

LEARNING-BY-INTERACTING

THE UNIVERSITY OF TWENTE VISION ON LEARNING AND TEACHING

APRIL 2023

UNIVERSITY OF TWENTE.



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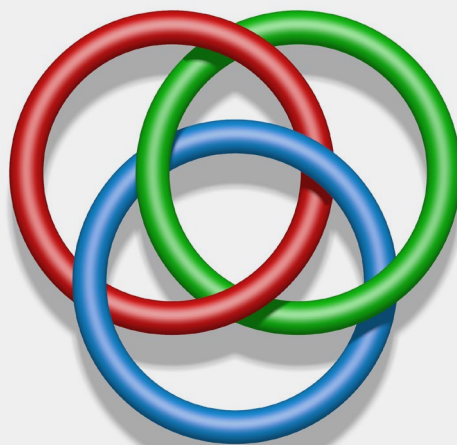
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THE UT VISION ON LEARNING AND TEACHING

How can education at UT empower students to contribute to a better world? And how can UT's commitment to making a positive impact on society through technology, strengthen that contribution? The 'UT Vision on Learning and Teaching' offers guidance, outlining how we can equip students with 'more than a degree.' Taking the challenges of our time as starting point, it places three goals at the heart of our education: **learning-by-doing, building inclusive communities** and **self-development**.

Interconnected like the rings of a *Borromean knot*, these three goals form a roadmap to achieve our UT mission: to be a people-centered university of technology that empowers society through sustainable solutions. The UT Vision on Learning and Teaching provides a basis for strategy, investments, and the implementation of educational activities.



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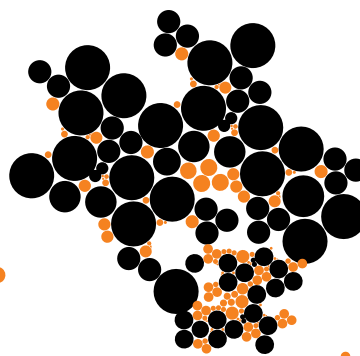
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THE UT VISION ON LEARNING AND TEACHING

The mission of education at UT, as indicated in the UT mission, vision and strategy document *Shaping2030*, is to prepare and empower students to contribute to a better world through the analysis and use of technology in a societal context. The UT Vision on Learning and Teaching (The UT Vision), as will be outlined here, defines the goals we want to achieve in our educational programmes and activities. The UT Vision will help us make choices and justify them. It highlights what we should invest in and make time for. It also initiates, encourages and sustains discussion about how to operationalise our vision. It invites us to organise activities that further flesh out the guiding principles of our education (such as lectures, workshops, podcasts and films). This also means that the UT Vision is further developed in dialogue with the UT community and responds to and anticipates internal and external developments. The UT Vision is all about what we find *important* in our education, now and in the future. It provides a foundation and a direction. This Vision builds on the founding principles that, since 1961, have made UT the university that makes technology socially relevant.¹ It also emphasises that, at UT, we consider research and education to be of equal value.



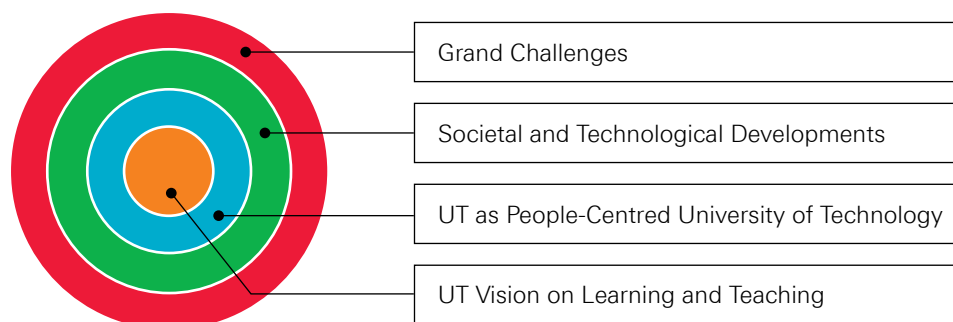
¹ An outline of the founding ideas and history of UT can be found in *High Tech Human Touch*. 1961-2011. A concise history of the University of Twente (2011) and on the [UT website](#).

