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TECHNOLOGY



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EUT+

PEDAGOGICAL FRAMEWORK

Deliverable for Task 4.2

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EUt+ PEDAGOGICAL FRAMEWORK

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EXECUTIVE SUMMARY

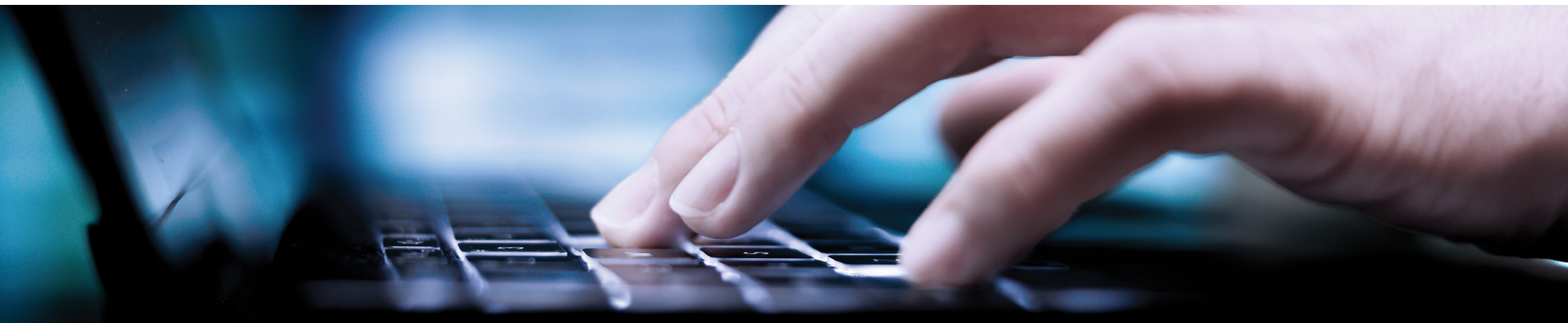
The EUT+ Pedagogical Framework establishes a comprehensive, evidence-based approach to higher education that responds to the evolving demands of the 21st-century global economy and the changing landscape of learning. Following an agile iterative design process using the Successive Approximation Model (SAM), this framework provides both a pedagogical foundation and practical guidance for transformative education in technology, engineering, and design fields. This framework establishes a common pedagogical terminology and approach across the EUT+ alliance while allowing for local adaptation and innovation, ultimately contributing to the advancement of a dynamic and inclusive learning environment across and beyond the EUT+ alliance.

At its core, the framework recognizes that learning is inherently a social process where individuals build knowledge through interaction and collaboration. This philosophy emphasizes communication, teamwork, and peer engagement, transforming education from an isolated activity into a shared, practical experience involving students, educators, and the broader community, extending beyond local boundaries to embrace transnational cooperation across the EUT+. The framework addresses the pressing reality that recent university graduates face a labor market that highly values skills and competencies specifically adapted to contemporary challenges, many of which require collaborative solutions that transcend national borders. Each individual brings unique expertise, and from the very beginning there is a commitment to sharing knowledge and drawing inspiration from diverse perspectives. The framework operates on the firm belief that working together across borders and disciplines enables more creative approaches to complex topics, fostering innovative ways to examine and discover the world around us.

The framework operates at multiple interconnected levels, distinguishing between pedagogy (the theory of education concerned with learning processes and content

knowledge), didactics (applied pedagogy in specific contexts focusing on teaching, learning, and assessment methods), and curriculum (systematic organization of learning pathways). This three-tiered approach ensures that the framework functions both as a macro-level organizational structure for EUT+ and as a micro-level guide for individual teaching paradigms, values, beliefs, and behaviors. The EUT+ Pedagogical Framework is built upon three interconnected core elements that collectively create a comprehensive and relevant learning experience: 1) Active and Experiential Learning; 2) Interdisciplinary Content Aligned with Labor Market and Society; 3) Digital and Global Learning Spaces.

The EUT+ Pedagogical Framework was developed through intensive collaboration among educators, researchers, and institutional leaders across the alliance, employing a systematic, evidence-based methodology aligned with contemporary educational research and European higher education policy frameworks. The development process comprised three integrated phases: (1) comprehensive needs analysis conducted through stakeholder consultations with faculty, students, and administrators across all partner institutions to understand context-specific requirements and expectations; (2) extensive desk research examining established pedagogical frameworks, current educational trends, best practices in European engineering and technology education, and the Blueprint for a European Degree to ensure evidence-based design; and (3) iterative co-design and refinement, incorporating continuous feedback through alliance meetings, virtual brainstorming sessions, and pilot course implementations. The pedagogical framework aims to inform degrees across EUT+, including bachelor's, master's and doctoral degrees, as well as short courses or microcredentials. Ultimately, the framework offers a model that can be adapted to a wide range of degrees, providing a transferable approach with replicability potential for other alliances.



GLOSSARY OF CORE TERMS

Pedagogical framework

A structured approach to teaching and learning that outlines the methods, strategies, and principles used to facilitate education. It provides a coherent and comprehensive guide for educators to design, implement, and assess instructional practices, ensuring they align with educational goals and learners' needs¹.

Learning Experience Design (LXD)

An approach to designing learning experiences that considers the entire learning environment, not just the instructional materials or content.

Learning Objectives

Statements that outline what students should be able to perform after completing a particular learning activity.

Learning Outcomes

Statements that outline what students will be able to do or perform at the end of the course or semester.

21st-century skills

A set of competencies, such as communication and collaboration, that are crucial for preparing students and individuals for the demands of modern society.

EUT+ learning paths

Different directions that serve as versatile blueprints for creating transformative educational experiences aligned with the EUT+ Pedagogical Framework and the 12 characteristics of EUT+ degrees.

¹ Barnett, R., & Coate, K. (2005). *Engaging the Curriculum in Higher Education*. Open University Press.





01

OVERVIEW

1.1 FRAMEWORK'S PURPOSE, SCOPE, AND STRUCTURE

The EUT+ Pedagogical Framework is designed as a comprehensive guide for developing a 21st-century pedagogical approach within the EUT+ alliance, aiming to foster a new paradigm for European technological education. It addresses the pressing need for new approaches to education and research. The EUT+ Pedagogical Framework's scope encompasses various aspects of education and learning. It addresses education and research from undergraduate to doctoral levels, informing bachelor, master and PhD degrees as well as short courses, or microcredentials across EUT+.

The core purpose of the EUT+ Pedagogical Framework establish a transformative model of higher education that is student-centered, collaborative, and interdisciplinary, embracing transnational cooperation across the EU and interculturalism through embedded mobility. The framework is built to guide teaching efforts, promoting learning as a social experience where individuals construct knowledge through interaction and collaboration. It aims to prepare students for leadership roles in a rapidly evolving technological landscape, ensuring they are capable of working in multi- and cross-disciplinary teams while upholding European values such as inclusiveness, sustainability, and equality. The framework intends to inform the delivery of a holistic educational experience that provides students with the necessary skills, knowledge, and competencies to thrive in the modern world.

This document is structured to provide a detailed exploration of key educational concepts, methodologies, and frameworks that underpin the design of curricula across the EUT+ partner institutions. Ultimately, the framework operates at multiple interconnected levels, distinguishing between pedagogy, didactics, and curriculum.

1.2 KEY TAKEAWAYS FOR HIGHER EDUCATION INSTRUCTORS

For higher education instructors, the EUT+ Pedagogical Framework offers a comprehensive guide that synthesises established pedagogical principles with innovative approaches, specifically tailored for 21st-century technological education.

WHAT WE KNOW

Established Principles from Best Practices and Learning Theories

Higher education widely recognises several foundational pedagogical principles and practices that place the learner at the heart of the educational process. **Student-Centered Learning (SCL)**, a defining feature of many leading institutions, involves active participation, a focus on real-life skills, adapting to student needs, increasing student choice and control, fostering autonomy, encouraging metacognition, utilising formative assessment, and adopting a humanistic role for the teacher². This is closely supported by **Active and Experiential Learning**³, which requires students to actively engage through thinking, discussing, investigating, creating, and solving problems, significantly enhancing learning experiences and often linking to real-world contexts. **Problem-, Challenge-, and Project-Based Learning (PBL, CBL, PjBL)** are prominent inquiry-based approaches that immerse students in solving open-ended, real-world problems or creating tangible products, thereby fostering critical thinking and practical application of knowledge by having students identify variables, formulate hypotheses, and suggest solutions under guidance⁴. **Interdisciplinary and Transdisciplinary Learning** acknowledges that complex problems necessitate a synergy of various disciplines, equipping students with the competence to work across different fields⁵. **Design Thinking**, an innovative, creative, and human-centered process, uses collaborative multidisciplinary teams to generate user-focused solutions, involving stages like empathising, defining, ideating, prototyping, and testing⁶. **Technology Integration** is crucial, utilising digital tools and technologies (e.g., learning management

² Bremner, N. (2021). The multiple meanings of 'student-centered' or 'learner-centered' education, and the case for a more flexible approach to defining it. *Comparative Education*, 57(2), 159-186.

³ Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410-8415.

Theobald, E. J., Hill, M. J., Tran, E., Agrawal, S., Arroyo, E. N., Behling, S., ... & Freeman, S. (2020). Active learning narrows achievement gaps for underrepresented students in undergraduate science, technology, engineering, and math. *Proceedings of the National Academy of Sciences*, 117(12), 6476-6483.

⁴ Guo, P., Saab, N., Post, L., & Admiraal, W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102, 101586. <https://doi.org/10.1016/j.ijer.2020.101586>

Jalinus, N., Nabawi, R. A., & Mardin, A. (2017). The seven steps of project-based learning model to enhance productive competences of vocational students. *Advances in Social Science, Education and Humanities Research*, 102, 251-256. <https://doi.org/10.2991/ictvt-17.2017.43>

Nurkhin, A., Kardoyo, K., Pramusinto, H., Setiyani, R., & Widhiastuti, R. (2020). Applying blended problem-based learning to accounting studies in higher education; Optimizing the utilization of social media for learning. *International Journal of Emerging Technologies in Learning (IJET)*, 15(8), 22-39. Retrieved from <https://www.learn-techlib.org/p/217078/>

⁵ Nicolescu, B. (2010). Methodology of transdisciplinarity – Levels of reality, logic of the included middle and complexity. *Transdisciplinary Journal of Engineering & Science*, 1, 17-32. <https://doi.org/10.22545/2010/0009>

Nicolescu, B. (2012). The need for transdisciplinarity in higher education in a globalized world. *Transdisciplinary Journal of Engineering & Science*, 3. <https://doi.org/10.22545/2012/00031>

⁶ Schmarzo, B. (2017, May 2). Can Design Thinking Unleash Organizational Innovation? Retrieved from <https://www.datasciencecentral.com/profiles/blogs/can-design-thinking-unleash-organizational-innovation>

systems, virtual classrooms, AR, VR, AI) to enhance teaching and learning, thereby allowing for personalised, interactive, and engaging learning environments⁷. A core tenet of social constructivism, *Learning as a Social Process*, emphasizes that individuals construct knowledge through interaction and collaboration, highlighting the importance of communication, teamwork, and peer engagement.

WHAT WE ADD

EUT+ Framework’s Emphasis and Innovations

The EUT+ Pedagogical Framework’s overarching vision is to establish a transformative model of higher education that is not only student-centered, and collaborative but also interdisciplinary and transnational. It is explicitly designed to guide teaching efforts to empower and equip learners with 21st-century skills to ensure the success across the EUT+ alliance. The framework deeply embeds core European values such as inclusiveness, sustainability, and active citizenship. It specifically prepares students to lead technological change in response to global demands, particularly for the green and digital transitions. Lastly, the pedagogical framework aims to provide a structured student-centered learning experience by prioritising three interconnected elements:

1. **Active and Experiential Learning:** Specifically fostered through problem- and challenge-based activities, practical application of knowledge, research engagement, peer-to-peer learning, and inclusive teaching methods.
2. **Interdisciplinary Content:** This content is carefully aligned with the labor market and societal needs, promoting civic engagement and societal impact.
3. **Digital and Global Learning Spaces:** These are constructed via technology integration, embedded mobility programs, micro-credentialing, and modularisation to provide flexibility and accessibility in learning.


Finally, the framework encompasses specific EUT+ Learning Paths and aims to inform the design of curricula across the alliance, providing modular, stackable, and flexible learning options that respond to evolving societal and labor market needs.

⁷ Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: A systematic review of meta-analyses. *Psychological bulletin*, 143(6), 565.

1.3 INTENDED AUDIENCE


WHO IS THE EUT+ PEDAGOGICAL FRAMEWORK FOR?	
Higher education instructors	Higher education students
<p>Provides them with the tools and guidance to foster 21st-century skills in their students through active learning strategies.</p> <p>Offers step-by-step guidance for integrating student-centered methodologies into their course design.</p>	<p>Promotes deeper engagement, developing essential competencies such as critical thinking and collaboration, and improving academic and professional readiness and employability.</p>
<p>The framework aims to bridge the gap between institutional reform visions and everyday classroom practice, leading to more effective and future-oriented higher education.</p>	

WHAT DOES THE EUT+ PEDAGOGICAL FRAMEWORK OFFER?




Guidance to Higher Education Instructors

Guidance to align teaching with educational reforms by integrating active learning and student-centered strategies




Support for Higher Education Students

Boost student participation and learning, foster skills and competencies improve academic and professional readiness



Tools and Practices for Instructors

Tools for instructors to enhance teaching effectiveness and foster 21st-century skills for their students



Effective Higher Education

Bridging the gap between institutional reform visions and everyday classroom practice, leading to more effective and future-oriented higher education

1.4 HOW TO USE THIS DOCUMENT

Here is how to use this document and what you will gain from each section: begin by developing a foundational understanding of the EUT+'s Pedagogical Framework vision, mission and rationale (Section 2). Then review the key pillars of the Framework and its design principles (Section 3), and how to apply them in your course through the five learning paths and their variations (Section 4). Get inspiration on how to transform your teaching with our high-impact teaching strategies (Section 5). Consult the example of the Blended Intensive Programme (Learn - Lead -Legacy) as it offers insights into how these ideas can be practically applied, allowing you to adapt aspects of this program to your own course design where applicable (Section 6). At the end of the document, you will find Concluding Remarks (Section 7) and Further Readings that can provide further guidance on informing your teaching with evidence-based practices and current trends (Section 8).





02

**WHY A NEW
PEDAGOGICAL
FRAMEWORK
NOW?**

2.1 CONTEXT AND RATIONALE

The EUT+ pedagogical framework is conceived as a response to the pressing challenges of 21st-century higher education. It provides a common structure for harmonising programs across the EUT+ alliance while offering an innovative approach to teaching and learning that meets global demands for leaders in technological and societal transformation.

