

EEMCS Quality Improvement Education

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July 2019

1 Introduction

In response to the request of the Ministry of Education, Culture and Science (Dutch acronym: OCW), the University of Twente develops agreements on the quality of education (in Dutch: kwaliteitsafspraken). This so called Quality Agreements will be effective until the end of 2024.

In line with the above mentioned process, in 2018 EEMCS was expected to: (i) come up with actions to improve the quality of education financed with the WSV money and (ii) to develop a long-term Quality Agenda (2019-2024) in which the vision on educational quality is given and the relation to the OCW themes is made explicit. Especially for the years 2019-2021, the Quality Agenda should be explicit and measurable, whereas for the years 2022-2024 the description may have a more global character.

2 OCW themes versus UT programmes

For the Quality Agenda it is required to specifically identify how the proposed actions connect to the following themes, prescribed by the Ministry of Education:

- i. Intensity of Education: Relation and contact between teachers and students, small groups, creating communities.
- ii. Study Success.
- iii. Differentiation in Education: Talent development within and outside the curriculum, relevant education (relationship education and research, social impact, international and intercultural experience).
- iv. Teacher Quality: Expertise and teaching skills, availability of and guidance by teachers, continuous professionalization, rewarding teachers' efforts, mutual sharing teaching materials and expertise.
- v. Guidance of Students: Equal opportunities for students regardless of background or origin, learning how to study, proactive study guidance.
- vi. Educational Facilities: Facilities to foster intensive and small-scale education, combination of physical and digital methods, future-proof facilities.

The UT has formulated five programmes, in line with its own educational vision:

1. Community Building
2. Learning facilities

3. Teaching professionalisation
4. Talent development students
5. Global citizens

In Figure 1, the relation between the UT profile and these five programmes is indicated. These five Quality Agreement Programmes are meant to consolidate action plans and to

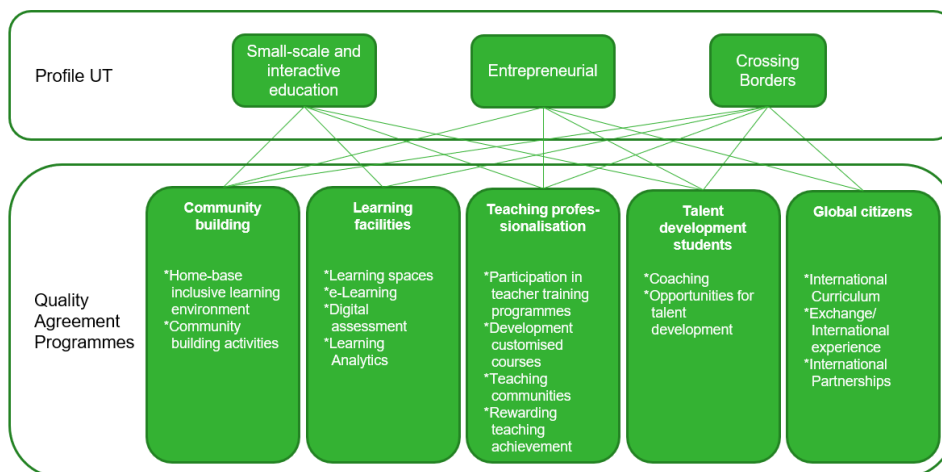


Figure 1: Relation between the UT profile and the five chosen programmes for the Quality Agenda.

focus the efforts that the UT will take in order to improve its education. They do not map one-to-one on the OCW themes, but are a mapping of these themes to our own Quality Agenda, see for instance Quality Agreements 2019, page 10.

Additional intentions of a educational programme that fit within one of these programmes can be financed by means of the WSV-budget (budget that is derived from Student Loan Fund). Intentions that don't related to these Quality Agreements Programmes will be executed as part of the regular Quality Assurance by means of regular funds.

3 EEMCS' student profile and philosophy of education

In the rapid changing society new problems arise which ask for new solutions. Who would have thought that virtual reality might relieve isolation for demented elderly people. Knowledge of today is no longer valid tomorrow. What society needs are professionals who not only want to solve today's problems but also anticipate on challenges in the future.

The faculty aims to educate professionals who are intrinsically motivated to gain knowledge and skills in order to solve complex problems within the context of the society, taking into account the possible implications of the proposed solutions. They seek challenges to cross existing borders, are flexible and creative and strive for innovation. Also they are critical and reflective on their actions and the results of their actions related to the society, disciplinary knowledge, collaboration, etc. In order to realize the development of the student profile as described above, the faculty wants to realize an inspiring, stimulating and safe environment in which students learn, experiment, make mistakes, work together, receive feedback and are challenged to improve. Naturally this is largely realized by professional teaching and support staff.

The philosophy of education of the faculty is closely connected to the student profile of the faculty. First of all, the Faculty EEMCS uses the University's profile (High Tech-Human Touch, T-shaped professional, crossing borders, entrepreneurial mindset and inclusive campus) as the basis for her own philosophy of education.

