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## Master's Thesis

Quality Evaluation of the Flipped Classroom Teaching Method in  
International Higher Education

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## Declaration of Authorship

I confirm that this Master's thesis is my own work and I have documented all sources and material used.

This thesis was not previously presented to another examination board and has not been published.

Munich, 14.02.2020

Place and date

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Abstract

In a flipped classroom (FC), students receive the instructional material before the physical lecture to study themselves and the implementation of this material is done during class. The increased demand for the FC method arose the need for accountability and quality. This study aimed to evaluate the initial effects of the FC method on learning outcomes, self-regulated learning (SRL) skills, motivation and interest of higher education students. More specifically, the study focused on the effect of SRL and motivational prompts on these variables. An experimental research design was implemented. The data was collected via online knowledge tests (pre, post, and follow-up) and questionnaires (pre and post) before and after the four flipped sessions. The research sample consisted of 26 master students. The findings suggested that there was a significant decrease in students' metacognitive skills, help seeking skills, interest, and motivation (i.e. relevance) and insignificant change in time management, persistence environmental structuring skills, and persistence after the flipped sessions. No significant difference between the strong and the weak group was found. Moreover, students' knowledge test scores were improved after the flipped sessions. Overall, the students accepted the FC method, however, they did not find the prompts technique useful. Discussion of the results and the implications for the design of the FC is provided.

*Keywords: Flipped Classroom (FC), Quality Evaluation, Self-Regulated Learning Strategies, Self-Regulated Learning, Motivation, Prompting.*

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## **Chapter 1: Introduction**

Current research highlights the high demand for external evaluation of public institutions, particularly higher education institutions (Sarrico, Rosa, Teixeira, & Cardoso, 2010). While providing an objective assessment of an institution for stakeholders, higher education quality evaluation can be considered as a cycle that benefits from itself: The outcomes of an evaluation study can be a beneficial basis for further improvement of the program that is subject to evaluation.

The growing role of e-learning in achieving certain global aims have been emphasized more often recently (Savic, Stankovic, & Janackovic, 2012). Considering this continuous growth in the number of online courses, we can estimate the growing demand for accountability and quality. As a well-known design of blended learning, the flipped classroom (FC) is a teaching methodology that inverts traditional classroom arrangements, delivering lecture instruction outside the class via online material while class time is spared for problem-solving and application of lecture content (Altemueller & Lindquist, 2017). In other words, the flipped classroom blends modern and traditional learning techniques. In a flipped technique the pre-lecture online videos replace traditional in-class lectures (McCollum, Fleming, Plotnikoff, & Skagen, 2017). Previous research emphasized the positive effect of the flipped classroom on learning outcomes and learner motivation (Abdullah, Hussin, & Ismail, 2019; McNally et al., 2017; Pérez et al., 2019; Souza & Rodrigues, 2015).

Blended learning scenarios, such as the FC, can promote autonomy and self-regulated learning as well as encouraging inquiry and building relationships (Whiteside, Garrett Dikkers, & Lewis, 2016). However, regulating their own learning can be challenging for students, especially in computer-based learning environments (CBLEs) where the teachers might not be available to help at any time (Lee, Lim, & Grabowski, 2010). This makes instructional designers



to come up with some solutions regarding supportive elements. One opportunity to do so would be to provide generative learning strategy prompts and metacognitive feedback, which can enhance learning (Lee et al., 2010). Prompting can include pedagogical agents that play the role of learning facilitators, which are lifelike characters used in multimedia learning environments (Schroeder & Gotch, 2015).

The aim of this study was to evaluate a flipped classroom by examining the initial effects of the flipped classroom method. In particular, we investigate the effects of the prompting technique that was used in the video-lectures, on higher education students' learning outcomes (test scores), motivation and self-regulated learning skills. Further, we investigated students' perceptions of the flipped classroom method. In the present study, we conducted a design-based evaluation that allows evaluating the effectiveness of an existing program, as well as helps researchers to test the effectiveness of a target intervention in an empirical setting such as an experimental or quasi-experimental design (Bodzin, 2008). The flipped method was implemented in two seminars of an international master's program, namely, Basics of Quality Assurance (BQA) and Quality Development by Professionalization (QDP). The sample included 26 second-semester students of the international master program, "Research on Teaching and Learning (RTL)" at the School of Education Faculty at the Technical University of Munich, Germany. Data was collected via questionnaires and test scores; statistical data analysis was conducted to analyze the findings.

## **Chapter 2: Theoretical Background**

### 2.1 Evaluation of Education Quality

The need for quality has always been present; however, the definition of quality has been considered as a very dynamic concept according to the different circumstances and needs. While defining the term quality, two main criteria are considered initially; customer satisfaction and fitness for use (Subrun & Subrun, 2015). Education as a dynamic concept itself has its own customers and needs, therefore, it is subject to quality. Customers, namely stakeholders can be defined as persons or entities with interest in the activity: e.g., those that pay for it and/or those that benefit from it (Sarrico et al., 2010). With the increasing need and interest in education, the evaluation of education quality has been a crucial focus of education policy and education research throughout the years: The establishment and the implementation of systematic procedures for quality assurance and improvement through evaluation dated back to the mid-1980s in Western Europe and the mid-1990s in Germany (Bornmann, Mittag, & Danie, 2006).

The role of higher education in a person's life is becoming more important. From the early years of education, the students' and the families' live plans can be influenced by the highly competitive and challenging path of achieving a successful higher degree. The increasing demand and competition for higher institutions created a market which brought confusion for the stakeholders of education (Sarrico et al., 2010). This resulted in the responsibility for authorities to provide objective methods for assuring the quality of these institutions. The available research presents the decline of the trust level for public institutions and particularly for higher education institutions which resulted in the demand for the external evaluation of their performance (Sarrico et al., 2010). In most higher education systems, evaluation and accountability measures have been activated to ensure the academic provision meets the clients' needs and expectations (Sarrico et al., 2010).

Having several indicators, higher education quality assurance can be defined in various forms. Yingqiang and Yongjian defined higher education quality assurance as a double-edged sword; on one hand, it enables higher education to respond effectively to the challenges brought by massification, markets, and internationalization. On the other hand, accountability control, efficiency, performance, and other values have become the new milestones of management at some institutions. Moreover, they presented the key feature of higher education quality assurance as “technology is to consider quality as something existing objectively that can be broken down and measured” (Yingqiang & Yongjian, 2016, p.11). Measurement of an aspect can have clearer definitions and methods compared to quality definition; however, when the implementation needs to be considered in a higher education institution, the process becomes more complex than expected. The quality in higher education is considered as multidimensional due to the different dimensions associated with the fulfillment of higher education’s mission, such as the quality of inputs, processes, and outputs (Sarrico et al., 2010). These dimensions cannot be considered apart from the demands put forward by students, universities, and society when the quality is subject to assessment (Sarrico et al., 2010). So again, the design for quality of evaluation can be affected by many dimensions and the effectiveness of each design can be changing according to the fitness for use. Barnett highlighted that there is a responsibility for everyone who is involved in the evaluation of quality to design their evaluations considering both the benefits and the available budget (Barnett, 1994).

Higher education quality assurance can be considered as a cycle that benefits from itself. In other words, in addition to the establishment of the quality evaluation process, it should be also emphasized that the use of the implications of evaluation is critical. Therefore, evaluation of education quality can be considered as an effective way to improve the quality of teaching and learning processes. Durlak and DuPre presented the results from over quantitative 500 studies that offered strong empirical support to the conclusion that the level of implementation of the

evaluation results affects the outcomes of the programs (Durlak & DuPre, 2008). A meta-evaluation study conducted by Bornmann and colleagues evaluated the effectiveness of the evaluation procedure in Germany. The data was collected via 648 questionnaires that were filled out by all former external reviewers and members of institutes who participated in evaluations. The results confirmed that multi-stage evaluation procedures in Germany receive wide acceptance and are seen to be useful and effective (Bornmann et al., 2006).

Considering this continuous growth in the number of online courses, we can estimate the growing demand for accountability and quality in such courses which leads authorities to continuously work on further improvement.

#### Quality Evaluation of Online Courses

The growing role of e-learning in achieving certain global aims has been emphasized in several international documents adopted by the United Nations (The Millennium Development Goals, 2009) and UNESCO (Education for All, 2004), also in the documents about the Bologna Process (Savic, Stankovic, & Janackovic, 2012). One widely known method of improving online courses and contributing to a higher level of student learning is emphasized by Peterson as student assessments such as asking students to evaluate the usefulness of the program via questionnaires (Peterson, 2016). Also, Jones considered the student course evaluation as a traditional instrument of assessment that has historically been utilized to assess students' perceptions of teaching effectiveness and overall course value (Jones, 2012).

##### 2.1.1 Design-based Evaluation

As explained in the previous section, quality itself and its evaluation are dynamic aspects and need to be considered as unique according to the needs and expectations. Therefore, evaluation methods can also vary according to the aim of evaluation, namely the need for

evaluation. In the current study, we used design-based evaluation. Design-based evaluation allows researchers to put an intervention into the program during the evaluation process (Bodzin, 2008). One goal of design-based research was presented by Bodzin as the improvement of the way in which a design operates in practice (Bodzin, 2008). In other words, while evaluating the effectiveness of an existing program, it allows the researchers to test the effectiveness of a target intervention in an empirical setting such as an experimental or quasi-experimental design. This method helps the researchers to work in real-world settings and to make use of the collected data for formative program evaluation purposes (O'Donnell, 2004). So, the implications of a design-based evaluation can contribute to the effective implementation of the program for further cases while identifying the weaknesses that require improvement. Having empirical support for the strengths and the weaknesses of a program can contribute to the effective use of the resources on the upcoming stages of implementation.

Conducting design-based research can provide empirical evidence for the effectiveness of the program. Bodzin conducted a design-based evaluation study to examine the effectiveness of the after-school science club program for 4th-grade students, which integrated instructional technologies to investigate a pond ecosystem in the local schoolyard, in promoting environmental attitudes and understandings of the local watershed. The author collected the quantitative data via an attitude scale that measures students' attitudes toward environmental issues; and the qualitative data via observing students' work and conducting student interviews. The results of the evaluation showed that participation in the program enhanced environmental attitudes promoted a sense of environmental stewardship, and fostered responsible environmental behavior (Bodzin, 2008).

Similarly, a quasi-experimental, design-based evaluation of a health and nutrition programme (AIN-C) was conducted to evaluate the effectiveness of the programme and to estimate the overall costs in order to provide a financial planning tool for further

implementation of a similar program. The results proved that the programme achieved near-universal coverage and was effective in improving mothers' child-rearing knowledge, attitudes, and practices, including feeding and appropriate care-giving and care-seeking practices for children with diarrhoea and acute respiratory illness (Fiedler, Villalobos, & Mattos, 2008).

As supported above, conducting a design-based evaluation can be an effective formative approach towards the freshly approached programs. Design-based evaluation can also be considered as an effective method to evaluate the flipped classroom teaching method.