1. OUTSIDE-IN

Today's world faces major challenges such as climate change, increased inequality, clashing cultural worldviews, war, extreme weather, pandemics, and other health hazards. At the same time, societies exhibit tremendous resilience, and people find and harness each other's strengths to meet these challenges. As stated in Shaping2030, UT can only contribute to tackling these grand challenges through intensive cooperation between different disciplines and fields, and in collaboration with partners and stakeholders outside the university. Our educational system incorporates these partnerships and is designed to structurally equip students for these developments and challenges.

The education at UT takes place in a society that is rapidly changing, often with significant disruptions driven by, or leading to, technological innovations. Digital transformations increasingly create networked societies that are taking the place of old organisations. These transformations call for a university that is continuously open to developments and questions from society outside its walls. UT responds and actively contributes to this development by establishing ever growing connections at regional, national and global levels.

The mission of UT is to be a people-centred university of technology that empowers society through sustainable solutions by explicitly combining social science and engineering, as expressed in the Shaping2030 strategy. This is clearly embedded in the way we teach and in the courses we offer. Focus on people means student-centred education that enables students with different approaches and cultures to cooperate with each other and participate in local, national and international networks and platforms. Only then can students develop critical and resilient attitudes that will enable them to deal with new situations and address and overcome challenges. The UT Vision on Learning and Teaching is explicitly developed from this outside-in perspective.



2. LEARNING AND TEACHING BY INTERACTING

Grand societal challenges and profound technological developments underscore the importance for higher education to equip students with *more than a degree*.² At UT, we believe that students acquire the right knowledge and skills by interacting with each other, with their tutors and teachers, and with the world around them. Adequately preparing students for an academic profession, the job market or future endeavours entails: 1) learning by addressing and tackling real-life issues and problems; 2) contributing to and developing diverse, safe and just communities and societies; and 3) enabling personal development and growth. We characterise UT's educational guiding goals as: *Learning-by-Doing*, *Building Inclusive Communities*, and *Self-Development*. Together, they make up the purpose of education at UT.³

LEARNING-BY-DOING

At UT, we believe in learning-by-doing. We believe that students learn best by working with others on real-life issues, problems and challenges. This *does not* mean that the sole purpose of learning is doing, *nor* that theory only serves practical application in a professional field. It expresses our conviction that students increase their learning and learn more broadly and deeply when they actually 'do' an activity. It is the active 'doing' itself that creates the possibility for developing new academic knowledge and learning. UT students acquire knowledge, skills, competencies, habits and insights, not only through memorisation, lectures and observation, but foremost through practical, active engagement with relevant, real-life issues in their natural and social environments. Due to its strong connection to real-world practices and developments, learning-by-doing aligns perfectly with lifelong learning. Learning-by-doing also fits well with an engineering and design approach, in which UT will continue to invest. It will invest in material and digital resources, as well as infrastructure and methods that enable students to work in small groups and have easy access to and receive intensive guidance from teachers and tutors. In this way, students will be supported to learn how to systematically tackle engineering and design problems and challenges. Hence, learning-by-doing is also something that has to be learned.



² *More Than A Degree* is the wonderful motto of the UT Student Union, which also reflects our Vision on Learning and Teaching well.

³ These three goals resonate with Gert Biesta's triangle in terms of qualification, socialization, and subjectification (Biesta 2009). They also relate to the views of John Dewey and other educators that teaching and learning occur through interaction with real-life issues in our social and natural environment. At UT, we believe that education is not preparation for life but rather that education is life itself (Dewey 1916). In addition, we emphasise that individual development and community building are necessary conditions for each other (Aydin 2021). Moreover, these teaching and learning goals align with our Shaping2030 core values and mindset, as well as with its strategic goals. The *Entrepreneurial* attitude that comes with being bold, experimenting, innovating and risk-taking is strongly expressed by the educational goal of *Learning-by-Doing*. The *Open* disposition to form local and global connections is strongly echoed in the educational goal of Building Inclusive Communities. The *Inclusive* mindset of helping students develop their unique talents is explicitly reflected in the educational goal of *Talent Development*. In addition, the three learning and teaching goals in this Vision align with and further guide the operationalisation of the UT strategic goals of *Shaping Individuals*, *Shaping Connections* and *Shaping Societies*. The UT's Vision on Learning and Teaching, in line with the Shaping mindset and strategic goals, will also ultimately advance addressing the broader Shaping themes and challenges of a digital, fair and sustainable society.

