

## Senior university teaching qualification via engineering education research and design

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## **ABSTRACT**

Despite decades of calls to engage in the scholarship of teaching [1], university teachers remain challenged to adopt an academic stance toward their education. Three crucial barriers are (1) the academic reward system, (2) the lack of support for teachers to develop such scholarship; (3) the isolation in which most teachers operate. We outline our senior university teaching qualification trajectory (SUTQ) that was designed to address these three barriers. First mid-term evaluation results are outlined showing that this new trajectory is much appreciated. Addressing workload

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issues of participants, enhanced opportunities for peer interaction and streamlining of our program are planned to further improve this new SUTQ program.

Conference Key Areas: Engineering Education Research; Curriculum Development

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## INTRODUCTION

Teaching quality has an important effect on student learning [2,3]. To contribute to this goal, the Senior University Teaching Qualification (SUTQ) is intended to further develop senior teachers professionally. The SUTQ is intended to contribute to educational innovation and continuous further improvement of education. This means that professional development of teachers in the framework of the SUTQ is not only focused on individual development, but also on these teachers functioning as 'change agents' in the organization [4].

The target group for participation in the SUTQ program are excellent teachers that have not only obtained their basic University Teaching Qualification (UTQ), but are considered forerunners in their department in terms of teaching. They need to be personally motivated to participate in the program and research and innovate their own teaching to further promote student learning. Participation in the program needs to be personally relevant and related to challenges and questions in participants' own teaching practice. Moreover, they need to see how their individual activities in the framework of the SUTQ relate to opportunities for improvement in education in their own courses. Their time investment is 160 hours in total in one (academic) year. This paper outlines how we implemented our SUTQ program and what our first evaluation results show.

## 1 DESIGN OF THE SENIOR UNIVERSITY TEACHING QUALIFICATION

### 1.1 Orientation on the SUTQ in the Dutch context

Currently 11 out of 14 Dutch universities have developed a SUTQ program including criteria for admission, facilities, program and an assessment procedure [5]. De Jong and Mulder [5] conclude that there is not one standard SUTQ program or profile yet as some different approaches can be distinguished. In their inventory they discern three different SUTQ approaches:

1. **The performance approach** (dossier): Norms and criteria are described beforehand, the dossier demonstrates evidence that a lecturer qualifies for the SUTQ referring to past and recent performance.
2. **The research project approach**: By completing an educational project a candidate demonstrates that he or she qualifies for the SUTQ. Starting point is a research question which addresses a challenge or a problem in the current education practice which is then investigated and evaluated.
3. **The program approach**: The most extensive approach which refers to a one-year development program with advanced courses, invited speakers on educational strategy themes, projects, discussion and peer feedback.

Currently the 3<sup>rd</sup> approach is most common in the Netherlands and can also be found in the HEA program for excellent teaching in the UK [6, 7]. The University of Twente has chosen the 2<sup>nd</sup> approach while supporting the research projects with supporting workshops and options for peer interaction. Inspiration for this approach was found at the University of Lund, Sweden [8].

## 1.2 Rationale of the SUTQ program

Based on a career framework for teaching (Fig. 1) teachers develop their competencies via SUTQ at the level of the 'skilled and collegial teacher' (2<sup>nd</sup> level), ready to contribute to the pedagogical knowledge in their own field of teaching (3<sup>rd</sup> level of the 'scholarly teacher'). The SUTQ is envisioned to impact the academic reward system in a formal way although most university boards in our country await evidence of added value before institutionalizing the benefits of SUTQ into promotion trajectories [5]. Therefore, we focus on making visible how the SUTQ design supports teachers in developing scholarship of teaching, in ways that leverage the power of teacher community interaction. A survey among potential candidates and directors of education helped define the SUTQ program. Teaching staff indicated that they would like to improve their skills and be able to approach their teaching in a more evidence informed way. Teaching skills and beliefs are powerfully influenced through an active (re)design and application of educational tasks [9,10]. Besides this design approach we invite staff to use their academic stance also in their teaching tasks that is using existing evidence and literature while (re)designing a course [8].

