

IDEE Program proposal Theme 1

Taking Responsibility

On how TU Delft can stimulate and facilitate students to take responsibility and agency for their learning

Delft, November 2023

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I. Introduction

This program proposal Taking Responsibility is part of TU Delft's IDEE program: Innovation for Delft Engineering Education. It first sets the scene by elaborating on the theme of responsibility from both a societal and educational point of view. This section ends with what we as a team see as the main challenges in TU Delft and what we give ourselves as objectives for this five-year program. Then we unravel our program proposal via four work packages and close it with some final words.

II. Setting the scene

Current global criticalities are challenging educational systems: matters like climate change, global health issues, social injustice, and rapid AI developments exert pressure on education. Universities are challenged to think afresh about how they can participate in the project of rethinking the **responsiveness and relevance of their curriculum** and **mode of pedagogy** with regard to those environmental, social, and political realities (Mostafavi, 2020). However, the non-linear behavior of these ecosystems gives way to an ever-growing sense of complexity; not only because of the rapidity of changes, but also because the challenges they bring forward are open-textured and can never be dissolved simply: not only multiple interpretations can exist, but also conflicting and incompatible ones (Barnett, 2004).

The university is intertwined with the world's multiple (learning) ecosystems and affected by their mutual interdependence: the question thus becomes, **what is now the university's responsibility?** And what are the roles and responsibilities of our **students and university teachers?** Barnett (2018) argues for an 'Ecological University' that engages not only with the complexity of these societal challenges but also with the pedagogical challenges that arise from this understanding of the world. The preparation 'for' carries some weight here, he argues: our uncertainty as to what is the best way of supporting students is growing (Barnett, 2004). What should be the (future-proof) competencies¹ of today's and tomorrow's learners in order **to take agency and responsibility?** And how will or should that affect our teaching practices?

One of the most critical components of ecological literacy is **systems thinking**; thus linking learning at the individual level with changes at the level of a community and the ecosystem as a whole (Tindal & Krasny, 2011; Bianchi et al., 2022). And what systems thinking brings forward in education is the need to resist traditional, siloed mono-disciplinary approaches to creating knowledge; instead, it advocates for 'the dialectic premises that underlie sociocultural, situative and socio-material approaches' where learning is not a confined internal process, 'but instead involves mutually constitutive relationships between individuals and environments' ultimately transforming both person and environment (Damsa et al., 2019: 2077).

Learning theories that follow the need for interactive, collaborative, and mutually transformative learning environments and where the roles of individual learners are considerably enhanced, have proliferated since the 1980s. Theories such as 'Communities of Practice' (Wenger & Wenger-Trayner, 2015) have created a novel, more nuanced interpretation of constructivism and social learning by **assigning learners with accountability** towards their learning and also towards the community they form part of. Building on this tradition, the more contemporary learning theories for emerging technologies such as Connectivism (Siemens, 2004; Downes, 2017); Communities of Inquiry (Garrison et al., 2009), Heutagogy (Hase & Kenyon, 2000), and Self-Regulated Learning (Zimmerman & Risemberg, 1997) have further developed this notion

¹ In the IDEE program the topics of 'Taking Responsibility' and 'Future Engineering Skills' might (seem to) have an overlap here. But for us, it is all about the competencies of students, the teaching practices of our university teachers, and the design and organization of the learning environment which stimulate and facilitate our students to take responsibility for their learning, their learning process, their study journey, and even their study program.

by using the network metaphor and by shifting the importance from content delivery to **learners' connectivity and interaction** (Anderson, 2016).

One important element the aforementioned theories have in common is that learning occurs within 'nebulous environments of shifting core elements that are not under the control of the individual' (Siemens, 2004). Learning is rhizomatic and therefore, it has 'mutable goals and constantly negotiated premises' and the community is not the path to understanding the curriculum, 'the community is the curriculum' (Cormier, 2008). Learning in these environments takes the form of 'actionable knowledge' and thus responsibility of learning is **shifted to the learners themselves and their capacity** to draw distinctions between important and unimportant information, while also recognizing when new information alters the landscape (Siemens, 2004).