BUILDING INCLUSIVE COMMUNITIES

At UT, we believe that learning is something you cannot do on your own. UT students acquire the knowledge, skills, competences and attitudes they need through engagement with peers, teachers, researchers, support staff, and other internal and external stakeholders. A diversity of beliefs and cultures broadens and enriches students' perspectives and is an asset in addressing problems and grand challenges. Therefore, UT will continue to invest in international relationships, environments and classrooms. It will provide facilities and tools to help students work together, become members of local, global and digital communities, actively maintain these communities and acquire shared values. Building resilient and inclusive communities requires safety and security for both students and employees. Therefore, UT will further invest in resources that establish, sustain and foster a safe environment, thereby also contributing to the wellbeing of students and employees. In this way, we ensure students become part of the UT's tradition and culture and enable them to develop it further. Inclusive, safe and healthy communities are also vital for personal development.

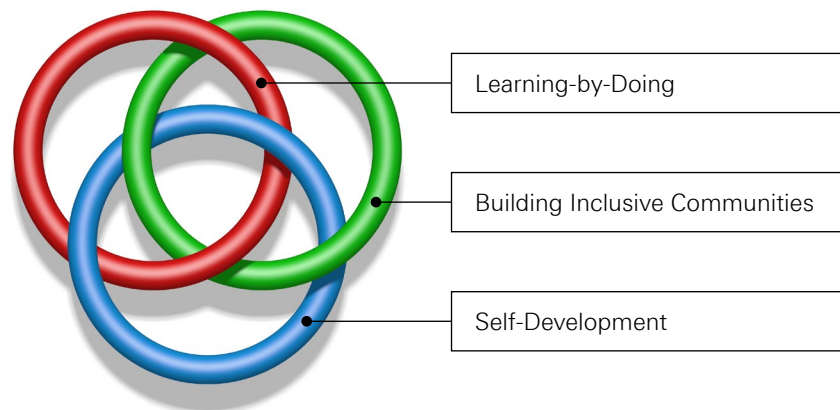
SELF-DEVELOPMENT

At UT, we support our students to acquire knowledge, skills and attitudes that are needed to develop themselves into critical and self-critical people. UT students are encouraged to think for themselves, make their own choices, to try new things, take acceptable risks and learn from mistakes and feedback. They are also stimulated to maintain high standards of integrity and take responsibility for their decisions and actions. Talent development, an overall goal of UT, is also of crucial importance in the context of education. UT will continue to adopt and further develop educational instruments that help students discover what they are good at, thereby enabling them to use their talents to tackle problems and challenges. These methods and models will support students to participate in the formulation of their learning goals, apply strategies to achieve those goals, evaluate their learning outcomes and think critically about their own development, both academically and personally. Large investments in lifelong learning, which will gradually permeate our regular programmes as well, will reinforce this process. To flourish, we believe it is important for students to be recognised and seen as (young) adults. At UT, teachers do not stand above students and do not engage in one-way information transmission. We believe that inclusive community building and self-development are mutually reinforcing. Small-scale education, intensive interaction and open and safe communities enable students to learn to see themselves as serious and equal partners and to discover and develop their talents. Conversely, personal development is crucial to building inclusive communities. In short, UT embraces self-directed learning.