Central to this vision is the preparation of graduates equipped with 21st-century skills—competencies such as critical thinking, problem-solving, decision-making, collaboration, creativity, innovation, and social responsibility. These skills are vital for navigating the complexities of contemporary societies and for engaging with emerging technologies, including Artificial Intelligence.

Developing such competencies requires a shared pedagogical framework adapted to the specific context of a pan-European university alliance. EUT+ thus positions itself to ensure its graduates are not only technically proficient but also capable of leadership and innovation in an interconnected, rapidly evolving world.

WHY A NEW PEDAGOGICAL FRAMEWORK NOW? EUT+ Pedagogical Framework



⁸ Partnership for 21st Century Skills. (2019). Framework for 21st Century Learning. Retrieved from <https://bit.ly/3ES9JBC>

EUT+ GRADUATES KEY 21st CENTURY SKILLS AND THEIR DEFINITIONS



⁹ Kennedy, T., & Sundberg, C. W. (2020). 21st century skills In B. Akpan, & T. J. Kennedy (Eds.), *Science education in theory and practice: An introductory guide to learning theory* (pp. 479–496). Springer International Publishing.

¹⁰ Haug, B. S., & Mork, S. M. (2021). Taking 21st century skills from vision to classroom: What higher education instructors highlight as supportive professional development in the light of new demands from educational reforms. *Teaching and teacher education*, 100, 103286.

¹¹ Importance and Benefits of Decision-Making Skills in the 21st Century – School Education Solutions. (n.d.). <https://www.rajeevelt.com/importance-and-benefits-of-decision-making-skills-in-the-21st-century/rajeev-ranjan/>

¹² Strawbees Education Team. (2024, November 4). 21st century skills: Collaboration. Strawbees. <https://strawbees.com/blog/21st-century-skills-collaboration>

¹³ Creativity as important 21st century skill and its development – Creative Thinking Toolkit. (n.d.). <https://creativethinkingtoolkit.com/toolkit/methodological-guide/creativity-as-important-21st-century-skill-and-its-development/>

¹⁴ Jalowiec, T., Masloch, P., Wojtaszek, H., Miciula, I., & Masloch, G. (2020). Analysis of the Determinants of Innovation in the 21st Century.

¹⁵ Haskins, R. (2009, July 31). The sequence of personal responsibility. Brookings Institution. <https://www.brookings.edu/articles/the-sequence-of-personal-responsibility/>

¹⁶ Shukla, A. (2023, August 23). Beyond profits: The social responsibility of 21st-century CEOs. LinkedIn. <https://www.linkedin.com/pulse/beyond-profits-social-responsibility-21st-century-ceos-shukla/>

2.2 WHAT MAKES EUT+ PEDAGOGICAL FRAMEWORK DISTINCT?

The EUT+ Pedagogical Framework is a comprehensive response to the need for a modern, relevant, and impactful higher education model across Europe. The EUT+ Pedagogical Framework is empowering 21st century educators, enabling them to prepare of preparing students for complex global challenges and future societal needs. It moves beyond single pedagogical approaches, opting for a combination of the best pedagogical practices that best meet diverse student needs in the context of a pan-European alliance. Ultimately, the EUT+ Pedagogical Framework is not merely adopting isolated pedagogical methods but rather synthesising approaches within a holistic, transformative model. This model is underpinned by a clear vision for shaping future European technological education that is deeply informed by global, labor-market, and digital imperatives, all while reflecting core European values.

2.3 VISION AND MISSION STATEMENT: EUT+'S UNIQUE CONTRIBUTION TO GLOBAL EDUCATION

The EUT+ Pedagogical Framework's **vision** is to establish a transformative model of higher education that is student-centered, innovative, collaborative, embracing transnational cooperation across the EU and interculturalism through embedded mobility. By fostering interdisciplinary and transdisciplinary approaches, and emphasizing real-world applications linked with industry, EUT+ aspires to address EU-wide challenges.

Our **mission** is to deliver a comprehensive and holistic educational experience that equips students across the EUT+ alliance with the skills, knowledge, and competences necessary to thrive in the complexities of the modern world.

We envision and are dedicated to creating a dynamic, inclusive, and adaptive learning environment that places students at the forefront of educational development. This approach not only addresses the evolving needs of students and society but also empowers future leaders to tackle global challenges with competence and creativity. These values are integrated across all aspects of the framework, including teaching, assessment, and alignment with the needs of both the labor market and society, representing EUT+'s unique contribution to global education.

2.4 ALIGNMENT WITH INSTITUTIONAL VALUES AND BROADER EUROPEAN EDUCATION GOALS

The EUT+ Pedagogical Framework distinguishes itself by establishing a transformative model of higher education that is not only student-centered and collaborative, but also interdisciplinary, redefining educational boundaries and addressing urgent challenges. A core innovation is the deep embedding of fundamental European values such as inclusiveness, sustainability, and active citizenship, while actively preparing students for a rapidly evolving technological landscape, particularly to lead technological change in response to global demands for the green and digital transitions.





03 **THE Eut+
PEDAGOGICAL
FRAMEWORK**

The **EUT+ pedagogical framework** is designed to create an innovative model of higher education within Europe, placing a strong emphasis on student-centeredness, interdisciplinary and global collaboration for building real-life solutions. This framework seeks to meet the evolving needs of both students and society by seamlessly integrating cutting-edge technology, fostering interdisciplinary approaches, and maintaining a strong focus on real-world applications in the context of a pan-European alliance. By doing so, it ensures that education is relevant, adaptable, and impactful.

The EUT+ pedagogical framework (see Figure 1) prioritizes student-centered learning experience design, supported by three core elements¹⁷. First, **active and experiential learning** is fostered through problem- and challenge-based activities, practical application of knowledge, research engagement, peer-to-peer learning, and inclusive teaching. Second, **interdisciplinary content** is carefully aligned with the labor market and societal needs, promoting civic engagement and societal impact. Third, **digital and global learning** spaces are created through technology integration, embedded mobility programs, micro-credentialing, and modularization to provide flexibility and accessibility. Together, these elements create a comprehensive and relevant learning experience for students.

3.1 LEARNING EXPERIENCE DESIGN

Central to the framework is Learning Experience Design (LXD)¹⁸. Unlike traditional instructional design, which often focus on content delivery, LXD puts the learner at the center of the process, focusing on their needs, contexts, motivations, and learning goals. This approach emphasizes creating meaningful, engaging, and effective learning experiences through the thoughtful integration of three key pillars: Digital and Global Learning Spaces, Active & Experiential Learning, and Interdisciplinary Content, Aligned with Labor Market and Society.

+ Digital & Global Learning Spaces

- + Technology Integration
- + Embedded Intercultural Mobility
- + Modularisation and Flexibility
- + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
 - + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + Research Exposure and Engagement
- + Sustainability Consciousness
- + Civic Engagement and Societal Impact

Figure 1: Key elements of the EUT+ Pedagogical Framework

¹⁷ At the heart of this Pedagogical Framework lies the Learning Experience Design, which is based on the Learning Experience Design model as proposed by Wasson and Kirschner (2020).

¹⁸ Wasson, B., & Kirschner, P. A. (2020). Learning design: European approaches. *TechTrends*, 64(6), 815-827.

The EUT+ Pedagogical Framework is human-centered, emphasizing interdisciplinarity and co-creation in curriculum design, aiming at inclusive and competence-driven learning pathways across and beyond the European alliance. The three key pillars of the EUT+ pedagogical framework are elaborated in the following pages.

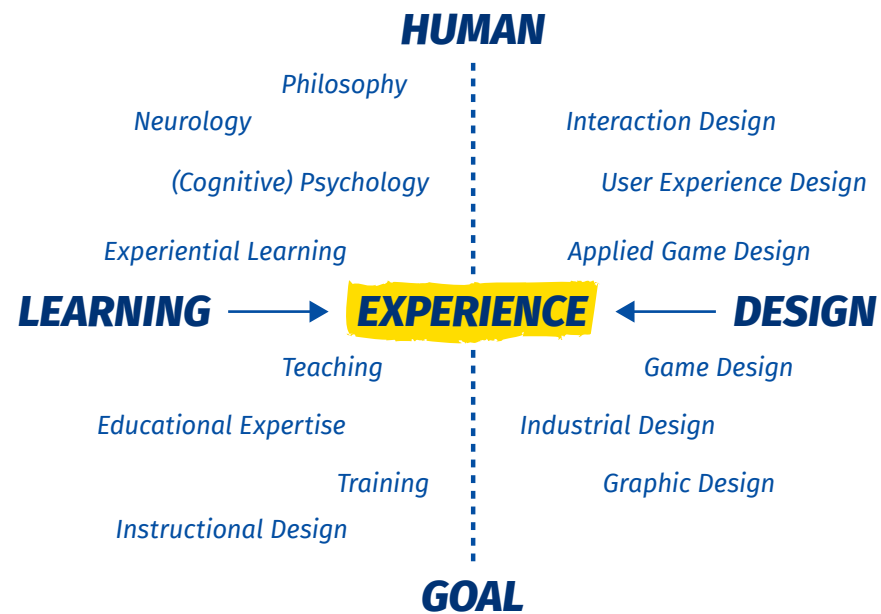


Figure 2: The Interdisciplinarity of Learning Experience Design Model¹⁹

¹⁹ LXD.ORG (2024). Fundamentals of learning experience design. <https://lxd.org/fundamentals-of-learning-experience-design/>

DIGITAL & GLOBAL LEARNING SPACES

This pillar denotes flexible and accessible learning environments through technology integration, embedded intercultural mobility programs, micro-credentialing, and modularization. It enables self-customization of study tracks and supports non-conventional student entry requirements, work-based learning integration, and blended online and on-campus experiences.



+ Technology Integration

Technology integration is fundamental to enabling a student-centered, inclusive, and flexible learning environment. Digital tools and platforms are core enablers of innovative pedagogy, transnational collaboration, and personalized learning. EUT+ employs technologies such as virtual classrooms, AI-enhanced feedback systems, e-portfolios, simulations, and collaborative learning environments to enhance accessibility, engagement, and pedagogical effectiveness across its network of universities. These tools support blended and hybrid models, facilitate real-time co-teaching and cross-campus collaboration, and allow students to track their progress toward learning outcomes across diverse settings.



+ Embedded Intercultural Mobility

Embedded intercultural mobility is a cornerstone of the EUT+ vision, aimed at developing graduates who are not only technically competent but also active and engaged European citizens. In this model, mobility is not an add-on but structurally embedded within degree pathways. It includes a combination of long-term, short-term, and virtual mobility experiences, all integrated into the curriculum to ensure accessibility and pedagogical value. These experiences provide students with meaningful immersion in diverse academic and cultural environments, allowing them to study alongside both local and international peers, engage with regional contexts, and participate in interdisciplinary, cross-cultural collaboration. Through this, students cultivate intercultural competence, language proficiency, and personal adaptability, essential attributes for navigating and leading in today's interconnected, multicultural societies.



+ Modularisation and Flexibility

Modularisation and flexibility in higher education refer to the design of curricula that allow students to select and sequence learning units according to their individual needs, interests, and life circumstances, rather than following rigid, linear degree pathways. This approach supports personalised learning trajectories, enabling students from different programs or institutions to access shared modules at different times based on pedagogical relevance rather than administrative constraints. As highlighted by the European Commission²⁰ and OECD²¹, modular and flexible systems are crucial for fostering student autonomy, facilitating mobility between institutions, and accommodating diverse learner profiles, including part-time students, working professionals, and those with disabilities. By emphasizing learning outcomes and competences rather than fixed content delivery, modularisation also promotes curricular coherence and recognition across diverse educational settings²².



+ Self-Customization of Study Track

Self-customization of study tracks allows students to build personalized academic pathways by selecting courses and learning experiences that align with their goals, prior knowledge, and readiness—while still achieving all the required learning outcomes for a degree. Rooted in competence-based education²³, this approach shifts focus from course accumulation to the demonstration of transferable skills in complex, real-world contexts. Evidence shows that such systems encourage student motivation, enable innovative and international study combinations, and do not negatively impact graduation timelines²⁵. Ultimately, self-customization strengthens learner autonomy while safeguarding the integrity and credibility of academic qualifications.

²⁰ European Commission. (2017). *Communication on a renewed EU agenda for higher education (COM(2017) 247 final)*. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017DC0247>

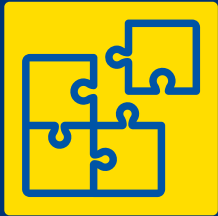
²¹ OECD. (2021). *OECD Skills Outlook 2021: Learning for Life*. OECD Publishing, Paris. https://www.oecd.org/content/dam/oecd/en/publications/reports/2021/06/oecd-skills-outlook-2021_6f4da936/0ae365b4-en.pdf

²² Cedefop. (2017). *Defining, writing and applying learning outcomes: A European handbook*. Luxembourg: Publications Office of the European Union. https://www.cedefop.europa.eu/files/4156_en.pdf

²³ Mulder, Martin. (2017). *Competence-based Vocational and Professional Education. Bridging the Worlds of Work and Education*. 10.1007/978-3-319-41713-4.

ACTIVE & EXPERIENTIAL LEARNING

This pillar emphasizes hands-on engagement through problem-based learning, challenge-based learning, and project-based activities. It promotes the practical application of knowledge, research engagement, peer-to-peer learning, and inclusive teaching practices. Students are encouraged to engage with real-world problems and collaborate in cross-disciplinary teams, developing critical 21st-century skills such as critical thinking, problem-solving, decision-making, collaboration, creativity, innovation, and personal and social responsibility.



+ Problem-Based Learning

Problem-Based Learning (PBL) is an active, cooperative, situated, and tutored pedagogical method which has shown its ability to help students achieve quite complex learning outcomes (both disciplinary and cross-disciplinary). It also provides a framework for assessing evidence of the acquisition of these skills and competences²⁴. Students explore authentic, open-ended problems with no predetermined solutions. Working in small groups, they learn to analyze, research, prototype, and iterate. The underpinning philosophy of PBL is that learning can be considered a “constructive, self-directed, collaborative and contextual” activity²⁵.



+ Challenge-Based Learning

Challenge-Based Learning (CBL) provides an efficient and effective framework for learning while solving real-world challenges. The framework fuels collaboration to identify big ideas, ask thoughtful questions, and identify, investigate and solve challenges. CBL helps learners gain deep subject area knowledge and develop the skills necessary to thrive in an ever-changing world²⁶. Rooted in social and environmental relevance, students co-design solutions to real-world challenges often posed by external stakeholders (e.g., NGOs, local governments, companies). This builds entrepreneurial spirit and a sense of civic responsibility. The Challenge-Based



+ Inclusive Teaching Practices

Learning Framework includes three interconnected phases: Engage, Investigate and Act. Each phase includes activities that prepare you to move to the next phase. There are opportunities within each phase for mini-exploration cycles and, if necessary, a return to an earlier phase. Supporting the entire process is an ongoing process of documentation, reflection and sharing.

