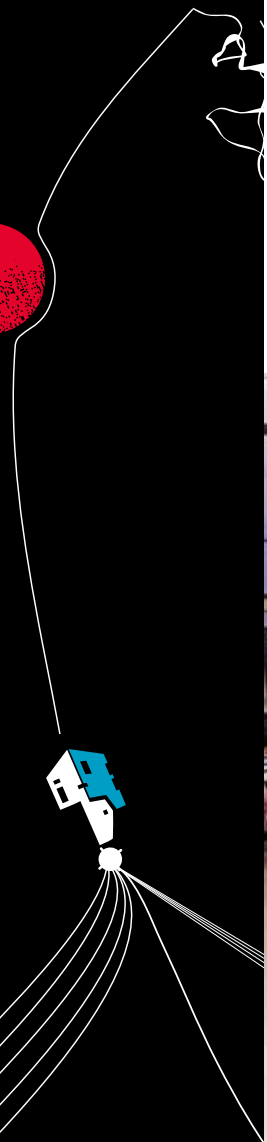




SENIOR UNIVERSITY TEACHING QUALIFICATION UNIVERSITY OF TWENTE PROJECTS OF 2020-2021

UNIVERSITY OF TWENTE.





THIS BOOKLET CONTAINS THE PRODUCTS OF THE THIRD GROUP OF TEACHERS WHO HAVE BEEN WORKING ON THEIR SENIOR UNIVERSITY TEACHING QUALIFICATION (SUTQ).

THE SUTQ

The SUTQ aims for experienced teachers who achieved their University Teaching Qualification (UTQ) and have the ambition to improve their education in a scholarly and evidence-informed manner. In the SUTQ, participants conduct research to improve and design innovative education within their educational practice. They work 160 hours on a research question, determine their learning path (student-driven Learning), and work together with other SUTQ participants. The participants receive supervision, advice and expertise from the Centre of Expertise in Learning and Teaching (CELT) and ELAN, Department of Teacher Development.

THE SUTQ IMPROVES EDUCATION

The University of Twente educates the professionals of tomorrow. To provide a high standard of education, the UT emphasizes the importance of highly skilled teaching staff. A wide range of activities stimulates teaching excellence, including the UTQ and SUTQ embedded firmly in the HR policy of life-long learning. CELT coordinates the UTQ and SUTQ programmes.

www.utwente.nl/en/ces/celt/sutq



A DIARY-BASED REFLECTION TO ASSIST STEM STUDENTS GAIN CLARITY ON THE TECHNOLOGY ENTREPRENEURSHIP PROFESSIONAL IDENTITY ASPIRATIONS

RAINER HARMS

I am Associate Professor for Entrepreneurship at the Entrepreneurship and Technology Management group (ETM) at the University of Twente. My passion is to support students and practitioners in their entrepreneurial journey. I teach at BMS, the Nanotechnology Design Project, and the European Institute of Innovation and Technology (EIT) entrepreneurship minor. I also connect to NoveIT and the University Twente entrepreneurial ecosystem. I chose the topic because I felt that the often-mentioned goal of entrepreneurship education, the increase of students' entrepreneurial intention, maybe misguided: I'd rather have students develop their own perspective based on experience and facts.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

My SUTO project is about supporting students to gain clarity about whether they want to become an entrepreneur. More precisely, it was about identity work towards clarity on professional identity aspirations towards entrepreneurship. The hypothesis was that a set of reflection exercises based on critical learning moments helps students develop that clarity.

WHAT I HAVE LEARNED

The study showed that the participants reported having gained a better understanding of what it means to be entrepreneurs. They noted that the reflection exercises contributed to this knowledge gain. The students' responses taught me about the mechanisms through which the reflections are useful. They also had numerous suggestions on how to improve the teaching innovation.

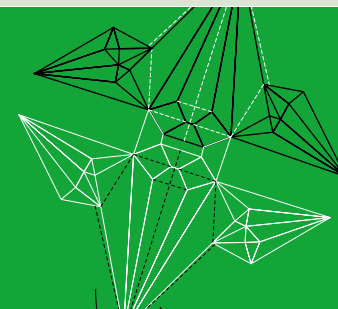
WHAT WAS THE BIGGEST CHALLENGE

My biggest challenge was to reconcile the systematic approach to educational design with an emerging understanding of the problem at hand. For example, at first, my focus was on professional identity aspirations. Only later in the process, the aspect of "clarity" became important. Hence, the research approach needed to be adapted.

WHAT ARE YOU PROUD OF

I am proud of the interest I get from the entrepreneurship educators' community on the clarity of entrepreneurial professional identity aspirations: Many feel that a focus on "entrepreneurial intention" was too narrow-minded. I am looking forward to improving the teaching innovation with my Comenius Teaching Fellow grant.