The **integration** of the notion of learners' responsibility towards their learning has been characteristically **slow** in pedagogy: the distributed, destabilizing nature of 'nebulous' learning environments as well as their informality clashes with the formal, hierarchical order of academic institutions and the established educational formats across disciplines (Ioannou et al., 2022).

Nevertheless, in recent years, there have been examples of pedagogical frameworks like 'Challenged-based Learning' (CBL) that have grown closer to rethinking student autonomy, agency, and responsibility. Learning in the CBL paradigm sets out by **engaging** students purposefully in formulating a research, engineering, and/or design question from practice in collaboration with a wide range of different stakeholders, all the way to **investigating** possible scenarios with them and ultimately **acting** by collectively developing an intervention, a set of interventions, a strategy for action(s), or a systemic transition strategy. Acting in uncertainty and complexity is prominent here as a means of making decisions and assuming responsibility for the proposed actions, strategies, and transitions. The transition literature emphasizes (e.g. Rotmans and Verheijden, 2021; Goudswaard and Oosten, 2022) this as well but has not yet thought about how to educate young and starting professionals and students.

Project-driven pedagogical frameworks such as CBL are crucial in exposing students to world challenges, making them collaborate in large(r) groups of multiple stakeholders; not only for 'solving' problems but in particular for identifying what the problems are in the first place. Two major implications arise here: the first is that considering knowledge as being situated in specific contexts implies that **knowledge is created by individuals who assume the responsibility for their translations and their positionings** and where the scientific objectivity becomes that of 'positioned rationality' (Haraway, 1988). The second implication relates to the open character of these project-driven pedagogies and their elusive nature: what happens when a solution or even the formulation of a problem is not possible? **Accepting failure** as a possibility and acknowledging that learning is possible even from failure is an inherent aspect of these endeavors.

So, what does all this mean for engineering education and in particular for our TU Delft engineering students, engineering educators, and our learning environment(s)? What are the

attitudes, skills, and competencies students must develop to be able to take and feel responsibility? Is our body of university teachers skilled and equipped to coach our students accordingly? Do our learning environments have the flexibility and agility to foster students taking the lead over their learning? And not to forget: what do we do in our teaching and in designing the learning environments that can (sometimes, too often) discourage students from taking responsibility?

In his visionary book on engineering education, Aldert Kamp (2016) emphasizes the implications of world complexity for engineers by introducing the VUCA framework (Volatility, Uncertainty, Complexity, and Ambiguity) arguing for a **shift of engineering skills beyond the technical domain** such as empathy, active listening, and out-of-the-box thinking. BANI (Brittle, Anxious, Non-linear, Incomprehensible), a recent upgrade of VUCA, further elaborates on the unpredictability of changes and by extension our incapacity to comprehend them fully and therefore stresses the need to develop resilience and mindfulness, flexibility, and intuition (Cascio, 2020). Similarly, the CDIO framework for engineering education - Conceiving, Designing, Implementing, Operating (<http://cdio.org>) - sets goals at the syllabus level; not only for technical but also personal and interpersonal skills that young engineers 'must possess' that will, in turn, allow them 'to function in real engineering teams and to produce real products and systems' (Crawley, 2001:1). The EU GreenComp sustainability competence framework (Bianchi et al., 2022) also explicitly refers to these kinds of skills when talking about the competence field 'acting for sustainability: political agency, collective action, and individual initiative'. In line with CDIO and Greencomp, the Inner Development Goals movement on transformational skills for sustainable development – being, thinking, relating, collaborating, acting – 'researches, collects, and communicates science-based skills and qualities that help people to live purposeful, sustainable, and productive lives' (<https://www.innerdevelopmentgoals.org>).

Wrapping up, we see that responsibility emerges as a common thread across the aforementioned frameworks and is also a key competence for creating knowledge itself. However, many of our TU Delft degree programs still **lack the flexibility to facilitate student agency**: conditioned to perform across several specific learning objectives that in turn relate mostly to technical skills or competencies, we currently **miss out on the development of the personal and interpersonal skills**. In addition, we **fail to acknowledge failure as an opportunity to learn**: our students fear failure and the responsibility that comes with it. Our grading system might be one of the reasons (perhaps even *the* reason) that makes students study strategically toward passing courses and good grades instead of focusing and enjoying the learning itself; what Alfie Kohn (2018) would call 'punishment by reward'.