Inclusive teaching begins with a recognition that today’s learners come from a wide range of backgrounds, abilities, languages, and cultural experiences. According to Hockings²⁷ (2010, p. 1), inclusive learning and teaching in higher education involve the deliberate design of pedagogy, curricula, and assessment methods to ensure that learning is meaningful, relevant, and accessible to all students. This means not only offering varied learning formats and materials but also fostering a sense of belonging and engagement for every learner, regardless of their starting point. In addition to inclusive course design, effective teaching requires ongoing awareness of the dynamics within the classroom. As emphasized by Harvard University²⁸, inclusivity involves recognizing how power, identity, and context shape classroom experiences and influence how students engage with content and with each other. Being inclusive, therefore, means being responsive to these dynamics and intentional in adopting strategies—also referred to as inclusive moves—that support equitable participation, reduce barriers to learning, and foster a supportive and productive learning environment.

²⁴ B. Raucant, E. Milgrom, C. Jacqmot, Y. Mauffette, V. Nagy, (2023), *What is problem based learning and how to put it into practice?*

²⁵ Dolmans DH, De Grave W, Wolphagen IH, van der Vleuten CP, (2005), *Problem-based learning: future challenges for educational practice and research. Med Educ.* 2005 Jul;39(7):732-41. doi: 10.1111/j.1365-2929.2005.02205.x., pp39.

²⁶ Nichols, M., Cator, K., and Torres, M. (2016) *Challenge Based Learner User Guide*. Redwood City, CA: Digital Promise.

²⁷ Hockings, C. (2010), *“Inclusive Learning and Teaching in Higher Education: A Synthesis of Research”, Higher Education Academy.*

²⁸ Harvard University (2025), *Inclusive Teaching Practices.* <https://bohrcenter.harvard.edu/inclusive-moves>.



+ Peer Learning

Peer learning is an educational practice in which students learn from and with each other, often through structured collaboration, discussion, and feedback. It shifts the traditional student-teacher dynamic by positioning students as co-constructors of knowledge rather than passive recipients. According to Boud et al.²⁹ peer learning is “a two-way, reciprocal learning activity involving students sharing knowledge, ideas, and experiences with one another.” It occurs formally (through structured group work, peer feedback sessions, co-assessment) and informally (through study groups, collaborative problem-solving, or discussion forums). Peer learning is particularly powerful in inclusive classrooms, as it allows students with diverse strengths, languages, or learning styles to participate actively and co-create knowledge. It also reduces reliance on a single authority figure, democratizing the learning space and promoting a sense of shared ownership³⁰.



+ Learner-Centered Assessment

In learner-centered education, assessment plays a crucial role in informing and guiding the learning process. Assessment practices that go beyond traditional tests and grades can provide a holistic understanding of a student’s progress and growth. Assessment in a learner-centered approach focuses not only on academic knowledge but also on the development of essential skills, competencies, and dispositions. It enables educators to gather evidence of learning, provide timely feedback, and tailored instruction to meet the unique needs of each learner. Learner-centered assessment cultivates deeper understanding, promotes critical thinking, and supports the growth and well-being of every student³¹.



²⁹ Boud, D., Cohen, R., & Sampson, J. (2001). *Peer learning in higher education: Learning from and with each other*. Routledge.

³⁰ Johnson, D. W., & Johnson, R. T. (1994). *Learning together and alone: Cooperative, competitive, and individualistic learning* (4th ed.). Boston, MA: Allyn and Bacon.

³¹ Fischer, J., Bearman, M., Boud, D., & Tai, J. (2024). *How does assessment drive learning? A focus on students’ development of evaluative judgement*. *Assessment & Evaluation in Higher Education*. <https://doi.org/10.1080/02602938.2023.2206986>

INTERDISCIPLINARY CONTENT ALIGNED WITH LABOR MARKET AND SOCIETY

This element ensures that educational content is carefully aligned with labor market demands and societal needs. It promotes civic engagement, societal impact, research exposure, sustainability consciousness, and prepares graduates to address global challenges with competence and creativity. The framework emphasizes technology studies from an ethical, societal perspective, equipping students to become leaders in technological innovation while reflecting European values.



+ Alignment with Labor Market

Aligning education with labor market needs is not only about employability but about empowering students to navigate and shape a rapidly evolving technological landscape. Programs are designed with active input from industry partners, public sector stakeholders, and alumni, ensuring relevance to emerging fields such as green technologies, digital transformation, and sustainable engineering. By embedding project-based learning, internships, and real-life challenges into the curriculum, EUT+ fosters the acquisition of professionally relevant competencies. This alignment supports Europe's broader economic resilience by producing graduates who are not only technically proficient but also agile, ethical, and socially conscious contributors to the workforce.



+ Research Exposure and Engagement

At EUT+, research is not confined to postgraduate or faculty work—it is an integral part of the undergraduate and master's learning journey. Students are introduced to research-led teaching, co-develop knowledge with faculty, and engage in cross-campus research collaborations that reflect the transdisciplinary nature of modern challenges. EUT+ encourages early exposure to applied and fundamental research, enabling students to explore innovation, contribute to open science, and co-create solutions with academic and non-academic partners. This culture of inquiry not only deepens understanding but cultivates critical thinking, curiosity, and evidence-based decision-making—key attributes for future leaders in technology and society.



+ Sustainability Consciousness

Sustainability is a foundational value of the EUT+ alliance and is woven into all aspects of teaching, research, and student engagement. Across disciplines—from engineering and architecture to design and human sciences—students are encouraged to approach problems through the lens of environmental responsibility, social justice, and economic viability. This includes designing sustainable materials, evaluating life cycles, considering ethical implications, and participating in local and international sustainability initiatives. By embedding Education for Sustainable Development (ESD) throughout the curriculum, EUT+ fosters a generation of graduates who are agents of systemic change, equipped to meet the demands of the European Green Deal and the UN Sustainable Development Goals.



+ Civic Engagement and Societal Impact

EUT+ is committed to forming not only skilled professionals but also engaged European citizens. Civic engagement is cultivated through community-based learning, collaboration with NGOs, local governments, and civic organizations, and participation in projects with direct social impact. Courses and extracurricular initiatives emphasize social responsibility, democratic values, and ethical awareness, encouraging students to see themselves as active contributors to society. This dimension also supports regional development and cohesion, as EUT+ campuses are embedded in diverse local contexts across Europe, offering students real-world opportunities to make meaningful contributions at both local and European levels.



04 **THE Eut+**
LEARNING PATHS:
BLUEPRINTS TO Eut+
COURSE DEVELOPMENT

THE EUT+ LEARNING PATHS

Blueprints to EUT+ course development

Description

EUT+ learning paths serve as versatile blueprints for creating transformative educational experiences aligned with the EUT+ Pedagogical Framework and the 12 characteristics of EUT+ degrees. They facilitate innovative, student-centered course delivery while maintaining enough flexibility to accommodate varied educational needs. By combining or adapting these paths, educators can meet specific objectives, contexts, and academic requirements across formats such as semester-long modules, summer schools, BIP programs, or microcredentials. Each path integrates at least one of the EUT+ framework’s core values—such as Active & Experiential Learning, Digital & Global Learning Spaces, or Interdisciplinary content aligned with labor market and societal needs—fostering a holistic approach to course design. Tailoring or merging these learning paths allows educators to enhance engagement, develop critical skills, and empower students to tackle real-world, interdisciplinary challenges with creativity and confidence.

- + **Learning Path #1: Academia-Industry Collaboration**
- + **Learning Path #2: Interdisciplinary Collaboration**
- + **Learning Path #3: Hands-On Community Innovation**
- + **Learning Path #4: Studio-Based Learning**
- + **Learning Path #5: Multilingual Digital Collaboration**

The 12 characteristics of EUT+ degrees



+ Digital & Global Learning Spaces

- + Technology Integration
- + Embedded Intercultural Mobility
- + Modularisation and Flexibility
- + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
 - + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + Research Exposure and Engagement
- + Sustainability Consciousness
- + Civic Engagement and Societal Impact

Figure 3: Key elements of the EUT+ Pedagogical Framework

LEARNING PATH #1

Academia – Industry Collaboration



Challenge-Based Experiential Learning



Alignment with future labor market



Student-Centered Learning



Innovative Pedagogies



Research exposure and engagement

Description

This learning path emphasizes strong collaboration between academic institutions and industry partners, offering students the chance to engage with real-world problems, acquire practical skills, and potentially see their solutions implemented by collaborating organizations. Its comprehensive structure ensures that participants develop technical competencies, teamwork capabilities, and a clear understanding of professional work flows.

Learning Outcomes

- + Work effectively in multidisciplinary and International teams.
- + Apply research methodologies in real-life industrial challenges.
- + Develop technical solution to the problem.
- + Identify the strengths and weakness of different solutions based on a multi-criteria evaluation.
- + Demonstrate Project Management & Leadership.
- + Demonstrate Professional Communication skills.

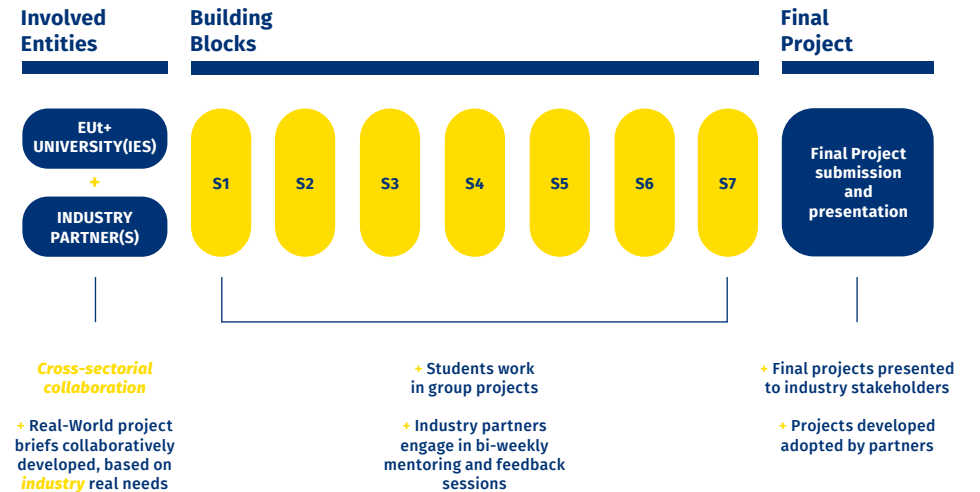


Figure 4: Academia-Industry Collaboration Learning Path #1: a partnership model between EUT+ universities and industry partners, combining real-world project briefs, structured learning blocks (S1–S7), and final project presentations to industry stakeholders

LEARNING PATH #2

Interdisciplinary Collaboration



Description

This learning path emphasizes virtual/physical mobility and interdisciplinary, international collaboration among multiple EUT+ universities. By immersing themselves in diverse academic environments, students gain a breadth of perspectives, enhance their disciplinary knowledge, and refine their collaborative problem-solving skills.

Learning Outcomes

- + Develop global awareness.
- + Understand the interconnectedness of European systems.
- + Analyze a given problem from multiple technical perspectives.
- + Integrate knowledge and work effectively across disciplines, both within and beyond engineering.
- + Develop enhanced Disciplinary Knowledge.
- + Develop Project Management & Coordination skills.
- + Develop Advanced Problem-Solving across different Cultural contexts.
- + Effectively communicate in diverse cultural contexts.

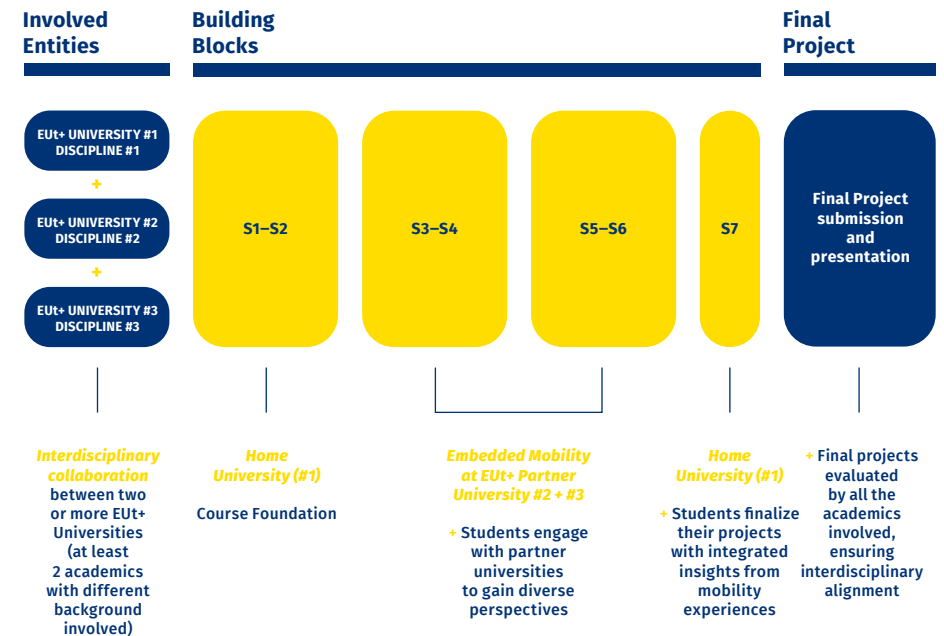


Figure 6: Interdisciplinary Collaboration Learning Path #2: A collaborative framework involving multiple EUT+ universities and disciplines, combining course foundation, embedded mobility experiences, and final project development to foster cross-disciplinary integration and collaboration

EUT+ ELEMENTS

+ Digital & Global Learning Spaces

- + Technology Integration
- + **Embedded Intercultural Mobility**
- + Modularisation and Flexibility
- + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
- + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + **Research Exposure and Engagement**
- + **Sustainability Consciousness**
- + Civic Engagement and Societal Impact

+ **When to Use**

It is particularly suitable for courses aiming to capitalize on the strengths of multiple disciplines and foster international or cross-university networking. Programs focused on mobility, cultural exchange, and project-based collaboration across distinct academic backgrounds can benefit greatly from this structure, as it encourages the exploration of diverse topics, content, or learning objectives and a deeper understanding of the course material.

+ **How to Use**

1. **Coordinate with at least one other EUT+ university** that contributes a distinct disciplinary lens, ensuring a diversity of expertise.
2. **Form interdisciplinary student teams** to begin exploring core concepts, objectives, and project themes at their home institution.
3. **Facilitate mobility to partner universities** so students can broaden their skill sets, collaborate with local experts, and adapt projects based on different academic resources and perspectives.
4. **Conduct regular academic reviews** to provide iterative feedback, keeping projects aligned with goals and maintaining momentum.
5. **Refine projects upon returning to the home institution**, incorporating insights gained from partner universities, and conclude with a final presentation evaluated by academics from each collaborating university.