<p>Problem</p> <p>Because studying something like (...) is so different from practicing it, I do not have that picture of me out there as a professional. It makes me unsure, ... Am I going in the right or wrong direction?" (a student, cited by Jensen & Jetten, 2016).</p> <ul style="list-style-type: none"> ● Unclear PIA is demotivating ● Clarity of TE-PIA: 'cognitive awareness of what ones' possible professional identity of technology entrepreneur could be based on' ● Increase TE-PIA clarity 	<p>Approach</p>																																																								
<p>Design</p> <p>Reflection on TE-PIA</p> <ul style="list-style-type: none"> ● Weekly (Bligh 2000) ● Diverse (Schilling et al. 2003) ● Project-based (Cope 2003) ● Guided (Masui & de Corte 2005) 	<p>Results</p> <ul style="list-style-type: none"> ● 10 / 11 students : TE-PIAC increased ● 10 / 11 students : TE-PIAC increased through reflection <table border="1"> <thead> <tr> <th></th> <th>Min</th> <th>Max</th> <th>Median</th> <th>SDy</th> <th>Cronbach's α</th> <th>n</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>TE Identity pre</td> <td>14</td> <td>30</td> <td>21.9</td> <td>6.4</td> <td>.944</td> <td>10</td> <td>Based on Chermers et al. (2010)</td> </tr> <tr> <td>TE Identity post</td> <td>14</td> <td>30</td> <td>22.5</td> <td>5.5</td> <td>.915</td> <td>13</td> <td></td> </tr> <tr> <td>TEIA Identity pre</td> <td>7</td> <td>28</td> <td>20.8</td> <td>6.9</td> <td>.961</td> <td>10</td> <td>Based on Farmer et al. (2009)</td> </tr> <tr> <td>TCE Identity post</td> <td>7</td> <td>28</td> <td>22.8</td> <td>5.8</td> <td>.926</td> <td>13</td> <td></td> </tr> <tr> <td>EPeP pre</td> <td>10</td> <td>30</td> <td>22.0</td> <td>7.0</td> <td>.961</td> <td>10</td> <td>Based on Watt et al. (2019)</td> </tr> <tr> <td>EPeP post</td> <td>8</td> <td>30</td> <td>22.4</td> <td>5.9</td> <td>.927</td> <td>13</td> <td></td> </tr> </tbody> </table> <p>TE: Technology Entrepreneurship; TEIA: Technology Entrepreneurship Identity Aspirations; EPeP: Entrepreneurship as part of the Engineering profession</p>		Min	Max	Median	SDy	Cronbach's α	n	Source	TE Identity pre	14	30	21.9	6.4	.944	10	Based on Chermers et al. (2010)	TE Identity post	14	30	22.5	5.5	.915	13		TEIA Identity pre	7	28	20.8	6.9	.961	10	Based on Farmer et al. (2009)	TCE Identity post	7	28	22.8	5.8	.926	13		EPeP pre	10	30	22.0	7.0	.961	10	Based on Watt et al. (2019)	EPeP post	8	30	22.4	5.9	.927	13	
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<p>Addtl. insights</p> <p>Reflecting upon past action</p> <ul style="list-style-type: none"> ● Remember: "I read in the reflection that I can remind the things I did in this week." (9, similarly 13) ● Clarify the reasons behind actions: "They (the reflections) have me (...) realize what actually was in my mind" (7) ● Thinking deeper: "I wish, maybe sometimes I because you start thinking about stuff more, that helps sometimes." (10) ● Instill pride: "I was writing all my thoughts and reflections, and then I was reading them all what I was realizing that, oh my God, I did that this week." (6) <p>Future-oriented</p> <ul style="list-style-type: none"> ● Keeping focus and pressure: "It helped me a lot because get me and get me focused and on pressure use every week." (8) ● Guide future action: "The reflection is pretty awesome because (...) you lay out all that you think you are going to." (8) 	<p>Iteration</p> <ul style="list-style-type: none"> ● Learning how to reflect ● Multimedia ● Peer reviews ● Reflecting the entire journey ● External comparators 																																																								
<p>References</p> <ol style="list-style-type: none"> 1. Bligh, D.A. (2000). What's the use of lectures? Jossey Bass. 2. Brand, S., M. Bloesch and N. Osmond. (2019). "Enterprise architects combine design thinking, lean startup and agile to drive innovation". From https://www.gartner.com/en/documents/5941917/enterprise-architects-combine-design-thinking-lean-start. 3. Cope, J. (2003). "Entrepreneurial learning and critical reflection: Discontinuous events as triggers for 'higher-level' learning." Management Learning 34(4): 429-450. 4. Jensen, D. H. and J. Jetten (2016). "The importance of developing students' academic and professional identities in higher education." Journal of College Student Development 57(8): 1027-1042. 5. Masui, C. and E. del Corte (2005). "Learning to reflect and to attribute constructively as basic components of self-regulated learning." Educational Psychology 23(3): 351-372. 6. McKenney, S. and T. C. Reeves (2014). Educational Design Research. Handbook of Research on Educational Communications and Technology. J. M. Spector, M. D. Merrill, J. Elen and M. J. Bishop. New York, Springer: 131-140. 7. Schilling, M. A., P. Vidal, R. E. Ployhart and A. Managioni (2003). "Learning by doing something else: Variation, relatedness, and the learning curve." Management Science 49(1): 39-56. 8. Vogel, P. (2016). "From venture idea to venture opportunity." Entrepreneurship Theory & Practice 41(6): 943-971. 																																																									



FOSTERING QUALITY OF REFLECTION IN FIRST-YEAR HONOURS STUDENTS IN A BACHELOR ENGINEERING PROGRAM TECHNOLOGY, LIBERAL ARTS & SCIENCE (ATLAS)

PROBLEM:

Quality of student reflections in Self-evaluation Reports (SERs) were consistently low. Student were in need of more support (pilot study) for writing reflections. Assessors appeared to use different feedback criteria for reflections (pilot study). Students were basically told to 'go out and reflect', and teachers were expected to recognize a good reflection when they saw one.

SOLUTION:

A standardized reflection method was introduced including scaffolding questions, feedback criteria and examples of low and high quality reflections (ATLAS Reflection Guide).

