4TU. Centre for Engineering Education - Wageningen University & Research

2020 Year Report

TU Delft

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

UNIVERSITY OF TWENTE.

WAGENINGEN UNIVERSITY & RESEARCH

4TU.

Preface

With great pleasure we present to you the 4TU.CEE-WUR 2020 year report. The Covid19 crisis has made the past year challenging, and forced all of us to work largely online and from home. Therefore, we hope that this year report helps to obtain an overview of the innovations and activities that are being conducted in the 4TU.CEE context at Wageningen. In the report, you will see that 4TU.CEE is engaged in more general projects and activities, relating to for example Blended and Online education, but also more Wageningen specific innovations, such as Boundary Crossing skills development, learning from Extracurricular Challenges and the Entrepreneurial Engineer. The report provides more detailed information on the various projects, but we also provide an overview of activities, presentations and publications. At the end of 2021, a more comprehensive report will emerge that brings together all projects and results from the past years for all 4 TU's. In the meantime, together with the Dean of Education, ESA, teachers, programme directors and others involved we will start outlining plans for a new strategic period (2022-2025). We wish you much pleasure reading the present report and hope you will contact us if you have questions, interest or want to collaborate with us!

On behalf of the 4TU.CEE Wageningen team,
Nicolette Tauecchio, Perry den Brok, Emiel van Puffelen
Wageningen, January 2021


(Cover) Photo: Marte Hofsteenge

Photo: Marte Hofsteenge

Contents

The projects on aiding teachers with general redesigning of the current education, had to be shifted into assisting short term education redesign within the pandemic limits. Teachers and staff worked hard and fast resulting in the entire university education being continued. For info contact: Barbara van Mossevelde, Huub Zonjee en Karly van Gorp.

Introduction to 4TU.CEE

Are you involved in education and looking for tools, best practices and research that will help you educate ‘futureproof’ engineers? Are you interested in innovative, interdisciplinary education and modern learning environments? Would you like to contribute and share your expertise in this field? Then join the 4TU.Centre for Engineering Education (4TU.CEE) community.

The 4TU.CEE is part of the 4TU.Federation; the joint collaboration between the four technical universities in Delft, Eindhoven, Twente and Wageningen. 4TU.CEE is the centre of expertise for teachers and scientists with questions and ambitions in the domain of education innovation. It believes in jointly inspiring, stimulating, supporting and disseminating effective and high quality education through research and application of evidence-based innovations and aims to gather, develop and implement up-to-date expertise in education. (New) improvements in education are implemented and the effectiveness of these improvements is monitored and analysed. The expertise and experiences of the four partners is exchanged to benefit all partners. In addition, the centre also works together with (inter)national partners.

Activities

The activities of 4TU.CEE consist of:

- Establishing networks connecting teachers, scientists, support staff and international colleagues involved in educational innovations;
- Contributing to new ideas, constructs new frameworks and experiments with new approaches;
- Providing input for university visions and helps implement these;
- Mapping surveying and communicating recent innovations, trends, tools, research evidence and advancements at the four universities;
- Engaging in research and professional development activities on a variety of topics to foster the innovation of engineering education, typically via projects, short-term practice-oriented projects, exploratory studies to identify promising practices, as well as more fundamental PhD studies;
- Organising workshops, conferences and other events to enable education staff to learn about innovations, exchange ideas and actively participate.

For these activities, the 4TU.CEE website, and in particular the networks of 4TU.CEE staff at the universities, provide a platform for staff to share expertise. An important source of information for teaching staff is our Innovation Map. It provides access to tools, research results and promising practices and can be accessed through the 4TU.CEE website.

Topics of Interest

4TU.CEE focuses on four themes (and related subtopics):

- Educating Future Engineers: engineering profiles; the professional identity of engineers; new competencies and skills for engineers, such as digital literacy skills and entrepreneurial skills; learning lines to realise the engineering profiles.
- Interdisciplinary Engineering Education: organising and assessing interdisciplinary learning activities; collaboration between disciplines, cultures and practices; boundary crossing; interdisciplinary tracks and projects.
- Engineering Educational Ecosystems: teaching and learning in modern learning environments; conditions for rich and flexible learning; challenges, innovation spaces, incubators and extra-curricular activities; involving business and society beyond regular projects and internships; augmented and virtual reality, blended learning solutions
- Teaching Excellence in University Engineering Education: frameworks for career paths for teachers; senior qualification trajectories in education; teacher learning during innovations and professional curriculum design or educational research communities.