## 2.2 Flipped Classroom

### 2.2.1 Flipped Classroom Definition

The flipped classroom, or sometimes termed as the inverted classroom, is a teaching methodology that inverts traditional teaching methods, delivering lecture instruction online outside the class while class time is spared for problem-solving and application of lecture content (Altemueller & Lindquist, 2017). The main features of the flipped technique are pre-lecture online videos that replace traditional in-class lectures held by the teachers (McCollum, Fleming, Plotnikoff, & Skagen, 2017). In a flipped classroom, students receive the instructional material (mainly online) before the physical lecture to study basic content by themselves and afterward the application of the content is to be done during class (van Alten, Phielix, Janssen, & Kester, 2019). While bringing many advantages, the flipped classroom requires a lot of commitment and preparation from an instructor ahead and it requires the students to be willing to take responsibility for their own learning (Houston & Lin, 2012). Including the pre-class preparation phase, the flipped classroom method has several steps of implementation. There were four steps presented by Zappe and colleagues for the successful implementation of a flipped classroom: "1) Before the class, students are supposed to complete an online quiz as a

‘gate-check’ to make sure that they are prepared. 2) The video-lectures need to be relatively short (no longer than 20 to 30 minutes) in order to ensure that students watch them. 3) A brief review of the course content is to be provided before in-class activities to answer any questions and to make sure that most of the students have enough understanding of the material. 4) The online lectures should be designed in an engaging way for students; such as including multi-media (Zappe, Leicht, Messner, Litzinger, & Lee, 2009, p.11).

### 2.2.2 Flipped Classroom – Empirical Investigations of the Concept

Previous research supported the effectiveness of the flipped classroom on learning outcomes and learner motivation (Abdullah, Hussin, & Ismail, 2019; McNally et al., 2017; Pérez et al., 2019; Souza & Rodrigues, 2015). Souza and Rodrigues conducted an experimental study to compare the effectiveness of a flipped classroom (experimental group,  $N=48$ ) with a traditional classroom (control group,  $N=52$ ) focusing on two variables: programming self-efficacy and academic performance. The results showed that the students in the flipped classroom increased programming self-efficacy skills and they achieved higher grades (Souza & Rodrigues, 2015). Similarly, McNally and colleagues collected surveys from 563 undergraduate and postgraduate students (61% female) participating in flipped teaching environments aiming to assess the effectiveness of the flipped method. The findings suggested that although students considered the flipped classroom as more difficult, student outcomes and active participation in class activities improved when the course is designed (a) using a theoretical perspective (e.g. student-centered learning) while flipping a course, (b) integrating assessment into the design of their flipped classroom, and (c) flipping the entire course rather than flipping a part of the class (McNally et al., 2017). Abdullah and colleagues used a combined method of pre and post oral proficiency tests, observation, and focus group interviews

to examine the effectiveness of using a flipped classroom model on English speaking performance of 27 undergraduate students. The results suggested that using the flipped classroom method was an effective approach in the EFL (English as a foreign language) speaking classroom. Moreover, the findings presented that student participation in the English conversational tasks and their level of commitment and their speaking performance increased gradually (Abdullah, Hussin, & Ismail, 2019). The evaluation study by Perez and colleagues supported the effectiveness of the flipped classroom method as well. The data was collected from third-year bachelor's students enrolled in a business communication course in the Business Administration department at a Spanish university. The results suggested that flipped classroom is highly appreciated among university students, in terms of skill development, knowledge generation and the improvement of learning motivation. The authors concluded that the flipped classroom is an effective teaching innovation in higher education (Pérez et al., 2019).

In addition, there were many meta-analysis studies that presented the conclusions from many studies supporting the effectiveness of the flipping classroom (Chen, Lui, & Martinelli, 2017; Chiang & Chen, 2017; van Alten et al., 2019; Xu et al., 2019). A meta-analysis conducted by Chen and colleagues aiming to assess the effectiveness of flipped classroom (FC) on medical learning showed that the FC is a promising teaching approach to increase learners' motivation and engagement (Chen, Lui, & Martinelli, 2017). Another meta-analysis study by Chiang and Chen suggested that the modified flipped classroom can effectively improve students' learning satisfaction and empirical research abilities (Chiang & Chen, 2017). Van Alten and colleagues conducted a meta-analysis including 114 studies which compared the flipped and the non-flipped classrooms in secondary and postsecondary education. The results showed that the flipped classroom has a small positive effect on learning outcomes, but no effect was found on student satisfaction regarding the learning environment (Van Alten et al., 2019). Another meta-



analysis was conducted by Xu and colleagues, examined the effect of a flipped classroom versus a traditional classroom on students' skill competence in China's nursing education. After a careful review of 22 studies, it was presented that the flipped classroom is more effective for the nursing students' skill competence than traditional teaching in China (Xu et al., 2019).

While the effectiveness of the FC method is presented above, the research also shows that it can be challenging for students to regulate their own learning (Lee, Lim, & Grabowski, 2010). One opportunity to support the students can be integrating prompts into learning materials.

### 2.3 Using Prompts to Promote Self-Regulated Learning in a FC

Learners' cognitive and metacognitive regulation has been considered as one of the most critical factors influencing learning, in particular, in computer-supported learning environments (see e.g., Bannert). On the other hand, it can be challenging for students to regulate their own learning, especially in computer-based learning environments (CBLEs) where they are alone (Lee, Lim, & Grabowski, 2010). Therefore, while designing computer-based learning environments, instructional designers need to support learners in regulating and monitoring their learning processes and allow them using generative learning strategies in a better way (Lee et al., 2010).

Prompting students to process the learning material deeply can improve learning in both well- and ill-structured domains (Papadopoulos, Demetriadis, Stamelos, & Tsoukalas, 2011). Schworm and Gruber defined prompts as questions or elicitations aiming to induce meaningful learning activities by eliciting learning strategies and learning activities that the students are capable of, but do not show spontaneously (Schworm & Gruber, 2012). Many studies emphasized the effectiveness of using metacognitive prompts on learning outcomes (Aurah et.al., 2014; Bixler & Land, 2010; Lee et al., 2010; Peters & Kitsantas, 2009; Schworm

& Gruber, 2012). A study by Peters and Kitsantas focused on the effectiveness of the metacognitive prompts on the eighth-grade science class students ( $N = 162$ ). The findings showed that there was a significantly higher gain in content knowledge for the experimental group receiving the metacognitive prompts in comparison to the control group (Peters & Kitsantas, 2009).

Bixler and Land investigated the effectiveness of using cognitive and metacognitive prompting strategies in a web-based learning environment of a freshman/sophomore level Information Sciences and Technology course ( $N = 79$ ). The results presented that the treatment group (those receiving prompts) significantly outperformed the control group (no prompts) on all four processes: (a) problem representation; (b) developing solutions; (c) making justifications; and (d) monitoring and evaluation (Bixler & Land, 2010).

In their study, Lee and colleagues focused on the effects of two scaffolding strategies on undergraduate learners' ( $N=223$ ) comprehension and self-regulation while learning the human heart system in a CBLE. The results proved that the combination of generative learning strategy prompts with metacognitive feedback improved learners' recall and comprehension by enhancing learners' self-regulation and better use of highlighting and summarizing as generative learning strategies. The researchers suggested that learning can be enhanced effectively by providing generative learning strategy prompts and metacognitive feedback which facilitates learners' regulation, monitoring, and refinement of their use of learning strategies (Lee et al., 2010).

Schworm and Gruber conducted a study to investigate the effect of giving prompts on the quantity and quality of academic help-seeking. They implemented the prompts on active help-seeking in order to foster help-seeking activities in a blended learning course on qualitative research methods ( $N = 39$ ). The results showed that, compared with students who received no prompts, students with prompts about the relevance of active help-seeking had better learning

outcomes, participated more actively in online learning activities, more explicitly referred to learning contents in the forums and took more initiative in starting discussions (Schworm & Gruber, 2012).

Another study was conducted to investigate the effectiveness of using metacognitive prompts during testing for improving results in a Genetics Problem Solving Test (GPST) on 2,138 high school students that were purposively selected from seventeen high schools in Western province, Kenya. The results presented that metacognitive prompting (MP) had a significant effect on students' genetics problem-solving ability (Aurah, Catherine Muhonja|Cassady, Jerrell Craig|McConnell, Tom John, 2014).

As presented above, prompting can be a useful strategy to facilitate learning and can have different forms and aims. Prompts can be used to promote metacognitive and motivational processes as well.

### 2.3.1 Metacognitive Prompts

As mentioned before in this paper, blended learning can promote autonomy and self-regulation, while encouraging inquiry and building relationships (Whiteside, Garrett Dikkers, & Lewis, 2016). In a flipped classroom design, learners are responsible for their own learning as there is a pre-class phase to be covered by themselves. Learner autonomy has been defined in different forms and via different models in years.

One of the main theories focusing on learner autonomy, self-determination theory is an approach to human motivation and personality that uses traditional empirical methods while implementing a theory that emphasizes the importance of humans' evolved inner resources for personality development and behavioral self-regulation (Ryan & Deci, 2000). According to empirical findings when three innate physiological needs of humans; competence, autonomy, and relatedness are satisfied; self-motivation and mental health will be enhanced (Ryan & Deci,

2000). While providing autonomous learning environments, instructional designers should consider presenting the content in a way that learners can relate to self-experiences.

A self-regulated approach to learning can be also defined as the student's cognitive engagement in learning (Howard-Rose & Winne, 1993). Self-regulated learning (SRL) theory considers learners as active participants of their own learning processes. Mainly SRL theory supports that effective learning is accomplished via the continuous and dynamic adjustment of specific motivational and cognitive components which help the learner to achieve particular learning goals (Sandars, 2013). Zimmerman defined self-regulation as a self-directive process by which learners transform their mental abilities into academic skills. He presented these skills as following; “(a) setting specific proximal *goals* for oneself, (b) adopting powerful *strategies* for attaining the goals, (c) *monitoring* one’s performance selectively for signs of progress, (d) *restructuring* one’s physical and social context to make it compatible with one’s goals, (e) managing one’s *time use* efficiently, (f) *self-evaluating* one’s methods, (g) *attributing* causation to results, and (h) *adapting* future methods” (Zimmerman, 2002, p.66).

Self-regulated learning (SRL) has been subject to education research for years and presented via several models, as well. Puustinen and Pulkkinen investigated these different SRL models considering the following four criteria: the background theories of the authors, the definitions of SRL, the components included in the models and the empirical research conducted by the authors. According to the findings, also presented in Table 1, all the authors summarized the SRL process in three main phases; (1) preparatory or preliminary phase consists of task analysis, planning, and goal setting activities; (2) actual performance or task completion phase including strategy use and on-line self-regulatory and monitoring activities and (3) appraisal or adaptation phase basically refers to evaluation of outcomes (Puustinen & Pulkkinen, 2001).

Ergen and Kanadli conducted a metanalysis to investigate the effect of self-regulated learning strategies on academic achievement in terms of course type, self-regulated learning strategy type, school level, and study design. They calculated the common effect size of empirical and relational studies conducted in Turkey between 2005-2014 and they concluded that self-regulated learning strategies had a “large” effect on academic achievement. (Egren & Kanadli, 2017).

