

## Appendix B :

### Active learning and aligned teaching

### University Teaching Qualification programme for lecturers at UNESCO-IHE

This document describes a programme designed to provide senior lecturers at UNESCO-IHE with the opportunity to obtain their **UTQ (University Teaching Qualification) certificate**.

#### Introduction

Teaching and learning take place in an environment of classrooms, buildings, and labs. In a good educational system, all aspects of teaching, learning and assessment are tuned to support high level learning, so that students are encouraged to use higher-order learning processes. 'Constructive alignment' (CA) is such a system. It is an approach to curriculum design that optimises the conditions for quality learning.

'Constructive alignment' starts with the notion that the learner constructs his or her own learning through relevant learning activities. The teacher's job is to create a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes. The key is that all components in the teaching system - the curriculum and its intended outcomes, the teaching methods used, the assessment tasks - are aligned to each other. All are tuned to learning activities addressed in the desired learning outcomes. (John Biggs, 2003)

**University Teaching Qualification programme (UTQ)** is offered to UNESCO-IHE faculty as an aid to improving their teaching in general and specifically to apply CA in their teaching activities. Each participating faculty member is required to invest a total of **about 130 hours** over the course of approximately one year.

#### Method

The UTQ program is facilitated by a qualified educationalist (coach). Participating teachers work independently over the course of the programme on putting together a UTQ portfolio. During the programme, they discuss their interim portfolio products with each other and their coach in feedback meetings. The products consist of teaching materials that lend insight into their didactic competencies, self-assessments and evaluations by third parties. The portfolio is finally assessed by a UTQ portfolio examination committee. The UTQ certificate will be issued upon obtaining a positive assessment.

The programme involves the following components:

1. **An Introductory meeting** with the aim to create a feeling of fellowship, to fully inform participants of the plans and to ensure that expectations are in general agreement. It is important to plan a collective starting point. The 2 hours course consists of an information session, and discussing and answering questions. In preparation participants have to fill in an intake form, and read the programme setup.
2. **Refresher Course**  
This module about active teaching and constructively aligned teaching covers basic concepts such as learning goals, teaching methods and testing, all of which are applied in the training of the participants by means of practical assignments and exercises. The assignments and exercises are input for the portfolio. The course is in the form of a 3 x 3.5-hours workshops: interpretation, assignments, exercises, self-motivation, feedback, question-and-answer sessions and discussion. Participants have to do homework assignments
3. **Compiling a portfolio**  
Each participant has to compile a portfolio by collecting teaching material and validations, and writing self- assessments. They have to peruse and respond to (parts of) the portfolios of other participants, and process the feedback of colleagues. The total workload of compiling a portfolio is about 80 hrs. A full description on the content of a portfolio is given below.
4. **Feedback meetings**  
Teachers learn well and willingly from each other. Every 6 weeks 2 hour feedback meetings are held so that they can help each other to compile their portfolios. In these, they are assisted by a UTQ coach. They are able to explain their teaching material, self-assessments and difficult situations, and process the tips and solutions they receive into their critical self-assessments. They have to read and formulate feedback on portfolios of fellow participants
5. **Observing and delivering lectures**  
The aim of this activity is learning to reflect on lectures given by colleagues, awareness of important points in the delivery of a good lecture, discovering what succeeds and what requires improvement, and identifying and formulating points for improvement. Use is made of an observation form and when possible: making a video recording, followed by a discussion and reporting by the teacher who gave the lecture
6. **Optional: taking a didactic course**  
In order to write a good self-assessment and have sufficient didactic material to take to the feedback meetings, participants may take a didactic course on a subject that best suits their experience, interests and tasks. This course could deliver products that can be included in the participant's portfolio.
7. **Optional: coaching on the job**  
If lecturers would like to receive more feedback on their teaching practice they can ask the UTQ coach to attend their class. Afterwards the coach will discuss the teaching activity.