METHOD:

First year students (n = 29) and assessors received the guide. Q&A sessions for students were offered. Quality of reflections was assessed in the SERs of the students and compared with the SER reflection quality level in an earlier cohort (n = 33). Perceived usefulness and value of the reflection method were measured in the intervention group and the assessors with a five-point Likert scale with ten items.

RESULTS:

Reflection quality level score in students from the intervention group was (on a four point scale) 2.0 (SD: .56, range 1.17 – 2.67). In the comparison group this was 1.3 (SD: .30, range 1.0 – 2.17). This difference was significant. Both students and assessors highly valued the reflection method. Mean score for students was 4.0 (SD: .46, range 3 – 4.80), for teachers this amounted to 4.08 (SD: .41, range 3.50 – 4.60).

CONCLUSION AND DISCUSSION:

The reflection method implemented improved quality of reflections in the SERs of first-year ATLAS students. Moreover, the ATLAS Reflection Guide was highly valued. It is suggested to further implement the reflection method in the ATLAS program. Due to Covid-19, the method did not include peer and teacher interaction. For example, no feedback cycles were included. On further implementation, it is suggested that the intended learning arrangement for developing reflection skills includes such interaction. Especially the inclusion of a "reflection partner" is considered.

PASCAL WILHELM

My name is Pascal Wilhelm and I work as a university lecturer in social science at ATLAS UCT (University College Twente). The interdisciplinary ATLAS program is run by a small, dedicated team of teachers from different academic backgrounds, mine is in developmental and educational psychology. In addition to my course work, I am also a semester coordinator, mentor, semester assessor, member of the Admission Board and secretary of the Examination Board. I also guide students in their process of Self-directed (or Student-driven) learning, the educational approach the program has adopted. The topic of my SUTO project is student reflection. I choose this topic because, in my opinion, education is all about learning how to think clearly and reflection is a deliberate thinking activity that can be developed. As a skill it was, wrongly, not given much attention in ATLAS.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

My project focused on fostering the quality of reflection in first-year ATLAS students. In the past academic years, it was noticed that the quality of student reflections was rather low and stayed consistently low across the program. In addition, teacher/assessors appeared to apply various feedback criteria for reflections. Basically, students were told to "go out and reflect" and teachers were expected to recognize a good reflection when they saw one. In five small-scale studies, I investigated students' needs regarding learning how to reflect, I evaluated the effect of using a specific reflection method (laid out in the ATLAS Reflection Guide) to foster the quality of student reflection, I assessed the criteria ATLAS teachers use to give feedback on reflections and I evaluated the perceived usefulness and value of the method applied in both students and teachers. The main results were that the method was effective in fostering quality of student reflections and that both students and teachers were equally and highly appreciative of the reflection method.

WHAT I HAVE LEARNED

The most important thing that I learned was that, even for someone with an academic background in the learning sciences, we must read the scientific literature. Read about for what questions learning scientists already have answers and stop reinventing the wheel, or worse, do as if our educational experience as educators is unique. It rarely

is. Others have gone before and went through the same experience. And studied it.

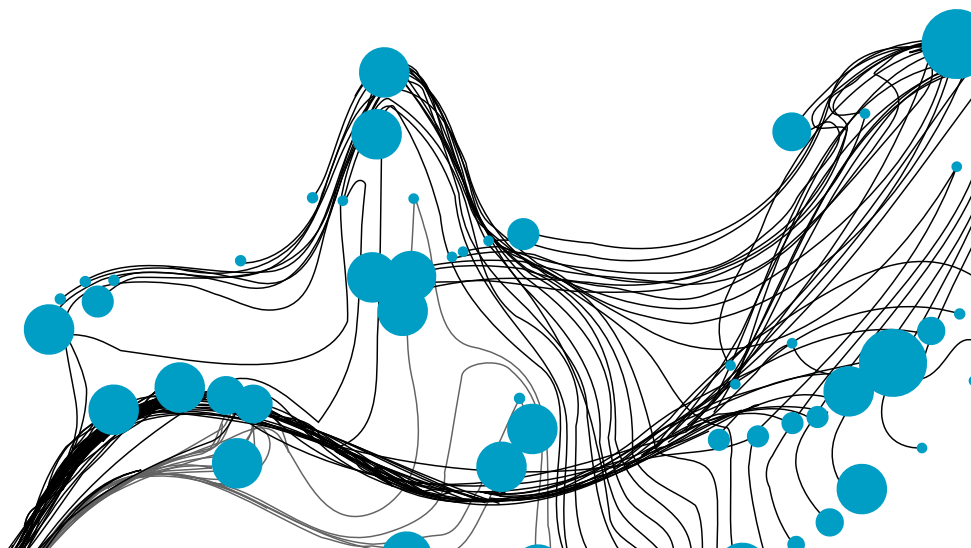
WHAT WAS THE BIGGEST CHALLENGE

My biggest challenge in my SUTO trajectory was to allocate time. Research activity and education have different dynamics. Education is urgent, research has patience. I needed to learn to resist the urgency of education, ignore my students' emails for a short while and enter a quiet zone to invest in this project. But once I got started, it became easier. So, that is my advice to those who'll start their SUTO in the future: Clear your agenda. And just start.

WHAT ARE YOU PROUD OF

A few years ago, I made an important decision. I gave up my position as an assistant professor and choose to embrace education as the focus of my career. Back then, I felt people put me on a different list: the list of the losers. Those who are not fit enough to be scientists and settle for second best: education. However, I feel a choice like this should be respected.

With Shaping 2030, the UT now wants to value, recognize and reward each individual contribution to our university. I am proud to be working at such a university.