All the educational programs in the faculty EEMCS are science (Dutch: bèta) programmes. Regarding all the fast developments in the society and the emphasis on application of the disciplinary knowledge and skills in the programs, multidisciplinary is a natural element of the education. At the bachelor level, the TOM (Twente Educational Model) modules consist of related courses and a project in which the knowledge is applied in order to solve mostly real life problems. In the projects the students work in small groups and attention is payed to not only the (multi) disciplinary knowledge and skills but also to 21 century skills in a learning line. This way students learn during the programme to collaborate, to work in multi discipline- and international divers groups. Also attention is payed to the personal development of the students. They learn to reflect and become more and more aware of their own strengths and points for improvement. Feedback and mentoring are important tools for them to grow in the direction of a professional who embraces challenges and is creative in finding solutions. During the bachelor students get more responsibility and less direction which leads to the open bachelor final assignment in which they decide on the topic, the methods, the planning and so on. This can be seen as a learning line of Student Driven Learning. The faculty uses different didactic concepts in the TOM curricula, like lectures, practicals, tutorials, team based learning (TBL), problem based learning (PBL), challenge based learning (CBL) and blended learning. The diversity of pedagogical methods supports next to the achievement of the specific final qualifications the development of the students towards becoming a valuable professional in the society.

In the Master phase students proceed to become more and more owner of their own learning process. They compose their own programme and are part of a chair in which they work together with PhD-candidates and other staff members in an international diverse group. The students are stimulated to do their internship abroad and their final assignment outside the UT. This way they get real life experience to learn and work as a professional in the society.

The disciplines in the faculty have strong interrelations. This results in shared modules (see module map) and during the master phase students can elect courses of other programmes. The three building disciplines decided to launch data-science as an overarching theme. It has become a specialization within the master programs of Electrical Engineering, Computer Science and Mathematics. The next step is to set up a master program for Robotics, even across faculties. In this way we strengthen the relation between research and education.

3.1 UTeachers'Academy@EEMCS

Continuous improvement of the quality of education is important to the faculty of EEMCS. The faculty board stimulates all efforts aimed at improving the quality of education with the follow-up of the Excellent Teacher Practitioner project (2016-2018) in a new initiative called UTeachers' Academy.

The objective of the UTeachers' Academy is the continuous improvement of the quality of education to increase student satisfaction and increase value of and reward employees dedicated to the professionalization of their teaching practices. Rewarding for teaching practice extends to the possibility to be promoted to the next level, be it associate professor or full professor.

The results of efforts in the past show an increase in student satisfaction. In 2019 we have four top-rated Bachelor's programmes and one top-rated Master's programme.

4 Budget for the Quality Agreement

4.1 Budget for 2018

In line with the UT-approach at EEMCS, the individual programmes started a dialog with staff and students about the quality of the programme. The results of these discussions were collected at the faculty level, resulting in the improvement agenda 2018. This agenda was approved by the Faculty Council.

4.2 First budget scheme for 2019-2024

In the course of 2018, the investment agenda for 2018 was translated into a quality agenda for the period 2019-2024. The items on the 2018 investment agenda with a permanent character contribute to the budget of the subsequent years. Objectives for the period 2019-2024 were formulated in line with the five UT programmes. Within these programmes, the emphasis of EEMCS is on community building (1), learning facilities (2), teaching professionalization (3) and talent development (4). As learning facilities and community building are sometimes difficult to distinguish, they were grouped together. The result of this process is given in Table 1 below.

The overview shows the financial consequences of our efforts that started in 2018. If we compare this to the available budgets, we can conclude that the expenses for the Quality Agenda already exceed the available budgets in 2019, and there is a small remaining budget for 2020.

4.3 Residual money from 2018

As the money for 2018 was not fully spent, the Programme Committees were asked to formulate additional plans to the amount of 269 k€. Plans were collected in June 2019 and a proposal for a selection of these is presented below, to be discussed with the Faculty Council mid August 2019. In Table 2 we present the new budget form for the years 2019-2024. The remaining money for 2018 is added to the budget. To get a balanced budget, it is divided over the years 2019-2021, with the largest amount in the budget for 2019.

From table 1, the only two items that do not come back in the new budget are items numbers 3 and 13. The climate control of the Educafé is realized from general UT budget. The fte's involved in the development of the course filling system can be found on the general EEMCS education budget. Item number 12 got a slightly lower budget attached to it. Item number 13 will be financed from general EEMCS education means.

We plan to have meetings with representatives of the Programme Committees and the Faculty Board twice a year, once in quartile 2 and once in quartile 4 to discuss progress and development. Although we present a detailed budget in Table2, we still will have freedom to adjust it, if appropriate. That could even imply that we abandon one the measures, if it turns out after evaluation not to be successful.