But **not all students are up to an approach of taking responsibility** and/or have other expectations from the TU Delft curriculum, especially considering that learning as in 'making choices' can also lead to a moral overload when different obligations apply but one is not able to fulfill them simultaneously (Van den Hoven et al., 2012). Furthermore, we observe that **many teachers steer a lot and have difficulties with letting go** ('loslaten en vertrouwen'). And what might be even worse, we do not have **the number of staff nor the expertise within the body of staff** to fully do this. Lastly, it remains largely unclear **what kind of pedagogical**

approaches and interventions really ‘work’ and how they can fit into the diverse educational contexts of TU Delft.

Opening up curricula and pedagogy to accommodate responsibility is imperative. In our **Taking Responsibility** innovation and research program we aim to not only improve our understanding of the theme at hand, but also develop evidence-supported strategies, interventions, and concrete tools for our students, our teachers, and our organization at large. The proposed research program aims to develop a holistic understanding of the changes necessary to transition to a fundamentally different teaching and learning culture. We are driven by the belief that...:

1. ...our TUD (under)graduate **students** (can) take (more, complete, full) responsibility and agency over their learning, their learning trajectory, their exit profile, and the development of their professional identity.
2. ...our body of TU Delft **university teachers** can further enhance their capacity to design, organize, and teach the curriculum and their courses in such a way that stimulates students to take responsibility and agency for their learning.
3. ...our TUD students should be professionally and personally **supported** by the learning environment, coaching teachers, and tools and technologies in this journey.

Our program approach consists of three work packages and a fourth managerial package that we will explain in more detail:

WP1: Common ground

WP2: Taking responsibility: innovation and research

WP3: Dissemination within and outside TU Delft

WP4: Program management & communication

III. WP1 Common Ground

Objectives and Research Questions

The first work package aims to define the **common ground** within the theme: Taking Responsibility in Learning. It will **explore various dimensions** of the theme through the perspectives of students and educators, theories and concepts, and means and methods. It will **develop a theoretical framework** by seeking answers to the main question:

What does taking, having, giving, and feeling responsibility mean?

Many sub-questions follow from here, which will be addressed in our WP1 activities.

Literature review:

- What are the roles of independence, autonomy, and agency toward responsibility in learning?
- What are the situations, skills, and attitudes needed for responsibility in learning?
- What are the roles of students and educators in stimulating students' responsibility? How can the two collaborate better for this?

TU Delft teaching practices:

- What is the current culture and practices of responsibility in learning at TU Delft? How does it differ in our study programs?
- How can curricula empower students to take responsibility for learning? What is the current situation of curricula in different programs of TU Delft in this sense?
- How good are our Delft educators at giving responsibility to students? Do educators take responsibility in teaching? How does this affect learners' responsibility?

Outside TU Delft:

- What is the culture of responsibility that the students carry from high school to university in The Netherlands? How does it change for international students who studied in different countries before coming to TU Delft?
- What is the position of society towards encouraging, allowing, or demanding responsibility from individuals within university education? How can TU Delft build stronger relationships with other societal actors in this sense?

Proposed Activities

The proposed activities in this work package include:

- **Literature review** (also via journal club meetings) on the current paradigms and endeavors in relation to learners' responsibility in learning.
- **Survey, panel talks, and interviews** with a wide and diverse group of students, educators, educational managers, and other stakeholders to gain insight into the different perspectives of all involved.
- Develop a **Glossary of Common Ground** that includes the shared approaches, concepts, and mindsets on the theme.

- Develop a **research framework** that will be implemented in the following work packages.

The WP1 activities will be organized as part of TU Delft's *100 DAYS OF...* festival supported and co-hosted by the Teaching Academy, TLS, 4TU.CEE.TUD, LDE-CEL, and our Extension School.