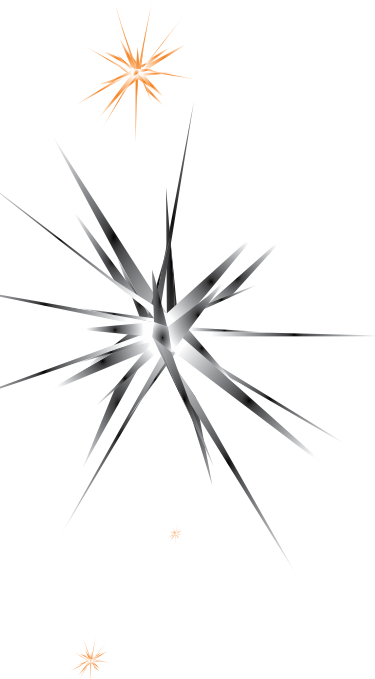
A BORROMEAN KNOT

The three goals of UT education, *Learning-by-Doing*, *Building Inclusive Communities*, and *Self-Development*, are interdependent and mutually reinforcing. They are all necessary and strengthen one another like a Borromean

knot. If one of the rings were cut, all three would be separated and the overall goal of education would not be fully realised. Together they define the purpose of our education: our education yields more than a degree; our degrees offer more than a starting qualification; and our educational ecosystem adds more to society than graduates and technology alone.



Depending on the design of the curriculum, talents and preferences of the student, and foreseen and unforeseen situations and conditions, one goal may (justifiably or unjustifiably) be more dominant than another. Throughout a learning trajectory, the relationship between these goals will change and a different balance will always need to be found. This is also part of the learning process. UT enables students to develop professionally and academically in open *High Tech, Human Touch* learning communities and to choose learning trajectories that fit their personal talents. However, we believe that this is only possible if our education pursues all three goals. This belief will resonate in all our investments in learning and teaching.

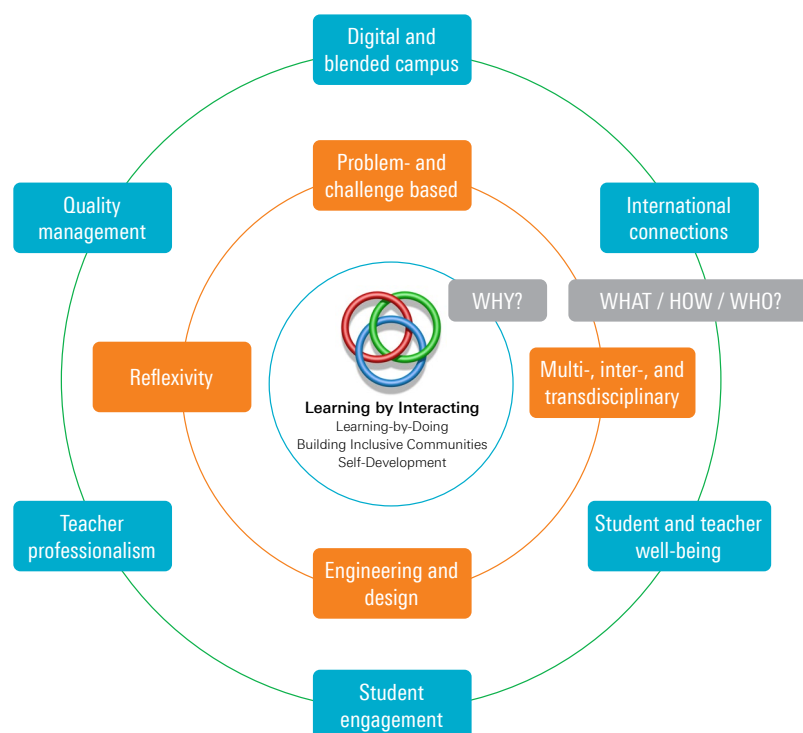


3. FROM VISION TO STRATEGY AND IMPLEMENTATION

The UT Vision on Learning and Teaching provides the basis for developing strategy, justifying investments, and implementing educational activities and projects. The *UT Vision* answers the question of *why* we teach at UT in the first place; it identifies the goals we want to realise. The *Strategy* answers the question of *what* we need to do to achieve those goals, including *how* to do it and *who* should make sure it happens. The *what* of the *Strategy* relates to educational programs, trajectories, activities, projects and partial visions (for example, blended learning and the UT master's education); the *how* relates to resources, methods and infrastructure (for example, the Design Lab and Do It Yourself Recording Studios); the *who* relates to leadership (for example, programme directors and quartermasters).