+ **Variations**

- **Adjust Mobility Periods:** Allow for deeper immersion at partner institutions, offering students a more comprehensive cross-university experience.
- **Online or Hybrid Collaboration:** Substitute physical mobility with virtual exchanges, ensuring continuity in cross-institutional work.
- **Broaden Partnerships:** Include NGOs, civic society groups, or industry collaborators alongside academic institutions to address a wider range of social or community-oriented challenges.

Figure 7: Key elements of the EUT+ Pedagogical Framework for Learning Path #2

LEARNING PATH #3

Hands-On Community Innovation



Challenge-Based
Experiential
Learning



Civic
Engagement



Student-
Centered
Learning



Innovative
Pedagogies



Embedded
Mobility

Description

This learning path fosters collaboration between EUT+ universities and local communities, with project briefs addressing real-world societal challenges. By integrating theoretical knowledge with hands-on experience, students develop leadership, teamwork and design thinking skills in a practical, real-world setting. Through active engagement with stakeholders, they gain valuable expertise while realizing their projects, making a meaningful impact on local communities. This approach promotes collaboration, sustainability, and social responsibility, empowering students to create innovative solutions.

Learning Outcomes

- + Develop leadership, teamwork, and interdisciplinary collaboration skills
- + Enhance critical thinking and problem-solving skills.
- + Integrate knowledge and work effectively across disciplines both within and beyond engineering.
- + Develop communication, documentation, and public engagement skills.
- + Gain practical, hands-on experience through direct project implementation.
- + Develop Commitment to Ethical and Sustainable Practices.
- + Develop Project Management & Coordination skills.

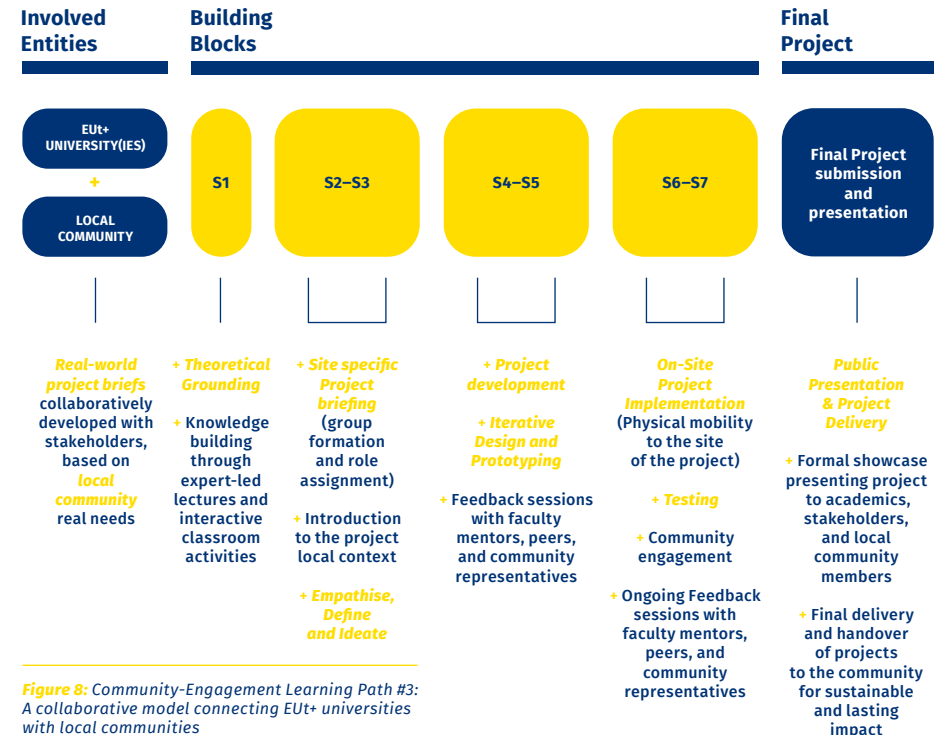


Figure 8: Community-Engagement Learning Path #3: A collaborative model connecting EUT+ universities with local communities

EUT+ ELEMENTS

+ Digital & Global Learning Spaces

- + Technology Integration
- + Embedded Intercultural Mobility
 - + Modularisation and Flexibility
 - + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
 - + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + Research Exposure and Engagement
- + Sustainability Consciousness
- + Civic Engagement and Societal Impact

EUROPEAN VALUES
EMPOWERING TECHNOLOGY

Figure 9: Key elements of the EUT+ Pedagogical Framework for Learning Path #3

+ When to Use

This learning path is ideal for courses that integrate theoretical knowledge with practical experiences, emphasizing the realization of tangible projects addressing authentic societal challenges. It supports students in effectively collaborating, managing, and implementing real-world solutions through interdisciplinary teamwork, leadership, and active community engagement.

+ How to Use

1. **Establish Clear Project Briefs:** Collaborate closely with community stakeholders to define clear, relevant, and authentic societal challenges aligned with learning objectives.
2. **Provide Theoretical Preparation:** Offer lectures, interactive sessions, and assignments from multidisciplinary experts to ensure strong foundational knowledge.
3. **Prepare for On-Site Activities:** Clearly outline student roles and responsibilities, brief students thoroughly on local contexts, and prepare them for fieldwork and physical mobility.
4. **Facilitate Project design and prototype:** Guide students in hands-on community engagement, regular mentor and peer feedback sessions, and iterative project refinement.
5. **Oversee Project Implementation:** Support and monitor the practical execution of student projects, ensuring alignment with defined objectives and community expectations.
6. **Conduct Public Presentation of the Project:** Plan formal showcases allowing students to communicate their results clearly and professionally to academic audiences, stakeholders, and the local community. Oversee the successful handover of projects to community.

+ Variations

- **Industry-Integrated Projects:** Partner with industry professionals to align projects closely with professional standards, technological advancements, and commercial implementation potential.
- **Hybrid or Virtual Engagement:** Facilitate remote collaboration through digital platforms, providing flexibility and enabling engagement with stakeholders who are geographically dispersed.
- **Cross-Disciplinary or Multi-University Collaboration:** Invite participants from diverse academic disciplines or additional EUT+ universities to broaden expertise, enhance resource-sharing, and foster interdisciplinary collaboration and innovation.

LEARNING PATH #4

Studio-Based Learning



Challenge-Based Experiential Learning



Interdisciplinarity



Student-Centered Learning



Innovative Pedagogies



Research exposure and engagement

Description

This learning path emphasizes collaborative, hands-on, project-driven problem-solving in a dynamic studio environment. It promotes iterative experimentation, creativity and design thinking and interdisciplinary collaboration, in a workshop-like setting, where students develop an assessable creative and/or design process, performance, or product. Students refine projects through ongoing informal feedback sessions with mentors, peers, and stakeholders. Midterm and final reviews involve presentations to invited juries and broader audiences, enhancing student engagement and delivering meaningful, real-world outcomes.

Learning Outcomes

- + Generate innovative and original design solutions.
- + Apply creative problem-solving techniques to address complex challenges.
- + Manage and execute projects within time and resource constraints.
- + Critically analyze and evaluate design work, both their own and others'.
- + Identify and implement tools and apply iterative design processes to develop and refine solutions.
- + Collaborate effectively in team-based design projects.
- + Develop Project Management & Coordination skills.
- + Develop Professional Communication skills.

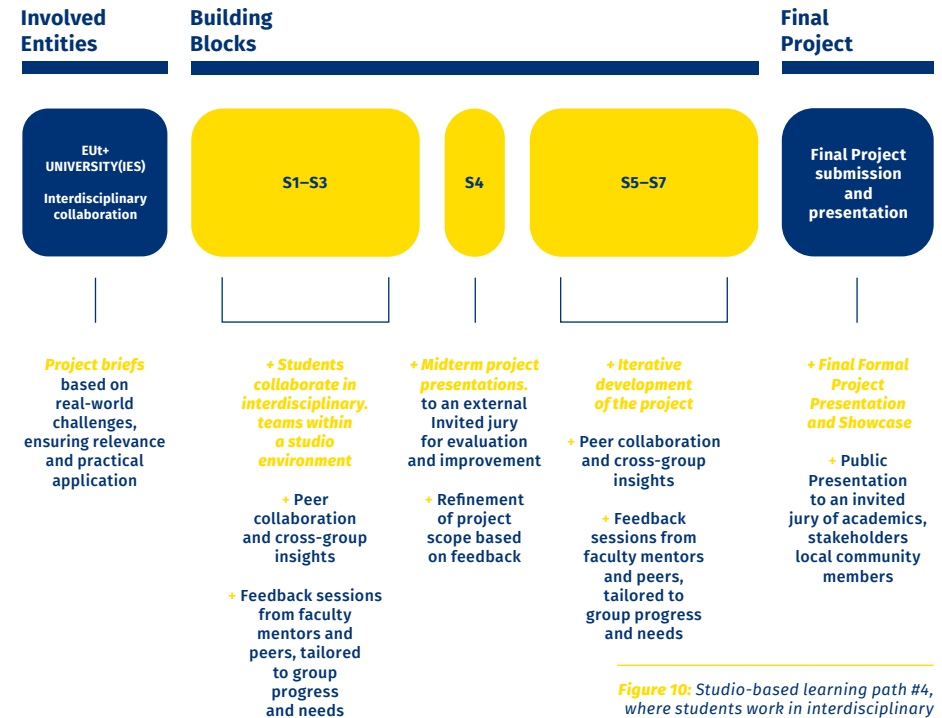


Figure 10: Studio-based learning path #4, where students work in interdisciplinary teams to address real-world challenges

LEARNING PATH #5

Multilingual Digital Collaboration



Description

This practice fosters multilingual digital collaboration through virtual mobility, connecting students across universities to co-create digital artifacts. Participants engage in structured online activities, navigating linguistic and cultural differences to produce shared outputs. They develop proficiency in digital communication tools, cross-cultural negotiation, and language adaptation. Students analyze diverse perspectives, build intercultural understanding, and enhance their digital literacy in multilingual contexts. This approach cultivates global competencies, preparing students for interconnected, diverse professional environments.

Learning Outcomes

- + Demonstrate the ability to effectively communicate and collaborate in multilingual virtual environments.
- + Produce digital artifacts that reflect an understanding of diverse cultural and linguistic perspectives.
- + Adapt language and communication strategies to facilitate cross-cultural understanding in digital contexts.
- + Critically analyze and evaluate the impact of multilingualism on digital collaboration and artifact creation.
- + Utilize digital tools and platforms to effectively manage and complete collaborative multilingual projects.
- + Develop solutions to a real societal and human challenges, facing society.

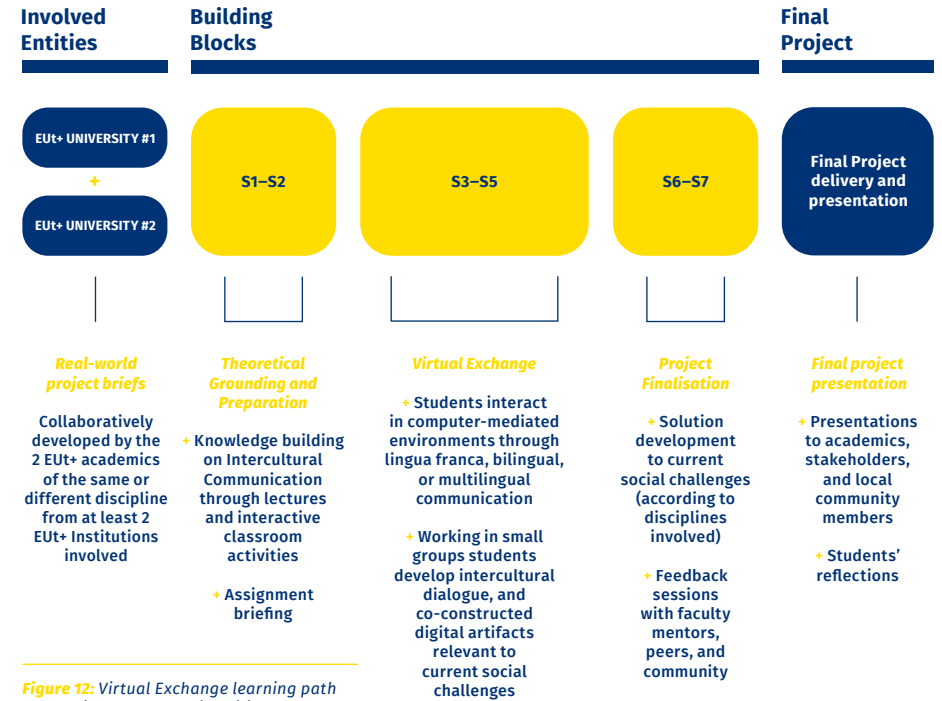


Figure 12: Virtual Exchange learning path connecting two EUT+ universities to promote intercultural communication

EUT+ ELEMENTS

+ Digital & Global Learning Spaces

- + Technology Integration
- + Embedded Intercultural Mobility
 - + Modularisation and Flexibility
 - + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
 - + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + Research Exposure and Engagement
- + Sustainability Consciousness
- + Civic Engagement and Societal Impact

EUROPEAN VALUES
EMPOWERING TECHNOLOGY

Figure 13: Key elements of the EUT+ Pedagogical Framework for Learning Path #5

+ When to Use

This learning path is ideal for courses or projects that involve collaboration between students from different countries, particularly when physical mobility is limited. It is especially valuable for fostering global competencies, improving intercultural understanding, and building students' proficiency with digital tools for multilingual communication.

+ How to Use

1. Establish a clear project framework with defined goals and deliverables.
2. Utilize collaborative online platforms (e.g., shared documents, video conferencing, project management tools).
3. Implement structured online workshops and activities that promote interaction and collaboration.
4. Incorporate peer review and feedback sessions to enhance learning.
5. Provide opportunities for students to reflect on their experiences and learning.
6. Facilitate language support, and translation tools when needed.
7. Establish clear communication protocols.

+ Variations

- **Language Focus:** Concentrate on specific language pairs or language families.
- **Artifact Type:** Vary the type of digital artifact (e.g., podcasts, interactive websites, digital storytelling, virtual exhibitions).
- **Thematic Focus:** Center projects around specific themes related to global issues, cultural exchange, or academic disciplines.
- **Skill Level:** Adapt the complexity of tasks and tools to the students' skill level.
- **Duration:** Vary the length of the project, from short-term workshops to semester-long collaborations.
- **Asynchronous vs Synchronous:** Focus on either asynchronous work, adapting to time zone differences, or synchronous work, to increase live interaction.
- **Physical Mobility:** Integrate short in-person sessions before or after virtual exchange to enhance cultural immersion and F2F collaboration.