Deliverables and Outcomes

The proposed deliverables and outcomes include:

- A university-wide symposium that will introduce common ground to all actors in the university and stimulate a larger group toward the goal of the theme.
- A website that includes the Glossary of Common Ground and the existing practices at the university within the theme.
- Input for the research and innovation frameworks of the Ph.D. candidate, the 2nd post-doc, and the university teachers who would like to systematically evaluate their individual education innovations.
- A conference contribution: either a peer-reviewed conference paper (a position paper) or a workshop or roundtable at SEFI or CDIO.
- Publication from Literature Review

Timeline

- From the 1st to the 12th month: Main work package activities take place (100 days of... taking responsibility).
- By the end of the 12th month: The symposium takes place.
- From the 9th to the 15th month: The website and the conference contribution are prepared.
- From the 15th month onward: The activities continue at a slower pace, integrated into the following work packages.

Roles

The roles will be assigned at the theme meetings, with the participation of the whole group. The activities will also involve the prospected Ph.D. candidate and Post-doc researchers, as well as a group of students (through the study associations (e.g., FSC) at the university).

- Coordination & post-doc supervision: **Serdar Asut & Aleksandar Staničić**
- Coordination literature review and journal club meetings: post-doc researcher
- Planning and implementing the surveys/interviews: post-doc researcher
- Developing the Glossary of Common Ground: Serdar Asut, Aleksandar Staničić, post-doc researcher + those who would like to join

- Symposium organization: post-doc researcher + those who would like to join
- Developing the website: post-doc researcher + Teaching Academy support
- Paper writing team: Serdar Asut, Aleksandar Staničić, post-doc researcher + those who would like to join

IV. WP2: Taking Responsibility: innovation and research

Objectives and research questions

This second WP aims at developing an informed overview of effective pedagogical interventions for students taking responsibility. The theoretical research implemented in WP1 will be further advanced in WP2 and enhanced by the systematic analysis of innovative pedagogy practices in existing TU Delft programs. A selected number of case studies will be investigated here across two key questions: (i) in what way(s) are these practices effective and impactful to foster student responsibility; and (ii) how can these practices become reusable, sharable, and communicable?

The results of the aforementioned research activities will be consolidated in a Pedagogical Pattern Language (PPL). A PPL (Rooij & Bossen, 2023; Laurillard, 2012; Mor & Winters, 2007) is a structured framework or collection of reusable solutions and best practices in teaching and learning. Its purpose is to capture effective teaching strategies, instructional design principles, and learning activities in a concise and easily understandable format. Each pattern consists of several elements, including the pedagogical problem, the context in which it arises, the forces or constraints at play, the scientific underpinning (references to literature), the proposed 'solution' or intervention, practical implications, and relationships to related patterns.

The proposed PPL will be developed to support educators in making informed decisions about their instructional design and teaching practices specifically with the aim of increasing student responsibility. It will provide a shared vocabulary and framework for discussing, analyzing, and improving teaching and learning formats and redistributing agency between all actors. By offering reusable, or transferable solutions to the challenge of raising student responsibility, it will help disseminate best practices within the teaching community more efficiently. It will further foster collaboration and communication among educators, enabling them to share insights, exchange ideas, and collectively contribute to advancing teaching and learning practices.

The newly developed PPL will provide the canvas for the design and implementation of specific interventions with the aim of increasing student responsibility. The interventions will be subsequently monitored and evaluated for their capacity to foster responsibility among students. Both the educational interventions and the pattern language will encompass various elements that contribute to the teaching and learning experience of students and university teachers, such as: course design, lecturing, teamwork and collaboration, assessment and feedback, active learning, technology integration, learning and teaching tools, and curriculum adaptability and differentiation.

Proposed activities

The proposed activities in this work package include:

- Conduct theoretical analysis by **exploring educational models** that promote student responsibility.
- Collect, map and analyze **existing innovative practices within the TU Delft** that foster student responsibility
- Investigate existing and develop new learning and/or teaching **tools and technologies** for supporting responsibility

- Building on the aforementioned input, develop a **Pedagogical Pattern Language** (PPL)
- Use the PPL to **design & implement custom interventions** to a selected number of existing TUD courses
- Develop **evaluation instruments** for assessing responsibility and **monitoring** the interventions.
- Refine and validate an updated version of the **Pedagogical Pattern Language** on engaging engineering pedagogies that foster student responsibility.