4.4 Assessment of the Quality Agreements by the NVAO

In June 2019, the board of the university received a letter from the NVAO, see Appendix B. In this letter, the NVAO explained how they will assess the Quality Agreements. Until

		Teacher Professionalization	Talent Development	Community Building / Learning Facilities	2018	2019	2020	2021	2022
1.	My DAQ's for students			+	20	20	20	-	-
2.	Teacher support for modules (1fte)	+	+		40	60	60	-	-
3.	Improve Climate control Educafé			+	50	-	-	-	-
4.	Upgrading student workspaces in the research groups			+	30	-	-	-	-
5.	Extra capacity for programme coordination	+	+		40	80	80	80	80
6.	Extra training facilities for student assistants		+		5	5	5	5	5
7.	Additional sockets in lecture and project rooms			+	5	-	-	-	-
8.	Technical (software) support staff education	+			40	60	60	60	60
9.	Lecturer capacity for digital testing in programming education (0.5fte)		+		20	-	-	-	-
10.	More room in EEMCS for small project groups			+	10	10	-	-	-
11.	Expand lecture recording facilities including metadata and editing			+	20	-	-	-	-
12.	Professionalization of student mentoring (0.8 fte)		+		35	70	70	70	70
13.	Design and start using course filing system (1fte)	+			10	-	-	-	-
14.	UTeachers'Acadamy@EEMCS	+	+		20	40	40	40	40
15.	ECA framework internationalization (0.8fte)	+	+		40	80	80	80	80
Estimated total investment from WSV budget					385	425	415	335	335
Available WSV budget					393	391	444	772	980
Budget still to be allocated and decided upon in consultation with students / programmes					8	-34	29	437	645
Additional Quality investments from general EEMCS education means									
16.	Lecturer capacity for digital testing in programming education (0.5fte)	+			-	40	40	40	40
17.	Design and start using course filing system	+			-	40	40	40	40

Table 1: Quality Agenda of EEMCS, formulated in May 2019, extrapolated from the input in 2018. For a detailed explanation of the items in this list, see Table 1.

June 2019, they visited 23 institutions, some of which received a negative review. Based on this, the board of this university asked to elaborate:

1. how the investments specifically contribute to an increase in the quality of education. (It should be clear that investments concern additional or new measures)
2. what measurable and assessable results the faculty wants to accomplish by means of the revenues from the student loan system. item how the faculty intends to invest the income of the student loan system during the whole period of the quality agreements (until 2024)

This deviates slightly from the original idea that making the plans for the Quality Agreements should be completely a bottom up process. Obviously, there are consequences for the plans we formulated before. *As those plans were based on the input from the students, they will all be realised, as promised.* The only difference is that we realise plans that do not entirely meet the above boundary conditions from our regular budget for education, rather than from the budget for the Quality Agreements.

The additional plans for 2018 that meet the above conditions better than the original ones will be inserted in our Quality Agenda for the years 2019-2024. As required, the Faculty Council will be asked for consent on a yearly basis.

Based on the old plans, the wishes for the spending of the remaining budget from 2018, and the new insights for dealing with the budget for the Quality Agreements, we formulate ten measures for the EEMCS Quality Agreements. These are elaborated in section 5.

4.5 Input from the Programme Committees in June 2019

The Programme Committees formulated their wish lists after consultation of the Student Associations. From this list we have selected a few common items that also fit well in the strategy of the faculty and that meet the conditions for the Quality Agenda:

1. Academic skills and mentoring.
2. Professionalization of Teaching Assistants in the form of a training program, application tool and community building.
3. There is a need for video-recordings of lectures and micro-lectures as a learning tool.
4. There is a need for well equipped study facilities that are directly related to our research programs. In particular this concerns lab facilities for Create/I-tech, data- science and Electrical Engineering (Welpzaal).

In the subsections below we give some additional considerations for the first three items on this list. The last one we address first.

As we plan a new master programme in Robotics, jointly set up with the faculty ET, we plan a Robotics-lab from 2022 on.

4.5.1 Student labs in the vicinity of research groups

Goal

- to create student work spaces in the in the form of well equipped labs;
- to create student communities;
- to develop a strong relation between research and education.

Context

The faculty EEMCS is convinced that having well equipped labs contributes strongly to community building and enables to develop a strong relation between research and education. The data-science lab is under construction, and gets a proper support from all disciplines. It is well worth investing and we foresee a growing need in the future.

The HMI-lab relies at present too much on the research groups. Investments are needed to run this lab more independently, which requires proper investment in tools and staff to maintain it.

The EE-lab (Welpzaal) has some deferred maintenance, and is also in need of support staff to guide student projects. The benefit for students will be that they can work in an up-to-date research environment, well supported by staff.

Planning

- upgrading of the Welpzaal will start in 2019; additional supporting staff will be ap-

pointed;

- setting up a data-science lab has already started; a postdoc was hired for two years to set it up and to create an environment for master students in data-science;
- at present a joint Master's programme with the faculty ET is under investigation. We plan a student lab and reserve budget from 2022 on.

Costs

- initial investments in the data-science lab, HMI-lab and EE-lab 80 k€
- support staff for data-science lab, HMI-lab and EE-lab 200 k€/yr
- support staff for robotics-lab (starting 2022), 80 k€

4.5.2 Mentors for learning Academic Skills

Goal

- to formulate a flexible academic skills line which could be adapted to the needs of the educational programme;
- to better support students in order to develop academic skills;
- high responsibility of students to show growth in academic skills;
- to train mentors to maximize the learning results of the students;
- to help students getting familiar with our education system, culture, finding all resources they need.