**Table 1.** The Components of the Models of Five Authors as a Function of the Three Phases of the SRL Process (Puustinen & Pulkkinen, 2001, p 32)

<b>SRL-process</b>			
<b>Author</b>	Preparatory phase	Performance phase	Appraisal phase
<b>Boekaerts</b>	Identification, interpretation, primary and secondary appraisal, goal setting	Goal striving	Performance feedback
<b>Borkowski</b>	Task analysis, strategy selection	Strategy use, strategy revision, strategy monitoring	Performance feedback
<b>Pintrich</b>	Forethought, planning, activation	Monitoring, control	Reaction and reflection
<b>Winne</b>	Task definition, goal setting, planning	Applying tactics and strategies	Adapting metacognition
<b>Zimmerman</b>	Forethought (task analysis, self-motivation)	Performance self-control, self-observation)	Self-reflection (self-judgment, self-reaction)

As empirically-supported, using metacognitive prompts in learning environments can foster cognitive processes. Moreover, the prompting technique can be used to foster student motivation.

### 2.3.2 Motivational Prompts-Fostering Relevance

Regulation of motivation was defined by Wolters as the activities through which individuals purposefully act to initiate, maintain, or supplement their willingness to start, to progress, or to finish a specific activity or goal (Wolters, 2003, p.190). Motivation requires the aspects of activation and intention such as energy, direction, persistence, and equifinality (Ryan & Deci, 2000). Krapp considered that interest can arise from a person's interaction with own environment. According to research, motivation based on interest has many positive effects on learning processes and outcomes (Krapp, 2002). When teachers find a way to link the content to students' needs, goals and interests, student motivation will be affected positively (Frymier, 2002). Kim and colleagues emphasized the gap in the literature about the computer-based scaffolds which can support an explanatory rationale for relevance to current and future lives and can arise students' curiosity and lead them to concentrate on a given task (Belland, Kim, & Hannafin, 2013). Adult learners tend to look for the knowledge that is relevant to their experiences and they like to solve real-life problems and they are more motivated when they are provided self-management, control of their own learning and sharing their expertise (Meyers & Feeney, 2016).

The research proved the importance of fostering relevance in autonomy-enhancing behavior. According to the study by Assor and colleagues, teacher behaviors that help students (grades 3–5,  $N = 498$  and grades 6–8,  $N = 364$ ) to understand the relevance of schoolwork for their personal interests and goals has a critical effect on students' engagement in schoolwork

(Assor, Kaplan, & Roth, 2002). In their research, Tabachnik and colleagues tested the predictions of the models, explaining the relationships among college students' ( $N = 412$ ) distal future goals (both extrinsic and intrinsic), their adoption of a middle-range subgoal, their perceptions of task instrumentality, as well as their proximal task-oriented self-regulation strategies. The results supported the model, namely, students' distal future goals (intrinsic future goals in particular) may be related to their middle-range college graduation subgoal, to their perceptions of task instrumentality, and to their adoption of proximal task-oriented self-regulation strategies (Tabachnick, Miller, & Relyea, 2008).

Prompting learners can be implemented in several ways. Using an educational agent is one of those methods to present prompts to learners.

#### 2.4 Pedagogical Agent

Pedagogical agents, which are considered as facilitators for learning, can be simple static on-screen characters that respond via visual stimuli that facilitate learning or can be complex as life-like three-dimensional characters that can provide visual signaling through gestures and body language (Schroeder, Adesope, & Gilbert, 2013). Pedagogical agents play the role of facilitation learning which are lifelike characters used in multimedia learning environments (Schroeder & Gotch, 2015). Agents can mainly take one of the following roles to facilitate learning; demonstrating/modeling, coaching/scaffolding, information source and testing (Graesser, Chipman, Haynes, & Olney, 2005).

The effect of using pedagogical agents in computer-based learning environments have been a subject to research. Alevan and colleagues found in their study that the use of an agent prompts as computer-based scaffolds could be useful for improving students' learning outcomes and eliciting higher levels of reflection. So they suggested that instructional designers

should foster students to reflect on their metacognitive strategies and beliefs, and allow students to take responsibility for directing their own learning autonomy and they added that using an agent tutee as an active and inquisitive learning partner (Aleven et al., 2010).

A meta-analysis investigated the effect of using pedagogical agents on learning by reviewing 43 studies with 3,088 participants. The results provided that pedagogical agents produced a small but significant effect on learning ( $g = .19, p < .001$ ) (Schroeder et al., 2013). Schroeder & Gotch presented the usefulness of pedagogical agents via several effects: (1) persona effect, which refers to a strong positive effect of using an animated agent in an interactive learning environment on student's perception of their learning experience (2) personal agent effect which supports that students are more motivated and more interested, and they achieve better transfer when a computer-based lesson is presented in a social agency environment rather than in an on-screen text environment (3) embodied agent effect supports that using nonverbal cues such as gesture and gaze helps to direct attention (4) presence principle claims that rather than the image, the agent's voice is important for improving learning (5) image principle, in contrast, claims that having a speaker's image on the screen has no effect on learning (6) persona zero effect similarly claims that an agent has no positive or negative effects on learning (Schroeder & Gotch, 2015).

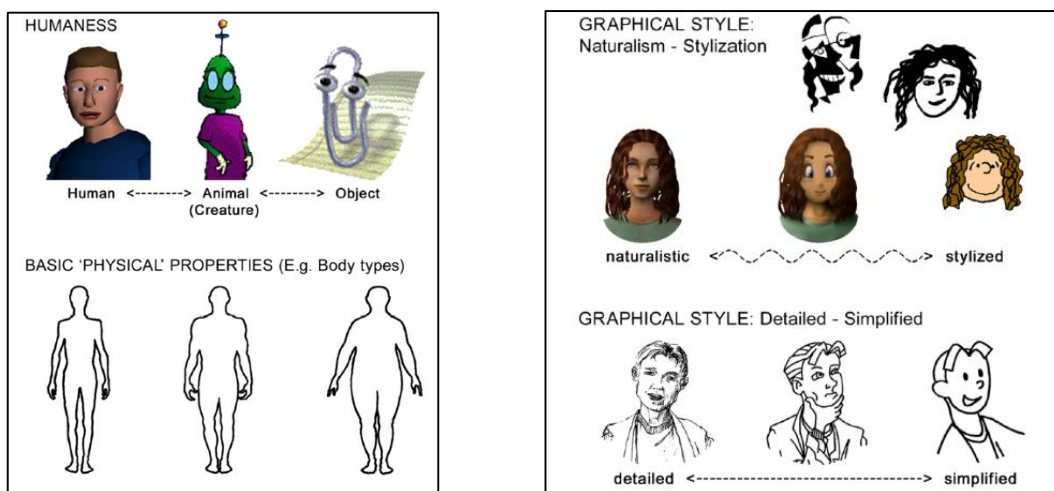
Having empirical support on the benefits of using educational agents arises the question of how an educational agent can be designed and implemented effectively. Like many other topics, having contradictive opinions, previous research presented some findings for the effective design of an educational agent.



### 2.4.1 Agent's Design

The agent's total visual appearance consisted of static qualities, referring to its shape and dynamic qualities referring to its gestures, speech, gaze, etc. As presented in Figure 1, the visual static dimensions are classified as humanness, basic physical properties, and graphical style. In addition, the graphical style has different approaches; naturalism vs. stylization and detailedness vs. simplification. It is good to mention that the believability of an agent is independent of its naturalism in appearance (Gulz & Haake, 2006). The empirical findings suggest it may not be necessary for an agent to appear as human-like to create the illusion and benefits of social interaction (Schroeder et al., 2013).

**Figure 1.** Dimensions of 'Static Visual Appearance' (Gulz & Haake, 2006, p.2)



The information that is presented via pedagogical agents should be carefully structured. Although pedagogical agents may cause cognitive load to some extent in the beginning, the learners will become more familiar in time and the strategies they facilitate will become more effective. Therefore the cognitive load presented by an agent could be decreased keeping the salient features of an agent consistent (Schroeder et al., 2013).

A meta-analysis by Schroeder and colleagues confirmed that learners take in new information through their eyes and their ears separately. (Schroeder et al., 2013). Therefore, the information presented on the screen and the information presented via audio recording can be slightly different to increase the cognitive load. Veletsianos and colleagues reviewed the previous research and presented some guidelines aiming to assist designers in enhancing pedagogical agent deployments and to help other researchers to study, critique, revise, expand, and improve this framework. As presented in Table 2, they focused on three main design areas; user interaction, message and agent characteristics (Veletsianos et al., 2013).

Research on the effects of pedagogical agents on learning has produced mixed results of positive effect or no effect on learning outcomes (Schroeder et al., 2013). In our study, we aimed to carefully investigate the effects of agents on learning outcomes, as well as learning outcomes, motivation, interest and self-regulated learning skills, to contribute to this gap. In addition, we evaluated students' attitudes toward prompting technique and how useful they found the prompts.

**Table 2.** Enhancing Agent Learner Interactions (EnALI) Framework (Veletsianos et al., 2013, p.180)

<b>Design focus</b>	<b>Guidelines</b>
<b>1 User interaction</b>	<p>Agents should be attentive and sensitive to the learner's needs and wants by:</p> <ul style="list-style-type: none"> <li>• Being responsive and reactive to requests for additional and/or expanded information.</li> <li>• Being redundant.</li> <li>• Asking for formative and summative feedback.</li> <li>• Maintaining an appropriate balance between on- and off-task communications.</li> </ul>
<b>2 Message</b>	<p>Agents should consider intricacies of the message by:</p> <ul style="list-style-type: none"> <li>• Making the message appropriate to the receiver's experiences, and frame of reference.</li> <li>• Using congruent verbal and nonverbal messages.</li> <li>• Clearly owning the message.</li> <li>• Making messages complete and specific.</li> <li>• Using descriptive, non-evaluative comments.</li> <li>• Describing feelings by name, action, or figure of speech.</li> </ul>
<b>3 Agent characteristics</b>	<p>Agents should display socially appropriate demeanor, posture, and representation by:</p> <ul style="list-style-type: none"> <li>• Establishing credibility and trustworthiness.</li> <li>• Establishing role and relationship to user/task.</li> <li>• Being polite and positive (e.g., encouraging, motivating)</li> <li>• Being expressive (e.g., exhibiting verbal cues in speech).</li> <li>• Using a visual representation appropriate to content.</li> </ul>

## 2.5 Research Questions and Hypothesis

In this study, we investigated the initial effects of flipped classroom method on higher education students' learning outcomes (test scores), motivation and self-regulated learning skills and students' attitude towards the flipped classroom and the prompts technique. We examined these aspects in the following research questions:

1. Overall research question: To what extent does the flipped classroom affect learning outcomes (test scores), motivation and self-regulated learning skills?

1.1 Is there a difference between participants' motivation, interest, and self-regulated learning skills before and after the flipped classroom method?

Hypothesis 1.1: Compared to before the FC experience, students' use of self-regulated learning skills, interest and motivation increase after the FC experience.

1.2 What is the difference among students' pre-test scores (before the video-lecture), post-test scores (after the video-lecture) and follow-up test-scores (after the in-class session) before and after the flipped classroom method?