MIREILLE HUBERS

My name is dr. Mireille Hubers, and I work as an assistant professor in the department Educational Science. I study organizational change and the role that professional development plays during those change processes. I mainly teach in the (pre) master Educational Science and Technology, though I also do some teaching for Psychology and Riskmanagement.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

My SUTO trajectory focused on students' written assignment in the M-EST course Leadership & Organizational change. They need to write a position paper about a leadership or organizational change hype, and I noticed that they found this very difficult in the past. They mainly struggle to formulate a coherent line of reasoning as well as to dive into the essence of a certain hype (what it aims to achieve etc.). Given the current age of 'alternative facts', I find it crucial that students learn to formulate coherent lines of reasoning based on scientific research, which is why I chose this topic for my SUTO trajectory. During my trajectory I studied what caused students' difficulties. It appeared that our students did not yet have the required higher-order thinking skills for this. During my SUTO trajectory I designed a six-step procedure to help them develop these skills. Moreover, I modelled the use of this procedure and included exercises for the students to practice these steps. They also provided each other with formative feedback.

WHAT I HAVE LEARNED

I have learned a lot of things, amongst which the importance of finding data to study the cause of your challenge. Without this, I would have probably designed an entirely different solution which would likely be (far) less effective. Content-wise, I learned about how to help students develop their higher order thinking skills.

WHAT WAS THE BIGGEST CHALLENGE

The biggest challenge during this trajectory was to balance the core content of the course with the newly designed focus on developing students higher-order thinking skills.

WHAT I AM PROUD OF

On average, my students improved over two full grade points and I am very proud of them for doing so!

DEVELOPING STUDENTS' HIGHER ORDER THINKING SKILLS

1. STUDENTS UNDERPERFORMED IN WRITING POSITION PAPER

2. DATA COLLECTION: questionnaires and performance data.
CAUSE: insufficient higher order thinking skills.

3. DESIGN: 6-step procedure including argument mapping. Use modelling techniques and exercises, provide formative (peer) feedback.

STEPS IN WRITING A POSITION PAPER:

0. Select your hype
1. Search for and read literature, and ask yourself: who, what, why, how questions.
2. Organize info in such a way that reveals the connections between the main topic and its various themes or categories.
3. Structure your reasoning: claim + argument
4. Search for additional literature: which claims and arguments can you back up with literature?
5. Evaluating the claim, evidence and conclusion
6. Communicate your line of reasoning in the paper

STRUCTURE REASONING VIA AN ARGUMENT MAP

By letting decisions be made on the operational level, efficiency is increased, resulting in more appropriate solutions in a shorter time frame (Rousseau & Aube, 2010)

The sense of ownership members are provided with results in them putting more effort into their tasks and performing better on their job (Spreitzer, Noble, Mishra, & Cooke, 1999; Manz, in Tata & Prasad, 2004; Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001)

In order to benefit, implementation must be done well: no 'fake authority' (old leaders still take authority/members don't take authority) (e.g. Ray & Bronstein, 1995; Piczak & Hauser, 1996; McNair, Newswander, Boden, & Borrego, 2011).

The use of self-managed teams positively relates to team performance (e.g. Luciano, Mathieu, & Ruddy, 2013; Cooney, 2004).

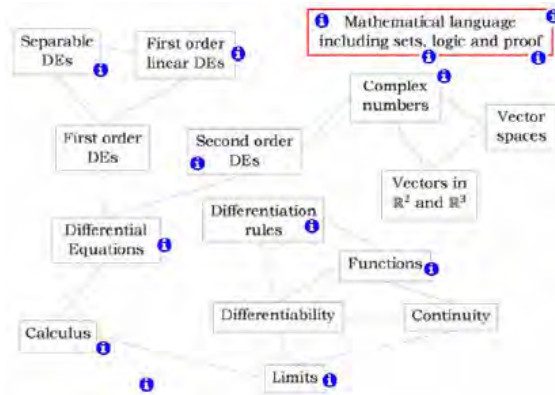
4. RESULTS: +2 grade points; design was implemented in the intended manner and students valued it. Thus, improved achievement attributable to re-design.

MAKING KNOWLEDGE NETWORKS VISIBLE

INNOVATION: Student curation of supplemental materials shared by means of a platform on Canvas using H5P image hotspots. The student-driven innovation addresses the lack of any systemic means of sharing within a learning community other than ad hoc word of mouth.

AIM OF INTERVENTION: To recognise the extensive use students make of online resources and to provide a systemic mechanism for sharing within their learning community.

FINDINGS ON RESOURCE CONTRIBUTION: About one third of the class submitted resources, 7% of the class submitted several. Most resources were videos but websites, online calculators and language-related resources were also contributed.



RESPONSES FROM STUDENTS: Students found the resources helpful for current studies as well as "refresher" of school work. Resources were also found useful in other studies for example circuit analysis. Responses also indicated that students were keen to share with one another even in the absence of external incentives.

A study undertaken for the Senior University Teaching Qualification (SUTQ)
Theme: Student-driven learning
Tracy Craig

Tracy Craig is a lecturer in the Department of Applied Mathematics, teaching calculus and linear algebra to first-year and pre-masters students. She has been at the University of Twente since 2018 and before that taught at the University of Cape Town, South Africa, which is also where she completed her PhD in Mathematics Education. Her PhD focussed on deepening understanding in problem solving through writing. Her research interests are in mathematics education and engineering education and are very much practice-driven. Current interests are the Twente Educational Model, the teaching and learning of vector calculus, and development of her classrooms as learning communities. Tracy is at present the EEMCS Teaching and Learning Fellow in which role she will engage with challenge-based learning.