## Portfolio

The compilation of a (digital) portfolio is the core activity of this programme: the portfolio should reflect the didactic competencies of the participant in the programme and will be assessed as such.

**Table 1: UTQ Competence profile with final achievement levels**

<p><b>A Developing teaching; the lecturer can:</b></p> <ol style="list-style-type: none"><li>1. re(develop) a course using specifically formulated learning objectives</li><li>2. develop effective, efficient and Active learning methods and also choose and/or develop suitable study materials in order to achieve the learning objectives</li><li>3. take the teaching context of the institute/faculty into account.</li><li>4. take the entry levels of the students into account</li><li>5. take the specific didactic requirements of the discipline into account.</li><li>6. demonstrate a relationship between the content of the course components he/she teaches and the academic research performed in his/her discipline.</li><li>7. design a test plan, including assessment criteria and, using this, develop tests to check whether the students have met the learning objectives sufficiently well.</li></ol>
<p><b>B Implementing teaching; the lecturer can:</b></p> <ol style="list-style-type: none"><li>1. provide insight into the formulated learning objectives or competences</li><li>2. use the formulated learning objectives and the students' entry levels to choose effective and efficient teaching methods and offer suitable study materials.</li><li>3. motivate students to interpret and design their own learning process</li><li>4. use technical aids in a didactically suitable manner.</li><li>5. supervise groups of and individual students and give them effective feedback during the learning process</li><li>6. support students in their development of academic skills</li><li>7. assess the learning process in groups of and individual students.</li><li>8. use student test results to assess whether learning objectives have been achieved</li></ol>
<p><b>C Organising and coordinating teaching; the lecturer can:</b></p> <ol style="list-style-type: none"><li>1. work in a team (e.g. course committees, semester/annual meetings) to agree on activities and to collaborate with colleagues.</li><li>2. plan teaching materials, exams, integration of administrative tasks and completion of teaching activities so they are logistically feasible and are implemented on time.</li><li>3. describe university and faculty regulations that are relevant to the teaching process, such as the Course and Examination Regulations and the role of relevant bodies, such as the Board of Examiners, Board of Studies and the department administration.</li></ol>
<p><b>D Evaluating teaching; the lecturer can:</b></p>

1. compile an evaluation plan, implement and analyse the evaluation results and draw conclusions about his/her teaching quality.
2. analyse test results and draw conclusions on the quality of learning, teaching and testing
3. formulate and implement enhancements that have been recommended for both teaching processes and products

***E Professionalisation; the lecturer can:***

1. acquire an understanding of developments in the didactics of higher education and also apply them in such a way that the methods used match established learning objectives or competences.
2. reflect on his/her own work and the students' work, and is aware of any problem areas in the way he/she performs.
3. reflect on his/her own performance and then formulate resolutions to improve activities and personal objectives relating to professional development.

Competences are demonstrated by means of the teaching portfolio which contains three sorts of products for three different type of teaching: teaching materials, validation reports and self-reflection reports.

The participants may take three thematic areas out of the following list to base their portfolio work on:

1. Classroom teaching
2. Individual teaching (thesis supervision)
3. International teaching
4. Online teaching

Each theme presented in the portfolio should cover three aspects:

1. **Evidence:** These are documents being developed. They have to demonstrate that the lecturer has acquired certain didactic competences (e.g. a lesson plan, design assignments, video recording, tests etc.).
2. **Validation:** Validation means that others reflect critically on parts of the portfolio and activities, both in terms of content and the manner in which the lecturer described/implemented them. Validation can be done by students, colleagues, the coach, management, fellow UTQ participants etc.
3. **Reflection:** These documents contain descriptions of the own point of view on how the whole process of acquiring a certain competence has gone. The lecturer analyses his/her own strong and weak points in terms of didactic competences. Which choices were made and why? What went well? What was difficult? Would things have to be done differently in the future?