CONTACT US

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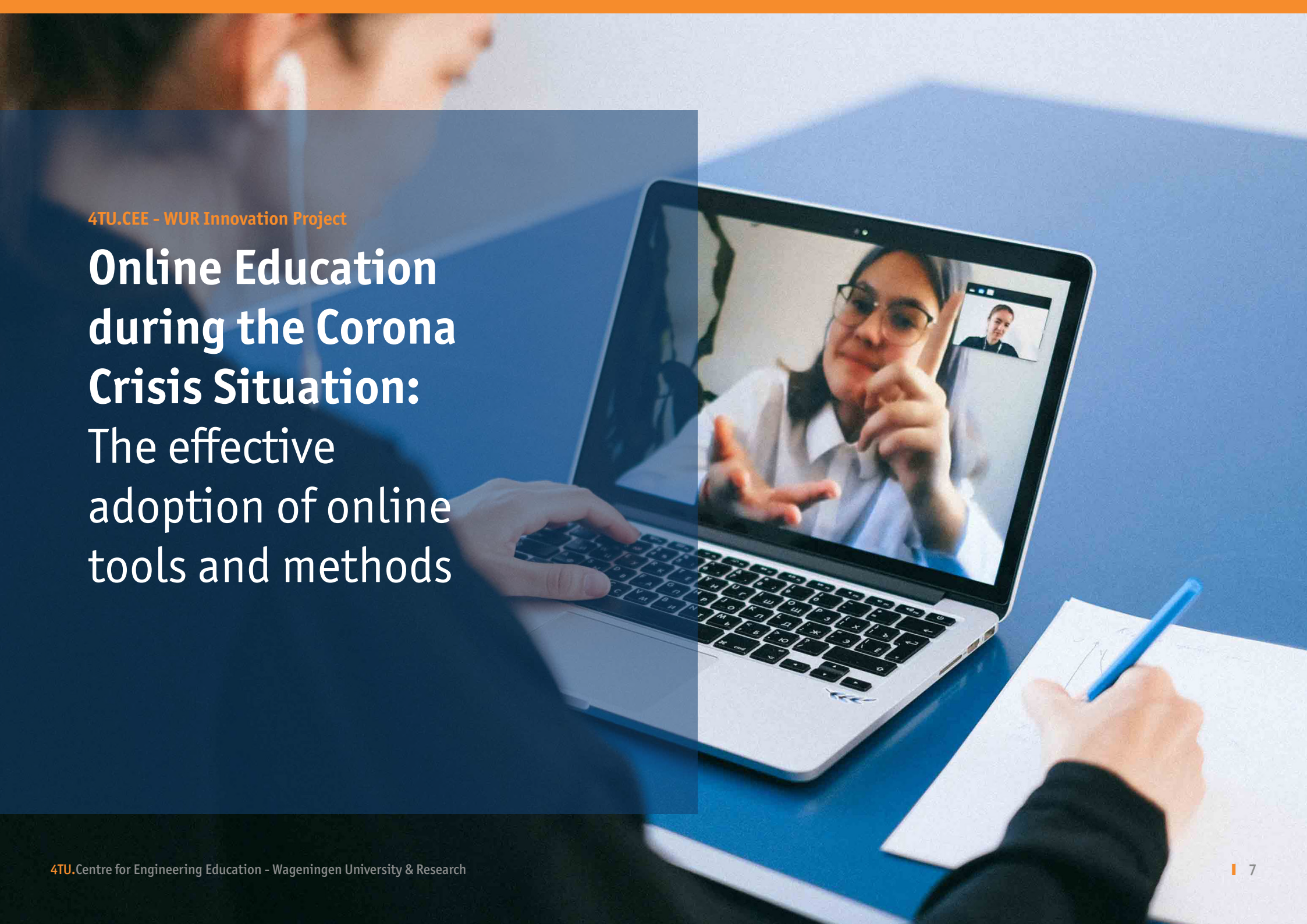

4TU.CEE - WUR Innovation Project

Online Education during the Corona Crisis Situation:

The effective adoption of online tools and methods

About this project

The global COVID-19 pandemic has forced a move to largely online education in many institutions, including Wageningen University & Research (WUR). The 4TU Centre for Engineering Education (4TU.CEE, location WUR), the Education & Student Affairs (ESA) of WUR, and the Education and Learning Sciences (ELS) chair group have joined forces to investigate and evaluate the process and outcomes of this transition at WUR. The aim is to identify how the transition influences course design, teaching and the learning of students.