Context

Mentors are students and/or lecturers specially selected and trained to work with students on the development of skills necessary for academic success at EEMCS such as presentation skills, being innovative, teamwork and study strategies. Mentors can help students to explore directions for professional and academic development, stimulate students to make their own development plan and give feedback on the implementation of this plan and feedback on the mastering of academic skills) Mentors draw on their personal experiences as well as their training to mentor younger students. Besides, workshops (given by professionals, or available with self-study materials) are being organized by lecturers to help students to further develop their skills. During the first study year the mentors will also be invaluable in helping first-year students access all the resources available on campus and to give them the feeling that they are part of the EEMCS community.

During the study programme and within modules students get opportunities to practice different academic skills. In each module a certain amount of EC's is made available for the development of academic skills. Several times during the first two bachelor years the development of the skills will be evaluated by mentors, giving the students diagnostic feedback on their development. In the end of the second year, students show individually their progress on the academic and professional skills in a meeting with at least two different lecturers/assessors. This is done by collecting evidence in a portfolio which is accessible for the assessors and mentor and giving a presentation where the student will show his progress on different academic skills.

Planning

October 2019 - June 2020: startup

- identifying mandatory and choice academic skills and mentoring programme;

- creating content/education, workshops for academic and professional skills;
- review with students/lecturers about the skills and mentoring of first year students;
- improve academic skills programme and mentoring programme based on review findings.

September 2020 - July 2021: Implementation

- Pilot with one EEMCS educational programme: 2020-2021.

June - September 2021: Evaluation

- Evaluation with students and lecturers about the academic skills and mentoring programme.

Costs

- Development flexible skills line (100 hr), including workshops given by professionals (300 hr yearly);
- Development of assessment of academic skills line (20 hr)
- Development of mentoring programme (40 hr)
- Development training programme for mentors (40 hr)
- Training for mentors (for mentoring and skills line (25 hr)
- Implementation and evaluation in at least one educational program (50 hr)

Total budget: 275 hr + 300 hr (for hiring professionals for academic skills line -yearly-). We foresee a growing need for mentoring when we develop to a truly international university and faculty. Consequently we have raised the reservation on the budget in the last three years.

4.5.3 Training Teaching Assistants

Goal

The main goal is to improve the quality of guidance of students during tutorials and practicals. The project has the following objectives:

- Research the current problems with teaching assistants and process them into a new skills line;
- Train teaching assistants for tutorials and practicals and self-study;
- Develop a register tool for (potential EEMCS) teaching assistants, where they can describe their availability, preferences for courses/educational programmes, where they want to guide students, etc.)

Context

A teaching assistant-ship offers students opportunities to learn how to teach in exchange for money. There are many benefits for students and lecturers and faculty. A teaching assistant may help a professor teach an especially large class, grade papers, run classroom related activities, and perform other tasks. Therefore, it's really important to have a pool with teaching assistants and that teaching assistants are very good prepared to their job to increase the amount of teaching time of the professor and to reach high quality guidance of students who follow the specific course/module.

Benefits for students are that they really come to understand the subject through teaching

a subject. They will explain (complicated) concepts in their field and develop a more sophisticated understanding of them. The relationships they develop with the professors could be important to their future success. By being a teaching assistant students will be able to interact with professors closely and will become more well known by faculty staff and develop a few close relationships that can lead to important opportunities in the future.

Planning

October 2020-June 2021:

- Research the current problems with TA's;
- Develop a training based on the current DISA training;
- Implement the new training and train TA's for tutorials and practicals and self-study;
- Develop a register tool for (potential EEMCS) TA's where they can describe their availability, preferences for courses/educational programmes where they want to guide students, etc.).

Costs

- Research the current problems with TA's (15 hr);
- Develop a training based on the current DISA training (25 hr);
- Implement the new training and train TA's (40 hr);
- Develop a register tool for (potential EEMCS) TA's where they can describe their availability, preferences for courses/educational programmes where they want to guide students, etc. (45hr);
- Evaluate the results with the teaching assistants and lecturers (25 hr).

Total budget: 150 hr. When successful, we will scale this up in the years 2022-2024.

4.5.4 Video lectures at EEMCS

Goal

Making the best of video lectures at EEMCS. A video lecture is the recording of a lecture. This will take place in a standard/usual lecture room while the lecturer delivers the lecture as normal. Video lectures are usually used to support students, enabling them to revisit a lecture if they didn't grasp something first-time around or if they were unable to attend. The project has the following objectives:

- to record lectures for students;
- implement one or more interactive aspects in the video lectures to stimulate application, critical thinking and deeper understanding;
- Researching (not only if students watched the video lectures but also, and more important, researching) the question "What did students learn from watching the video lectures?"
- Phase 1: 10% of the EEMCS courses offers video lectures;
- Not in this project: Phase 2: Based on evaluation results a new goal (20%) will be established.