In the development and evaluation of the interventions, tools, technologies, and pedagogical patterns, we will call upon both students and staff to assess (with us) the value and feasibility of our ideas.

Deliverables and Outcomes

- Enhanced courses and curricula promoting responsibility via the implementation, monitoring, and evaluation of interventions.
- Evaluation criteria/frameworks for monitoring and evaluating students' responsibility.
- Pedagogical Pattern Language as a tool for designing courses with the aim of increasing student responsibility.
- A number of papers in scientific conferences.
- A number of approximately 4-5 publications in peer-reviewed journals.
- A complete overview of this research in the form of thesis by the PhD candidate.

Timeline

This work package will run. For 48 months, starting on month 6 of the IDEE program. Initially, the conceptual and theoretical framework (in connection with WP1) is further developed by the Ph.D. candidate. Simultaneously, the Ph.D. research and innovation approach is developed. The PhD candidate will be evaluated after 12 months (Go-No Go meeting). In case of a successful result, from month 13 onwards the PhD candidate will work on developing the PPL, the innovation cases (design-implement-monitor-evaluate), and the evaluation instruments.

Roles

Coordination: **Sylvia Mooij & Caroline Wehrmann**

Ph.D. candidate: vacancy

PhD supervision and research coordination: Remon Rooij (promotor), Marcus Specht (promotor), Sylvia Mooij & Olga Ioannou (daily supervisors/co-promoters)

Innovation case owners' coordinator(s): Sylvia Mooij, Caroline Wehrmann

Innovation case owners: TBD

Learning Developer/ technology advisor: someone appointed by IDEE/TLS

V. WP3 Dissemination within and outside TU Delft

Objectives

The main objective of WP3 is the wider application of the findings within the TU Delft community on the one hand, and the validation and dissemination of our results in a broader, international, educational context on the other (e.g. 4TU, SEFI, CDIO, and others). To prevent the innovation and research team from only having interventions locally (i.e. in a specific and limited amount of Delft courses, or programs), WP3 will develop strategies on how the innovation and research results can be implemented in various engineering education contexts.

Proposed activities

Although students, teachers, and organization are inseparably connected to each other, for now, WP3 sees the following activities related to those three target audiences.

Students

Develop possible activities or course(s) for students to develop their attitudes and metacognitive skills. This involves knowing who you are, where you are, and what your end goal is to make students become and feel more responsible for your learning path and reflect upon their (future) professional identity as engineers. A preliminary example of this might be an MSc Q5 course on professional identity, but also other courses or modules can be developed for students across programs at the university.

Teachers

To make the university teachers aware of their changing role, we will develop a Train-the-Trainer program on the *whys*, *whats*, and *hows* of giving and having students take responsibility and agency for their learning. This module can be in the form of a new UTQ module or workshops across faculties. WP3 can imagine that Teaching and Learning Support (TLS) will be involved to align the newly developed module(s) with existing materials for teachers. The PPL of WP2 will be the main resource for developing this T-t-T program.

TU Delft organization

Next to concrete modules and courses for students and teachers, WP3 will also look at the organizational level. What does 'student taking responsibility' mean for the TU Delft organization and for the programs? One direction WP3 sees for now is to look at the 'curriculum agility' of programs or departments. To better understand the agility of our institutional teaching, (support) systems, culture, and learning context to make positive transitions in Delft, WP3 needs to map the perceptions, needs, wishes, of our students and staff, as well as the (perceived) opportunities and obstacles for change. As a result, WP3 will set up organizational strategies for continuous curriculum change, adaptability, and monitoring.

If the findings of WP1 and WP2 would point in another direction, other additional activities should be set up. To disseminate the findings to a broader context, WP3 will also reach out to other educational institutions and other educators to inform and discuss with them our findings.

In all activities the different stakeholders (students, teachers and organization) will be involved to develop connected and integrated courses and modules.

Deliverables and outcomes

To summarize the outcomes of the aforementioned activities, WP3 will have the following deliverables:

- student approaches in the form of modules or courses, focusing on developing their attitudes and metacognitive skills.
- teacher resources in the form of (UTQ+) modules or train-the-trainer module(s).
- vision and strategy for the organization on how to deal with 'students taking responsibility'.