Project activities in 2020

We collected data in period 5 and 6 of last academic year (March-May and May-July respectively), which was signified by a crisis situation of 'online only' education, and in period 1 of the new academic year (September-November), which was signified by more prepared, blended education. A variety of data sources were used, including: teacher surveys about online education in Covid19 times (N = 521), student surveys about online education in Covid19 times (N = 1251), student course evaluation data (17953 responses on 721 courses), grades and pass rates (the present year in comparison with previous years) and students remarks on online proctored exams in p5 (N=1136). In addition, interviews and interactive sessions helped to get a more comprehensive understanding of teacher' and students' perspectives. Intermediate results were frequently shared to inform and improve education, and to learn from the interpretations of everyone involved.

Outcomes in 2020

- Although teachers experienced stress and a high work pressure, they generally felt they had the support and the skills to teach to their own satisfaction.
- Students experienced a loss of motivation and physical and mental problems, but they generally felt capable to follow online education successfully.
- Both teachers and students think the learning performance is worse in online education, but grades and course evaluations remained stable.
- A cluster analysis revealed four groups (types) of teachers that differed in their attitude towards online education, beliefs about students' learning performance in online education, experienced stress levels, self-efficacy and professional development.
- Courses are increasingly being fundamentally revised, and teachers increasinly intend to maintain the changes for next year.
- Students differed in the their evaluation of new online teaching methods. This indicates that there is no single 'best method' for online teaching and that it is important to consider different type of students.

What 2021 will bring

- The analysis and results on teacher types will be reported and placed within the current body of knowledge about teachers' professional development in innovation and crisis situations in higher education – in an academic publication and various other outlets.
- The student survey data will be analyzed in more depth to identify significant relationships and overarching patterns that provide insight into different student types. Results will be reported to WUR, 4TU.cee and academia.
- Finally, to get a comprehensive understanding about the changes in Covid19 times we will analyze how didactic changes in different type of courses are experienced and evaluated by different type of teachers and students.

Project team

- Tim Stevens (contact)
- Perry den Brok
- Harm Biemans
- Omid Noroozi

More information

Visit the 4TU.CEE Innovation Map.

4TU.CEE - WUR Innovation Project

Skills learning trajectories at the bachelor level

About this project

The objective of this project is to evaluate the design and implementation of learning trajectories for skills education. These trajectories are currently being implemented in several bachelor programs at Wageningen University. The project is divided in two phases. In the first phase, the process of the implementation is investigated: what choices were made before implementing the learning trajectory and why, and which factors promote or hinder successful implementation? The second phase aims at evaluating the effect of the learning trajectories on students' skills development, on students' and teachers' perceptions of students' learning processes, and on the bachelor program as a whole.

Project activities & outcomes in 2020

In 2020, the research project started. Two main research activities were carried out during the year. First, a review study has been initiated. The study started with a literature search on scientific studies on the implementation of learning trajectories for skills education in higher education. This yielded a number of scientific papers, and these papers have been read in order to determine the various choices that the programs described in these papers made with regard to the implementation and forms of the learning trajectories. These choices have been coded according to certain themes. Themes are for example whether the trajectory is integrated in content courses or can be seen as a stand-alone trajectory, and whether skills are taught by a specialist skills teacher or by the course content teacher.

Second, decisions were made concerning the research design of the research project on learning trajectories at Wageningen University. Decisions were made concerning the exact research questions, the bachelor programs that are included in the study, on data collection by means of studying relevant (policy) documents, on the inclusion of various participant groups, the way of investigating participants' views, and on the eventual dissemination of the research results. The design of the research study was presented to a number of stakeholders. The first steps in the study of policy documents have been taken.

What 2021 will bring

In 2021, the review study will be finished. The research design will be put into practice. Data will be gathered and analyzed, also in light of the results found in the review study. The results will be disseminated afterwards.