Context

A video lecture is not intended to replace the live lecture for students. In this project video lectures offer a complementary service to students. Advantages for students:

- If the lecture covers new terminology or complicated material which must be remembered and understood, it is an enormous help to students to be able to play back the lecture at their own pace and look again at specific topics they may not have fully understood the first-time round;
- Students can repeat the material as additional preparation for exams;
- Students who are sick or cannot attend the lecture for other reasons can still follow the lectures;
- Students abroad can also follow the lectures;
- Disabled students can also follow the lectures;
- As different students prefer to learn in different ways and at different paces, giving them the flexibility to view a lecture in their own time. Especially those students who find it difficult to learn from lectures or are lagging behind have an alternative method of delivery to suit their learning style.

Benefits for lecturers:

- use video lectures for (re-)use in other courses, for example pre-knowledge for other courses;
- use video lectures for showing lectures by guest lecturers;
- video lectures offer the possibility of adding additional sources, background information, comments, questions and feedback;
- Video lectures offer the lecturers to make the lecture even more interactive, for example by adding Multiple Choice questions or small assignments in the video.
-

Lecturers can sign up for recording their lectures, starting with 10% of the total amount of courses/lectures.

Planning

October 2019- June 2020 (10% of total amount of courses/lecturers)

Start up:

- Finding lecturers/courses/modules for recording video lectures. Realisation;
- Recording lectures (possible in all lecture rooms);
- Adding interactive elements to the video lectures Implementation;
- Making the interactive video lectures available through Canvas Evaluation;
- Evaluation with students and lecturers about the usefulness of video lectures.

October 2020- June 2021: Phase 2 (next 20 % of total amount of courses/lecturers) (Total 30%)

October 2021- June 2022: Phase 2 (next 30 % of total amount of courses/lecturers) (Total 60%)

October 2022- June 2023: Phase 2 (next 40 % of total amount of courses/lecturers) (Total 100%)

Costs

Phase 1:

- Finding lecturers/courses/modules for recording video lectures. Intake with lecturers

(60 hr).

Realisation

- Recording lectures (possible in all lecture rooms) (250hr Lectures, LISA, TELT);
- Adding interactive elements to the video lectures (250hr, Lectures, CELT, LISA, TELT).

Implementation:

- Making the interactive video lectures available through Canvas (is part of the organisation of the course).

Evaluation

- Evaluation with students and lecturers about the usefulness of video lectures (60 hr, CELT, Lecturers).

Total budget: 620 hr in the academic year 2019-2020. We foresee a growing need, if successful, in the years thereafter.

4.5.5 Micro-lectures for the Math line

Goal

Producing micro-lectures for the math line. The micro-lectures are provided to students as extra learning materials. This means that students can follow the weekly 'normal' lecturers as well. The project has the following objectives:

- Define a relevant kind of microlecture for the math line. (microlecture, penecast, screencast, ...). Decision on what kind of video should be the focus for the math line;
- to train lecturers to record 'professional' micro-lectures;
- record professional micro-lectures for the math line;
- researching (not only if students watched the microlectures but also, and more important, researching) the question "What did students learn from watching the micro-lectures?"
- Phase 1: 25% of the Math line offers micro-lectures;
- Phase 2: 50% of the Math line offers micro-lectures;
- Phase 3: 75% of the Math line offers micro-lectures;
- Phase 4: 100% of the Math line offers micro-lectures;
- Evaluate results (kind of video, amount of students who think the small lectures are useful, etc.);

Not in this project: Phase 2-4: Based on evaluation results a new goal (phase 2-4) will be established.

Context

It is important to recognize that micro-lectures are NOT simply a short video; micro-lectures utilize short video but incorporate active learning strategies to promote student learning. Micro-lectures allow students to control the pace and sequence of learning, provide opportunities for unlimited review of course concepts, and promote active engagement with course material. In this project we use micro-lectures for small 2-10 minute lectures, penecasts and screencasts.

With micro-lecture the lecturer can give students a brief overview of the content with key concepts, and demonstrate a problem solving procedure/give a step-by-step instruction for math problems. This is appropriate especially for concepts and assignments that are difficult to understand. Easy re-usability of micro-lectures over time and in different modules (pre-knowledge). And updating a 5 minute lecture is easier than a 45 minute one.

The main benefits for students are the following. With core-focused micro lectures students can control their own learning. They can choose which lesson/content to watch and move through them at their own pace. They can return to and replay micro-lecture any number of times.

Planning

October 2019- June 2020 (one subject), Phase 1:

Start up

- Finding lecturers/courses/modules for recording micro-lectures (one subject, for example Linear Algebra);
- Train lecturers to record micro-lectures;
- Develop a plan for micro-lectures.

Realisation

- Recording micro-lectures;
- Adding interactive elements to the video lectures Implementation;
- Making the micro-lectures lectures available through Canvas.

Evaluation

- Evaluation with students and lecturers about the usefulness of micro-lectures.