Hypothesis 1.2: Compared to the pretest scores, students' posttest scores increase after the video lecture. Similarly, compared to the students' post-test scores, the follow-up test scores increase after the in-class session.

1.3 Is there a difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to motivation, interest and self-regulated learning skills after the flipped classroom method?

Hypothesis 1.3: Compared to the weak group motivation, interest, and self-regulated learning skills of the strong group are higher after the flipped classroom method.

2. Overall research question: How effective do students find the FC method?

2.1 What are the attitudes of the students towards FC in terms of ease of use and usefulness?

2.2 What are the attitudes of the students towards the prompts technique and how useful they find it?

2.3 How useful do students find pre-class and in-class activities?

2.4 Is there a difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to their attitude towards prompts and FC technology, and how useful they found the activities and the prompts technique?

Hypothesis 2.4: Compared to the students in the weak group, the students' attitude score towards the prompts technique and the FC technology will be higher in the strong group.

## Chapter 3: Methodology

### 3.1 Research Approach

In the current study, our aim was to evaluate the flipped classroom method that has been implemented in the last three years in two seminars of the master program, “Research on Teaching and Learning (RTL)” at the School of Education Faculty at the Technical University of Munich, in Germany (N = 26). The main purpose of this evaluation was to obtain a scientific guide for further improvement of the recently implemented method in the department. The first evaluation of the flipped classroom method was conducted by Shahada (Shahada, 2018). He conducted an experimental research to explore the impact of the timing of self-regulated prompts, that were included in the video lectures, on students’ self-regulation, achievement, acceptance of flipped seminars, interest in content, acceptance of self-regulated prompts, and preference of teaching method (FC vs. TC). The implications of the mentioned study by Shahada were taken into consideration during the design process of the current study. In accordance with Shahada’s results, the video lectures and the overall design of the two courses “Basics of Quality Assurance (BQA)” and “Quality Development by Professionalization (QDP)” were updated re-examined in the current study. During the semester, four sessions out of 14 sessions were flipped. In addition to an introductory session, the students had self-learning phase activities and in-class activities for each flipped session. Self-learning phase activities were to be completed prior to each class session and included the pre-tests, the video lectures, the post-tests, the written tasks, and the non-compulsory reading materials. In-class activities aimed to review, discuss and practice the self-learning phase via group work activities.

The research focused on two main aspects; one was to investigate the initial effects of the flipped classroom method on higher education students’ learning outcomes (test scores), motivation and self-regulated learning skills. Secondly, the study aimed to investigate the

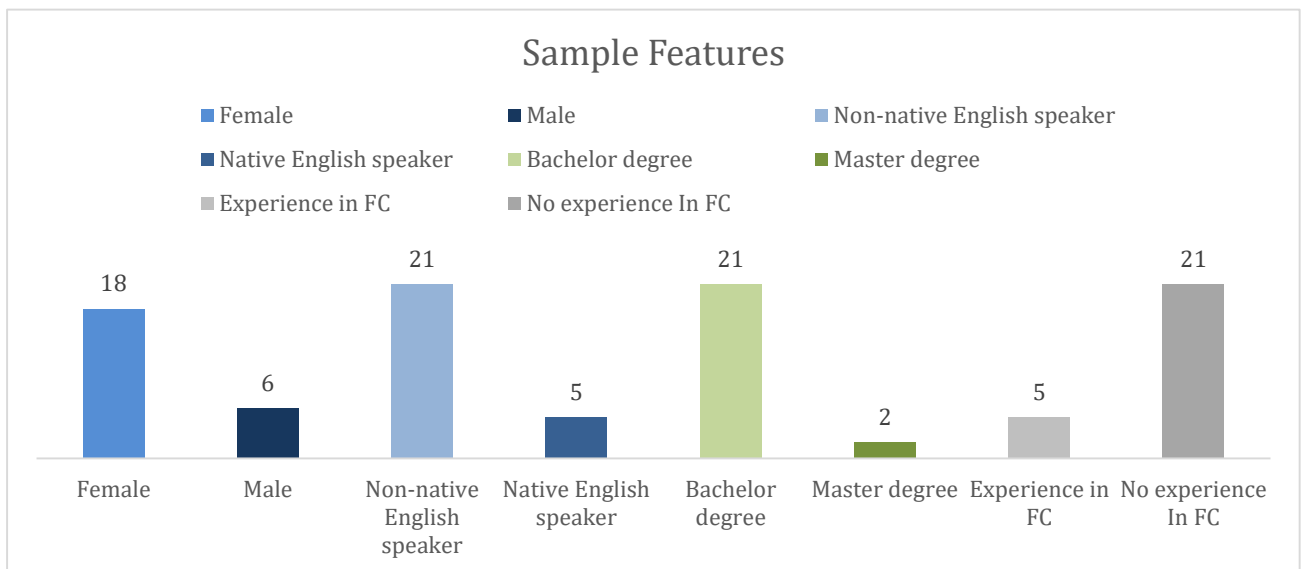
students' attitudes towards the flipped classroom and the prompting technique that was included in the video lectures. An experimental research method was implemented to investigate the second focus of the study, the prompting. The participants were randomly assigned to one of two groups: the experimental group and the control group. The experimental group received metacognitive prompts and strong motivation prompts (both appeared 3 times per video-lecture), the control group received metacognitive prompts (appeared 3 times per video-lecture) and weak motivation prompts (appeared 1 time per video-lecture). In other words, the weak and the strong groups were differed according to the frequency of the motivational prompts that appeared during the video lectures. The independent variables of this study were motivational and meta-cognitive prompts and the dependent variables were learning outcomes (test scores), self-regulation skills, interest, motivation (relevance), perceived usefulness of the FC technology, perceived ease of use the FC technology, attitude to the FC technology, activities usefulness, perceived usefulness of the prompts technique, attitudes to the prompts technique.

### 3.2 Research Sample

The research sample consisted of 26 second-semester students of the international master program, from the 2018-year cohort. Three of the students were later excluded from the data analysis due to missing data. 75% of the sample were females ( $n = 18$ ) and 25% were males ( $n = 6$ ). The participants' age ranged between 22 to 34 years ( $M = 27.56$ ;  $SD = 3.92$ ). The instruction language of the program was English and the participants have been selected to the master's program as soon as they meet the language requirements, so all of the students were proficient in English. 21% of the sample ( $n = 5$ ) were native English speakers while the rest of them were non-native English speakers (79%,  $n = 21$ ). English native and non-native speakers were distributed almost equally in the two groups; control (2 of 12) and experimental (3 of 11). Regarding the educational background of the participants, 21% ( $n = 5$ ) had their master's degree

completed and the rest (79%,  $n = 21$ ) had a bachelor’s degree. Regarding their previous experience with the flipped classroom method, only a few students (5 of 26) had experience (1 to 168 months). As a result of this experience, two of these students preferred the flipped classroom over the traditional classroom. Moreover, the majority of the participants did not face serious technical problems when working in online-based environments, especially TUM Moodle ( $M = 1.52$ ;  $SD = 0.79$ ). For the detailed descriptive statistics of the sample, please see Figure 2.

**Figure 2.** Features of Research Sample





### 3.3 Research Design and Procedures

This study aimed to evaluate the effectiveness of the flipped classroom design. Therefore, an experimental design with two groups was implemented. The sample was divided into two groups randomly: experimental group ( $n = 13$ ) and control group ( $n = 13$ ). The control group received the weak-prompted videos, and the experimental group received the strong-prompted videos. Both versions were explained previously in this paper. In addition, both groups received the following instruments; pre-questionnaire, pre-test, post-test and post questionnaire. See Table 3 for the distribution of the instruments between the groups.

The data collection period lasted for 7 weeks from 08.05.2019 to 05.06.2019, see Table 4. This period included one introductory and four flipped sessions. During this time frame, the registered students were supposed to receive an introductory session and complete the pre-questionnaire. Then, for each flipped session, they were supposed to do “pre-class” activities which required approximately 90 minutes and consisted of solving the pre-test, watching an approximately 15 minutes video-lecture, and solving the post-test and doing the written task. Finally, reading the provided reading materials, if desired. The knowledge tests were reviewed by the author every week and the open-ended questions were graded to calculate the total grade for each student. Moreover, the written tasks were reviewed every week and a short feedback session was given each week along with the student discussion.

**Table 3.** Distribution of the Instruments between the Groups

	<b>Seminar 1*</b>		<b>Seminar 2**</b>	
	Experi- mental Group	Control Group	Experimental Group	Control Group
<b>Introduction to FC Method</b>	✓	✓	✓	✓
<b>Pre-questionnaire</b>	✓	✓	✓	✓
<b>Pre-tests</b>	✓	✓	✓	✓
<b>Video Lectures-Strong Version</b>	✓	✗	✓	✗
<b>Video Lectures-Weak Version</b>	✗	✓	✗	✓
<b>Post-tests</b>	✓	✓	✓	✓
<b>Post-questionnaire</b>	✓	✓	✓	✓

\* Basics of Quality Assurance

\*\* Quality Development by Professionalization

**Table 4.** Timetable of the Data Collection Period

Dates	Sessions for the Both Seminars*
08.05.2019	Introductory session
08-15.05.2019	1 <sup>st</sup> Online Session
15.05.2019	1 <sup>st</sup> In-Class Session
15-22.05.2019	2 <sup>nd</sup> Online Session
22.05.2019	2 <sup>nd</sup> In-Class Session
22-29.05.2019	3 <sup>rd</sup> Online Session
29.05.2019	3 <sup>rd</sup> In-Class Session
29.05-05.06.2019	4 <sup>th</sup> Online Session
05.06.2019	4 <sup>th</sup> In-Class Session
05.06-12.06.2019	5 <sup>th</sup> Online Session

\* Basics of Quality Assurance and Quality Development by Professionalization

Every student was given a pre-questionnaire before the flipped sessions started and a post-questionnaire at the end of the flipped sessions. The pre-questionnaires consisted of 7 parts and 52 items in total; demographic information, self-regulated learning skills which had 5 sub-scales within (1- metacognitive skills, 2- time management, 3-environmental structuring, 4-persistence, 5-help seeking), interest in the topic, and relevance. The post questionnaire consisted of 14 parts and 87 items in total and had the same scales that were used in the pre-questionnaires and in addition included the following scales: perceived usefulness of the FC technology, perceived ease of use the FC technology, attitude to the FC technology, activities usefulness, perceived usefulness of the prompts technique, and attitude to the prompts technique. Finally, the post-questionnaire included an open-ended section where the participants were asked to share their comments on the FC method. The scales were presented in more detail in the following section under each variable. The questionnaires were distributed in paper form and classroom time was used to reach all the students for data collection. The entire process was summarized in Table 5.

The questionnaires were adapted from current popular scales and all questionnaires had a five-point Likert scale that ranged from “1= not at all true for me” to “5= very true for me”. There were some missing data to be mentioned. Eight items were excluded from the knowledge tests due to the technical problems appeared during the implementation of these items. Moreover, three students did not complete the tests who were later excluded from the analysis.