LEARNER-CENTERED ASSESSMENT

The Crucial Role of Assessment

In learner-centered education, assessment plays a crucial role in informing and guiding the learning process. Assessment practices that go beyond traditional tests and grades can provide a holistic understanding of a student's progress and growth. Assessment in a learner-centered approach focuses not only on academic knowledge but also on the development of essential skills, competencies, and dispositions. It enables educators to gather evidence of learning, provide timely feedback, and tailor instruction to meet the unique needs of each learner.

Description

Learner-centered assessment places students at the core of the evaluation process, emphasizing personal engagement, individual growth, and the development of meaningful competencies. Instead of measuring knowledge at a single point in time, it integrates continuous reflection and feedback, empowering learners to take ownership of their learning journey and adapt their strategies for improvement. By aligning assessments with individual interests, goals, and pathways, it fosters deeper engagement, critical thinking, and ultimately supports the growth and well-being of every student.

Key Characteristics

- + **Real-World Relevance** involves evaluating learners through authentic tasks, projects, and problem-solving experiences rather than relying solely on standardized tests. This approach ensures students demonstrate practical skills applicable to real scenarios, making their learning more dynamic and engaging.
- + **Continuous, Integrated Feedback** weaves assessment naturally into daily learning instead of treating it as an isolated event. By embedding formative checks and feedback into regular activities, students receive timely insights that guide ongoing improvement.

- + **Tailored and Adaptive Assessment** aligns evaluation with each learner's individual pace, preferences, and progress. By incorporating technology, self-reflection, and flexible criteria, students advance through material as they master it, resulting in a more supportive and meaningful learning experience.
- + **Emphasis on Process** highlights how learners think, explore ideas, and refine strategies, rather than focusing solely on final outcomes. This perspective values creativity, resilience, and critical thinking, allowing mistakes to become opportunities for deeper understanding.
- + **Reflective Self-Growth** encourages learners to critically examine their own work, articulate their reasoning, and seek continual improvement. Through this reflective process, they develop metacognitive skills, take ownership of their learning, and become active participants in their progress.



05 **HIGH-IMPACT
TEACHING
STRATEGIES**

How does the EUT+ Pedagogical Framework build on existing good practices?

The framework recognises that no single method can meet all student needs. It draws heavily from best practices across Europe and beyond. To develop the framework, the consortium conducted an extensive review of best practices from leading institutions by studying Olin College of Engineering, MIT, Stanfrod and other global innovators in engineering education to incorporate successful approaches that promote innovation, leadership, and collaboration. Key features identified from these institutions, such as design-centered active learning, multidisciplinary learning, and student-centered approaches, are directly embedded.

In essence, the EUT+ Pedagogical Framework builds on existing good practice by evaluating, synthesising, and then integrating a rich array of proven educational theories, methods, and institutional best practices. It elevates these practices within a transformative model that uniquely prepares students for leadership in a global, technologically driven European context.

Key practices for the EUT+

The key practices derived from identified best practices are outlined in this section (see Figure 14). They aim to highlight effective strategies for fostering high-quality teaching and learning within the EUT+ framework³².



<p>GOAL SETTING</p> <p>Providing students with a roadmap for their academic journey</p>	<p>INTERACTIVE KNOWLEDGE</p> <p>Fostering dynamic learning through interactive methods</p>	<p>EXPERIENTIAL PRACTICE-BASED LEARNING</p> <p>Engaging students in hands-on, practical learning experiences</p>	<p>INTERDISCIPLINARY CURRICULUM AND COLLABORATION</p> <p>Encouraging collaboration across different academic disciplines</p>	<p>REAL-WORLD SOCIETAL CHALLENGES</p> <p>Identifying and addressing real-world societal issues through education</p>
<p>HYBRID LEARNING AND MOBILITY</p> <p>Combining traditional and digital learning methods for flexibility and trans-national education</p>	<p>TECHNOLOGY INTERGRATION</p> <p>Incorporating technology to enhance educational practices</p>	<p>AI-INTERGRATED PEDAGOGY</p> <p>Utilizing artificial intelligence to personalize and improve teaching</p>	<p>INCLUSIVE AND SAFE LEARNING ENVIRONMENT</p> <p>Creating a safe and welcoming learning space for all</p>	<p>FEEDBACK, METACOGNITION AND ASSESSMENT</p> <p>Providing constructive feedback, assessing learning outcomes and reflecting on learning and teaching</p>

Figure 14: Key teaching practices of EUT+

³² **Disclaimer:** It is important to note that the reporting is done to the best of the experience and knowledge of EUT+ project partners and does not represent any particular corporate interest. They are meant to give an overview of useful practices, but they are not exhaustive. Practices were evaluated using a star rating system adapted from the United Nations (2014). Our aim is to highlight a selection of practices and suggest criteria that can help define what "best teaching practices" might look like within the EUT+.

GOAL SETTING

Setting goals is a fundamental practice for success in designing higher education programs, providing students with a roadmap for their academic journey. Goals or learning objectives provide focus and direction giving students clear targets to aim for. They also enhance motivation, improve time management and foster accountability³³⁻³⁶.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Actively contribute to the setting of goals in the academic programs they attend. + Understand the goals set and monitor their understanding and progress during learning, through self-reflection. + Comprehend how the learning experiences designed by the course facilitator will eventually help them achieve the goals set. + Identify areas of improvement to better achieve the goals set. + Take the general learning outcomes provided by instructors and transform them into personal, actionable goals. + Manage their time realistically in order to take all the necessary actions to achieve the goals. + Seek the facilitator's feedback often, so that they monitor their learning progress. 	<ul style="list-style-type: none"> + Define clear objectives and outcomes, clearly articulating what students are expected to know, understand, and be able to do by the end of a course or program. This should be based on needs and situation analysis processes. + Set SMART goals, in other words, goals which are Specific, Measurable, Achievable, Relevant, and Time-bound. + Align the goals with the curriculum. + Explain these goals in terms of actionable steps. + Connect goals with students' broader academic and professional goals. + Use these goals as a guide of assessment processes and planning of students' learning experiences.



Figure 15: Setting Goals, a key teaching practice that fosters clear targets, enhances motivation, improves time management, and builds accountability among students

Fosters responsibility in learning	Increases student engagement
Helps in organizing study schedules	Provides focus and direction

³³ Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York, NY: David McKay Company.

³⁴ Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*, 70(11).

³⁵ Martins van Jaarsveld, G., Wong, J., Baars, M., Specht, M., & Paas, F. (2024). Goal setting in higher education: how, why, and when are students prompted to set goals? A systematic review. In *Frontiers in Education* (Vol. 9). Frontiers Media SA. <https://doi.org/10.3389/educ.2024.151160523>

³⁶ Locke, E. A., & Latham, G. P. (1991). A Theory of Goal Setting and Task Performance. *The Academy of Management Review*, 16(2), 480. <https://doi.org/10.2307/258875>

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + What goals did I set? Did I achieve them? + What helped or hindered me? 	<ul style="list-style-type: none"> + Did my students' goals align with learning outcomes? + How well did I do in the achievement of the goals set, and what do I need to do to further improve?

INTERACTIVE KNOWLEDGE CONSOLIDATION

Interactive knowledge consolidation is a pedagogical strategy that deepens and sustains learning by engaging learners in shared, collaborative activities. It emphasizes teamwork, digital participation, emotional engagement, and critical reflection, ensuring that knowledge is not only memorized but internalized, applied, and transferred³⁷.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> Actively participate in collaborative tasks (face-to-face and online). Share ideas, ask questions, and co-construct knowledge with peers. Use digital tools (LMS, mind mapping, interactive apps) to consolidate understanding. Engage emotionally as well as cognitively to ensure retention. Link new information with prior knowledge through association and reflection. 	<ul style="list-style-type: none"> Act as facilitators, counsellors, and guides rather than sole knowledge providers. Design and assign interactive activities (recapping, mapping, group discussions, simulations, game-based tasks). Integrate digital platforms to foster synchronous and asynchronous participation. Scaffold learning with prompts, images, diagrams, and models to enhance association and repetition. Create meaningful environments replicating real-world job conditions.

³⁷ Hedlund, A. (2020). Engage, Build, Consolidate: An Effective Framework for Lesson Planning. *National Geographic Learning: In Focus*. <https://infocus.eltnl.com/2020/11/11/engage-build-consolidate-an-effective-framework-for-lesson-planning/>

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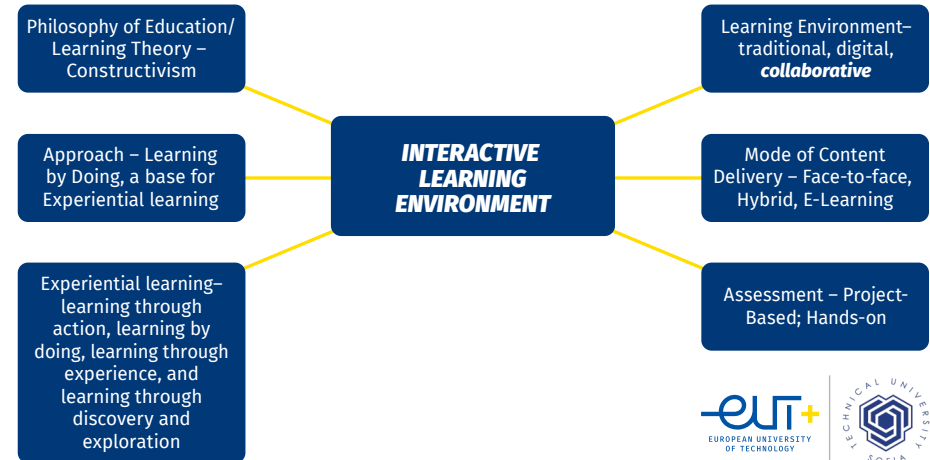


Figure 16: Interactive Learning Environment, a key teaching practice that applies constructivist and experiential learning principles, encouraging learning by doing within collaborative, hybrid, and project-based settings

Teaching Strategy – Interactive Teaching and Learning – a form of Experiential learning

REFLECTIVE QUESTIONS		
Design & Intentionality	Student Engagement	Facilitation Role
<ul style="list-style-type: none"> Did my activities today foster collaboration and shared meaning-making, or did they slip back into teacher-centered delivery? Did I choose digital/ interactive tools that genuinely enhanced learning, or just added technology for its own sake? 	<ul style="list-style-type: none"> Were students actively engaged – cognitively, socially, and emotionally – during the consolidation activities? How did I encourage quieter students to participate and make the experience inclusive? 	<ul style="list-style-type: none"> Did I act as a facilitator and co-learner, or did I dominate the interaction?

EXPERIENTIAL, PRACTICE-BASED LEARNING

Interpersonal skills in engineering are the set of communication, teamwork, leadership, conflict-resolution, emotional intelligence, and problem-solving abilities that enable engineers to collaborate effectively, adapt to complex contexts, and lead innovation. They transform technical expertise into professional competence by embedding human-centered collaboration in engineering practice³⁸.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Engage in experiential activities (group projects, role plays, case studies) to practice interpersonal skills. + Develop communication skills (verbal, non-verbal, active listening). + Work collaboratively, manage conflicts constructively, and build resilience. + Practice leadership by guiding peers and motivating teams. + Reflect regularly on emotional intelligence (self-awareness, empathy, regulation). 	<ul style="list-style-type: none"> + Embed interpersonal skill-building into curricula alongside technical content. + Design experiential, practice-based learning activities (simulations, projects, real-world scenarios). + Provide structured feedback on communication, teamwork, and leadership behaviors. + Model interpersonal competence in teaching (clarity, empathy, collaborative facilitation). + Assess interpersonal skills through performance-based tasks, not only exams.

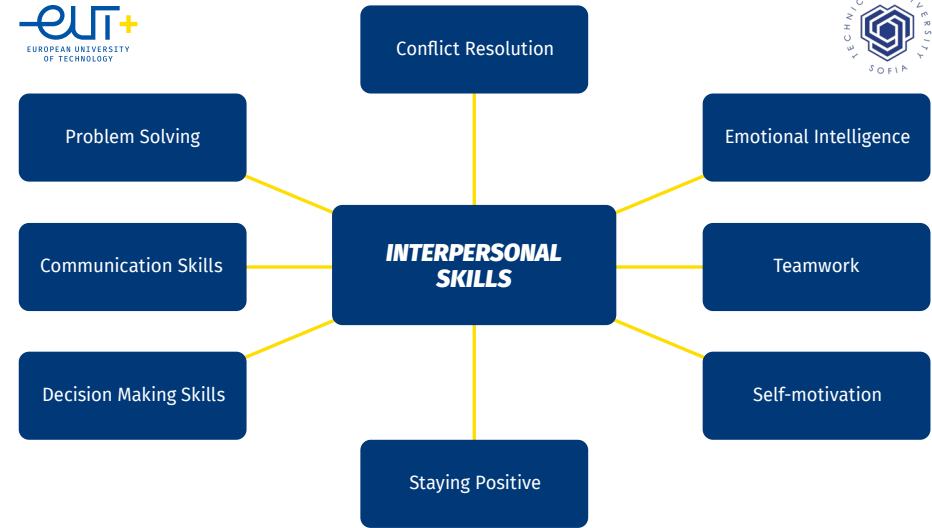


Figure 17: Essential skills developed through practice-based learning

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + How effectively did I communicate my ideas today, both verbally and non-verbally? + Did I listen actively and acknowledge my peers' perspectives? + How did I contribute to teamwork — did I support, motivate, or lead others? + When conflict arose, how did I respond? + What strategies worked, and what could I improve? + Did I show empathy and emotional awareness when working with others? + How did I manage stress and maintain a positive attitude during challenges? + In what ways did I practice leadership, even without holding a formal role? 	<ul style="list-style-type: none"> + Did my teaching activities today provide opportunities for students to practice interpersonal skills (e.g., teamwork, communication, conflict resolution)? + Did I balance technical content with human-centered collaboration in my lesson design? + How effectively did I model interpersonal competence (clarity, empathy, constructive feedback) in my teaching? + Were my assessments aligned with the interpersonal skills I wanted students to develop? + Did I create a safe and supportive environment where students felt comfortable to speak, collaborate, and take risks?

³⁸ Belcheva, K. (2024). Learners As Digital Content Creators In Educational Settings. Technical University of Sofia, S., 78-87. <https://digilib.nalis.bg/xmlui/handle/nls/36459>

Dimitrov L., Tomov P., Belcheva K. (2023). Survey On Employers Attitude Toward Education At European University Of Technology And Eut Diploma. Union of scientists in Bulgaria – branch Sliven. ISSN: 1311 2864, volume 38 (1), 76-83. https://e-university.tu-sofia.bg/e-publ/files/12316_2023-38-1-41.pdf

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INTERDISCIPLINARY CURRICULUM AND COLLABORATIVE CULTURE

An interdisciplinary curriculum is developed in two aspects. First, classes connect areas of engineering and integrate math, science, humanities and social science. Second, there is an integration of arts, humanities and social sciences in the curriculum that allows students to customize their study path. A collaborative academic culture that emphasizes the active implication of the students in the learning process³⁹.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Participate actively in their learning process. + Collaborate in projects and academic activities. + Consider a problem or situation from different points of view. + Engage in interdisciplinary group work. + Participate in the curriculum development. 	<ul style="list-style-type: none"> + Act as mentors and facilitators. + Prepare students to become engineering innovators. + Teach students to find the right problems to solve. + Collaborate between them and develop the classes and common activities and projects.