The scope of this Vision does not allow for a detailed elaboration on strategy and implementation. That would require mapping out and integrating the full landscape of programmes (Foundational, Bachelor, Master, PhD, Lifelong Learning), partial visions and strategies, and innovation projects. What is feasible here is to provide some guidelines for proceeding from vision to strategy and implementation.

The road from vision to strategy and implementation is presented in a three-layer model. At the core are the three goals of education discussed in section 2; the *why*. These are the foundation of all UT education. To achieve these goals, the second layer designates the educational methods and approaches used at UT. Neither goals nor methods would be attainable without the UT's educational infrastructure and ecosystem, which form the third layer. These outer layers relate to the *what*, *how* and *who*.



UT EDUCATIONAL METHODS AND APPROACHES

The UT signature education has an academic orientation and is characterised by four educational methods and approaches: problem- and challenge-based; multi-, inter- and transdisciplinary; engineering and design; and reflexive.

Problem- and Challenge-based

Learning-by-Interacting underscores that learning is a process, a lifelong process. Learning builds on itself. In foundational and bachelor programmes, students are gradually initiated into learning-by-doing by providing well-defined problems within their own domain. Through our Twente Educational Model, the bachelor's students use, at least initially, predesigned projects to experience learning-by-doing. Taking on the roles of Designer, Organiser and/or Researcher, they learn by doing in different contexts and gain insight into their own talents and preferences. In the Master and PhD phase, UT students must increasingly define their own problems. Gradually, they learn to tackle larger, more complex, wicked problems and challenges that require different disciplines and intensive collaboration. Informed and guided by sound research, students eventually become co-creators of solutions to grand societal challenges. Learning-by-doing cannot be done independently of the challenges that students encounter in their own professional or personal life. Therefore, it fits seamlessly with lifelong learning. UT will offer students, alumni and external professionals trajectories in different ways that enable them to acquire new knowledge and competencies, take charge of their own learning path and continuously develop themselves.

Multi-, Inter-, and Transdisciplinary

Learning-by-Interacting implies that specialisation in one area is not sufficient to learn to contribute to solutions to present and future grand challenges. What makes UT different and unique is that it houses a strong combination of engineering faculties and a large social science faculty. Programmes are designed in such a way that students can connect science and engineering with medical, social and behavioural sciences, culminating in a solid multidisciplinary or even inter- and transdisciplinary approach. We believe that multidisciplinary and monodisciplinary are not mutually exclusive, but reinforce each other. Through national and international minors, flexible learning routes and mixed classrooms, students interact with other views and cultures and are challenged to critically reflect on their own skills, attitudes and development. Depending on their learning paths, preferences and talents, UT will support students to become professionals and leaders who can make an impact.

Engineering and Design

Learning-by-Interacting takes further shape in the UT's engineering and design approaches to learning. Systematic and methodological analysis and modelling, building and design of new products and tools, and implementation and practical application are not separate, but intertwined and mutually reinforcing. Both engineering and design education stress that learning is generated through doing and making in labs or projects at increasing levels of competence. Learning-by-doing and making allows students to actively learn and improve their creativity and problem-solving skills systematically using academic theory, rather

than passively absorbing subject matter. The specific multidisciplinary context at UT, combining engineering with social and behavioural sciences, is a huge and unique asset, which ensures that both the technical and social and ethical embedding of products is taken into account from the outset. UT will continue to invest in engineering and design teaching. This is strongly connected to student-driven learning, where students work and are intensively supported in small groups with plenty of room for personal attention and development of different talents.