October 2020- June 2021: Phase 2 (next subjects) (Total 50%)

October 2021- June 2022: Phase 2 (next subjects) (Total 75%) October 2022- June 2023: Phase 2 (next subjects) (Total 100%).

Costs

Phase 1:

- Finding lecturers/courses/modules for recording video lectures. Intake with lecturers (40 hr);
- Train lecturers to record microlectures (100 hr, Lecturers, TELT);
- Develop a plan for microlectures (100 hr, Lecturers, TELT).

Realisation

- Recording lectures (150 hr Lectures, LISA, TELT);
- Adding interactive elements to the video lectures (100 hr, Lectures, CELT, LISA, TELT).

Implementation

- Making the interactive video lectures available through Canvas (is part of the organisation of the course).

Evaluation

- Evaluation with students and lecturers about the usefulness of video lectures (60 hr,

CELT, Lecturers).

Total budget: 550 hr (phase 1). We foresee growing costs when successful. The budget is therefore raised in the years 2022-2024.

5 Plans for the Quality Agreements until 2024

FACULTY OF EEMCS

COMMUNITY BUILDING & LEARNING FACILITIES

Ambition Create labs where students can study close to EEMCS academic research groups.

Measure 1: Create additional project rooms, well equipped, including technical support staff (HMI,EE and data-science-lab) & education support staff

Target until 2021: three well equipped and staffed labs.

Intended effect for students: Students experience the educational building as a safe and stimulating environment, and a good place to develop their talents in close contact to research groups. They feel part of the academic community and contribute to research projects. Students experience environment in which education and research are interwoven. Teachers can find students in regular places. EEMCS intends to apply the lab-concept to other research areas as well. In particular, a robotics-lab is planned from 2022 on.

	2019	2020	2021	2022	2023	2024
<i>Budget</i> Datascience-lab	60	40	40	80	80	80
HMI-lab	120	80	80	80	80	80
EE-lab (Welpzaal)	100	80	80	80	80	80
Robotics-lab	-	-	-	80	80	80
measure 1	280	200	200	320	320	320

For the setup of the labs we make a reservation of 80 k€ in 2019. For the data-science lab we foresee a growing need.

LEARNING FACILITIES

Ambition Make use of modern tools to facilitate students and staff aiming to

- increase accessibility of lecturers for students;
- to help students better understand difficult concepts;
- to offer more flexible ways of learning and to support students in designing their own learning experience;
- to organise explanation of theory more efficient so that more is left for interactive education/tutorials.

Measure 2: Video lectures
Target until 2021: 30% of all lectures are recorded.
Intended effect for students Support for Student Driven Learning, flexible learning;

Measure 3: Micro-lectures
Target until 2021: The math-line is available in micro lectures.
Intended effect for students: Support for Student Driven Learning, flexible learning, explanation of difficult concepts.

Measure 4: Hire additional technical staff to develop software that will be used for digital testing and programming education. This support staff will investigate available tools and integrate them in programming education.
Target until 2021: In 2021, digital testing is used in all Bachelors programmes as a tool for testing but also as support in the learning process. Programming education is on-line available.
Intended effect for students More and better personalized feedback and programming tools to support the learning process. The outcome of the NSE can serve as a way to measure this.

Measure 5: Hire additional staff for programme coordination
Target until 2021 Hire 1.5 additional fte for module and master coordination, thereafter extend when successful.
Intended effect for students Teachers have more time available for individual contact with students.
 More and better personalized feedback and programming tools to support the learning process.

	2019	2020	2021	2022	2023	2024
<i>Budget</i> measure 2	40	40	40	75	75	75
measure 3	40	40	40	80	80	80
measure 4	60	60	60	60	60	60
measure 5	120	120	120	180	180	180

6 Budget for the Quality Agreements

In the first three years, required is 1925 k€, while available is 1617 k€. The difference, 308 k€ is almost covered by the remaining budget for 2018, i.e. 269 k €.

TALENT DEVELOPMENT

Ambition Students are stimulated to develop their own talents

Measure 6: Professional mentoring of students
Target until 2021: All staff member with a mentoring task have been trained.
Intended effect for students: Students

- feel more competent to develop their talents;
- reflect on their own talents and motives;
- actively explore future (career) possibilities.

Measure 7: Student assistants with educational competencies
Target until 2021 50% of the student assistants follow training program.
Intended effect for students: Paradigm shift, responsibility, other perspective on disciplinary content.

	2019	2020	2021	2022	2023	2024
<i>Budget</i> measure 6	40	40	40	110	110	110
measure 7	10	10	10	50	50	50

TEACHING PROFESSIONALISATION

Ambition Stimulate professionalisation of teachers

Measure 8: Introduce UTeachers' AcademyEEMCS, a network of EEMCS teachers who have the ambition to improve their performance based on literature, experiences elsewhere, or input from colleagues.

Target until 2021: 15 participants in UTeachers' AcademyEEMCS per 2021.
Intended effect for students: The philosophy and practise of teaching methods is optimal for our student community.