Outside Delft

Next to these concrete examples, WP3 will deliver reports, articles, and conference papers, like educational conferences, educational journals, and white papers to disseminate the findings to a broader (international) audience. The pedagogical pattern language (WP2) is also explicitly meant for engineering educators worldwide.

Timeline

The start of this work package will be after WP1. A post-doc will be involved in this work package. As this work package will start later, the activities and plan will be updated based on the (first) findings of WP1 and WP2.

Roles

Coordination: **Bahareh Abdikivanani**

As both the content and the planning of this work package largely depend on WP1 and WP2, decisions about further roles and responsibilities will be made at the end of year one of the program, after the WP1 Symposium has taken place.

VI. WP4 Program management & communication

This work package entails the management approach of the program and the development (and execution of) a shared outreach and visibility strategy. Each WP will organize its own activities and events, but all participants of the program meet once a month (10x per year, same day, same time, same place: Jan-Feb-March-May-Jun-Sep-Oct-Nov-Dec) in a 2-hrs meeting, in which questions, activity planning, insights, results, and experiences are shared and discussed together. These meetings are content-driven. The WP4 coordination team will prepare and organize these meetings, but the input for the agenda may come from all.

Additionally, the eight work package coordinators (4x 2pp) also meet once a month (10x per year, same day, same time, same place) but right in the middle between the full-team meetings. These meetings are more process-driven as the WP coordinators are responsible for monitoring the process and progress of the WPs and the program as a whole. In particular they are responsible for reaching out to the Teaching Academy management (e.g., IDEE board members) and the educational management of faculties (deans, directors of education), developing a communication strategy among all people involved and towards the 'outside' world, that is the wider TU Delft community, 4TU, but also (inter)national networks of higher engineering education.

The Ph.D. candidate and post-doc fellows have their own dedicated supervision teams. They will be positioned (and thus have their physical home base) in the department of their daily supervisors (see for the names in WP1,2,3).

Roles

Coordination: **Remon Rooij & Lisanne Roseboom**

Support: secretarial support, budget available via TA-IDEE

Website, social media, and design & layout: to be decided later

VII. Final words

Writing a program proposal with a large group of Delft colleagues and a smaller 'writing group' has been a challenge in itself, to put it mildly. We had (and still have ongoing) several interesting discussions about what we should aim for. As a writing team, we made sincere efforts to be as inclusive as possible in our writing in order to keep on board as many colleagues as possible who showed their interest in the theme of Taking Responsibility. We are convinced that all WPs (i) give room to include cases, practices, and experiences from all kinds of TU Delft colleagues, courses, and programs and (ii) connect interventions and innovations in the learning environment to monitoring, evaluation, and pedagogical research strategies. In the appendix, we present our current list of program participants with their expressed interests.

We see clear linkages with the other two IDEE programs on Future Engineering Skills and Retention. Taking Responsibility is about how we could or should (re)develop our teaching and learning environment helping our students to take responsibility for their learning, their learning process, their study journey, and even their study program. It focuses on the way, the **how** of learning. The Future Engineering Skills program focuses much more on the **what** of engineering and thus on the what of learning engineering. The Retention program focuses on the **sustainability of student learning**. Giving students responsibility for their learning might be one way (but definitely not the only one) to tackle TU Delft's retention challenge.

On purpose, we have tried to be as clear as possible for the short term – for the work packages that will start in year 1, that is WP1, WP2, and WP4 – and leave things more open for WP3. We see room for TU colleagues, courses, or programs to join us later (e.g., in years 3, 4, 5 in WP2 and WP3), also when they did not show interest for now. They might become interested and connected via (for example) our 1st year festival of activities (100 days of...).