Project team

- Claire Goriot (contact)
- Harm Biemans
- Carla Oonk
- Judith Gulikers
- Perry den Brok

More information

Visit the 4TU.CEE Innovation Map.

Photo: Marte Hofsteenge

4TU.CEE - WUR Innovation Project

Pedagogical Development programmes in Higher Education: What works for whom and under which circumstances?

About this project

Higher Education is changing rapidly: Teachers encounter challenges in relation to strongly increased use of ICT in education; and the number of students registered at universities is growing. However, most university teachers are not trained to teach. In the last few years, Higher Education institutes increased the attention to the quality of university teaching and learning. Higher Education institutes have developed pedagogical courses (programmes) and requires teachers to follow these pedagogical courses (programmes). These courses vary in goals, content and activities. Although previous studies suggest positive effects, a deep insight into what works for whom and under which circumstances is lacking.

Therefore, in this PhD project we aim to find an answer to the question: How are characteristics of Pedagogical Development Programmes (PDP) in Higher Education related to changes in teacher development for the personal domain (knowledge, skills and attitude), the domain of practice (professional experimentation) and the domain of consequences (student behaviour and outcomes)? We will investigate this by doing a systematic review on what is already known from previous research, and by investigating the WUR University Teaching Qualification programme in depth by using teacher perspectives in combination with student perspectives and observations.

Project activities/outcomes in 2020

We have started a systematic literature review by setting up a search query, inclusion and exclusion criteria, and have started analyzing the included studies.

What 2021 will bring

- We will finish the systematic review and publish an article/publication about it.
- We will set up a questionnaire to get more insight into what characteristics of PDPs do teachers from the four technical universities in the Netherlands perceive as related to their development as teachers, and what hinders or stimulates this process.
- We will invite 4TU UTQ teachers to fill in the questionnaire (see bullet 2).
- We will start analyzing the filled in questionnaires.

Project team

- Marloes Vreekamp (contact)
- Perry den Brok
- Piety Runhaar
- Judith Gulikers

More information

Visit the 4TU.CEE Innovation Map.

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4TU.CEE - WUR Innovation Project

Learning in extracurricular challenges

About this project

In recent years, Challenge-based learning has been gaining much traction in universities. Due to the large variety present in Challenges, several universities are also starting up research projects to investigate how to best design Challenge-based activities. Those projects (e.g. projects initiated by TUDelft and TU/e) mainly focus on Challenges within curricula and study the design, the assessment and their role in educational programmes.

In this research into Challenge-based learning in WUR, we aim to study the extra-curricular Challenges (e.g. MOOC Challenge, Urban Greenhouse Challenge, Re-Think Protein). As extra-curricular Challenges are relatively new within WUR, we aim to define what extra-curricular Challenge-based learning means in the WUR context, and identify similarities and/or differences with the in-curricular type of 'Challenges' (e.g. courses such as Academic Consultancy Training and European Workshop).

In addition, we are interested to find out which groups of students engage in these extracurricular Challenges and what motivates them to do so. We will dive, both quantitatively as well as qualitatively, into the effects on student learning, both on the short and long term. We are also interested in students who do not engage in these challenges and their motives, in order to connect with their needs in future Challenges. With regard to learning gains of students, we will try to find out if, and how these can and should be made visible without interfering in the flexible and open character of Challenge-based learning. Finally, our research will focus on the value for Wageningen University in organizing these extracurricular challenges, finding a balance between curricular activities, and the degree to which they can be scaled up.

Project activities & outcomes in 2020

Connections were made with various groups that are involved in Challenges, both internally and externally to find out on developments


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within the sphere of Challenge-based learning. Besides this, a collaboration with WUR Student Experiences mapped the Challenge experience with a few students that took part in the Urban Greenhouse Challenge. This methodology was used to map out the students' learning journey and pin-point (critical) learning moments that occurred during the challenges.

What 2021 will bring

A Delphi study will be conducted to understand how various stakeholders (policy staff, teachers, Challenge owners, students) within WUR that are somehow involved in the Challenges view and define Challenges, and attempt to differentiate between the extra-curricular Challenges and "challenges" within the curriculum.

The project team will also be following a few of the Challenges in 2021 to have a closer look into what motivates students to participate in these Challenges and what students learn from these extra-curricular Challenges. Besides this, surveys and interviews will be conducted with alumni of past Challenges to investigate the long-term effects on student learning i.e. what they gained from the Challenge(s) and the impact the Challenges might have had on their personal and professional development thus far.