Measure 9: Additional training facilities for teachers.
Ambition: In 2021, we have per year on average two staff members enrolled in the LOL-programme, two staff members enrolled in the SKO traject and one staff member enrolled in the SKE traject.
Intended effect for students: Students experience a professional education environment. They experience that teachers' teaching skills improve, to be measured via the NSE.

	2019	2020	2021	2022	2023	2024
<i>Budget</i> measure 8	40	40	40	40	40	40
measure 9	25	25	25	25	25	25

GLOBAL CITIZENS

Ambition: Development of international curriculum in our Bachelor and Master programmes

Measure 10: Reserve 0.4 fte to adjust programmes to an international standard
Target until 2021: In 2021, two programmes within EEMCS have obtained the ECA qualification for internationalization.

Intended effect for students: Experience an international, inclusive classroom, preparing for an international career, and a programme with international and intercultural learning outcomes.

<i>Budget</i>	2019	2020	2021	2022	2023	2024
	measure 10	40	40	40	40	40

measure	2019	2020	2021	2022	2023	2024
measure 1	280	200	200	320	320	320
measure 2	40	40	40	75	75	75
measure 3	40	40	40	80	80	80
measure 4	60	60	60	60	60	60
measure 5	120	120	120	180	180	180
measure 6	40	40	40	110	110	110
measure 7	10	10	10	50	50	50
measure 8	40	40	40	40	40	40
measure 9	25	25	25	25	25	25
measure 10	40	40	40	40	40	40
total required	735	655	655	980	980	980
available	391	444	772	980	980	980

Table 2: The budget outline for the years 2019-2024.

A Explanation budget sheet 2018

1. My DAQ's are a pc-controlled generator, scope, network analyzer and more. By using this My DAQ the student will have more freedom for doing their labs, because they are no longer dependent on the Westzaal, so more free space in the Westzaal, less study pressure and more time to learn.
2. Teacher support for modules means that a module gets an extra (non-)technical person to do all the administrative work. This will give the teacher more time for students. So, the guidance, teacher quality and intensity will be much better.
3. Climate control Educafé is needed to make a better environment for students to study in the Educafé which is now sometimes poor because of the high temperature in the Educafé.
4. Upgrading student workspaces in labs of research groups means that there is enough space in the labs for students to do their work. This should also result in students finding their home-base in these labs/environments, having places to collaborate in projects and being able to study collaboratively.
5. Analysis shows that at EEMCS the programme coordination for the master is too limited. Extra course coordination will lead to more support for teachers and students.
6. Training in particular in the area of professional skills and competencies.
7. No further explanation needed
8. Within Computer Science there is high demand for building, maintaining, and technically supporting various tools and systems for education, such as TAhelp me, TCS M3 Challenges, OpenEdx, and digital programming tests, to increase the observed quality of the teaching. Systems for blended learning and digital tests (exams) are also of interest for BIT.
9. Feedback and correction of practice programs and tests are perceived as bottlenecks of programming education. Dedicated lecturer capacity to investigate available tools, and integrate them in our programming education could improve this situation, and at the same time help the TCS bachelor deal with the increasing student numbers. Bottleneck in programming education also holds for BIT.
10. No further explanation needed
11. No further explanation needed
12. To alleviate lecturers and to improve mentoring we will hire additional expertise in the area of student mentoring
13. The introduction of a "vakdossier system" (course filing system) containing and disclosing all course relevant information for teachers enhances teacher quality and quality assurance
14. As a follow up of the ETP program we will introduce the UTeachers' Academy@EEMCS. This is a network of EEMCS teachers who have the ambition to improve their performance based on literature, experiences elsewhere, or input from colleagues. Members get the opportunity to execute pilot studies and to discuss the outcomes with colleagues.
15. We will make a start monitoring the ECA qualifications for internationalization. This will be a major effort for most of our bachelor/master programs. We intend to achieve

that our programs and teachers pay ample attention to the development of intercultural competences and provide specific international experiences.

B Letter of the NVAO



Aan het college van bestuur

Datum 6 juni 2019	Uw kenmerk -	Ons kenmerk NVAO/20191923
Bijlagen -	Dossiernummer 008109	
Onderwerp Aandachtspunten planfase kwaliteitsafspraken		
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Geacht college van bestuur,

De afgelopen periode heeft de NVAO de eerste 23 bezoeken afgelegd in het kader van de beoordeling van de plannen voor de kwaliteitsafspraken bij instellingen. Dit heeft tot wisselende resultaten geleid. Over een aantal instellingen heeft de NVAO een positief advies gegeven aan de minister, maar er zijn ook instellingen die een negatief advies hebben gekregen. In deze brief ga ik in op de opvallende zaken uit de reeds uitgevoerde panelbeoordelingen met als doel een negatieve (herstel)beoordeling te voorkomen.