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Appendix 1

Roles of participants in IDEE Theme Responsibility

| last name | first name | faculty | type of role | WP1 | WP2 | WP3 | WP4 |
|-------------------------|------------|---------|--|-----|-----|-----|-----|
| Abdikivanani | Bahareh | EEMCS | researcher, case | v | v | | |
| Abelmann | Leon | EEMCS | case | | v | | |
| Asut | Serdar | ABE | coordinator, researcher | v | | | |
| Dehli | Silje | IDE | designer, case owner, junior researcher | (v) | v | v | |
| Doctor | Margreet | AS | researcher, SUTQ, interventions | | v | | |
| Garcia Espallargas | Santiago | AE | program for implementation of intervention | | v | | |
| Ioannou | Olga | ABE | researcher, daily supervisor | v | v | | |
| Kousoulas | Stavros | ABE | researcher | v | | | |
| Mooij | Sylvia | IDE | coordinator, daily supervisor, researcher | | v | v | |
| Rooij | Remon | ABE | coordinator, promotor, researcher | | v | | v |
| Pera | Sole | EEMCS | case | | v | | |
| Roosenboom | Lisanne | TA | coordinator, support | | | | v |
| Schut | Suzanne | SEC | researcher | v | | | |
| Specht | Marcus | EEMCS | promotor, researcher | v | v | | |
| Staničić | Aleksandar | ABE | coordination, researcher | v | | | |
| Wehrmann | Caroline | SEC | coordinator, researcher | | v | v | |
| <i>no reaction yet:</i> | | | | | | | |
| Haan de | Jeanna | SEC | | | | | |
| Rans | Calvin | AE | | | | | |
| Verbug | Robert | TPM | | | | | |
| Zwanikken | Jos | AS | | | | | |
| <i>new members</i> | | | | | | | |
| Leandro Cruz | Mariana | AE | | | | | |
| Implon | Jan | TLS | Educational Advisor | | | | |
| post doc 1 | | | | v | | | |
| post doc 2 | | | | | | v | |
| PhD | | | | | v | | |

Appendix 2 Mini CVs of core team members, WP leaders, and supervisors

In alphabetic order

Bahareh Abdi

Bahareh Abdi is an Assistant Professor with an emphasis on education within the Electrical Engineering department. She holds a Ph.D. in Electrical Engineering, specializing in signal processing and machine learning. With three years of teaching experience, she currently coordinates the first-year Bachelor's education program, advises the IEEE student branch, and co-founded the Women+ in Engineering affinity group at the EEMCs faculty. Her goal is to bridge her expertise in signal processing and machine learning with her passion for education, contributing to cutting-edge research in the field. She is particularly enthusiastic about integrating innovative, evidence-based teaching practices into engineering education, creating an inclusive and flexible learning environment that fosters student engagement and retention.

Serdar Asut

Serdar Aşut is a Lecturer of Design Informatics at the Department of Architectural Engineering and Technology of the faculty of Architecture and the Built Environment at TU Delft. He is an architect, and he holds a Ph.D. in Informatics. His Ph.D. research focused on integrating Human-Robot Interaction in the design process, specifically within design education. He has experience working as a researcher and educator in architecture schools in Türkiye, Denmark, Switzerland, and The Netherlands. The international scope of his teaching portfolio, coupled with the diverse range of schools where he has served as an educator, has provided him invaluable opportunities to explore various teaching styles and approaches in education. He is currently involved in master's and bachelor's education at the faculty and has developed three new courses on design computing and architectural robotics in the Building Technology M.Sc. program. He received the Open and Online Education Fund from SURF in 2021. Within this fund, he is leading the HANDZONE project, which is an applied research for educational innovation on using XR technologies in education on architectural robotics.

Olga Ioannou

Olga Ioannou is Assistant Professor at the Department of Architectural Engineering and Technology of the faculty of Architecture and the Built Environment at TU Delft. She holds a Ph.D. in architectural engineering education with an emphasis on networked learning and the transformation of learners within the extended communities of knowledge. Her expertise lies in blending multiple learning environments to redistribute agency whilst increasing diversity, autonomy, and interaction. She has over thirteen years of experience in teaching, and also designing and coordinating on campus and online courses. Olga is co-chair of the Circular Built Environment Hub at the faculty of ABE and is actively involved in integrating circularity in the faculty's curricula. She is currently the coordinator of the Circular Impulse Initiative, a faculty-wide educational project that aims to support educators and learners alike in the transition toward a circular education.