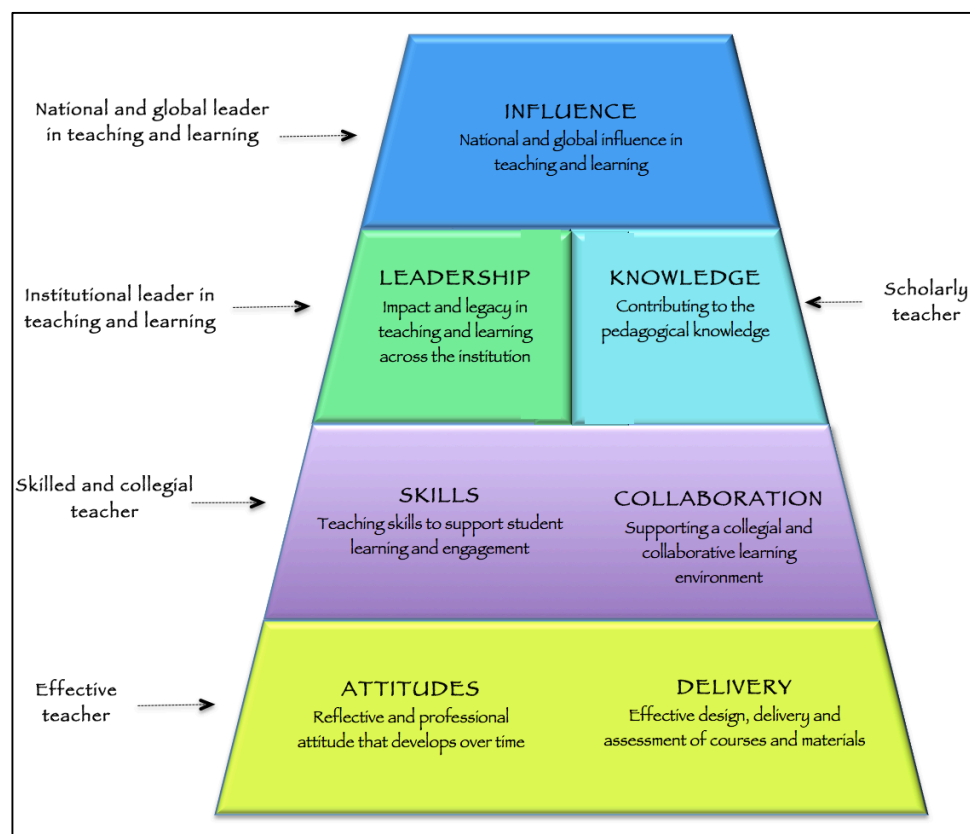


Fig. 1. Levels of teaching achievement [11, reproduced with permission].

### 1.3 Objectives

Building on the basic skills acquired in the UTQ at the 'effective teacher' level, the focus of the SUTQ program is on researching and innovating teaching, participants need to develop the following competencies: the participant is able to ...

1. Define a problem or ambition for current teaching in terms of student learning and engagement. The focus should be within the area that the participant works in.
2. Collect evidence and data either in relation to the educational research or as part of the exploratory phase before redesigning a course.
3. Analyze data and connect with literature. This leads to conclusions about the cause and nature of the problem/challenge, or ideas about the design of the intervention to achieve the ambition.
4. Design and implement an intervention or formulate insights to share with peers. Make adjustments based on discussion with peers/formative evaluation of design and present outcomes.

### 1.4 Initial design

Situated learning as applied in the initial SUTQ design emphasizes learning within the context of real-world situations. When it comes to the professional development of teachers, the need to anchor learning in real-life settings has been highlighted by many [4,12]. Specifically, research shows [13] that successful professional development programs:

- focus on the concrete classroom application of general ideas;
- expose teachers to actual practice, rather than descriptions of theory;
- provide opportunities for group support and collaboration;
- involve deliberate evaluation and feedback by skilled practitioners;
- are accompanied by sustained support;
- build on teachers' current pedagogical and content knowledge (UTQ); and
- allow for observation, critical analysis, reflection, and evaluation.

In the first round we applied these requirements and defined eight components that together make up for the SUTQ program (Table 1.). A special intake session was organised with both candidate and his or her director of education. This setup was supposed to ensure that the candidate would be facilitated with both time and the opportunity to experiment or research in a selected educational setting. The intake discussions also helped to shortlist the topics of interest taking into account available time, faculty priorities and the need for focus when researching their education.