Project team

- Cassandra Tho (contact)
- Judith Gulikers
- Renate Wesselink
- Yvette Baggen
- Perry den Brok

More information

Visit the 4TU.CEE Innovation Map.

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4TU.CEE - WUR Innovation Project

Boundary Crossing @ WUR:

Boundary Crossing as modus operandi at Wageningen University

About this project

Boundary Crossing Competence (BCC), the competence to work together with others outside one's own scientific domain, institute, culture or context, is regarded as one of the major competencies needed by future university graduates in order to respond better to emerging global challenges. Boundary Crossing (BC) is also at the forefront of the new educational vision of Wageningen University and has been a topic of its educational innovation and research.

This Comenius Leadership Fellow project is a university-wide project aiming to implement BC in WUR education, research and policy. It aims at mapping existing BC practices in education, developing a conceptual foundation for the development of boundary crossing competence, and further improving and implementing BC learning experiences. Four Bachelor programmes collaborate as pilot programmes within this Comenius project. We focus at the level of courses as well as learning pathways, and will develop a BC toolbox for and with teachers, course coordinators and management. The boundaries that will be explored in this project are cultural, disciplinary as well as academia-society boundaries.

Project activities & outcomes in 2020

A position paper and an animation clip that explains Boundary Crossing and its importance was developed; a Boundary Crossing Crash Course was organized in

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April and October, which gave teachers more insight into BC and how they can incorporate it into their respective courses as well as work together to develop a learning trajectory in their respective programmes; bi-monthly meetings with Programme Directors and chairs of the Programme Committees were held to exchange ideas and keep each other on track; our bi-annual bigger group meeting gave teachers the platform to share and learn from their colleagues from a different department and this helped to make the concept of "Boundary Crossing" less abstract and more concrete, tangible and doable; the project was also presented at the SEFI Conference in September, and at the annual WUR Teachers' Day(s), which drew many educators (and researchers) that were curious and also saw the value of making BC explicit in their courses/ programmes to facilitate the development of students' boundary crossing competences.

What 2021 will bring

In the third and last year of the project, the team will be working on outreaching to other programmes and chair groups within WUR to introduce Boundary Crossing and get them to implement BC in their courses/ programmes. Besides this, the team will continue to work with teachers to collect examples of BC learning activities and assessment strategies for the BC Toolbox. Knowledge Clips will also be developed for use in class to explain the concept. A monitoring and evaluation plan is also in the works to evaluate the BC learning trajectories and ensure the continuity of Boundary Crossing in WUR. In the research aspect, the team plans to present at the EARLI conference, turn the position paper into a journal article as well as publish an article on the lessons learned from implementing BC at various levels of the university.

Project team

- Arnold Bregt
- Carla Oonk
- Karen Fortuin
- Judith Gulikers
- Nynke Post-Uiterweer
- Cassandra Tho (contact)

More information

Visit the 4TU.CEE Innovation Map.

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4TU.CEE - WUR Innovation Project

Teaching Large Groups

About this project

Wageningen University's Board of Education acknowledges the growing concerns that teachers have of teaching larger groups and continuing to maintain the quality of education provided to students. WUR has plans to invest in more staff, facilities and infrastructure to cope with this issue. However, these measures will take time to be implemented. Thus, there is a need for a solution in the current situation – which is to look for ways to handle large groups of students without compromising the quality of education. As such, the Dean of Education requested an inquiry into what is currently known about teaching and assessing large groups of students.

The overall objective of the project is to find out what is currently known about teaching and assessing large groups of students. The question that we aim to answer with our report is "How to deal with large student groups (in terms of teaching and assessment)?" as well as to provide inspiration to teachers and management to deal with this issue at hand.

Project activities & outcomes in 2020

The outcome of this project is a report on Teaching Large Groups, which includes many practical strategies for educators that are faced with large groups of students. The strategies mentioned in the report are tried and tested by teachers/lecturers all over the world, and it includes suggestions on how to keep students engaged in class, the use of ICT, various assessment types, handling the logistics of a bigger class, as well as managing class attendance, student emails and allocating office hours for students. The appendix of the report provides an inspiration list of links to a variety of methods and suggestions to deal with different aspects of teaching large groups, such as strategies for: teaching with technology, different types of assessment, providing feedback to large groups as well as working with teaching assistants (TAs).