TRACY CRAIG

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

For my SUTO project I provided a mechanism for students to share good resources with one another using embedded links on a network of course-related concepts. In doing so the development of the class as a learning community is supported, as is student-driven learning in the form of peer-curation of supplemental materials.

WHAT I HAVE LEARNED

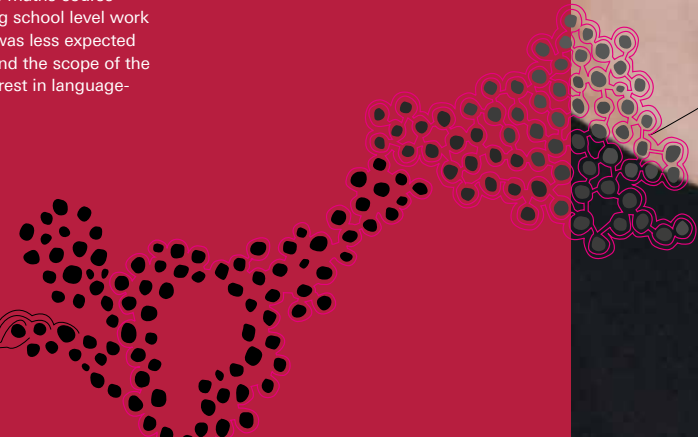
Students are happy to share resources with one another and appreciate seeing what others recommend. Finding the resources useful for the work in the maths course itself as well as refreshing school level work was expected but what was less expected was the usefulness beyond the scope of the course and the keen interest in language-related resources.

WHAT WAS THE BIGGEST CHALLENGE

The nature of the platform (H5P image hotspots in Canvas) did not record any usage data so it was challenging to determine what students were using. This challenge was partially met with a weekly assignment in one course but has not been solved long term.

WHAT ARE YOU PROUD OF

I am proud of my students for contributing to their learning community simply out of altruism and a desire to help one another.



ANNA BOS NEHLES

Anna Bos-Nehles is Assistant Professor in the field of Human Resource Management at the Faculty of Behavioural, Management and Social Sciences (BMS). Her main research interest lies in the role of line managers towards HRM implementation effectiveness, their effect on innovative employee behaviours and their role in digitalization. She teaches in International Business Administration (IBA, BSc), Business Administration (BA, MSc) and Gezondheidswetenschappen (GZW, BSc) and is chair of the Examination Board of GZW and HS.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

The purpose of my SUTO project was to design and evaluate a co-created 360 degree peer feedback process. The process is designed to seek feedback from various perspectives in an online peer feedback and assessment process. Business partners are also invited to co-create the course delivery by providing real-life challenges, data and feedback in a university-business cooperation. Four raters were involved in a three-round holistic feedback process: teachers, peers, self-assessment and business partners. The aim was that students perceive engagement in the co-created 360 degree peer feedback as valuable for their learning process. The results showed that nearly 80 percent of the students perceived the co-created 360 degree peer feedback process as beneficial for the learning process

WHAT I HAVE LEARNED

I have learned 5 lessons: 1. That students need to learn how to provide and receive effective peer feedback and thus we should start teaching peer feedback in the bachelor programme. 2. Students learn most from reading the work of other students because they compare the work with their own and reflect on their own writing. 3. Designing and implementing peer feedback in a course does not provide time savings for the teacher, especially not when it is offered supplementary to teacher feedback. 4. Self-assessment should be the first form of feedback before feedback from other

stakeholders, since saturation of feedback can take place and thus students do not perceive self-assessment as worthwhile any more. 5. The usage of SMART assessment criteria, that are ideally co-created with students is essential for an effective peer feedback process.

WHAT WAS THE BIGGEST CHALLENGE

The biggest challenge for me was handling students perceptions of inequality in the peer review process. Since students became unsatisfied when they had the feeling that their peers did not spend as much time as they had on the review, I needed to monitor the quality of the feedback process and I have awarded feedback queens and feedback kings to reward excellent peer reviews.

WHAT ARE YOU PROUD OF

I am very proud of my students. The co-created 360 degree peer feedback process has helped them to develop their self-regulated learning behaviours by actively engaging in the course, actively seeking and providing feedback from and to peers, engaging with business partners and improving their learning process by seeking feedback from peers even outside the structure offered in the course.

CO-CREATED 360 DEGREE PEER FEEDBACK PROCESS

THE GOAL OF THIS PROJECT IS TO DESIGN A CO-CREATED 360 DEGREE PEER FEEDBACK THAT HELPS STUDENTS TO ACTIVELY SEEK, ACCEPT AND WORK WITH FEEDBACK OF VARIOUS PERSPECTIVES AND PERCEIVE PEER FEEDBACK AS VALUABLE FOR THEIR LEARNING PROCESS.



Self-regulation and co-creation:

- Co-creation of assessment rubric
- Feedback seeking
- Peer feedback and assessment



Start small but early:

- Limit coordination effort
- Max. two stakeholders
- First year study programme



University-business cooperation:

- Guest lecture
- Press Conference
- Poster presentation



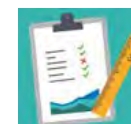
Provide preparation:

- Adequate instructions
- Rules and guidelines
- Role of stakeholders



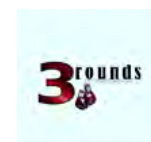
Four stakeholder perspectives:

- Peers
- Teacher
- Business partner
- Self-evaluation



Create criteria:

- SMART criteria
- Co-create with students
- Share with all stakeholders



Three rounds of feedback:

- Introduction
- In-between version
- Draft version



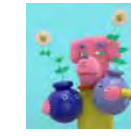
Stay engaged:

- Coaching
- Monitoring
- Evaluating



Three stage model:

- Pre-task guidance
- In-task guidance
- Post-task guidance



Self-initiated peer feedback:

- Reflection with friends
- Inviting other peers
- Brainstorming

THEATRICAL TECHNOLOGY ASSESSMENT

A ROLE-PLAY SIMULATION ABOUT COMPLEX STAKEHOLDER DYNAMICS AROUND EMERGING TECHNOLOGIES

EDUCATIONAL CHALLENGE:

- Students tend to overly identify with the promoters of new technologies and oversimplify stakeholder dynamics, leading to ineffective or irresponsible perspectives on technology development.
- Create an engaging and effective educational method in which students learn to understand and deal with complex stakeholder dynamics around emerging technologies.