Regarding the matching of knowledge test scores and questionnaires, a coding sheet was designed to protect the confidentiality of the questionnaires as the names of the participants were visible in Moodle test results (see Appendix 5, for coding sheet). After distributing the post questionnaire, the participants were given the coding sheet to write their codes and names. This sheet was distributed by the secretary of the department, who was not involved in any

other part of the overall study. After collecting the names and the passcodes of the participants, she replaced the participants' names with their passcodes in the data file of the test scores. Later the author was able to put the scores and the questionnaire results all together which was the final step of the data collection.

**Table 5.** Summary of the Data Collection Process

Session Type	Phase	Content
Introductory session	Presence	<ul style="list-style-type: none"> <li>● Orientation about the Seminars</li> <li>● Introduction to the FC Method</li> <li>● Distributing the Pre-Questionnaire</li> </ul>
Flipped session 1	Self-learning	<ul style="list-style-type: none"> <li>● Pre-Test 1</li> <li>● Video Lecture 1</li> <li>● Writing Task 1</li> <li>● Post-Test 1</li> <li>● Readings 1</li> </ul>
	Presence	<ul style="list-style-type: none"> <li>● In-class Activities</li> </ul>
Flipped session 2	Self-learning	<ul style="list-style-type: none"> <li>● Follow-up Test 1+ Pre-Test 2</li> <li>● Video Lecture 2</li> <li>● Writing Task 2</li> <li>● Post-Test 2</li> <li>● Readings 2</li> </ul>
	Presence	<ul style="list-style-type: none"> <li>● In-class Activities</li> </ul>
Flipped session 3	Self-learning	<ul style="list-style-type: none"> <li>● Follow-up Test 2+ Pre-Test 3</li> <li>● Screen-Cast Video 3</li> <li>● Writing Task 3</li> <li>● Post-Test 3</li> <li>● Readings 3</li> </ul>
	Presence	<ul style="list-style-type: none"> <li>● In-class Activities</li> </ul>
Flipped session 4	Self-learning	<ul style="list-style-type: none"> <li>● Follow-up Test 3+ Pre-Test 4</li> <li>● Video Lecture 4</li> <li>● Writing Task 4</li> <li>● Post-Test 4</li> <li>● Readings 4</li> </ul>
	Presence	<ul style="list-style-type: none"> <li>● In-class Activities</li> <li>● Distributing the Post-Questionnaire</li> </ul>
Traditional session 1	Self-learning	<ul style="list-style-type: none"> <li>● Follow-up Test 4</li> </ul>
	Presence	<ul style="list-style-type: none"> <li>● Distributing the Post-Questionnaire</li> </ul>

### 3.4 Materials

#### 3.4.1 Seminars

Two seminars of the master program namely Basics of Quality Assurance (BQA) and Quality Development by Professionalization (QDP) were investigated in this study. The scope of these seminars was focused on quality development and quality assurance in education. The instructor was female, holding a Ph.D. The author of the current study assisted her during the introductory session and the four flipped sessions which provided an opportunity for close observation of in-class flipped sessions. These seminars consisted of 14 lecture weeks and only four weeks were conducted as flipped sessions. So, this study focused on the first five weeks of both seminars including the introductory session and the flipped sessions. The topics of the BQA seminar for the four flipped sessions were as following: Quality in Education, Quality Management in Education, Internal and External School Evaluation, and Understanding and Using Feedback from External Evaluations. Similarly, the QDP seminar had four sessions with the topics of; The Importance of Teacher Professional Development, Standards in Teacher Education, Assessing Teacher Professional Development (TPD), and Effectiveness of TPD programs. See Appendix 1 for the detailed presentation of the syllabus.

#### 3.4.2 Seminars' Introductory Session

The introductory sessions were held for each seminar to introduce the schedule, overview of seminar content, learning objectives, course requirements and grade policy of the seminars. The introductory session was continued on the following week with a separate presentation about the flipped classroom method by the author, in order to introduce the students the following topics; definition of flipped classroom, why FC is useful, guidelines for Moodle (an online learning platform that was used by the university for every seminar), class materials and required tasks of the seminars. During the presentation, the students were also

informed about the study and the data collection process. There was some time spared for answering students' questions too. The questions addressed the details of the study such as intervention, were carefully handled in order to avoid any effects on the study. Finally, the students were distributed the pre-questionnaire towards the end of the introductory sessions.

### 3.4.3 Self-learning Phase Activities

Self-learning phase activities refer to the activities that the students needed to perform prior to every flipped session. These activities consisted of the knowledge pre-tests, the video lectures, the knowledge post-tests, the written tasks, and the noncompulsory reading materials. In the following session, each of these activities were presented in detail.

#### Knowledge Tests

The knowledge tests were adapted from Shahada's study (Shahada, 2018). They were conducted in three forms; pre-tests, post-tests and follow-up tests. Prior to each video-lecture, the students were supposed to respond to the pre-test which aimed to identify their background knowledge on the topic. The post-tests consisted of the same questions of the pre-test with different order which aimed to assess students' progress after watching the video lecture. The follow-up tests were implemented a week after the post-test that the students had a chance to apply their theoretical knowledge in the classroom activities and discussions. The follow-up test questions were integrated into the pre-test of the following week, repeated questions of the previous week and again in a mixed order. Overall, the first pre-test presented the new items about the content of the first week and for the next four weeks also repeated questions from the previous week presented. After the fourth week, students were supposed to respond to the follow-up test in week 5 after the very last in-class flipped session.

Each test included 5 to 6 items which approximately took five minutes' time to be completed. In total there were 41 items that were asked three times in different orders and different measurement points (pre, post, and follow-up) for each seminar. Overall, 123 responses were collected from the students. The question types that have been used in the tests were as follows; complete the blanks, true or false, select one option or more, multiple-choice, write a short answer for a question, and drag the phrases into their correct place in the diagram. The open-ended items were graded by the author every week, and all the rest items were automatically scored by the platform. Please see Appendix 2 for the complete versions of the knowledge tests.

#### Video Lectures

The video lectures were the first tools to present the content of the lecture. They were developed by doing the screen recording of PowerPoint slides that were prepared by the instructor and her assistant in the previous years. The content of the PowerPoint slides was improved, and the visual materials were updated, most of the recordings were renewed for the current study. For the screen recordings, Screencast-O-Matic was used. The post-production of the videos was made via Movie Maker 2013. Each video lecture had approximately 15 minutes long and there were two different types of videos designed for two different groups; weak prompted videos for the control group and strong prompted videos for the experiment group.

#### Prompts

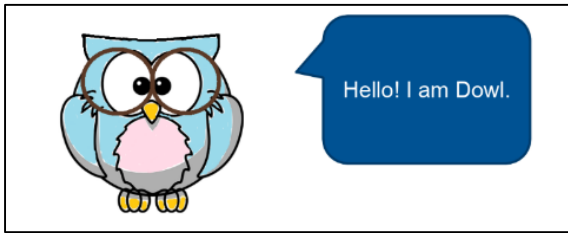
We used both metacognitive and motivational-relevance prompts in both groups' video lectures. We used metacognitive prompts in several forms, but mainly in question forms. The research supported that the question prompts provide cognitively complex ways learners think about, feel about, and make connections in experience which fosters reflection



(Aleven, Kay, Mostow, Wu, & Looi, 2010). Moreover, we used the motivational prompts aiming to highlight the relevance of the content for learners. The frequency of the motivational prompts differed between the experimental and control group. Our purpose was to investigate the initial effect frequency of prompting on motivation, interest and self-regulated learning skills.

The videos of both groups had the same number of metacognitive prompts (appeared 3 times per one video lecture) and a different number of motivational prompts (appeared 1 time per video for the control (weak) group and 3 times for the experimental (strong) group). There was one video lecture for each weak per seminar. The students had access to the videos right after completing the in-class session of the previous week. The weak-prompted videos were only available for the students who were registered in the weak- control group and the strong-prompted videos were only available for the students who were registered in the strong-experimental group. The prompts were presented via an educational agent. The educational agent was an owl, named *Dowl* and designed by the author. As the research suggested that it may not be necessary for an agent to appear as human-like to create the illusion and benefits of social interaction (Schroeder et al., 2013), in our study, we decided to use a simple design for our educational agent (see Figure 3). The script of *Dowl*'s speech was carefully revised considering the guidelines by Veletsianos (Veletsianos et al., 2013). We reduced the speech of the agent in the visual presentation to avoid learners reading everything they hear, rather process the visual and aural information separately.

**Figure 3.** Screenshot of the Educational Agent Used in the Current Study



The motivational prompts consisted of one main and two detailed sections. In the main section, which appeared at the beginning of the videos, right after the presentation of the learning objectives, presented some main professional areas that the students can make use of the content of that week’s seminar in a professional way. The next two sections of the motivational prompts presented in the middle of the video lecture, after section one, and at the end of the video lecture, after section two, relatively more detailed examples of professions related to the topics that were covered during the video. The metacognitive prompts were presented at the same places, at the beginning of the video, before the section one, in the middle of the video, after the section one and at the end of the video, after the section two.

***Sample for motivational-relevance prompts:***

*Dowl: “Do you know why it is important to learn the standards in teacher education?*

*Now I will provide you some cases to show how important it is:*

*-as an education researcher, you can work on the evaluation of TPD programs effectiveness, which might need standards to be assessed*

*-working as a teacher, syllabus developer, school director as you can evaluate the effectiveness of the teaching is based on these standards.”*

***Sample for metacognitive prompts:***

*Dowl: “Before we go pause the video, and give yourself some time to think about the following points:*

*1- Consider the learning goals and your own learning expectations,*

*2- Decide if you will use the same strategy you followed in the previous lecture, is there anything you want to change?*

*When you are done, resume the video-playing! “*

Please see Appendix 3 for the complete script of the prompts used in the video-lectures.

### Writing task

The writing tasks (see Appendix 6) consisted of open-ended questions with the statement that leads students to discussion. The students were supposed to write 100-200 words per writing task. The responses of the tasks were reviewed by the author and presented in the following week's session to provide feedback for students as well as creating a room for the class discussion.

#### ***Sample writing task:***

*If you are a teacher (or if you were one), would you love to use the INTASC principles? Answer this question based on your own perspective. Justify with examples when it is possible. Please write about 150-200 words.*

### Reading materials

There were some academic reading materials, such as research articles, provided for the students on TUM Moodle, for each week. The readings were non-compulsory. The purpose of these materials was to encourage the students to gain further information about the topic as well as provide them a source in case of unclear and missing points that can remain after watching the video-lecture. The content of the reading material was provided in the syllabus, in Appendix 1.

### In-class Activities

In-class activities aimed to revise the content that was provided in the video lectures and to provide room for students to discuss what they have learned as well as an opportunity to put their theoretical knowledge into practice via group work activities. Receiving the content initially from the video lectures helped the class time to be specified for class discussions and

group works. The in-class activities consisted of a short revision of the video-lecture, a feedback session for students' written tasks, an introductory activity, a practice activity, and a closing activity. The introductory activities were designed as warm-up tasks such as watching a video for a purpose, discussing shortly in pairs or with the audience, brain-storming about, or solving a puzzle word. The practice activities consisted of small group presentations, role plays, product creation, and material analysis. Finally, the close-up activity aimed to conclude the topic and exchange of final ideas about the content of the week as well as reviewing the unclear points. For the class activities please see Appendix 4.

