

Research Agenda 2023-2028

Introduction

The TU Delft Extension School for Continuing Education develops and delivers technical and engineering (online) courses and short programmes. The portfolio is designed to equip people with the skills needed to find solutions to today's global challenges in the field of Energy Transition; Quantum Technology; Skills for Engineers; Sustainable Cities; AI, Data & Digitalization; Future of Transportation; and Medical Technology. Our interdisciplinary courses bring benefits to individuals worldwide, enabling them to stay up to date in their area of expertise or to increase their career prospects.

Starting out as one of the pioneers in providing online courses, the drive to innovate education is still alive in our organization which is now grown to a leading position in the field of lifelong learning education. We want to improve our courses and show our leader position by facilitating research in an educational field lab. The possibility of transferring knowledge from research into practice is key to us.

If you are interested in working on one of our research topics (see [Appendix](#)), please contact us to explore the possibilities: research-es@tudelft.nl We look forward to it.



**Energy
Transition**



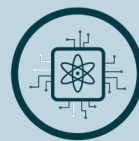
**Skills for
Engineers**



**AI, Data &
Digitalization**



**Medical
Technology**



**Quantum
Technology**



**Sustainable
Cities**



**Future of
Transportation**



Learner-centered approach

Our lifelong learning courses and programmes are designed with a learner-centered approach to meet the needs of each learner. Compared to campus education, the learners who follow our continuous education vary more in professional background, knowledge level, and in their motivation and personal goals. One learner may join out of curiosity about the topic, another may desire to obtain a certificate to increase employability. Learners' needs are also dependent on societal changes. The arrival of new technologies, developing geopolitics or challenges linked to the energy transition result in changes in the labour market and in requirements for the reskill or upskill of the workforce.

For these reasons learners' needs are varied and constantly changing, proving a challenge for organizations that deliver continuous education. We therefore need to well understand those needs to be able to meet them through high-quality courses and an excellent learning experience. Additionally, societal and individual needs have the potential to create novel formats of professional development that focus more on personalized learning paths and learning networks. Efficient assessments and accreditations will be key for educational organizations such as ours to support all learners.

Research agenda

EDUCATIONAL RESEARCH to build knowledge and shape practice.

We believe that educational research is essential for evidence-based education and innovation. Therefore, we aim to continue our collaborations with educators and researchers worldwide, creating a valuable, two-way exchange: data from our online courses is shared to conduct research projects, while the outcome and insights from such research are available in an open-access format and can be used to improve teaching and learning practices. We aim to translate the educational research outcomes into practical recommendations for educational development. Moreover, increased access to both data and results (e.g., articles, papers, datasets) further supports a common vision for open education.

PORTFOLIO AND CUSTOMER FOCUSED RESEARCH to evaluate the learner experience.

The courses and short programmes of the TU Delft Extension School attract a large variety of learners from over 200 countries, each with their own professional backgrounds and goals. We want to create inclusive courses that are informative, enjoyable, and engaging for all types of learners and bring benefits to individuals, organizations, and society. This third approach focuses on mapping the alignment of learner's needs, the technical and engineering labour market requirements, and our portfolio offering. Alignments need to be investigated at the levels of course content and of course format. For example, we could ask ourselves what innovations in course format could make our services more attractive?

DEVELOPMENT AND INNOVATION to implement what we have learned.

Educational research, conducted by others or in collaboration with us, delivers novel insights and, potentially, new methods and tools. It would therefore be valuable to translate such insights into practical solutions and to incorporate the new tools in our existing educational system. However, scaling up from a pilot study to an implementation comprising all courses offered by the organization is often a rather difficult step; it may require the training of educational staff or adjustments in platform and/or data infrastructure. Evaluation of the benefits, constraints, and potential improvements is part of this approach.

MEASURE THE IMPACT of our courses and programmes for our learners.

This fourth approach focuses on mapping the TU Delft Extension School's impacts. We can expect that an up-to-date portfolio with a broad coverage of areas of great relevance for the learners, the environment, the market, and society will lead to a positive impact on the world. We therefore aim to develop indicators that can measure the impact of our portfolio offer and provide evidence of the fact that we equip people with the skills needed to solve global challenges.



Implementation

Alignment

With its Research Agenda, the TU Delft Extension School aims to align its research activities with relevant agendas and policy plans, such as the TU Delft Strategic Priorities 2022-2024, TU Delft Lifelong Learning Strategy, the 4TU.CEE Strategic Plan 2022-2025, the LDE Centre for Education Learning Strategy, and the Enhance University Alliance's goals. Furthermore, our four approaches link to the Dutch National Research Agenda with regards to questions about lifelong learning and to big data routes. At the European level, we aim to connect with the Horizon Europe and the Erasmus Plus programmes. All research activities will follow the General Data Protection Regulations (GDPR) and ethical guidelines.

Timeline

It is the intention to carry out these four approaches within the next five years. We are confident that our Research Agenda will help us to improve the quality of our online education, create the opportunity for well-informed decision making, and create excellent support for teaching staff who will then transfer their online teaching and learning knowledge to campus education. Together with faculties, we will be contributing to and innovating in the field of lifelong learning, campus education and open education.

Photo by Christina Morillo on Pexels

APPENDIX – RESEARCH TOPICS

Within the four approaches of our Research Agenda, we focus on seven research fields. These are listed below together with some examples of questions we aim to answer.

1. Learners' needs

- a. What clusters of learners can we identify in our courses based on their needs and their behaviour? Do they match our envisioned personas? Persona or segmenting research would help us develop a better customer-focused portfolio- and course-design.
- b. What course type and duration, mix of elements and learning experiences fit the best each of these learning clusters? Does this match with our offered course type?
- c. What kind of skills and learning experience do we offer? Are these in line with the current technical and engineering labour market? Or with the interest of learners to professionalize themselves?
- d. Does the analysis of learners' behaviour on our platform indicate the need of a more mobile-friendly course design?

2. Learning networks

- a. How can learning communities empower professionals to contribute to societal problems?

3. Scaling up & quality

- a. What types of learner/lecturer behaviours are good indicators of course quality? Are these indicators in line with learners' answers in evaluation surveys?
- b. How can we create the infrastructure needed to automatically analyze learner/lecturer behaviours in courses to assess course quality?
- c. Can predictions of student success, linked to a dashboard with actionable insights for lecturers, help increase retention times and passing rates?

4. Open Education

- a. Are our open educational resources often shared/re-used in courses or learning communities?
- b. Is the creation of a personalized learning path throughout our courses possible with tools such as Skill Circuits and available open resources? Would offering this possibility be beneficial for learning outcomes?

5. AI in education

- a. How can we incorporate existing/available AI tools in our platforms to provide learners with direct feedback?
- b. The introduction of ChatGPT and other AI tool makes us rethink our assessment strategies. In what ways can we assess the learning goals in this AI world?

6. Assessment and accreditation

- a. What is the value of microcredentials for a learner and for what courses and programmes should we provide them?

7. Impact on society

- a. Can we approach the impact on society by implementing the Theory of Change in one or multiple portfolio areas?
- b. Did learners gain the knowledge and/or skills that they were looking for when enrolling in our courses? How did this affect their (professional) life?
- c. Can we identify problems or important developments in a field based on the communication taking place within a learning community and bring those to the table of policy makers?

TU Delft Extension School for Continuing Education

Since 2013, our online courses and programs help thousands worldwide to make an impact on areas of great relevance to the environment and society. By delivering expert knowledge and applicable skills for engineers, we support working professionals to stay on top of their game – whether they are looking to change career, broaden their skillset, or acquire further academic qualifications.

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