THEORETICAL BACKGROUND:

- Constructive Technology Assessment
- Improvisational theater
- Educational role-play simulations

IMPLEMENTATION CONTEXT:

- 1st year ATLAS students
- Project on sustainable energy systems

INCREASED STUDENT LEARNING ABOUT:

- Dealing with uncertainty (technological and societal risks and benefits, shifting evaluation criteria)
- Effective stakeholder strategies (collaboration, compromise, persuasion, power games, mobilizing support, etc.)
- Technology dynamics (innovation races, hype cycles, waiting games, deadlocks, stepping-stones, niche development, regime changes, etc.)

EVALUATION HIGHLIGHTS:

- Novel and useful insights
- Realistic stakeholder discussions
- Fun

ROLE-PLAY DESIGN GUIDELINES	HOW IMPLEMENTED IN THE ROLE-PLAY SIMULATION?
Create verisimilitude	Student research, role descriptions, fact sheets
Provide focus	Preparatory questions, teacher moderation
Allow for agency	Improvisation, role descriptions, time-lapse in role-play
Provide structure	Teacher moderation, role descriptions
Stage confrontations	Stakeholder selection, teacher moderation
Allow for fun	Improvisation, warming up, teacher moderation
Prepare	Student questions and expectations, role and case descriptions, warming up, try-out, teacher coaching
Debrief	Reflection in class, reflection assignments after class
Involve observers	Dual set-up with students as players and co-designers, assignments, use of chat for comments and observations



Dr.ir. Klaasjan Visscher is Associate Professor and head of the Science, Technology and Policy Studies (STePS) section at the BMS Faculty. His teaching and research focuses on innovation processes in organizations and society. Klaasjan is programme director of the Transdisciplinary Master-Insert 'Shaping Responsible Futures' and teaches at ATLAS, Business Administration and other programmes. He has received a Comenius teaching fellowship and leads a Comenius leadership project on interdisciplinary project education. Klaasjan is a board member of the ComeniusNetwork.

KLAASJAN VISSCHER

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

In my SUTO project I designed and evaluated an online educational role-play simulation, 'Theatrical Technology Assessment', which enables students to explore complex stakeholder dynamics and investigate scenarios of emerging technologies. It provides students with an engaging learning experience in which they can develop a deep understanding of stakeholder perspectives and interactions, practice communicative, creative and critical thinking skills, and develop an attitude towards technology development that embraces complexity.

WHAT I HAVE LEARNED

In the SUTO project I learned about the 'evidence-informed' approach of education. There is large amount of relevant educational literature available that provides concrete examples and guidelines for role-play simulations. However, to design education that is innovative as well as effective, a scholarly teacher should go beyond the literature and, together with colleagues and students, experiment in class.

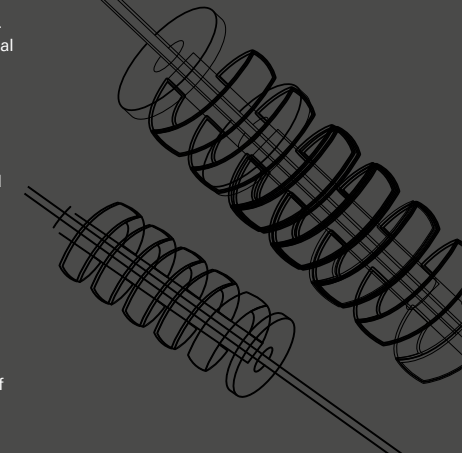
WHAT WAS THE BIGGEST CHALLENGE

Theatrical Technology Assessment uses techniques from improvisational theatre to enhance student agency, fun, and outcome variability in the role-play. A big challenge was to preserve the theatrical aspect in an online environment. Thanks to the efforts of

the involved students, the way in which they were prepared, and the creative use of video conferencing tools, this worked out well.

WHAT ARE YOU PROUD OF

I am proud of how we (students and teaching staff) have succeeded in making this role-play simulation work as an effective and engaging educational format. Theatrical Technology Assessment has gained attention of other students, teachers, practitioners and funding agencies, and is now being further developed for a variety of new programmes and contexts.



FRANK OSTERMANN

Frank joined the ITC in 2014 as an Assistant Professor in the department of Geo-Information Processing. His main research interests are collaborative and crowdsourced approaches to creating and processing geographic information, e.g., involving OpenStreetMap, geosocial media, or citizen science, and their impact on scientific reproducibility and representativeness of results. Since 2009, he holds a PhD (Dr. sc. nat.) from the University of Zürich. Prior to ITC, Frank worked for three years as a post-doctoral researcher at the Joint Research Center of the European Commission, and several years as a research assistant at the Universities of Zürich and Hamburg on EU-funded projects on user-generated geographic content and spatio-temporal data analysis in urban contexts. At the ITC, Frank has supervised more than 20 MSc students during their thesis research, and coordinated several MSc courses, most recently the Q3 case study for the Spatial Engineering MSc, which implements interdisciplinary and challenge-based learning. This task, combined with his ambition to improve as a teacher and his concern for scientific reproducibility in the geosciences, led to the topic of this SUTO.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

How to introduce students to the scientific concept of reproducibility, and let them learn effectively how to evaluate reproducibility of a given study, and how to acquire and apply skills to improve the reproducibility of their own work.