Reflexive

Reflexivity is a necessary and crucial aspect of *Learning-by-Interacting*. Learning only progresses if students not only learn by doing and experiencing, but also systematically *reflect* on their own doing and experiencing. This requires both analysis and evaluation of what happened (reflectivity) and ongoing awareness and evaluation of how one's own behaviour affects what happens (reflexivity). At UT, reflection education is offered in both bachelor's and master's programmes. Students are supported to reflect on the history, methods and foundations of their discipline, as well as to think critically about their own learning trajectory and take a deliberate position within it. UT will further invest in reflection education that is aligned to its programmes, strengthening its academic profile. Reflexivity, which also strongly nurtures self-development and leadership skills, takes place not only in courses, but also through interaction and collaboration in small-scale education, group assignments, and collaboration in local and global communities, curricular and extracurricular.

UT EDUCATIONAL INFRASTRUCTURE AND ECOSYSTEM

To achieve the three learning goals and support the four educational methods, UT offers a comprehensive and rich infrastructure and ecosystem.

Digital and Blended Campus

As our home base, the UT's green campus is essential for facilitating *Learning-by-Interacting*. UT will further invest in state-of-the-art teaching and research facilities, as well as technical equipment, that support learning-by-doing. (Re) Design of buildings and spaces will accommodate small-scale physical and digital interaction, teaching and tutoring with easy access to peers and faculty. One-directional forms of education are being supplemented by self-directed online and blended formats, mixing digital and on-campus activities. Blended learning allows students to process information at their own pace, mutually reinforcing on and off campus learning, and offering more flexible combinations of summative and formative, online and offline assessment. Ideally located next to the Twente Business & Science Park (Kennispark), the campus is a place for real-life experimentation and innovation. We will further integrate the working field into the curricula of the programmes and make lifelong learners and alumni increasingly part of our learning communities. Blended learning allows us to extend community building beyond the physical boundaries of the campus. Therefore, our campus is also a digital campus open to different internal

and external communities. It serves, and will be further developed, as a hub where learners and partners from across the globe participate in our journey to contribute to the solution of global grand challenges. And the campus offers more; it is also a place where culture, sports and nature intersect, creating an environment where people are encouraged to engage socially in various settings and activities. Finally, our unique campus is where a large proportion of our students live, build communities of their own and discover and develop their and each other's talents.

International Connections

Contributing to the solution of major challenges is done through *Learning-by-Interacting* in an international context. UT builds diverse academic communities, connecting and integrating strong regional communities with students, staff and partners from around the world. A diverse, inclusive and safe community with shared core values and respectful relations, both on campus and online, is an essential part of the UT educational environment. Intercultural and international learning experiences, both in our own classrooms and at our carefully selected partner institutions, enable students and staff to use and improve the skills they have acquired in new environments. This also helps to further develop talents and strengthen intercultural social and academic integrity. UT will continue to support internationalisation through language policy, support services, staff training, scholarships and exchange. Investments in digitalisation and technology will further enhance and promote international connections, collaboration and learning opportunities while supporting a sustainable future.

Student and Teacher Wellbeing

Working, studying and living with peers from around the world allows students to explore different roles, create new communities, gain new personal and academic insights and discover new talents. These professional, personal and social goals can only be realised when both students and teachers feel safe. Safety nets will continue to be developed that can help students and teachers, especially when things do not work out. UT will further invest in and stimulate physical, social and mental wellbeing. While the campus offers a wide variety of sports and cultural facilities, students can also draw upon a chain of student support professionals and activities to help them with issues that affect their academic choices and performance. *Learning-by-interacting* challenges students and teachers to evaluate, reassess or reaffirm their values and beliefs. In our learning and teaching communities, students, academic, support staff and administrators share the responsibility for creating a safe environment in which diverse preferences, orientations and backgrounds are respected so all can thrive. UT will actively promote and facilitate reflection on personal preconceptions, provide resources to adjust organisational and systemic biases, and strongly intervene in cases of transgressive behaviour.