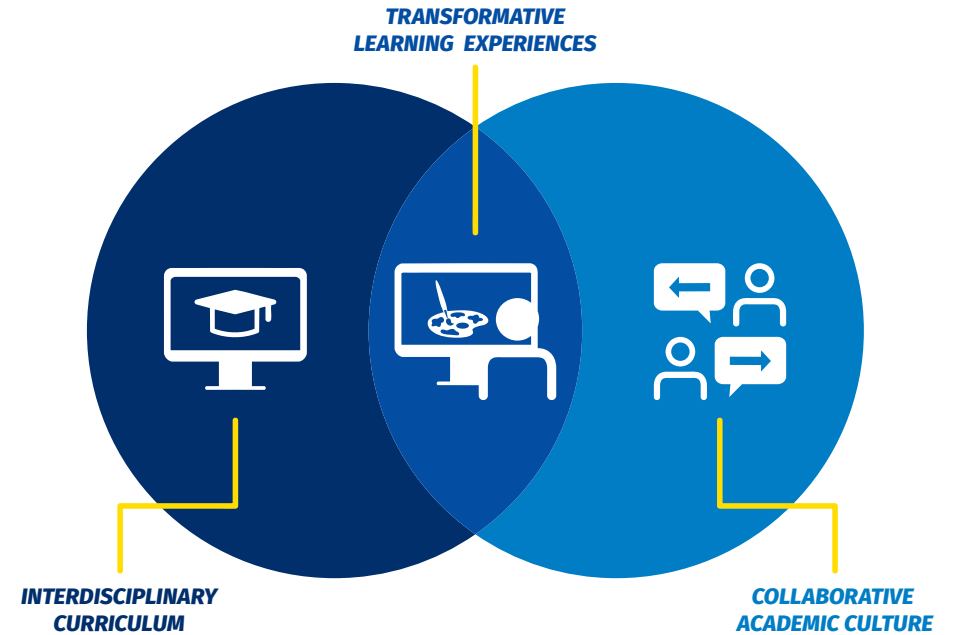


Figure 18: Cultivation of an interdisciplinary curriculum and collaborative culture by integrating engineering, science, and the arts within a cooperative learning environment

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + In what ways has the flexibility to customize my study path shaped my academic identity and future goals? + How has participating in a collaborative learning culture impacted my role and responsibility as a student? + What challenges did I encounter in connecting knowledge across disciplines, and how did I navigate them? + How do I see the value of interdisciplinary and collaborative learning extending beyond the classroom into my personal or professional life? 	<ul style="list-style-type: none"> + Am I preparing students to be not just “engineering innovators” but socially responsible innovators who understand cultural, ethical, and environmental dimensions? + How do I assess whether the interdisciplinary curriculum is preparing students to tackle the complex societal challenges of the EU and beyond, rather than just producing polished academic projects? + When co-designing curriculum with colleagues, how do I ensure that cultural, ethical, and environmental dimensions are embedded as core elements rather than treated as add-ons?

³⁹ Olin College of Engineering. (2023–2024). Curriculum, goals and outcomes. <https://olin.smartcatalogiq.com/en/2023-24/catalog/programs-of-study-and-degree-requirements/curriculum-goals-and-outcomes>

MULTIDISCIPLINARY PROJECT-BASED EXPERIENCE

A multidisciplinary project-based experience creates an environment in which students learn to design products and services that will change the lives of the society and world's citizens.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Work in multidisciplinary teams. + Work directly and engage meaningfully with community partners on real world problems. + Design, test, and refine prototypes based on real-world feedback for innovative solution. + Strengthen abilities to showcase ideas through design reviews, presentations, and stakeholder interactions. 	<ul style="list-style-type: none"> + Conduct periodic design reviews along with faculty, advisors, and industry experts. + Provide continuous guidance and constructive feedback to refine solutions and ensure alignment with project goals.

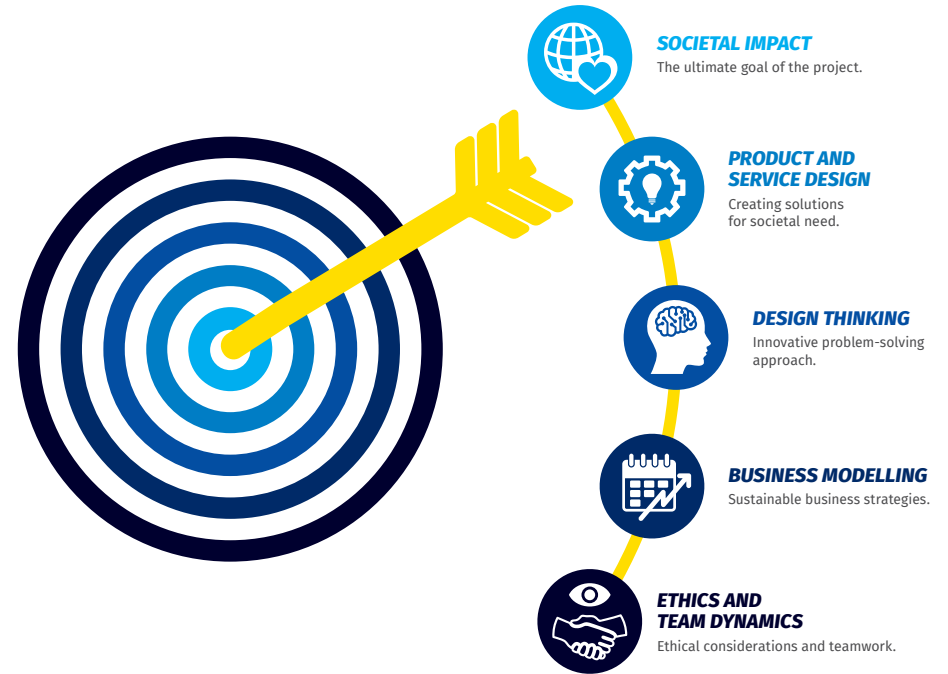


Figure 19: Identifying real-world societal challenges as a practice for creating solutions with meaningful societal impact

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + How did engaging in design thinking and rapid prototyping shape the way I approach complex, real-world problems? + In what ways did working on solutions for underserved communities challenge my assumptions and broaden my perspective? + How did collaborating across disciplines (engineering, business, design, etc.) influence my team experience and learning? 	<ul style="list-style-type: none"> + Am I preparing students to design with communities rather than for them? + How do I help students connect their project work to the pressing societal challenges facing the EU (e.g., climate crisis, inclusion, digital transition), rather than just local or technical issues? + In what ways do I support students in understanding the complexity of EU-wide challenges — such as balancing national priorities with collective European goals?

HYBRID LEARNING AND EMBEDDED MOBILITY FOR TRANSNATIONAL EDUCATION

An inter-institutional hybrid learning model integrates digital and physical classroom environments across multiple European universities. This model supports challenge-based, transdisciplinary learning and enables international collaboration and mobility among students and faculty. The initiative fosters inclusivity, technological innovation, and pedagogical advancements in higher education⁴⁰.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Work in groups and independently, with a mixed participation of online and on-site participants. + Collaborate with students from different universities on sustainability challenges via virtual classrooms. + Visit a collaborating university for short or long term mobility. + Engage in real-world problem-solving and challenge-based learning. 	<ul style="list-style-type: none"> + Develop methodologies using the designed educational environments. + Teach simultaneously across multiple universities. + Interact with students using poll tools both locally and online. + Actively participate in student discussions.

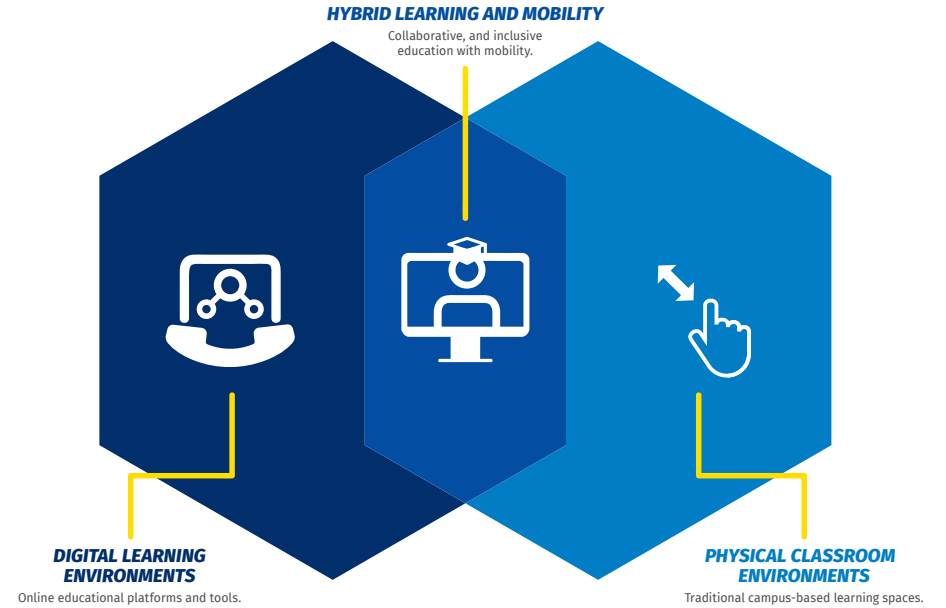


Figure 20: Hybrid learning and embedded mobility for transnational education combining digital and physical classroom environments to foster collaborative and inclusive learning

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + What competencies (digital, intercultural, collaborative) are most crucial for successful hybrid environments? + How do we measure the impact of this initiative beyond academic outcomes (e.g., inclusivity, innovation, global citizenship)? + How do we maintain a balance between technological innovation and the human aspects of learning? 	<ul style="list-style-type: none"> + In what ways have I adapted my learning and communication strategies when moving between online, hybrid, and in-person contexts? + When visiting or engaging with another university, do I balance learning from their practices while also contributing meaningfully from my own background? + How do these transnational learning experiences prepare me to act as a responsible and engaged European/global citizen beyond the classroom?

⁴⁰ Utrecht University. (2024, September 23). CHARM-EU hybrid classroom model (Deliverable D7.3, CHARM-EIGHT∞). CHARM-EU. <https://www.charm-eu.eu/wp-content/uploads/2024/09/Deliverable-7.3-Hybrid-Classroom-FINAL-and-MERGED.pdf>

TECHNOLOGY INTEGRATION

Technology integration involves the purposeful use of digital tools and resources to shift the focus from the instructor to the student. This approach transforms the learning environment from a passive, lecture-based model to one that is dynamic, collaborative, and experiential. Examples include using learning management systems (LMS) for personalized content delivery, incorporating virtual and augmented reality for immersive experiences, and leveraging online collaboration tools for group projects⁴¹⁻⁴⁴.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Are active participants in the education processes through the use of technology and flipped classroom processes. They take part in collaborative, problem-based tasks focused on creating tangible products. + Use online platforms and dedicated learning management systems (LMS) to generate content (e.g. co-author documents, brainstorm ideas), and manage group projects in real time or asynchronously. + Use online research tools, data analysis software, and collaborative platforms to gather information, analyze findings, and propose solutions to real-life problems. + Provide feedback on their peers' work, and engage in targeted discussions outside of the traditional classroom setting, establishing Communities of Practice (CoP). 	<ul style="list-style-type: none"> + Are facilitators and guides of the learning process. + Use technology to design and structure the learning process, selecting and organising digital resources, such as videos, readings, and interactive simulations, that students can access outside of class. + Use technology to provide more targeted and timely feedback to the learners. + Use technology to build a sense of community among learners, setting and moderating online discussion forums, encouraging peer-to-peer feedback, and creating a supportive digital space. + Demonstrate how to ethically use digital tools for research, content creation, and collaboration, teaching students not just what to learn, but also how to learn and thrive in a digital world.

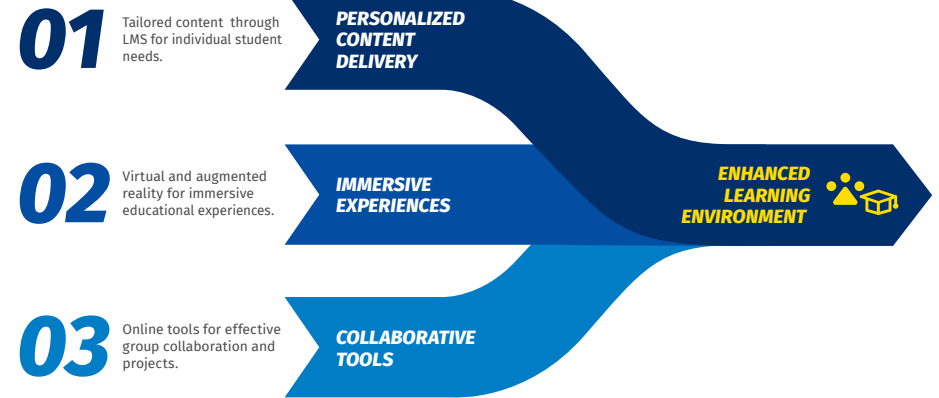


Figure 21: Technology integration for promoting active and experiential learning

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + Am I actively contributing to my group projects and using the collaborative tools to their full potential? + Am I using the digital research tools and databases to find credible and reliable sources? + Am I engaging in online discussions and forums in a way that is respectful and contributes positively to the learning community? 	<ul style="list-style-type: none"> + Is the technology I've selected truly enhancing the learning experience? + Am I actively fostering a supportive and inclusive digital community where students feel safe to ask questions + Am I using technology in a way that models professional and ethical digital practices for my students?

⁴¹ Rossi, I. V., de Lima, J. D., Sabatke, B., Nunes, M. A. F., Ramirez, G. E., & Ramirez, M. I. (2021). Active learning tools improve the learning outcomes, scientific attitude, and critical thinking in higher education: Experiences in an online course during the COVID-19 pandemic. *Biochemistry and Molecular Biology Education*, 49(6), 888–903. <https://doi.org/10.1002/bmb.21574>

⁴² Chima Abimbola Eden, Onyebuchi Nneamaka Chisom, & Idowu Sulaimon Adeniyi. (2024). Harnessing technology integration in education: Strategies for enhancing learning outcomes and equity. *World Journal of Advanced Engineering Technology and Sciences*, 11(2), 001–008. <https://doi.org/10.30574/wjaets.2024.11.2.0071>

⁴³ Southeast Missouri State University (2025). *Benefits of Integrating Technology in the Classroom*. Available from *Benefits of Integrating Technology in the Classroom*.