### 3.5. Instruments

The data was collected via the knowledge tests (see Appendix 2) and the questionnaires (see Appendix 7) which were adapted from the previous evaluation study conducted by Shahada (Shahada, 2018). The knowledge tests were implemented via the online learning platform Moodle and the questionnaires were implemented in paper forms. The summary of the scales that were used in this study is presented in Table 6. All the variables that were measured in this study and their scales are presented in the following sections.

**Table 6.** Summary of the Scales Used in the Study

<b>Variables and Scales</b>	<b>Number of Items</b>	<b>Scale's Reference</b>	<b>Pre-Q.</b>	<b>Post-Q.</b>
<b>Self-regulated learning skills</b>	<b>36</b>	SOLQ (Jansen et al., 2016)	✓	✓
1) Metacognitive skills,	18		✓	✓
2) Time management,	3		✓	✓
3) Environmental structuring,	5		✓	✓
4) Persistence, and	5		✓	✓
5) Help seeking	5		✓	✓
<b>Interest In The Topic</b>	<b>4</b>	Krapp (2002)	✓	✓
<b>Relevance</b>	<b>12</b>	Frymier and Schulmann (1995)	✓	✓
<b>Acceptance of FC technology</b>	<b>25</b>	TAM (Ngai et al., 2007)		✓
1) <i>Perceived Usefulness Of The FC Technology</i>	6			✓
2) <i>Perceived Ease Of Use The FC Technology</i>	5			✓
3) <i>Attitude To The FC Technology</i>	4			✓
4) <i>Activities Usefulness: Pre-Class</i>	4	McNally et al. (2016)		✓
5) <i>Activities Usefulness: In-Class</i>	6			✓
<b>Acceptance of the Prompts Technique</b>	<b>10</b>	TAM (Ngai et al., 2007)		✓
1) <i>Perceived Usefulness Of The Prompts Technique</i>	6			✓
2) <i>Attitude To The Prompts Technique</i>	4			✓

### 3.5.1 Academic Performance-Knowledge Tests

The academic performance of the students was measured via the knowledge tests in three different versions: pre-test, post-test and follow-up test. There were some technical problems with the implementation of some items such as; two correct answers per question, or a problem in drag and drop function. Therefore, the following test items are excluded from the analysis; in BQA seminar, item no. 1 and no.3 from the pre and the posts tests of the first week, and item no.4 from the pre and post-tests of fourth week, and in QDP seminar, item no.6 from the pre and post-tests of the first week. There were also some missing data due to the sample.

One participant did not respond to any question in one seminar, and two participants constantly skipped some tests among the weeks.

### 3.5.2 Self-regulated Learning Skills

Considering that student surveys have been used as an effective evaluation method for years (Maassen, 1997), student surveys were used as the main data collection method of the current evaluation study. Self-regulated learning skills was measured via 36 items scale which had 5 different sub-scales. This scale was adapted from the Self-regulated Online Learning Questionnaire (SOLQ) of Jansen et al. (2016) and used both in the pre and post questionnaire. Some of the items were adapted to better fit into the current study's context. In the pre-questionnaire, the participants were asked to consider their previous learning experiences on a seminar that was almost structured the same as the current seminars while responding the questions (e.g. "I ask myself questions about what I am to study before I begin to learn."). However, for the post questionnaire, the items were adapted to gather participants' experience in the target seminars; "Basics of Quality Assurance" and "Quality Development by Professionalization".

#### Metacognitive skills

The metacognitive skills of the participants were measured via an 18 items scale which aimed to measure how the participants use metacognitive skills during the learning process (e.g. "I think of alternative ways to solve a problem and choose the best one.").

#### Time management

The time management scale consisted of 3 items and two of these items were negatively directed which were changed into a positive direction in order to avoid reader confusion and

provide stability in the whole questionnaire as these two items were the only negatively directed ones in the entire questionnaire.

***Negatively directed:***

*I find it hard to stick to a study schedule during learning.*

*I often find that I don't spend very much time on learning because of other activities.*

***Adapted:***

*I find it easy to stick to a study schedule during learning.*

*I make sure other activities do not take from my learning time.*

This scale aimed to measure participants' time management skills during the learning process (e.g. "I make sure I keep up with the weekly readings and assignments.").

Environmental structuring

There were five items aiming to measure how the participants arranged their study environment (e.g. "I know where I can study most efficiently.").

Persistence

The persistence scales had five items to measure the participants' persistence on studying and their ability to achieve learning goals when they are challenged (e.g. "I work hard to do well even if I don't like what I have to do.").



### Help seeking

Help seeking scale also included five items that were focused on participants' strategies to handle the situation when they could not understand something during learning (e.g. "When I am not sure about some materials, I check with other people.").

### 3.5.3 Interest in the Topic

The four items interest scale was developed based on Krapp's theory of interest. (Krapp, 2002). This scale aimed to assess students' interest in the content of the seminars which was presented prior to the pre-questionnaire. The scale of interest was also implemented in the post questionnaire to determine the possible change in participants' interest after the four flipped sessions (e.g. "I like to get new knowledge about the topics of these courses.").

### 3.5.4 Relevance

The relevance scale was adapted from Frymier and Schulmann's scale which was first developed in 1995 (Frymier and Schulmann, 1995). The scale had 12 items and in the original version, the items targeted the instructor's presentation's relevance. These items were adapted referring to the flipped classroom material. The scale was included in both the pre and the post questionnaires.

#### ***Sample item from the original scale:***

*(The teacher) Explicitly states how the material relates to my career goals or my life in general.*

#### ***Sample item from the pre-questionnaire:***

*I think I will find statements on how the material relates to my career goals or my life in general.*

***Sample item from the post-questionnaire:***

*I think I found explanations in the seminars to make the content relevant to me.*

3.5.5 Perceived Usefulness of the FC Technology

The scale consists of six items and was adapted from the Technology Acceptance Model (TAM) questionnaire of Ngai, Poon, and Chan (2007). The scale aimed to see how useful the participants found the FC technology, therefore, it was only included in the post-questionnaire. (e.g. “Overall, I found the flipped seminars to be advantageous to my learning.”)

3.5.6 Perceived Ease of Use the FC Technology

Similarly, this scale was only implemented in the post questionnaire and was adapted from the Technology Acceptance Model (TAM) questionnaire of Ngai, Poon, and Chan (2007), as well. There were five items aimed to measure how easy or understandable the participants found the flipped seminars (e.g. “Learning to operate the flipped seminar online system was easy for me.”).

3.5.7 Attitude to the FC technology

This scale was also derived from the TAM questionnaire of Ngai, Poon, and Chan (2007) and had four items to measure the participants' attitude towards the FC technology (e.g. “Flipped seminars system provided an attractive learning environment”).

3.5.8 Activities Usefulness

This scale was derived from the questionnaire of McNally et al. (2016) which aimed at obtaining information on flipped classroom experiences in higher education context. More specifically, the scale aimed to see the participants' experiences in flipped classroom activities. There were two sections in this scale; pre-class activities (e.g. videos, online tasks, literature,

etc.) and in-class activities (e.g. group work, audience discussion, take-home-message, etc.). The scale had 10 items in total and the four of these items were focused on the usefulness of the pre-seminar activities (e.g. “The pre-seminar activities motivated me to learn more”) and the remaining six items were designed to check the usefulness of the in-seminar activities (e.g. “The in-seminar activities helped me improve my group work skills”).

#### 3.5.9 Perceived Usefulness of the Prompts Technique

This scale was also adapted from the TAM questionnaire of Ngai, Poon, and Chan (2007) in order to identify what the participants think about the prompts, the “owl” picture (an educational agent named Dowl) with instructional messages appeared occasionally in the video lectures on Moodle. The scale consisted of six items (e.g. “The prompts enhanced the effectiveness of my learning.”).

#### 3.5.10 Attitude to the Prompt’s Technique

Similarly, this scale was adapted from the TAM questionnaire of Ngai, Poon, and Chan (2007) to measure students’ attitudes towards the prompts technique. The scale consisted of four items (e.g. “The prompts provided an attractive learning environment.”)

#### 3.5.11 Reliability

In order to check for the internal consistency of the questionnaires, Cronbach's Alpha test was conducted for each scale. The results showed that the reliability levels of all the scales were high, there were no scales unreliable. The Cronbach's Alpha was ranged between .72 and .97. The detailed information on the reliability of the scales is presented in Table 7.

**Table 7.** Summary of the Scales Used in the Study

<b>Scales</b>	<b>Cronbach's Alpha</b>	<b>Number of Items</b>
Pre-Metacognition	.90	18
Post-Metacognition	.88	18
Pre-Time Management	.72	3
Post-Time Management	.75	3
Pre-Environmental Structuring	.89	5
Post-Environmental Structuring	.86	5
Pre-Persistence	.78	5
Post-Persistence	.85	5
Pre-Help Seeking	.77	5
Post-Help Seeking	.87	5
Pre-Interest In The Topic	.88	4
Post-Interest In The Topic	.94	4
Pre- Relevance	.86	12
Post-Relevance	.88	12
Perceived Usefulness Of The FC Technology	.94	6
Perceived Ease Of Use The FC Technology	.95	5
Attitude To The FC Technology	.89	4
Activities Usefulness: Pre-Class	.84	4
Activities Usefulness: In-Class	.91	6
Perceived Usefulness Of The Prompts Technique	.97	6
Attitude To The Prompts Technique	.91	4

### 3.5.12 Participant Comments on the FC Experience

The post-questionnaire had one open-ended item to provide the participants with a chance to share their comments on the flipped classroom experience. The participants were provided a half a page-sized empty box which provided them a limited space. Fifteen students shared their comments and experiences.

3.6 Data Analysis

All the data were analyzed using SPSS. First, Cronbach's Alpha was calculated for each scale in order to check the reliability of the scales. Reliability scores are presented in Table 7. Then, the normality test was calculated for each scale to check the normal distribution of the scales (see Table 8). The descriptive statistics were computed for each scale. For each research question, the data analysis methods explained below.