Student Engagement

Learning-by-Interacting goes beyond the classroom environment. Student engagement is central to who we are. We believe that student engagement helps the university to grow by actively involving students in decision-making

processes and educational developments on all levels. Students are involved in the running of the university through various committees, councils, boards, organisations and associations. Through organisation of, and participation in, extracurricular activities, students discover and develop their talents, strengthen their (soft) skills and broaden their network. These academic, athletic, cultural and social events, and study-broadening initiatives help students to meet, learn and grow. The university recognises the importance of student engagement as key for achieving the three UT goals of education. It will further invest through financial and practical support of student events and activities.

Teacher Professionalisation

Learning-by-Interacting can only succeed if teachers are also supported in shaping their own learning trajectories, using a variety of innovative methods, tools and technology. Continuous reflection on, and development of, one's own teaching, in interaction with peers, students and educational experts, is increasingly a structural part of an academic profile. There is ample opportunity for professionalisation, supported by various networks and learning communities, as well as basic and advanced courses to further qualify oneself. Teachers choose different professionalisation paths depending on what suits their talents and can further foster their ambitions in different directions: from continuous improving existing education; to developing new teaching instruments and methods; to introducing new educational portfolios and strategies at a national or even international level. These achievements will be recognised and rewarded as part of academic excellence that can lead to making significant leaps in academic careers.

Quality Management

Educational models, methods and infrastructures that are being introduced or further developed must not only be adapted to a changing world, but also continue to meet high quality standards. UT's three educational goals also guide our quality management. This entails that UT is also a learning organisation actively learning-by-doing so that the quality of our approaches is secured and monitored. This is done through systematic evaluation and discussion of courses, modules and programmes. Adapting to a changing environment also requires experimentation, risk-taking and ongoing refinement. Lessons learned are shared in small and large communities. Quality is ensured and improved through inclusive communities, networks, trainings, workshops and teaching days. In this way, teachers can gain new insights, share their successes and failures, and inspire and learn from each other. Moreover, a strong system of student and staff participation councils allows for horizontal consultation and involvement. Self-development of teachers and support staff is essential to the continuous quality improvement of our courses, modules and programmes and is part of our annual HR-cycle and strategic staff planning. To manage and improve educational quality, UT will continue to invest in teaching committees, academies and communities that strengthen the UT organisation and procedures, and support teaching innovation and teacher professionalisation.



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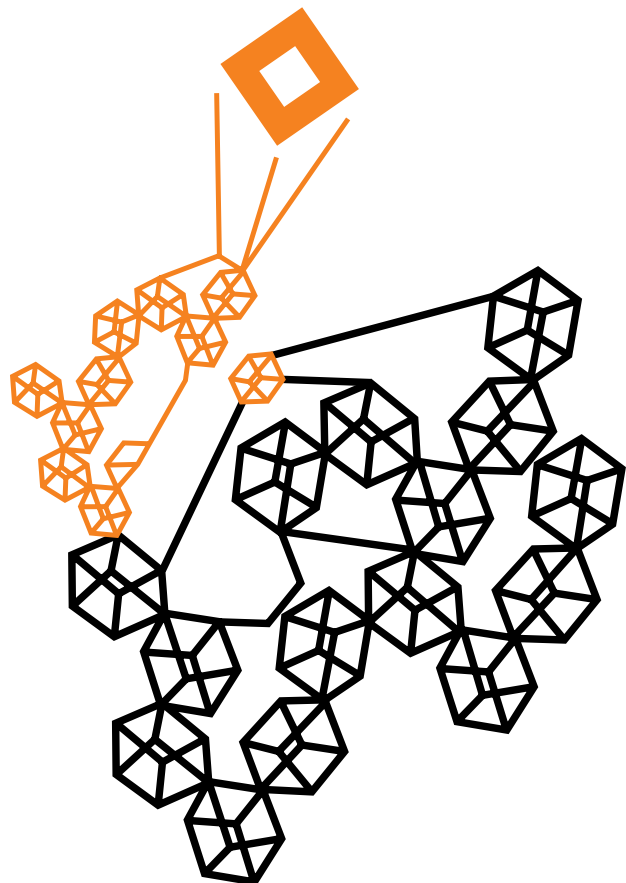
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