⁴⁴ Chansa Thelma, C., Hassan Sain, Z., Mpolomoka, D. L., Matthew Akpan, W., & Davy, M. (2024). Curriculum Design for the Digital Age: Strategies for Effective Technology Integration in Higher Education. *International Journal of Research*, 11(07), 185–201. <https://doi.org/10.5281/ZENODO.13123899>

AI-INTEGRATED PEDAGOGY

AI-Integrated Pedagogy⁴⁵ positions artificial intelligence as a supportive learning tool, while maintaining structured supervision to safeguard deep learning. Learners are encouraged to interrogate, negotiate, and challenge AI outputs rather than passively accept them, and teachers act as supervisors who design, scaffold, and assess AI use critically⁴⁶. The goal is not to replace human pedagogy with technology, but to create a hybrid model where AI facilitates exploration and practice, and educators ensure reflection, accuracy, and meaningful engagement.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Use AI tools purposefully to explore, draft, or refine work, while keeping ownership of decisions. + Compare AI outputs with their own thinking to identify gaps, errors, or oversimplifications. + Adjust prompts and strategies to get better outputs, learning how to control AI effectively. + Collaborate with peers to critique, revise, and contextualize AI-generated content. + Document and reflect on their use of AI (logs, journals) to build critical awareness. + Develop agency by deciding when AI adds value and when human judgment is essential. 	<ul style="list-style-type: none"> + Design tasks where AI is a supportive aid, not a replacement for learning. + Provide criteria and scaffolding for evaluating AI outputs critically. + Model responsible prompt design and show how to refine AI responses. + Facilitate group activities where AI outputs become material for debate and improvement. + Require AI use diaries or appendices to make student choices transparent. + Assess not only final work but also students' reasoning about AI use.

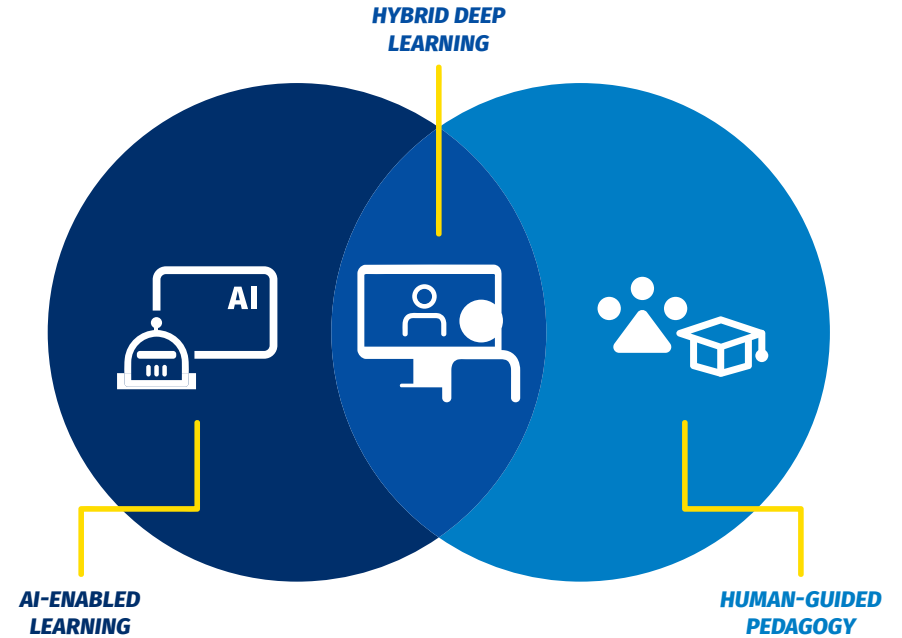


Figure 22: The synergy of AI and human pedagogy

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + How did AI help me, and where did I need to go beyond it? + What did AI miss or get wrong, and how did I recognize this? + How did my prompting shape the AI's output? + How did my peers and I use or challenge AI differently? + Which AI suggestions did I accept, adapt, or reject — and why? + What role should AI play in my future learning? 	<ul style="list-style-type: none"> + How do I ensure that AI is used as a supportive aid rather than diminishing students' critical and creative thinking? + Am I preparing students to not just critique AI outputs but also to understand the ethical, cultural, and societal implications of AI in their disciplines? + How do I assess both the process (students' reasoning and reflection) and the product (final outputs) fairly, when AI is part of the workflow?

⁴⁵ Xu, G., Yu, A., & Liu, L. (2025). A meta-analysis examining AI-assisted L2 learning. *International Review of Applied Linguistics in Language Teaching*, (0).

⁴⁶ Tang, Q., Deng, W., Huang, Y., Wang, S., & Zhang, H. (2025). Can Generative Artificial Intelligence be a Good Teaching Assistant?—An Empirical Analysis Based on Generative AI-Assisted Teaching. *Journal of Computer Assisted Learning*, 41(3), e70027.

INCLUSIVE AND SAFE LEARNING ENVIRONMENT

Create an inclusive and safe learning environment means intentionally cultivating a space where all students are treated fairly, have equal access to learning, and feel valued, supported, and included in their educational journey. Such an environment ensures that students can participate and belong, regardless of their background, abilities, or prior knowledge⁴⁷.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Should feel safe to make mistakes, ask questions, and attempt challenging tasks. + Should actively participate. + Express themselves. + Engage in debates and freely express their arguments. + Provide peer support and feedback. 	<ul style="list-style-type: none"> + Are approachable and supportive. + Foster a positive classroom dynamic. + Implement inclusive teaching practices (multiple means of representation, multiple means of expression and multiple means of engagement). + Design a safe and equitable learning environment.

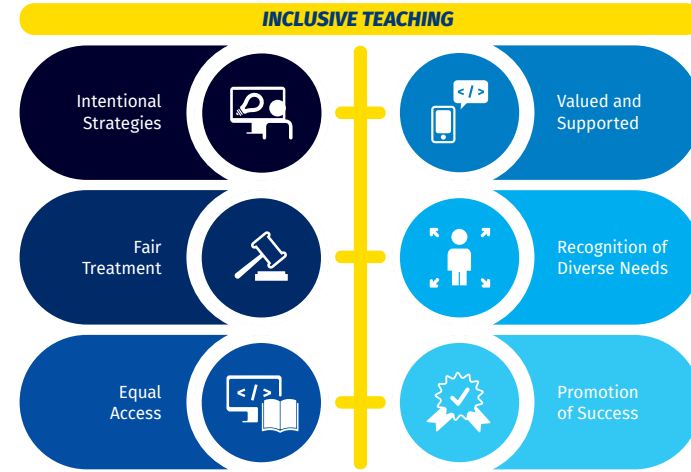


Figure 23: The dimensions of inclusive teaching

⁴⁷ The Center for Universal Design. (1997). *The principles of universal design (Version 2.0)*. North Carolina State University.
 Rose, D. H., Harbour, W. S., Johnston, C. S., Daley, S. G., & Abarbanell, L. (2006). *Universal design for learning in postsecondary education: Reflections on principles and their application*. *Journal of postsecondary education and disability*, 19(2), 135-151.
 European Education Area (2022). *Inclusive and connected higher education*. <https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education>
 Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal Design for Learning: Theory and Practice*. CAST Professional Publishing.
 Hockings, C. (2010). *Inclusive Learning and Teaching in Higher Education: A Synthesis of Research*. York: Higher Education Academy.
 Learning Development Network (2025). *Guide to Practices and Tools for Inclusive and Accessible Teaching in Higher Education*. Cyprus University of Technology.

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + Am I aware of initiatives in my higher education context related to inclusiveness? + Could I provide a material in different form (e.g. a short video of the lecture so students can re-watch)? Is the material at an appropriate level for each and every student? + Have I adapted the learning material for students with disabilities? + How do I vary the level of support according to the needs of my students in order to achieve the learning objectives? 	<ul style="list-style-type: none"> + Do I feel safe to take risks, make mistakes, and ask questions in this learning environment? + How do I contribute to making the classroom a more inclusive space where everyone feels valued and able to participate? + In what ways do I actively listen and engage in debates or discussions while respecting different perspectives? + How do I provide constructive peer support and feedback that helps others grow, while also reflecting on what I learn from them?

FEEDBACK, METACOGNITIVE LEARNING AND ASSESSMENT

Through feedback, metacognitive and self-regulation techniques, learners gain the ability to reflect on their own thinking and learning, become more motivated, and control their own learning. Similarly, instructors can evaluate students' learning, provide them with constructive feedback facilitating their learning and also reflect on their own teaching methods, and use portfolios to document their contributions to improving the quality of education. Explicitly preparing how to approach learning, employing observable thinking routines, reflecting on experience and progress and tracking individual comprehension are examples of metacognitive activities, which are about teaching students how to learn⁴⁸⁻⁵¹.

Learners	Higher Education Instructors (HEI)
<ul style="list-style-type: none"> + Learn in environments that are tailored to their needs, foster critical thinking, collaboration, and deeper learning. + Plan their approach to learning tasks by setting goals and selecting strategies. + Monitor their understanding and progress during learning, recognizing when comprehension breaks down. + Reflect on the effectiveness of their learning strategies and outcomes after completing tasks. + Engage actively in collaborative activities, explaining their thinking and providing peer feedback. + Use self-questioning and journaling to become aware of their cognitive processes and regulate them. + Adjust learning strategies and plans based on self-reflection and feedback from teachers and peers. 	<ul style="list-style-type: none"> + Plan lessons that integrate metacognitive strategies with subject content to support deeper understanding. + Design and facilitate collaborative learning activities such as group discussions, project work, and peer feedback that foster metacognitive skills. + Provide scaffolding, prompts, and feedback to help students reflect on their thinking and learning strategies. + Encourage reflection through journaling, questioning, and discussion to make students' metacognitive knowledge visible. + Actively engage in self-reflection and peer reviews. + Assess and adjust teaching based on reflection and evaluation of both student learning and their own instructional effectiveness.

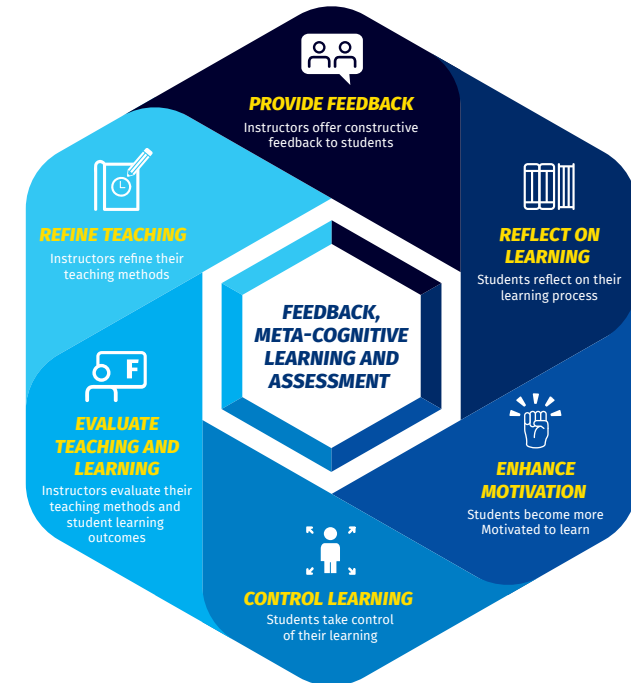


Figure 24: Feedback, metacognitive learning, and assessment

Reflective Questions for Learners	Reflective Questions for HEI
<ul style="list-style-type: none"> + How does the teacher's approach to teaching help me engage and learn effectively? + In what ways has the feedback I received helped me improve my work or understanding? + How well do I understand the topic now compared to before, and what can I do to further improve my understanding? + What challenges did I encounter, and how did I overcome them, or how could I overcome them in the future? + What strategies did I use while learning this material, and how effective were they? 	<ul style="list-style-type: none"> + What challenges did I encounter, and how did I overcome them, or how could I overcome them in the future? + How has my teaching evolved, and how is it reflected in my current courses? + What do student evaluations and outcomes reveal about the effectiveness of my teaching? + In what ways does my feedback help students progress, and how could I improve it?

⁴⁸ Ozturk, N. (2022). A pedagogy of metacognition for reading classrooms. *International Journal of Education and Literacy Studies*, 10(1), 162-172.

⁴⁹ Akamatsu, D., Nakaya, M., & Koizumi, R. (2019). Effects of metacognitive strategies on the self-regulated learning process: The mediating effects of self-efficacy. *Behavioral Sciences*, 9(12), 128. <https://doi.org/10.3390/bs9120128>

⁵⁰ Kaw, A., Lim, G. T., & Clark, R. M. (2024). Reflective Questions: Promoting Metacognition Through Discussion Board Prompts. *Journal of Higher Education Theory and Practice*, 24(8). <https://doi.org/10.33423/jhetp.v24i8.7238>

⁵¹ Université catholique de Louvain. (2025). Fonds de développement pédagogique (FDP). <https://www.uclouvain.be/fr/III/fonds-de-developpement-pedagogique-fdp>



06 **BEST
PRACTICE**

BEST PRACTICE CASE: BLENDED INTENSIVE PROGRAM (BIP) – “LEARN, LEAD, LEGACY”

The Blended Intensive Programme (BIP) for Civil Engineering and Architecture students represents a compelling application of the EUt+ Pedagogical Framework. The BIP followed learning path #3 (see Section 4) focusing on Active and Experiential Learning through hands-on, constructionist activities beyond the classroom walls. The project embedded both virtual and physical components, taking place initially in a digital and eventually in an on-site construction space. The program drew interdisciplinary content that extended in depth, encouraging students to develop transversal competence development (see Figure 25). The BIP transformed abstract principles into concrete practices, enabling students to become reflective practitioners who learn by doing, think critically about their role as engineers and architects, and contribute meaningfully to society. By combining experiential learning, interdisciplinary collaboration, and international engagement, the programme showcases the EUt+ commitment to a student-centered, innovative, collaborative, and sustainable model of education. Designed as a blended initiative that combines preparatory online learning with intensive on-site practice in Cyprus, the programme integrates theory, technical expertise, and interdisciplinary engagement in ways that embody the EUt+ vision for higher education. It demonstrates how active and experiential learning, interdisciplinary collaboration, and digital and global learning spaces can be brought together to create meaningful educational impact.