**Table 8.** Tests of Normality of the Scales Used in the Study

<b>Tests of Normality</b>		<b>Shapiro-Wilk</b>	
<b>Scales</b>	<b>df</b>	<b>Sig.</b>	
Pre-Metacognition	22	.385	
Post-Metacognition	22	.971	
Pre-Time Management	22	.265	
Post-Time Management	22	.438	
Pre-Environmental Structuring*	22	.001	
Post-Environmental Structuring	22	.072	
Pre-Persistence	22	.685	
Post-Persistence	22	.162	
Pre-Help Seeking	22	.469	
Post-Help Seeking	22	.349	
Pre-Interest In The Topic*	22	.049	
Post-Interest In The Topic*	22	.003	
Pre- Relevance	22	.701	
Post-Relevance	22	.895	
Perceived Usefulness Of The FC Technology	22	.630	
Perceived Ease Of Use The FC Technology*	22	.000	
Attitude To The FC Technology	22	.507	
Activities Usefulness: Pre-Class	22	.545	
Activities Usefulness: In-Class	22	.801	
Perceived Usefulness Of The Prompts* Technique	22	.000	
Attitude To The Prompts Technique*	22	.000	

\*Non-normally distributed scales

The first research question of the study was: *Is there a difference between participants' motivation, interest, and self-regulated learning skills before and after the flipped classroom method?* In order to find this, first, a Shapiro-Wilk test was used to check for normal distribution of the self-regulated learning strategies' scales (metacognitive, time management, environmental structuring, persistence, and help seeking), the interest's scales, and the relevance scales of the pre and the post-questionnaire. The results of the Shapiro-Wilk test showed that all scales were normally distributed ( $p > .05$ ) except the following scales; pre environmental structuring, pre and post interest in the topic, perceived ease of use the FC technology, perceived usefulness of the prompts and attitude to the prompts technique scales. Therefore, we carried out a Paired-samples T-Test for normally distributed scales and a Wilcoxon signed-rank tests for non-normally distributed scales to analyze the differences in participants' use of self-regulated learning strategies, their level of interest in the seminars' content, and their motivation (i.e. how relevant they find the class content) before and after experiencing the four flipped sessions.

The next research question was: *What is the difference among students' pre-test scores (before the video-lecture), post-test scores (after the video-lecture) and follow-up test-scores (after the in-class session) before and after the flipped classroom method ?* In order to investigate this question, a factorial repeated-measures ANOVA test was computed to compare students' pre-test scores, post-test scores, and follow-up test-scores.

The following research question was: *Is there a difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to motivation (i.e. relevance), interest and self-regulated learning skills?* In order to find an answer to this question, we compared the two groups considering the following variables; motivation, interest and self-regulated learning skills. An independent samples T-test was computed for normally distributed scales and Mann Whitney U test was computed for non-normally distributed scales.

The following main research question aimed to investigate the students' attitudes toward the flipped classroom method and the prompts techniques used in online lectures; *How effective do students find FC?* This question was analyzed under four separate research questions. The first question was: *What are the attitudes of the students towards FC in terms of ease of use and usefulness?* In order to find this, we computed the descriptive statistics for the two scales; Perceived Usefulness of the FC Technology and Perceived Ease of Use the FC Technology. Similarly, the following question was investigated via descriptive statistics; *What are the attitudes of the students towards the prompts technique?* In order to see this, we computed the descriptive statistics for the two scales; Perceived Usefulness of the Prompts Technique and Attitude to the Prompts Technique. We followed the same computation for the next two scales; Pre-Class and In-Class Activities Usefulness, in order to investigate the following research question: *How useful do students find the pre-class and in-class activities?*

The last research question was; *Is there a difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to their attitude towards prompts and FC technology, and how useful they found the activities and the prompts technique?* In order to investigate this, a Shapiro-Wilk test was used to check for normal distribution of the five scales; perceived ease of use the FC technology, attitude to the FC technology, activities usefulness, perceived usefulness of the prompts technique, attitude to the prompts technique. Only three scales were non-normally distributed; perceived ease of use the FC technology, perceived usefulness of the prompts technique, and attitude to the prompts technique. The two groups were compared computing an independent sample T-Test for the normally distributed scales and Mann Whitney U tests for normally distributed scales.

## Chapter 4: Results

### 4.1 The Initial Effect of the FC on Students' Learning Outcomes, Motivation, Interest and SRL skills

This section focused on the initial effect of the FC on learning outcomes (test scores), motivation (i.e. relevance), interest and self-regulated learning skills.

According to the results of the paired-samples T-tests, there was a significant difference in the scores for metacognitive skills ( $M = .85$ ,  $SD = .61$ ;  $t(21) = 6.49$ ,  $p = .000$ ), help-seeking skills ( $M = .86$ ,  $SD = 1.01$ ;  $t(21) = 4.06$ ,  $p = .001$ ) and motivation (i.e. relevance) ( $M = .64$ ,  $SD = .55$ ;  $t(21) = 5.41$ ,  $p = .000$ ). These results suggest that after flipped sessions, the metacognitive skills, help seeking skills and motivation of the participants significantly decreased. No significant difference was found for time management skills ( $M = -.01$ ,  $SD = 1.03$ ) and persistence ( $M = .28$ ,  $SD = .96$ ) before and after flipped classroom sessions. The results are presented in Table 9.

Moreover, Wilcoxon signed-rank tests were conducted for non-normally distributed scales and the results showed receiving four weeks of flipped sessions showed a significant decrease in interest in the topic ( $Z = -2.249$ ,  $p = .014$ ). The median score in the pre-interest scale was 4.00, while the in the post-interest scale was 3.5. However, there was no significant difference in the environmental structuring skills of the students after the flipped classroom sessions ( $Z = -1.719$ ,  $p = 0.086$ ). The median score rating was 4.0 both pre- and post-scales. The results are presented in Table 10.



**Table 9.** Paired-samples T-test Results

<b>Paired Samples Test</b>							
Pairs (Pre and Post Tests)	Mean(SD)		M (mean difference )	SD	t	df	Sig.
	Pre	Post					
Metacognition	3.72 (.63)	2.88 (.69)	.85	.61	6.49	21	.000
Time Management	3.07 (.89)	3.00 (.92)	-.01	1.03	-.06	21	.946
Persistence	3.30 (.70)	3.55 (.89)	.28	.96	1.36	21	.185
Help Seeking	3.71 (.80)	2.86 (1.16)	.86	1.01	4.00	21	.001
Relevance	4.02 (.52)	3.36 (.76)	.64	.55	5.41	21	.000

**Table 10.** Wilcoxon Signed-Rank Test Results

<b>Wilcoxon Signed-Rank Test</b>		
Pairs (Pre and Post Tests)	Z	Sig.
Environmental Structuring	-1.719	.086
Interest In The Topic	-2.449	.014

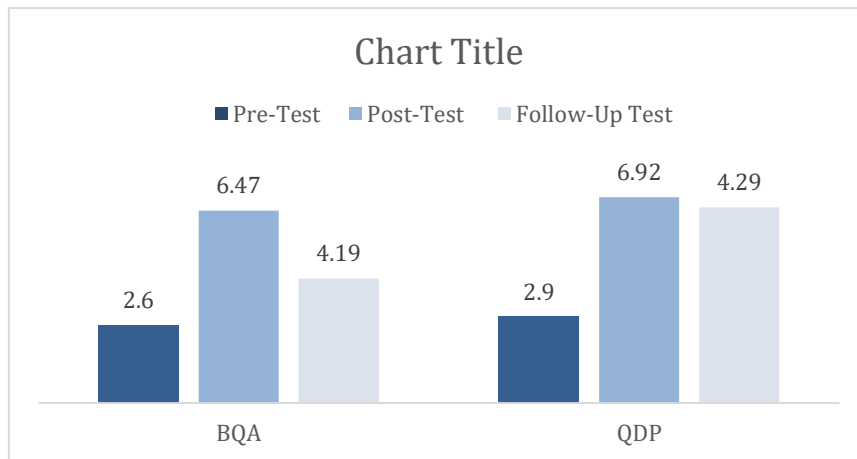
#### 4.1.1 Effect on Learning Outcome (Test Scores)

The following research question investigated the difference among students' pre-test scores (before the video-lecture), post-test scores (after the video-lecture) and follow-up test-scores (after the in-class session). The results of factorial repeated-measures ANOVA tests showed that there was a significant change in participants' pre-test, post-test and follow up test scores for both BQA seminar ( $F(2) = 107,510, p = .000$ ) and for QDP seminar ( $F(2) = 129,267, p = .000$ ). See Table 11 and Figure 4 for descriptive statistics.

**Table 11.** ANOVA Descriptive Statistics

Descriptive Statistics		
	M	SD
<b>BQA</b>		
Pre-Test	2.60	.90
Post-Test	6.47	1.60
Follow-up Test	4.19	2.07
<b>QDP</b>		
Pre-Test	2.90	1.06
Post-Test	6.92	1.18
Follow-up Test	4.29	1.58

**Figure 4.** Means of Test Scores



#### 4.1.2 The Effect of Different Prompts on Motivation, Interest and SRL Skills

In this section, the research focus was the difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to motivation (i.e. relevance), interest and self-regulated learning skills. The means of the two groups are presented in Figure 5. According to the results of independent samples T-tests, there was no significant difference found in the following scales (see Table 12);

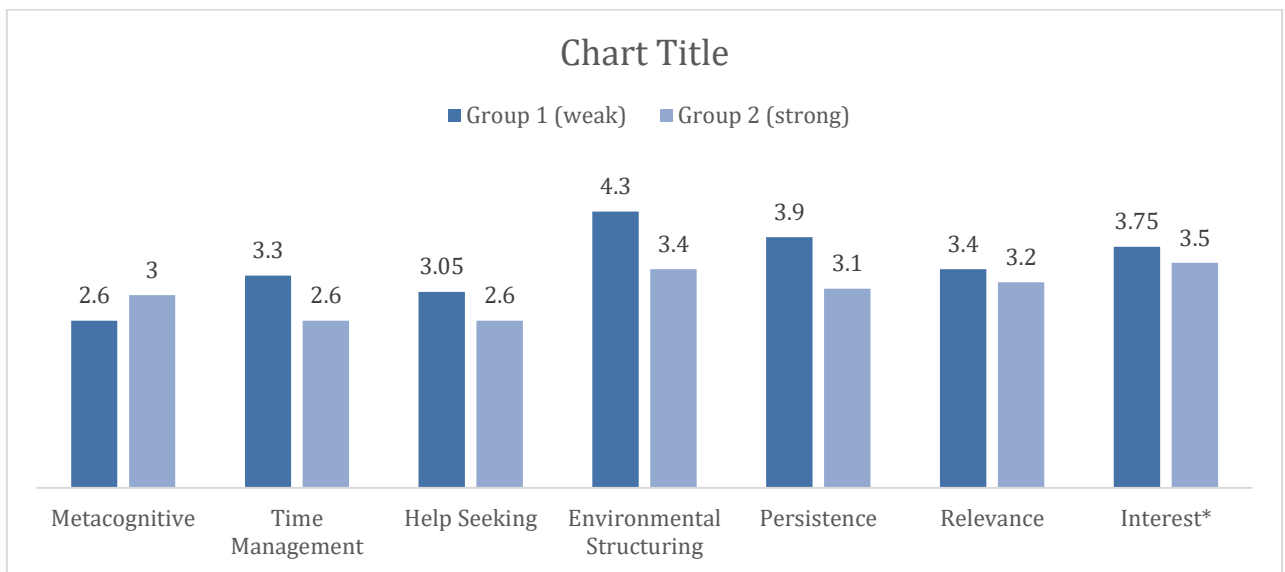
1. Metacognitive skills weak ( $M = 2.69$ ,  $SD = .62$ ) and strong ( $M = 3.09$ ,  $SD = .73$ ) conditions;  $t(21) = 1.409$ ,  $p = .174$ .
2. Time management skills weak ( $M = 3.30$ ,  $SD = 1.02$ ) and strong ( $M = 2.66$ ,  $SD = .69$ ) conditions;  $t(21) = 1.724$ ,  $p = .099$ .
3. Help seeking weak ( $M = 3.05$ ,  $SD = 1.1$ ) and strong ( $M = 2.65$ ,  $SD = 1.25$ ) conditions;  $t(21) = .803$ ,  $p = .431$ .
4. Motivation (i.e. relevance) weak ( $M = 3.45$ ,  $SD = .55$ ) and strong ( $M = 3.27$ ,  $SD = .55$ ) conditions;  $t(21) = -.684$ ,  $p = .596$ .