Een eerste aspect dat naar voren komt, is dat de beoordeling een ander karakter heeft dan de andere beoordelingen die de NVAO doet. In opdracht van de minister en conform de sectorakkoorden toetst de NVAO bij de plannen voor de kwaliteitsafspraken de aanwezigheid van een concreet uitgewerkt meerjarig plan voor de besteding van de studievoorschotmiddelen dat tot stand is gekomen in samenspraak met de onderwijsgemeenschap van de instelling. Dit vergt een andere houding van het panel dan dat bij de Instellingstoets Kwaliteitszorg (ITK) het geval is. Het panel beoordeelt in de ITK op basis van vertrouwen visie, beleid, besturingswijze en kwaliteitsborging inzake onderwijs. Voor de kwaliteitsafspraken wordt beoordeeld of de gevraagde onderdelen van het plan (inhoud, proces, realisme) er daadwerkelijk zijn. Daarmee krijgt deze beoordeling meer het karakter van een audit. Indien de beoordeling voor de kwaliteitsafspraken wordt gedaan tijdens het bezoek voor de ITK, is dit als op apart onderdeel opgenomen in het programma.

Ten tweede kijkt het panel naar de meerjarige uitwerking van het plan. Ten grondslag aan de beoordeling liggen de sectorakkoorden (met als onderdeel hiervan 'Investeren in Onderwijskwaliteit, Kwaliteitsafspraken 2019-2024'), het Protocol Beoordeling kwaliteitsafspraken Hoger Onderwijs 2019-2024 en het Besluit kwaliteitsbekostiging

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hoger onderwijs. In het akkoord over de kwaliteitsafspraken staat beschreven dat de instelling één of meer van de zes overeengekomen thema's vertaalt in concrete maatregelen en beleid en hierin een gemotiveerde keuze maakt. Hiervoor worden doelen en voornemens gedefinieerd door de instelling, in dialoog tussen studenten, docenten, relevante externe belanghebbenden, bestuurders, medezeggenschap en toezichthouders. De instelling laat in een plan zien waar zij met de inzet van de studievoorschotmiddelen naar streeft tot en met 2024 en neemt in het plan de voorgenomen bestedingen op (pagina 3 van Investeren in Onderwijskwaliteit, Kwaliteitsafspraken 2019-2024). De meerjarenbegroting is onderdeel van het plan (pagina 4 van de sectorakkoorden). Daarbij staat ook in het sectorakkoord dat de instelling in haar plan tevens formuleert welke voortgang zij in 2021 wil hebben geboekt met de verwezenlijking van haar voornemens (pagina 3 van Investeren in Onderwijskwaliteit, Kwaliteitsafspraken 2019-2024). Zoals ook in de sectorakkoorden is opgenomen, is tussentijdse bijstelling van de doelen en voornemens mogelijk.

De NVAO heeft vanaf de uitwerking van het protocol aangegeven dat voor de beoordeling door panels het plan voor de jaren 2019, 2020 en 2021 concreet moet zijn uitgewerkt en dit voor de jaren 2022, 2023 en 2024 meer op hoofdlijnen kan. Het is voor het panel van belang om de concrete uitwerking te kunnen beoordelen, vanwege de in criterium 3 benoemde toets op realisme en ten aanzien van de monitoring van de voortgang. Concreet betekent dat de voornemens en de beschikbare middelen tenminste voor drie jaren zijn vastgelegd en uitgewerkt in concrete plannen. Een niet geoordeelde reservering is niet toereikend.

Een derde aandachtspunt is de relatie tussen de centrale bestedingen en de eventuele decentrale bestedingen. Zodra de instelling besluit dat de middelen decentraal worden besteed, wordt daarmee de verantwoordelijkheid decentraal belegd. Het panel spreekt dan met decentrale belanghebbenden en neemt tevens kennis van de decentrale plannen, die dan ook wel, zoals in de vorige alinea beschreven, concreet en meerjarig moeten zijn uitgewerkt. De plannen van alle decentrale eenheden moeten uitgewerkt en beschikbaar zijn. Het panel zal tijdens het bezoek bij grotere instellingen een steekproef nemen en de daarbij betrokken belanghebbenden spreken. De instelling doet hiervoor een voorstel aan het panel. Een decentrale invulling laat overigens onverlet dat het bestuur van de instelling eindverantwoordelijk blijft voor de plannen en het proces; er komt ook een advies per instelling.

Zorgvuldigheid en consistentie zijn van belang in deze procedure. De NVAO heeft regelmatig contact met de betrokken partijen uit het sectorakkoord (Ministerie van OCW, VH, VSNU, ISO, LSvB, bestuurders en medewerkers van instellingen). Daarnaast is er regelmatig overleg met de panelvoorzitters, worden paneladviezen gecontroleerd op consistentie van oordelen en kijkt het dagelijks bestuur van de NVAO nog eens kritisch naar de paneloordelen en komt op basis van consistentie zelfstandig tot een advies.

Ik hoop u hiermee voldoende geïnformeerd te hebben. Indien u vragen hebt, kunt u contact opnemen met Anke Schols (NVAO coördinator Kwaliteitsafspraken) via kwalitytsafspraken@nvaonet.

Hoogachtend,

Dr. A.H. Flierman
(voorzitter)