inclusion in global higher education: Lessons from across Asia*, pp.31-71.
- [9] Universities and Colleges Information Systems Association. (2015). The UK Higher Education Learning Space Toolkit.
- [10] Radcliffe, D. (2009). A pedagogy-space-technology (PST) framework for designing and evaluating learning places. In *Learning spaces in higher education: Positive outcomes by design. Proceedings of the Next Generation Learning Spaces 2008 Colloquium*, University of Queensland, Brisbane (pp. 11-16).
- [11] Walker, R., Jenkins, M. and Voce, J. (2018). The rhetoric and reality of technology-enhanced learning developments in UK higher education: reflections on recent UCISA research findings (2012–2016). *Interactive Learning Environments*, 26(7), pp.858-868.
- [12] Utrecht University. (2017). Future Learning Spaces. Centre for Academic Teaching and Learning. Utrecht University. <https://www.uu.nl/onderwijs/future-learning-spaces> (Access Date: 4 December 2024).
- [13] Temple, P. (2008). Learning spaces in higher education: An under-researched topic. *London Review of Education*, 6(3).
- [14] Patel, H. (2019). The future of learning environments. Higher Education Design Quality Forum.
- [15] Dalsgaard, C. and Ryberg, T. (2023). A Theoretical Framework for Digital Learning Spaces: Learning in Individual Spaces, Working Groups, Communities of Interest, and Open Connections. *Research in Learning Technology*, 31, p.3084.
- [16] University of British Columbia. (2022). University of British Columbia Learning Space Design Guidelines 2022. https://learningspaces.ubc.ca/sites/learningspaces.ubc.ca/files/ubc_learning_space_design_guidelines_2022.pdf (Access Date: 4 December 2024).
- [17] Khurana, A., (2022). September. Converting physical spaces into learning spaces: Integrating universal design and universal design for learning. In *Frontiers in Education* (Vol. 7, p. 965818). Frontiers Media SA.
- [18] Wilson, H. K. and Cotgrave, A.J. (2020). Learning space design: the presentation of a framework for the built environment discipline. *International Journal of Construction Education and Research*, 16(2), pp.132-148.
- [19] Elkington, S., and Bligh, B. (2019). Future Learning Spaces. Space, Technology and Pedagogy. A Case Study Series. Advance HE.
- [20] Healey, M. (2022). The Design of Physical Learning Spaces in Supporting Learning and Engaging Students on

Campus. A Report for the Centre for Education Teaching Innovation, University of Westminster.

[21] O'Halloran, J., Irvin, S., and Duggan, T., (2015). Status of Teaching and Learning Spaces at UCC. University College Cork. Teaching and Learning. Available from: 2015learningspacestatusreport.pdf (ucc.ie). (Access Date: 4 December 2024).

[22] Quirke, M., and McCarthy P. (2020). A Conceptual Framework of Universal Design for Learning (UDL) for the Irish Further Education and Training Sector. SOLAS. Available from: A Conceptual Framework of Universal Design for Learning for the Irish Further Education and Training Sector (solas.ie). (Access Date: 4 December 2024).

[23] O'Farrell, L. (2019). Understanding and enabling student success in Irish higher education. In National Forum for the Enhancement of Teaching and Learning in Higher Education (pp. 1-65).

[24] Dictionary, C. E. (2014). Collins English dictionary. Complete and Unabridged.

[25] Power, K., and Supple, B. (2021). Teaching Spaces: The Fourth Corner of University Learning. Transformative Dialogues: Teaching and Learning Journal, 14(3), pp.90-106.

9. Acknowledgements

The authors express special thanks to the participants in the research study, who gave valuable insights into their experiences of learning spaces. Special thanks are also given to the colleagues in universities who shared their practices for designing learning spaces, as well as giving the authors tours of current spaces.