WHAT ARE YOU PROUD OF

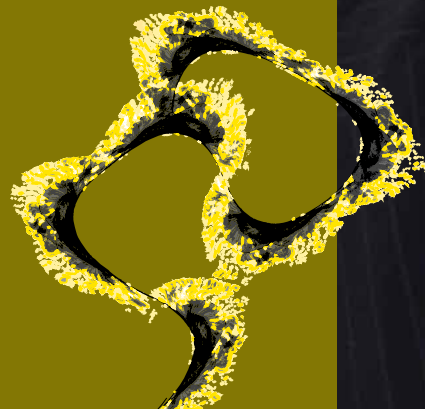
How well students adapted to the lockdown and were motivated to invest time and effort in this "obscure" new topic; and to have managed together with them to complete the SUTO with promising results despite the odds.

WHAT I HAVE LEARNED

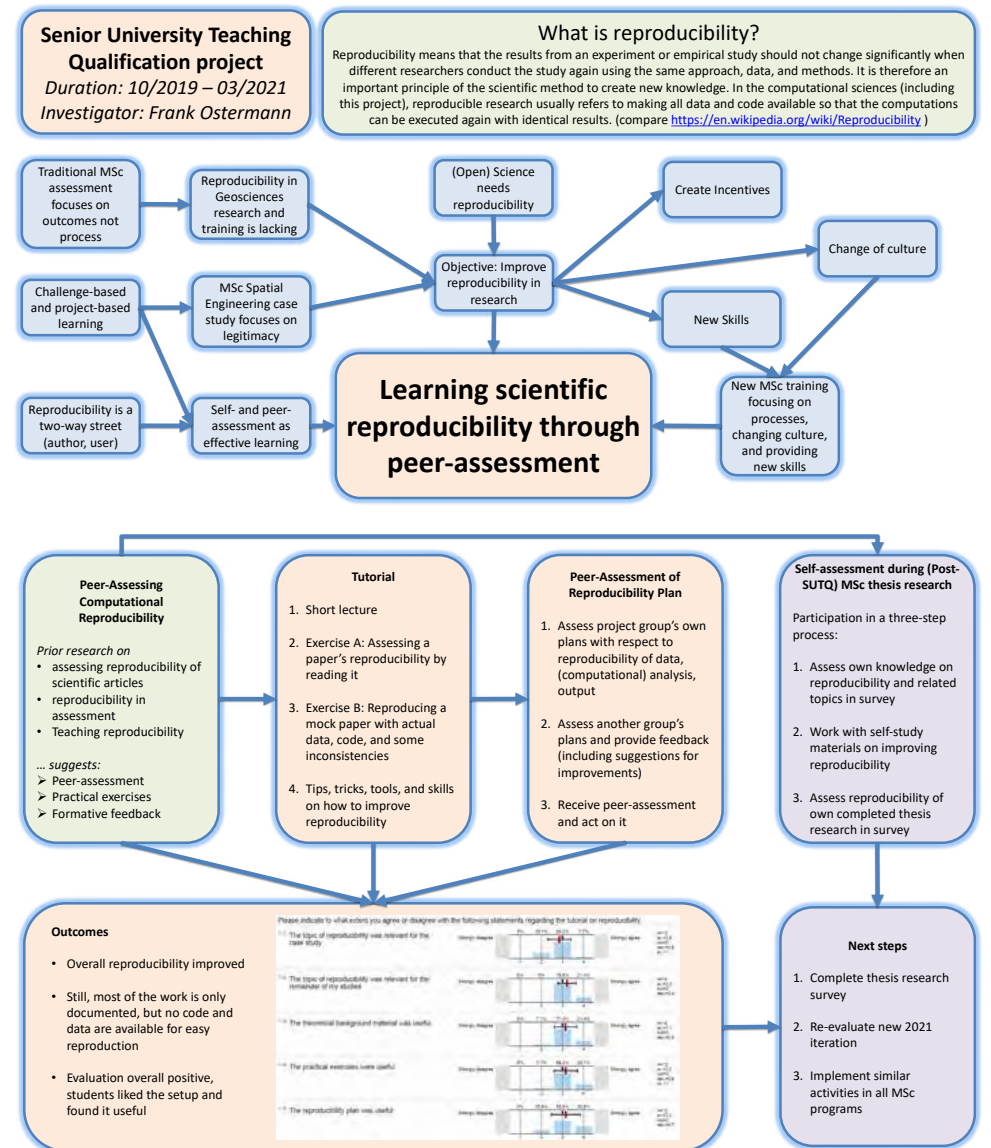
That formative peer assessment after a short tutorial with background lecture and hands-on exercises is an effective and appreciated way to introduce students to reproducibility challenges and evaluate their work for opportunities to improve it.

WHAT WAS THE BIGGEST CHALLENGE

At first, to fit the SUTO planning into the tight and crowded academic time table; then, to complete it amidst a pandemic lockdown.