After the intake a first group of 16 participants has started their SUTQ trajectory. During a joint kick-off meeting they met their coaches and peer teachers. Also they pitched their personal project ideas as input for a first peer reflection round in groups. Their project topics range from improved student understanding in a certain science or engineering domain, to integration of mathematics and physics in engineering courses, and new applications of ICT. During their 12 month SUTQ trajectory personal coaching, intervention sessions with peer feedback, R&D sessions and inspiration workshops are the building blocks that each of the participants should take part in. To reduce the pressure on the busy timeschedules of our teaching staff the different sessions were scheduled separately and on different workdays or evenings. In the final stages presentations for colleagues in their own departments should help disseminate the outcomes while ensuring that the participants would come to conclusions including reflections on what has been achieved with respect to professional development. For each participant an optional travel budget is available

if a work visit, an international workshop or a conference presentation would fit in with the personal trajectory.

*Table 1. Components in the Senior University Teaching Qualification trajectory*

<b>Senior University Teaching Qualification</b>	<b>Description</b>
Intake interview	Identify entry level, personal pursuit options, align with curriculum challenges, availability (160 hrs in 12 months).
Kick-off	Outline of the program. Meeting participants and coaches. Directors of Education present to show commitment.
Personal education project	Personal educational research or design activity. Link to literature and existing practises. Finishes with a reflection and a presentation.
Coaching	Educationalists available to help design, plan and evaluate.
Intervision sessions	Small peer groups supporting and commenting each other.
R&D sessions	Familiarizing engineers with educational R&D methods.
Inspiration sessions	Workshops on 'flipped classroom', 'assessment for learning' and other topics as suggested by participants.
Personal budget	Funding of a work visit or conference participation (including presentation).

## **2 EVALUATION OUTCOMES**

### **2.1 Method of evaluation**

While the first group is still underway we can already report on the mid-term evaluation which should help us optimise the second cycle of the SUTQ trajectory scheduled for 2018. The evaluation so far consists of a combination of questionnaires and discussions with both SUTQ participants (n=10) and SUTQ coaches, coordinators and experts involved (n=13). The preliminary outcomes were then discussed in a session with all coaches and experts. Changes that we plan for the second cycle will be presented to the first group of participants for comments.

### **2.2 Outcomes: priority up, complexity down**

Apart from appreciation for the opportunity to progress professionally on the educational tasks, what stands out in the evaluation is that both organisers of the SUTQ and faculties should give high(er) priority to this professional development and its strategic value. Faculties did not always find ways to reschedule tasks of SUTQ participants so as to enable full participation. Early and strict intake with respect to priority and availability is needed. Also, organisers should plan well in advance a number of days on which joint activities are planned. By scheduling different sessions around the normal daily tasks we did not encourage facilitation of time for participants and ended up with participants perceiving the set-up much more like a cafeteria model whereas we had intended it as an integral program.

Second, participants ask for improved opportunities to have peer interactions with other participants. This links to literature that shows that informal professional development is linked to microcultures or networks of colleagues with whom educational issues are discussed [8,14]. By rescheduling the separate sessions in a more clustered way on certain days participants can more easily work together and transfer what has been learned from R&D and inspiration sessions to coaching and peer intervention sessions in which progress and next steps are discussed. Also the sessions in itself will have more time for discussion among the participants who already bring a lot of educational experience themselves.

Thirdly we will reduce the number of coaches and experts involved as there are now many stakeholders involved. This will reduce the complexity. Whereas intakers, coaches, R&D experts and assessors all take part in the program we plan to reduce this to minimise the loss of information if participants are moving from one phase to the next phase. This way participants will much more team up with one SUTQ coach and their fellow colleagues while having access to relevant experts.

Finally, as we expect from our students to take the lead in their project work we had also expected our SUTQ participants to be able to formulate what inspiration sessions with invited speakers would stimulate and support them in their professional development. It turned out that participants did bring forward topics of interest such as flipped classroom implementation, team based learning and assessment for learning. By no means they were interested in selecting and inviting experts. A more facilitating approach from the SUTQ staff is appreciated and has already been implemented during this first execution of the SUTQ program.

### **3 CONCLUSIONS AND DISCUSSIONS**

Teaching staff at universities are eager to embark on senior professional development programs that link to their own personal educational settings. A first execution of the program shows that they try hard but have to manage with many other demands. This also relates to the rewarding of teaching versus research. The debate on that is ongoing [11]. The SUTQ program will be streamlined reducing complexity and improving opportunities for peer interaction. At the intake we have to ensure priority and availability to fully embark on the program. We expect those that will complete their SUTQ program and project to be a source of inspiration both for their direct colleagues and future teaching staff who are working on their teaching competencies in UTQ and SUTQ programs and beyond that in continuing scholarship of teaching networks and projects. For the university as a whole it will be of strategic importance to have a group of dedicated expert teaching staff who can build future science and engineering education that will shape our future students.

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