Project team

- Cassandra Tho (contact)
- Perry den Brok

More information

Visit the 4TU.CEE Innovation Map.


Photo: Marte Hofsteenge

Photo: Joris Schaap

4TU.CEE - WUR Innovation Project

Education design for new educational challenges of universities

About this project

The 4TU are transforming their programme and course designs geared towards modern, flexible educational ecosystems, educating future engineers and interdisciplinary education. In 2017 Wageningen University started research on the required changes in the programmes and combinations of Teaching and Learning Activities. The results so far were published in four publications and presented in SEFI and CDIO conferences, a meeting of the Euro league universities for Life Sciences as well as in internal meetings and on-line communication with staff and teachers.

Project activities/outcomes in 2020

Within this programme, two topics were selected for 2020. Research using the 4TU.CEE innovation map gave a clear picture of our education innovation and changes needed for the next years. For example, the need for more visible education innovation on the programme level. Also, a full analysis was made of the support for cross-cultural education at Wageningen University, combined with data of the successful 4TU.CEE training programme on cross-cultural education. The results are shared online using the WUR intranet group and the 4TU.CEE website. They were also presented on the CDIO 2020 international conference and are available in two publications:

- Puffelen, E.A.M van, & Vonk, C. (2020). Learning from education innovation using the 4TU.CEE innovation map. Proceedings of the 16th International CDIO Conference, Hosted on-line by Chalmers University of Technology, 8-10 June 2020. 264-272. https://edepot.wur.nl/532014.
- Puffelen, E.A.M. van, & van Oppen, M. (2020). Supporting cross-cultural university education. Proceedings of the 16th International CDIO Conference, Hosted on-line by Chalmers University of Technology, 8-10 June 2020. 112-121. https://edepot.wur.nl/531990.

What 2021 will bring

In January 2021 survey results will be available, on teaching staff's opinion for future education innovation. This information will be combined with that of the CDIO "chasing the sun" project and other sources into a report with recommendations for policy at WUR and also for the new strategic plan for 4TU.CEE. Both lessons learned during the pandemic and ideas about the consequences of societal change will be included. In addition the report will be used for two more (journal) publications and presentations within this programme.

Project team

- Emiel van Puffelen (contact)
- Caroline Vonk (TU/e)
- Marijke van Oppen
- Nicolette Tauecchio

More information

Visit Researchgate.

4TU.CEE - WUR Innovation Project

The Entrepreneurial Engineer

About this project

Innovating engineering education for tomorrow's engineer: that is the mission of the 4TU.CEE. The need for engineers that are able to contribute to solving present and future industrial and societal wicked problems is evident. We need engineers who are flexible, can deal with uncertainties and who are able to work in interdisciplinary teams. In other words, engineers of the future need to develop an entrepreneurial mind-set, as their future working environment and the society as a whole demand that students are able to deal with complexity, uncertainty and ambiguity. Having an entrepreneurial mind-set can help engineering students tackling problems and design solutions whilst facing uncertainty and ambiguity. This especially holds for our engineering students, being active in fields such as energy, health, mobility, safety and the environment, in which many challenges can be identified.

It is the aim of our project team to ignite the entrepreneurial mind-set among all engineering students by entrepreneurship education: education that sparkles their curiosity, challenges them to be flexible and create multiple value (i.e., economic, social and/or ecological) in close collaboration with stakeholders. Education in which uncertainty and ambiguity are key – embracing learning surprises as valuable opportunities for learning experiences.

What 2021 will bring

For 2021 we have three concrete activities in mind to start realizing our ambition. We will (1) define a theoretical framework as conceptual ground for defining entrepreneurship education; (2) formulate fitting learning goals; and (3) conduct an inventory of existing entrepreneurship education programs at the 4TU's. The results of these activities will be shared in easy-to-use and attractive formats on the website of the 4TU. On the long-term, we are eager to develop educational interventions, progression lines, and a train-the-trainer program on entrepreneurial teaching – of which we would be willing to investigate the effects on student and teacher learning. In the meanwhile, we are thinking about creating a platform for discussing ideas, providing the opportunity to use and expand the materials. You are more than welcome to get involved!