LEARNING SCIENTIFIC REPRODUCIBILITY THROUGH PEER-ASSESSMENT



ARMAĞAN KARAHANOĞLU

My name is Armağan Karahanoğlu, and I work as an assistant professor of Interaction Design at the University of Twente. I carry out design research on human-technology relations, and teach several courses in Industrial Design Engineering, both at Bachelor's and Master's levels. My roles in IDE education cover module coordinator, tutor, supervisor, and lecturer of various courses that focus on human-centred experience design and behaviour change. I choose this topic because teaching the methods and processes of design is not sufficient to develop products that address societal challenges. As educators, we should teach the students to be critical about evaluating the design process results and be reflective on how the end-users would use the systems they design. I propose peer-testing as a realistic replica of real-life experience-design testing.

MY EXPERIENCE WITH THE SUTO

WHAT MY SUTO PROJECT WAS ABOUT

During my SUTO process, I explored the necessity and challenges of teaching experience design in higher education. I hypothesized that peer-assessment could be a suitable method to achieve the goals of this project. To test my hypothesis, I explored the possibilities of peer-assessment to teach experience design evaluation. By developing a peer-testing method, I addressed one of these challenges, teaching how to assess experience design. I applied this method in the Design and Meaning course of Industrial Design Engineering bachelors' programme in two consecutive years (2019 and 2020).

WHAT I HAVE LEARNED

During SUTO, I got a more profound knowledge of peer-assessment and peer-testing tools and learned and developed a peer-testing approach to assess experience design works. My end goal was to contribute to the body of knowledge in experience design. I learned in the process that my personality as a design researcher affects my perception of how an education designer and educational researcher should be.

WHAT WAS THE BIGGEST CHALLENGE

The biggest challenge is knowing that every student is unique in their needs

and every design project is unique in its outcomes. That's why the teachers in higher education should be flexible in mixing the learning modalities by seeking new means of delivering knowledge, such as virtual environments, live classrooms, feedback, and peer learning. I believe in student-based learning, which should be supported with the teacher's flexibility and creativity. I acknowledge that the project-based learning notion of the University of Twente is a very effective way of learning in that sense. It involves the active involvement of students in their learning. This enables the students to gain knowledge and skills at the same time while learning at an academic level rather than mere training.

WHAT ARE YOU PROUD OF

I am actually proud that despite the pandemic, my intervention design was possible to be held online. In the 2021, the students were able to have the peer-testing on campus, which turned out to be a great learning moments for students

ACT LIKE A USER WORK LIKE AN EXPERT

EVALUATION OF EXPERIENCE DESIGN WORKS THROUGH PEER-TESTING

This project aimed to help students to set the goals for the outcome (owning) of their design process. It guided them to learn the topics of Design and Meaning course through tools and instructions (learn it); and communicate their knowledge by peer-feedback and peer-testing (share it).



During the lectures, students were introduced theory around experience design, such as Experience Design (Hassenzahl, 2011), and psychology theory that is related to experience design such as Self-Determination (Deci & Ryan, 2011) and Flow Theory (Csikszentmihalyi, 1990).



In groups of 3 or 4 students worked on applying the theory in a design assignment, in which they worked towards designing a meaningful experience for a chosen activity.



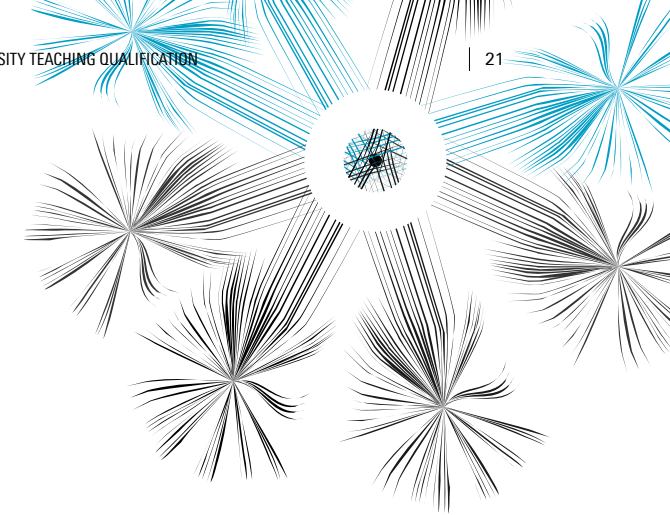
Groups were asked to define a set of criteria based on which their experience design would be assessed (i.e. self-defined assessment criteria). At the beginning of the course, students were provided with a template for writing down their experience design assessment criteria.



Peer-testing of the prototypes was planned in the sixth week of the course. During peer-testing, each group tested the experience design of other groups. To increase the reliability of the peer-testing, the guidelines provided by Topping (2009) were followed.



In peer-testing, each group had three roles: designer, user and design expert. The designer groups presented the prototype of the interactive product that enrich their target experience. The assessor group had then taken user and design expert roles to assess the work of the presenter group and give feedback.



The results from 2019 and 2020 showed that peer-testing as a teaching design experience evaluation has several potentials. Based on the results of the two consecutive years, five suggestions to the future design educators in the application of peer-testing is provided.

▶ Introduce the goals and importance of peer-testing

An educator who would like to employ peer-testing in design education should introduce why peer-testing is part of their teaching.



Prepare the students for peer-testing

Rubrics can achieve this goal while arranging a prior peer-feedback session would greatly prepare the students for peer-testing.



Guide the students for defining self-driven assessment criteria

Defining self-driven assessment criteria could be regarded as planning for experience design evaluation.



Consider that planning of peer-testing is time-consuming for the teacher.

The teachers might consider not assessing the feedback if there is no assessment involved in the peer-testing activity.



Peer-testing should both be summative and formative

Received feedback should be used in the next step of the design process.