Sylvia Mooij

Sylvia Mooij is a senior Lecturer at the Department of Design, Organisation & Strategy of the faculty of Industrial Design Engineering. She is the program director of the TU Delft Bachelor of Industrial Design Engineering (1,000 students). She is responsible for the Bachelor program and keeps track of (educational) developments to implement in the curriculum to keep it up-to-date and future-proof. Sylvia was the project leader of the revised BSc programme that was introduced in 2021, in which the didactic concept of autonomous learning was introduced. She has over twenty-five years of teaching experience in both BSc and MSc courses, in lecturing, coordinating, and coaching students in groups and on an individual level. Since 2021 she has been the academic portfolio director of Skills for Engineering at the TU Delft Extension School for online continuing education.

Remon Rooij

Remon Rooij is an Associate Professor at the Department of Urbanism of the faculty of Architecture and the Built Environment and the scientific director of the 4TU Centre for Engineering Education, the national platform in the Netherlands that promotes innovation and pedagogical research in engineering education. Remon is a passionate lecturer, coach, course and curriculum designer, education innovator, and researcher in engineering education. Remon has over twenty-five years of experience in teaching and coordinating a large variety of urban planning courses and programs within the ABE faculty. He is particularly interested in engaging engineering pedagogies that stimulate the intrinsic motivation, agency, and responsibility of students (such as design education, CBL, and inter- and transdisciplinary learning environments) and the kind of academic and professional skills that come with these.

Lisanne Roosenboom

[later]

Marcus Specht

Marcus Specht is Professor for Digital Education at the Technical University of Delft, Director of the Leiden-Delft-Erasmus Center for Education and Learning, and the Delft lead for the 4TU Centre of Engineering Education. He received his Diploma in Psychology in 1995 and a Dissertation from the University of Trier in 1998 on adaptive information technology. From 2001 he headed the department “Mobile Knowledge” at the Fraunhofer Institute for Applied Information Technology (FIT). From 2005 to 2018 he was Professor for Learning Technologies at the Open Universiteit Nederland and head of the Learning Innovation Lab. His research focus is on Computational Thinking, Learning Analytics, AI in Education, and Virtual and Augmented Reality for Education. Prof. Specht is an Apple Distinguished Educator and was President (2013-2015) of the International Association of Mobile Learning.

Aleksandar Staničić

Aleksandar Staničić is an Assistant Professor at the Department of Architecture of the Faculty of Architecture and the Built Environment, and coordinator of Master studies for the Chair of Methods of Analysis and Imagination. He has over ten years of experience in teaching and designing advanced courses with a focus on culturally sensitive design at MIT and TU Delft. As

an educator, Aleksandar always aims to create teaching environments in which students are encouraged to take initiative, develop their personal strengths, take a position as future practitioners and intellectuals, and define their own criteria in responding to the issues under examination. He is the recipient of the Marie Curie Postdoctoral Grant and acts as an expert project evaluator for the European Commission. Aleksandar is an active member of international organizations with a focus on architectural education, ACSA (Association of Collegiate Schools of Architecture) and EAAE (European Association for Architectural Education).

Caroline Wehrmann

Caroline Wehrmann is Assistant Professor at the Applied Science faculty. She is academic program leader *Skills in engineering education* for all BSc and MSc programs within this faculty. Caroline has a background in communication and social sciences and over 30 years of experience in engineering education. In 2006 she was co-founder of the master program Communication Design for Innovation (CDI). Since then, Caroline really enjoys combining her roles as curriculum designer, education innovator, coordinator, lecturer, coach and researcher. Her focus in research and education is on transdisciplinary collaboration and on personal professional development of future and young engineers. In that context, she conducted research into adaptivity and how students deal with uncertainty.

Appendix 3: Role descriptions

WP coordinator

- project leader of WP
- overviews of activities
- connects team members within WP
- reports to core team

PhD supervisors

- as TU Delft
- connects to WP coordinator

Post-doc supervisors

- as TU Delft
- connects to WP coordinator

Core team

- overviews program progress
- reports to TA/IDEE management
- connects WPs

Full team

- contributes to content and activities
- connects to faculty community (via Faculty Ambassadors)