Project team

- Frido Smulders (TUD)
- Remon Rooij (TUD)
- Raymond Loohuis (UT)
- Rainer Harms (UT)
- Isabelle Reymen (TU/e)
- Maris Talmar (TU/e)
- Lisa Ploum (WUR)
- Yvette Baggen (WUR; contact)

More information

Visit 4tu.nl/cee.

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4TU.CEE - WUR Innovation Project

Teacher professional learning and development in higher education: What works and how and why does it work?


Photo: Marte Hofsteenge

About this project

Higher education in The Netherlands is in the midst of a host of innovations in teaching and learning: learning analytics, personalized learning pathways, flipped classrooms, competency based teaching, collaborative learning in interdisciplinary projects, challenge-based learning, and technology enhanced learning are only a few examples of such innovations. These innovations require different roles from teachers. Unfortunately, in the introduction and evaluation of such innovations what teachers learn and what skills, knowledge, views and identities they (need to) acquire is hardly ever taken along.

A variety of professional development initiatives is being practiced, for instance workshops, teacher research, learning through reflection, peer coaching, 'scholarship of teaching and learning' programmes, lesson studies, learning communities and networked learning.

This research project aims to answer the question whether, how and why different approaches to teacher professional learning and development work for different innovations, contexts and populations. This will be done by conducting a literature study, conducting a broad as well as an in-depth study of existing cases, and an intervention study, in which data will be collected on the innovation (context), teacher activities, support for teachers, teachers' learning and the effect on students.

The project was granted in July 2020 by the Netherlands Organisation for Scientific Research (NWO), will be conducted between 2020 and 2024, and involves 25 higher education universities and universities of applied science. Main applicant of the project was Jan Vermunt (TU/e) and the project is managed by both Jan Vermunt and Perry den Brok. The 4TU Centre for Engineering Education is involved in several aspects of the study, and 4TU innovations will be studied as part of the project. Also, results will be disseminated via the 4TU.CEE website and activities.

Project activities & outcomes in 2020

The project started in September 2020. One postdoc was appointed, another is being searched. Two work packages in the project were started: the literature review and the broad case study review. The first step in these two packages is creating a first framework to analyse types of innovations, the roles of teachers in these innovations, the activities teachers engage in during which they learn and learning outcomes or innovation results.

What 2021 will bring

In 2021, the majority of the remaining work packages will be started. The framework for analysis will be finalized, literature will be reviewed, and a wide variety of innovation cases will be analyzed. The broad analysis will provide input for a more detailed and in-depth analysis and design criteria for teacher learning during innovation and their support will be inventoried. In the years after 2021, this will result in proposed interventions or recommendations. Project results will be disseminated via a project news letter and the 4TU.CEE website, as well as a specific project website.

Project team

- Jan Vermunt (TU/e; contact)
- Perry den Brok (WUR; contact)
- .....and many others from over 25 institutes

More information

Visit 4tu.nl/cee.

4TU.CEE - WUR Overview

Activities & Events at Wageningen and beyond

- **WUR Teachers Day(s) 2020**
  - Session on BC@WUR: Developing Students' Boundary Crossing Competences (Judith Gulikers, Cassandra Tho, December 2020).
  - Q&A session: Research about WUR education in Covid19 times (Tim Stevens, December 2020).
  - Closing session: Innovating education at WUR: looking back on the Teachers Day(s) and look forward (Perry den Brok, December 2020).

- **SEFI2020 Online Conference**
  - Paper presentation on 'Training students to cross boundaries between disciplines, cultures and between university and society: Developing a Boundary crossing learning trajectory' (BC team: Karen Fortuin, Judith Gulikers, Nynke Post Uiterweer, Carla Oonk, Cassandra Tho, September 2020).
  - Paper presentation on 'Choosing challenges in challenge based courses' (Nina Bohm, Renate Klaassen, Perry den Brok, E. van Bueren, September 2020).
  - Paper presentation on 'Design guidelines for laboratory learning activities in Structural Mechanics' (Martha Gavioli, Renate Klaassen, Perry den Brok, C. Bisagni, September 2020).

- **ICAB2020 Online Conference**

  Keynote on 'Online engineering education in corona times: results from a large scale evaluation at WUR and lessons learned' (Perry den Brok, November 2020).

- **Supervision of PhD thesis on perceptions of assessment in higher education**

  First supervisor/promotor: Perry den Brok.