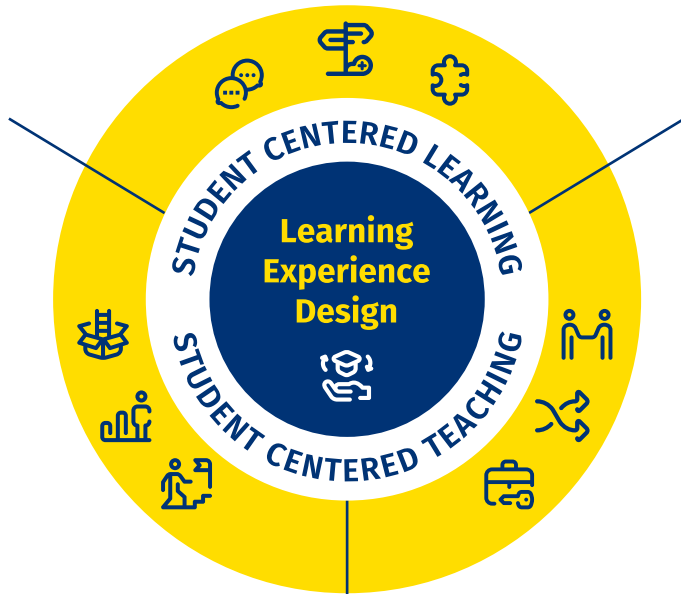
The participants were both undergraduate and postgraduate civil engineering students from across the EUt+ alliance. The mixed composition of the groups, together with role assignments ranging from project manager to health and safety officer, ensured that all participants experienced both the complexity of professional teamwork and the responsibility of individual accountability.



EUT+ ELEMENTS

+ Digital & Global Learning Spaces

- + Technology Integration
- + Embedded Intercultural Mobility
- + Modularisation and Flexibility
- + Self-customization of Study Track



+ Active & Experiential Learning

- + Problem-Based Learning
- + Challenge-Based Learning
- + Inclusive Teaching Practices
- + Peer2Peer Learning
- + Learner-Centered Assessment

+ Interdisciplinary Content, Aligned with Labor Market and Society

- + Alignment with Labor Market
- + Research Exposure and Engagement
- + Sustainability Consciousness
- + Civic Engagement and Societal Impact

Active and Experiential Learning

The teaching practice employed was rooted in experiential and problem-based learning. Educators acted as facilitators and mentors rather than instructors, modelling professional behaviours, scaffolding critical processes, and ensuring safety and quality standards. Daily debriefs functioned as structured reflective spaces where students evaluate progress, identify gaps, and co-design solutions. This approach operationalized the EUT+ commitment to student-centered and collaborative pedagogy.

The task design was built around the authentic challenge of planning, managing, and delivering a construction project for public benefit. Students were assigned professional roles within a simulated construction company and were collectively responsible for delivering a small-scale community structure.

Learning outcomes combined technical, professional, and civic competencies. Students demonstrated mastery of construction management principles such as project planning, scheduling, costing, and risk assessment, while also applying technical knowledge of structural design and sustainable construction. Equally important were transversal outcomes: leadership, teamwork, cross-cultural collaboration, critical problem-solving, and public communication.

Digital and Global Learning Space

The program deliberately integrated preparatory online learning, collaborative planning, and intensive on-site practice to mirror the realities of professional construction management. This blended design emphasizes that learning happens across both virtual and material contexts, preparing students for the increasingly hybrid nature of professional practice.

Interdisciplinary Content Aligned with Labor Market and Society

The content of the program combined disciplinary integration and depth with interdisciplinary breadth. While students studied subjects such as project planning, health and safety, personnel and materials management, and technical areas like concrete mix design or quantity surveying, they were encouraged to approach these not as isolated topics but as interdependent aspects of real projects. For example, understanding material properties was connected to formwork, reinforcement, and construction processes; similarly, calculating quantities from drawings was integrated with managing delivery, personnel, and timelines on site. Alongside these technical components, students also addressed transversal themes including sustainability, community impact, and communication strategies.

Figure 25: Key elements of the EUT+ Pedagogical Framework for Learning Path #3 as applied in the "Learn-Lead-Legacy" BIP



By scanning this QR code, you may access an overview and a timelapse video of the “Learn-Lead-Legacy” BIP.



07

CONCLUDING REMARKS

To effectively incorporate the EUT+ Pedagogical Framework into a course, educators can follow several key steps designed to foster student-centered, practice-based, and innovation-driven learning:

1. Familiarise with the EUT+ Pedagogical Framework

Begin by thoroughly reviewing the vision and mission of the framework. The framework views learning as a social experience where individuals interact to construct knowledge, emphasising collaboration, communication, and peer learning.

2. Select a Learning Path

Navigate through the 5 learning paths, their key components and variations. Select the one that best fits keeping in mind your specific learning objectives and build collaborations within the EUT+ alliance to address a challenge or real-world problem.

3. Incorporate Key Teaching Practices into Your Course

Structure your course using the EUT+ Pedagogical Framework's key teaching practices. Focus on creating opportunities for students to engage with real-world problems, case studies, work in interdisciplinary teams, and collaborate on innovative solutions. The framework integrates core elements like value co-creation and open innovation, requiring processes that facilitate seamless collaboration among students, educators, and stakeholders.

4. Refer to the Example of the Best Practice Case

Use Blended Intensive Program (BIP) – “Learn, Lead, Legacy” as a practical example. This program is designed based on EUT+ pedagogical principles and offers insights into how these ideas can be applied in a real-world academic context.

5. Consult Additional Resources

Utilise the references and appendices at the end of the document, which offer additional resources, case studies, and supporting materials to deepen your understanding and provide further guidance on integrating these principles into your courses.

The framework aims to be flexible, and aligned with the global demand for leaders who can navigate the technological, ethical, and societal challenges of the future, which inherently requires ongoing adaptation and refinement based on user experience and emerging needs.





08 **FURTHER
READING**

ANNOTATED BIBLIOGRAPHY OF FOUNDATIONAL RESEARCH AND RECENT REPORTS

Booklet. *What is problem based learning and how to put it into practice?* [Link.](#)

This publication is a simple guide to the PBL methodology and its implementation. It aims to provide a practical, easy-to-read and playful introduction for those who would like to experiment with PBL in their curricula.

Raucent, B., Milgrom, E., Jacqmot, C., Mauffette, Y., & Nagy, V. (2023). *What is problem based learning and how to put it into practice?*

Booklet. *CU.til - Teaching Innovation Lab What and how?* [Link.](#)

CU.til - Teaching Innovation Lab - is a platform created in the new ecosystem of Circle U (CU). This booklet serves as a tangible statement to CU.til's foundational principles. Within these pages, you will discover the cornerstone elements of CU.til – a compendium of its missions, values, and strategic endeavors envisioned to propel us towards our collective aspirations in the years to come.

Champagne, L., Mathelart, C., Raucent, B., & CU.til. (2024). CU.til Guide n°0 - 2024. In *CU.til - Teaching Innovation Lab*.

Report. *The global state of the art in engineering education.* [Link.](#)

The study considers the global state of the art in engineering undergraduate education. It was undertaken to inform Massachusetts Institute of Technology's (MIT) New Engineering Education Transformation (NEET), an initiative charged with developing and delivering a world-leading program of undergraduate engineering education at the university.

Graham, R. (2018). *The global state of the art in engineering education* (By Massachusetts Institute of Technology). Massachusetts Institute of Technology.

Article. *Can Design Thinking Redesign Higher Ed?* [Link.](#)

The article explores whether design thinking – a method from the design and innovation world – can be meaningfully applied in higher education settings to bring about pedagogical and institutional change.

Gardner, L. (2017). Can design thinking redesign higher ed? In *The Chronicle of Higher Education*.

Article. *D.LIGHT II: Market Research and Prototyping in Remote Regions.* [Link.](#)

The publication documents the development of d.light, a solar-powered LED lighting solution designed for communities without reliable electricity. It focuses on the market research and prototyping process undertaken in remote regions of India to understand user needs, test product concepts, and refine design features.

Tozun, N., Goldman, S., & d.light. (2012). D.LIGHT II: Market research and prototyping in remote regions. In *D.LIGHT: MARKET RESEARCH AND PROTOTYPING IN REMOTE REGIONS*.

Doctoral Research. *The emergence of engineering education 5.0 in a new Industrial era.* [Link.](#)

This paper is part of ongoing doctoral research and presents a framework for Engineering Education 5.0. It is based on the shift from Industry 4.0, marked by the integration of cyber-physical systems and the automation of technology, to a focus in Industry 5.0 on human-centricity, sustainability, and resilience.

O'Gorman, L., Atlantic Technological University, Leahy, M., Dublin City University, Young, P., Dublin City University, Brown, M., & Dublin City University. (2023). THE EMERGENCE OF ENGINEERING EDUCATION 5.0 IN A NEW INDUSTRIAL ERA [Conference-proceeding]. In *Outreach and openness: industry and civil society in engineering education* (p. 1).

Article. *Integrating Responsible Innovation into Engineering Education: Insights from Scenario Leads at UCL's Integrated Engineering Programme.* In *SEFI 2024-52nd Annual Conference of the European Society for Engineering.* [Link.](#)

This paper explores the integration of responsible innovation into engineering education through a case study of UCL's Integrated Engineering Programme.

Ramachandran, V., Centre for Engineering Education, University College London (UCL), Roach, K., Centre for Engineering Education, University College London (UCL), Tilley, E., & Centre for Engineering Education, University College London (UCL). (n.d.). Integrating Responsible Innovation into Engineering Education: Insights from Scenario Leads at UCL's Integrated Engineering Programme. In *Conference Key Areas: Teaching the knowledge, skills and attitudes of sustainable engineering, Engineering ethics education*.

Article. *On Students' Future Readiness Regarding Sustainable Development.* [Link.](#)

This paper focuses on questions regarding how well the alumni have absorbed teaching elements regarding SD, and how they find themselves being future ready based on their previous studies.

Einarson, D., & Klonowska, K. (2025, January 17). *On students' future readiness regarding sustainable development*. Kristianstad University Research Portal.

Book. A guide to teaching in the active learning classroom: History, research, and practice. Routledge. [Link](#).

This book introduces Active Learning Classrooms (ALCs), innovative teaching spaces designed to foster collaboration and engagement, but which challenge traditional classroom norms such as central focal points and lecture-style seating. It synthesizes research on ALCs to provide faculty with practical, evidence-based strategies for navigating these spaces effectively.

Baepler, P., Walker, J. D., Brooks, D. C., Saichaie, K., & Petersen, C. I. (2023). *A guide to teaching in the active learning classroom: History, research, and practice*. Routledge.

Article. The multiple meanings of 'student-centred' or 'learner-centred' education, and the case for a more flexible approach to defining it. [Link](#).

This article examines the varied and sometimes conflicting definitions of student-centred or learner-centred education in both research and practice. The author argues that rather than rigidly adhering to one definition, educators should adopt a more flexible, context-sensitive approach that recognizes the strengths of multiple interpretations. The discussion emphasizes that effective pedagogy often requires balancing teacher guidance with student autonomy, depending on goals, subject matter, and learner needs.

Bremner, N. (2020). The multiple meanings of 'student-centred' or 'learner-centred' education, and the case for a more flexible approach to defining it. *Comparative Education*, 57(2), 159–186. <https://doi.org/10.1080/03050068.2020.1805863>

Article. Assessment revisited: a review of research in Assessment and Evaluation in Higher Education. [Link](#).

This review analyzes research on assessment in higher education (2006–2013), highlighting shifts from traditional exams toward alternative, student-centred practices. It categorizes findings across methods, modes, and pedagogical alignment, while noting gaps in validity, fairness, and cross-national comparisons. Useful for understanding evolving trends in assessment post-Bologna and identifying areas for further research.

Pereira, D., Flores, M. A., & Niklasson, L. (2015). Assessment revisited: a review of research in Assessment and Evaluation in Higher Education. *Assessment & Evaluation in Higher Education*, 41(7), 1008–1032. <https://doi.org/10.1080/02602938.2015.1055233>

Article. Improving student retention in higher education. [Link](#).

This article argues that student retention is best supported through high-quality teaching and learning practices rather than solely administrative measures. It emphasizes engagement, inclusive pedagogy, and curriculum relevance as central to persistence. Useful for educators and policymakers seeking evidence-based strategies to improve retention outcomes.

Crosling, G., Heagney, M., Thomas, L., Monash University, & Edge Hill University, UK. (2009). Improving student retention in higher education. *Improving Teaching and Learning*, 51–51(2). <https://files.eric.ed.gov/fulltext/EJ864028.pdf>

Book Chapter. Creating curb cuts in the classroom: Adapting universal design principles to education. [Link](#).

This chapter introduces Universal Instructional Design (UID) as a proactive approach to embed accessibility and diverse learning styles into the curriculum. It links UID to multicultural education and adult learning theory, highlighting the role of assistive technology. Useful for educators seeking inclusive teaching strategies that reduce stigma around accommodations.

Johnson, D. M., & Fox, J. A. (2003). Creating curb cuts in the classroom: Adapting universal design principles to education. In Higbee, J. L. (Ed.). (2003). *Curriculum Transformation and Disability: Implementing Universal Design in Higher Education*, 7–21.

Article. The first steps of blended mobility in European higher education: A survey of blended intensive programmes. [Link](#).

This article surveys academic coordinators of Blended Intensive Programmes (BIPs) across Europe to examine how these “blended mobility” formats, i.e. combining online and short physical mobility phases, are being implemented, the benefits perceived, and the challenges encountered. Useful for higher-education practitioners and policy-makers exploring internationalisation strategies with hybrid mobility models.

O'Dowd, R., & Werner, S. (2024). The First Steps of Blended Mobility in European Higher Education: A Survey of Blended Intensive Programmes. *Journal of Studies in International Education*, 28(5), 798–817. <https://doi.org/10.1177/10283153241235704> (Original work published 2024)

Report. Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators. [Link](#).

European Commission outlines principles and recommendations for the ethical use of AI and data in education, aiming to help educators engage responsibly with AI systems while mitigating risks. It covers issues such as transparency, fairness, privacy, accountability, and pedagogical integration in teaching. Useful as a policy framework for institutions and educators designing AI-enabled learning environments.

European Commission: Directorate-General for Education, Youth, Sport and Culture. (2022). *Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators*. Publications Office of the European Union. <https://data.europa.eu/doi/10.2766/153756>.

Book. The learner-centered curriculum: Design and implementation. [Link](#).

This book provides a framework for designing curricula that prioritize learner needs, active engagement, and outcomes over content coverage. It offers practical guidance for shifting institutional and classroom practices toward learner-centeredness. Useful for faculty and administrators implementing curriculum reform.

Cullen, R., Harris, M., & Hill, R. R. (2012). *The learner-centered curriculum: Design and implementation*. John Wiley & Sons.

Article. Student-Centered Approaches to Curriculum and Course Design. [Link](#).

This article explores contemporary strategies for embedding student-centered approaches in curriculum and course design. It emphasizes active learning, adaptability to diverse needs, and alignment with 21st-century skills. Useful for educators seeking practical models for student-focused teaching in higher education.

Hasibuan, K., Frista, A., & Fiveronika, F. (2025). Student-Centered Approaches to Curriculum and Course Design. *Innovative: Journal Of Social Science Research*, 5(1), 4472-4484.

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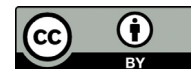
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