In addition to the above described components, the portfolio also contains an explanation of how the products in the portfolio are related. This explanation should make clear what the materials consist of, how much he/she contributed to the materials or their development, why this piece of evidence is included and what the context of this material is (place in the academic year /curriculum).

### **Assessment**

The portfolios of the participants are submitted to an independent **portfolio commission**, to be appointed and consisting of three individuals. This committee will assess the portfolios in accordance with a specially established procedure and using the assessment criteria established for the purpose. The committee is expected to come to a consensus in mutual consultation.

Referee #3: Todd Walter

We thank Dr. Todd Walter for reviewing this article. Two questions are raised by the reviewer:

1. If the researchers considered a more global survey of water educators, would they find that there is a sort of a natural trend towards active or problem-solving teaching styles, and
2. Is there a way to assess effectiveness of these teaching styles for the students?

While being somewhat out of the scope of the present study, both these questions are extremely relevant to the bigger picture of this article. Therefore, we will include in a revised paper the following two sub-sections within the discussion.

### **A global trend in teachers to be student-centered?**

The broad field of hydrology naturally demands problem-oriented skills. Many innovations in hydrology are fundamentally based on empirical findings. Systems hydrologists deal with are complex, and problems they pose are largely unique and original. This context should 'naturally' induce a framework apprenticeship that values active or problem-solving teaching styles. However, there are diametrically opposing forces as well. First there are the habits: Many seasoned water educators today are products of very much teacher-centered education systems and old habits die hard! Also creative teaching does not sustain well with the institutional pressures driving towards efficiency in numbers. Therefore, it is unlikely that there is or will be a natural change (not triggered by ....) towards active or problem-solving teaching styles.

However, most of the water educators understand and appreciate the value of providing an environment for active learning. To keep their desire to be innovative in education alive and to provide opportunities to apply that enthusiasm, it is necessary to provide a structured set of activities that work as a counterbalance for the above-mentioned habits and institutional pressures. Training programs like UTQ, opportunities to attend seminars and talks on education, encouraging faculty to engage in didactic research, etc. are steps that can be taken towards this. It is also important to give a non-superficial importance in faculty assessment process.

In our opinion it probably is a mistake to rely on a 'natural tendency' of educators to become more active educators in order to implement student-centered instruction. Even within the somewhat limited sample of UNESCO-IHE water educators who participated in this study, we believe that the long-term success of implementing student-centered education depends heavily on the presence of series of activities within a sustainable framework.

### **How to assess the effectiveness on the students?**

In any educational program, ultimately what matters is the quality and effectiveness of learning. Therefore, the ultimate objective of altering teaching styles, or for that matter, any kind of innovation in education, is to what degree it improves the learning processes. However, measuring effectiveness in education (the degree to which the learning objective have been achieved) is not simple. First, it is not

necessarily reflected by the student grades: Naturally, changing the way of teaching must lead to change in the nature of the assessments. Once the assessment is changed the basis of comparison is lost! Student evaluations, while being very useful to judge the satisfaction, comfort and sense of achievement of students, are not useful tools to evaluate the effectiveness of innovative teaching. Innovative teaching is no synonymous with providing the students a comfort-zone in education. Indeed, students may feel somewhat uncomfortable, at least in the beginning, of the novel and unfamiliar approaches to education. Student evaluations provide useful signals about such situations and can be invaluable mechanisms of feedback on how students feel. But, they do not necessarily provide good indications on how effective the education is.

It is not our suggestion that innovation in education in general and specifically, more delegatory teaching styles should be assumed to be superior without hard evidence. Our intention is to indicate that gathering evidence for real effectiveness of education is a hard task, but it should not be substituted by proximate indicators such as student grades and feedback. Robust evaluation of effectiveness of education needs careful contemplation.

The ultimate indicator of an effective education is how successful the graduate is in the real-world situations. But measuring this is a long-term endeavor that is not practical for the purpose of evaluating the outcome of a single action, for example, altering teaching style. Arguably the alternative is to create assessment opportunities that resemble the reality 'out-there'.