- **CDIO2020 Online Conference**
  - Paper presentation on 'Learning from education innovation using the 4TU.CEE Innovation Map' (Emiel van Puffelen, June 2020).
  - Paper presentation on 'Supporting cross-cultural university education' (Emiel van Puffelen, June 2020).

- **Organizing several (online) workshops on cross-cultural university education, open to all 4TU staff**
  - Workshop: Helping international students turn fear of failure into self-governance (Marijke van Oppen, February 2020).
  - Workshop: Leveraging benefits of intercultural-interdisciplinary group dynamics (Marijke van Oppen & Jeanine Gregersen, December 2020).
  - Workshop: Culturally appropriate and effective feedback (Marijke van Oppen, December 2020).

- **4TU.techtalk**

  Interview with Perry den Brok on 'The recipe for tomorrow's engineer'.

Visit our website for more activities and events in cooperation with the other TUs.

Output & Publications from CEE-WUR

- **Report on 'Teaching large groups'**
  Report with practical recommendations on teaching large groups (online).

- **Evaluation report of 'Bring your own device' project in WUR**
  Evaluation with practical recommendations on the do's and don'ts when working with mobile and digital tools.

- **Reports with results on 'The Transition to Online Education during the Corona Crisis Situation'**
  Reports with first results from a large scale evaluation at WUR and the lessons learned.

- **Video animation on Boundary crossing**
  A visual product that aims to explain Boundary Crossing Competence, and the relevance for WUR students and graduates.

- **PhD Thesis (supervision)**
  Vaessen, B. E. (Accepted/In press). Students' perceptions of assessment and student learning in higher education courses. Technische Universiteit Eindhoven.

- **Paper and conference presentation on 'Learning from education innovation using the 4TU.CEE Innovation Map'**
  Van Puffelen, E. A. M., & Vonk, C. (2020). Learning from education innovation using the 4TU.CEE Innovation Map. In The 16th International CDIO Conference Proceedings - Full Papers (Vol. 2, pp. 264-272). https://doi.org/10.18174/532014.

- **Paper and conference presentation on 'Supporting cross-cultural university education'**
  Van Puffelen, E. A. M., & van Oppen, M. A. A. U. (2020). Supporting cross-cultural university education. In The 16th International CDIO Conference Proceedings - Full Papers (Vol. 1, pp. 112-121). https://doi.org/10.18174/531990.

- **Paper and conference presentation on 'Choosing challenges in challenge based courses'**
  Bohm, N., Klaassen, R., Brok, P. den, & Bueren, E. van (2020). Choosing challenges in challenge based courses. In J.T. van der Veen, N. van Hattum-Janssen, H. Jarvinen, T. de Laat & I. ten Dam (Eds.), Engaging engineering education: SEFI 48th annual conference proceedings (pp.98-109). Enschede: SEFI.

- **Paper and conference presentation on 'Design guidelines for laboratory learning activities in Structural Mechanics'**
  Gavioli, M., Klaassen, R., Brok, P. den, & Bisagni, C. (2020). Design guidelines for laboratory learning activities in Structural Mechanics. In J.T. van der Veen, N. van Hattum-Janssen, H. Jarvinen, T. de Laat & I. ten Dam (Eds.), Engaging engineering education: SEFI 48th annual conference proceedings (pp.214-224). Enschede: SEFI.

- **Paper and conference presentation on 'Training students to cross boundaries between disciplines, cultures and between university and society**

  Fortuin, K.P.J., Post Uiterweer, N.C., Gulikers, J.T.M., Oonk, C., Tho, C.W.S. (2020). Training students to cross boundaries between disciplines, cultures and between university and society: developing a boundary crossing learning trajectory. In J.T. van der Veen, N. van Hattum-Janssen, H. Jarvinen, T. de Laat & I. ten Dam (Eds.), Engaging engineering education: SEFI 48th annual conference proceedings (pp752-771). Enschede: SEFI.

- **Keynote on 'Online engineering education in corona times'**

  Brok, p. den (2020). Online engineering education in corona times: results from a large scale evaluation at WUR and lessons learned. Keynote at the 2020 national Innovation Centres in Academic Beta education conference, Eindhoven, November 5.

- **Blog on the WUR Teachers Day(s) 2020**

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