These results suggested that metacognitive skills, time management skills, help seeking skills and motivation of the participants insignificantly differed between the groups with different prompts. Whereas, the environmental structuring skills and persistence skills of the weak group was significantly higher than the strong group;

5. Environmental structuring skills weak ( $M = 4.31$ ,  $SD = .44$ ) and strong ( $M = 3.40$ ,  $SD = 1.09$ ) conditions;  $t(21) = 2.671$ ,  $p = .014$ .
6. Persistence weak ( $M = 3.95$ ,  $SD = .71$ ) and strong ( $M = 3.12$ ,  $SD = .90$ ) conditions;  $t(21) = 2.439$ ,  $p = .024$ .

For the non-normally distributed scale, a Mann-Whitney U test was computed (see table 13) and the results indicated that the interest of students in the weak group ( $Mdn = 3.75$ ) was insignificantly different from the students in the strong group ( $Mdn = 3.50$ ); ( $U = 50.00, p = .318$ ).

**Figure 5.** Means of Groups: The SRL, Relevance, and Interest



\*Median

**Table 12.** Independent Samples T-Test: The SRL and Relevance

	<b>group</b>	<b>n</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>Sig</b>
Metacognitive	weak	12	2.69	.62	1.409	21	.174
	strong	11	3.09	.73			
Time Management	weak	12	3.30	1.02	1.724	21	.099
	strong	11	2.66	.69			
Help Seeking	weak	12	3.05	1.1	.803	21	.431
	strong	11	2.65	1.25			
Environmental Structuring	weak	12	4.31	.44	2.671	21	.014
	strong	11	3.40	1.09			
Persistence	weak	12	3.95	.71	2.439	21	.024
	strong	11	3.12	.90			
Relevance	weak	12	3.45	.55	-.684	21	.596
	strong	11	3.27	.55			

**Table 13.** Mann-Whitney U Test: Interest

	<b>group</b>	<b>n</b>	<b>Mdn</b>	<b>U</b>	<b>Sig.</b>
Interest	weak	12	4.40	45.59	.196
	strong	11	4.80		

#### 4.2 Students' Reactions

In this section, the main research focus was on students' attitudes towards the FC method and how useful and effective they found the FC method as well as the prompts included in the video lectures. So, the overall research question was: *How effective do students find FC?*

##### 4.2.1 Attitude towards FC, Ease of Use and Usefulness

The descriptive statistics (see Table 14) showed that the students found the FC method easy to use ( $M = 4.27$ ,  $SD = 0.87$ ) and their attitude was natural ( $M = 2.51$ ,  $SD = .96$ ) and they found the FC method relatively useful ( $M = 2.78$ ,  $SD = 1.01$ ).

##### 4.2.2 Attitude Towards the Prompts and its Usefulness

The descriptive statistics (see Table 10) showed that the students found the prompts technique relatively not useful ( $M = 1.76$ ,  $SD = .91$ ) and their attitude towards the prompts techniques was relatively negative ( $M = 1.57$ ,  $SD = .69$ ).

##### 4.2.3 Usefulness of Pre-class and In-class Activities

Similarly, the descriptive statistics (see Table 14) showed that the students found both the pre-class activities ( $M = 3.21$ ,  $SD = .74$ ) and in-class activities useful ( $M = 3.10$ ,  $SD = .85$ ).

**Table 14.** Descriptive Statistics of the FC and Prompts Technique Acceptance

	<b>M</b>	<b>SD</b>
Perceived Usefulness Of The FC Technology	2.78	1.01
Perceived Ease Of Use The FC Technology	4.27	.87
Attitude To The FC Technology	2.51	.96
Activities Usefulness: Pre-Class	3.21	.70
Activities Usefulness: In-Class	3.10	.85
Perceived Usefulness Of The Prompts Technique	1.76	.91
Attitude To The Prompts Technique	1.57	.69

#### 4.2.3 The Effect of Receiving Different Prompts on Students' Attitude

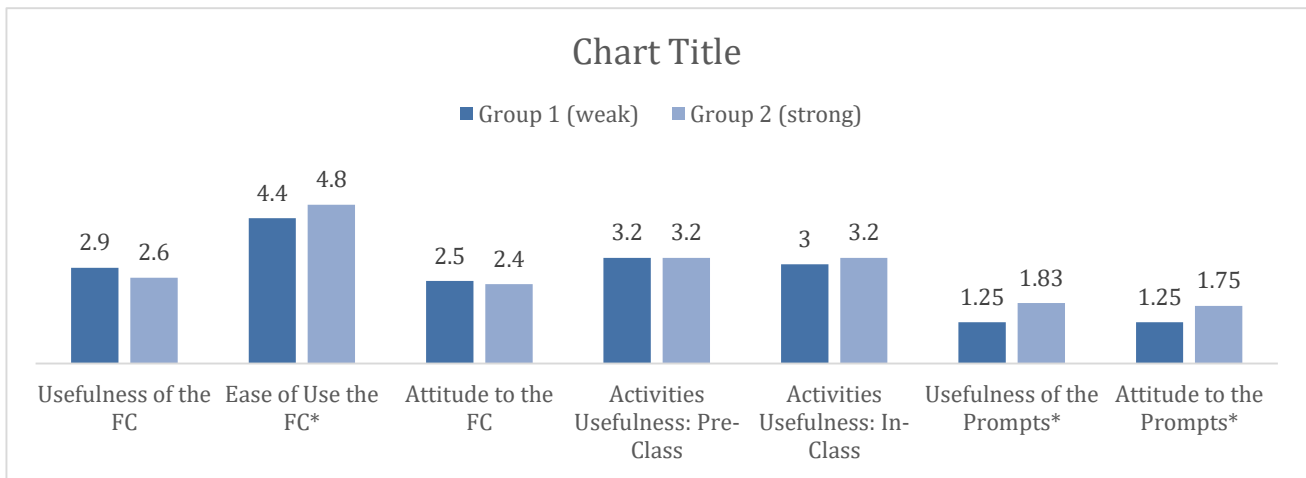
This section presented the findings of the difference between the two groups with different prompts (group 1-strong, group 2-weak) in regard to their attitude towards prompts and FC technology, and how useful they found the activities and the prompts technique. The means of the two groups presented in Figure 6. For normally distributed scales, independent samples T-tests results (see Table 15) indicated that there was no significant difference found between the groups;

1. Perceived usefulness of the FC technology, weak ( $M = 2.9$ ,  $SD = 1.21$ ) and strong ( $M = 2.6$ ,  $SD = .79$ ) conditions;  $t(21) = .614$ ,  $p = .546$
2. Attitude to the FC technology weak ( $M = 2.5$ ,  $SD = 1.17$ ) and strong ( $M = 2.4$ ,  $SD = .71$ ) conditions;  $t(21) = .368$ ,  $p = .717$ .
3. Pre-seminar activities usefulness weak ( $M = 3.2$ ,  $SD = .85$ ) and strong (i.e. relevance) ( $M = 3.2$ ,  $SD = .54$ ) conditions;  $t(21) = -.063$ ,  $p = .650$ .
4. In-seminar activities usefulness weak ( $M = 3.00$ ,  $SD = .78$ ) and strong (i.e. relevance) ( $M = 3.2$ ,  $SD = .95$ ) conditions;  $t(21) = -.626$ ,  $p = .538$ .

For non-normally distributed scales, a Mann-Whitney U test (see Table 16) indicated that there was no significant difference between the groups;

5. Perceived ease of use the FC technology weak ( $Mdn = 4.4$ ) and strong ( $Mdn = 4.8$ ) conditions;  $U = 45.50$ ,  $p = .196$ .
6. Perceived usefulness of the prompts technique weak ( $Mdn = 1.25$ ) and strong ( $Mdn = 1.83$ ) conditions;  $U = 65.00$ ,  $p = .950$ .
7. Attitude to the prompts technique weak ( $Mdn = 1.25$ ) and strong ( $Mdn = 1.75$ ) conditions;  $U = 54.50$ ,  $p = .462$ .

**Figure 6.** Means of Groups: The FC and Prompts Technique Acceptance



\*Median

**Table 15.** Independent Samples T-Test: The FC and Prompts Technique Acceptance

	group	n	Mean	SD	t	df	Sig
Attitude To The FC	weak	12	2.58	1.17	.368	21	.717
	strong	11	2.43	.71			
Usefulness Of The FC	weak	12	2.91	1.21	.614	21	.546
	strong	11	2.65	.79			
Activities Usefulness: Pre-Class	weak	12	3.20	.85	-.063	21	.950
	strong	11	3.22	.54			
Activities Usefulness: In-Class	weak	12	3.00	.78	-.626	21	.538
	strong	11	3.22	.95			



**Table 16.** Mann-Whitney U Test: The FC and Prompts Technique Acceptance

	<b>group</b>	<b>n</b>	<b>Mdn</b>	<b>U</b>	<b>Sig.</b>
Ease Of Use The FC	weak	12	4.40	45.59	.196
	strong	11	4.80		
Usefulness of the Prompts	weak	12	1.25	65.00	.950
	strong	11	1.83		
Attitude to the Prompts	weak	12	1.25	54.50	.462
	strong	11	1.75		

#### 4.2.4 Students' Comments

The students were asked to state their overall comments about the FC experience at the end of the FC sessions and some of them are presented below.

*“I do not know the reason why the questions from the previous week were repeated. At some point it was boring to work on them.”* (strong group)

*“I think it's a good idea to use FC method, but for the motivation part, I can't say it motivated me a lot. It was like reading the slides, it wasn't like in a conversational way or it didn't feel like that. I didn't like the prompts. However, it was nice to work with my own pace and study anytime I wanted to.”* (strong group)

*“Initially, the aim of FC was not clear to me as, found it boring. But after a couple of FC, began to understand the concept and found it used to me. It prepared me for the classes.”* (weak group)

*“The fact that this study was not entirely volunteer, made have made it extra boring. It was very hard to keep up with schedule. The visual used didn't address our age group. More videos and more authentic materials should have been used to give me more concrete idea of*

*implementation in our profession. "Dowl" was too repetitive, we memorized his lines unintentionally which made it annoying to see. The instructors were monotonous, didn't feel natural enough."* (weak group)

*"Learning with FC outside the CR made me feel like I didn't need to come to the class. Prompts and the owl Dowl were truly not attractive for our age. Some open-ended questions in the post-test were really not attractive me to write 100-150 words."* (weak group)

*"That bird was so annoying. I have skipped it mostly. It doesn't serve anything. About the videos, it is not easy to follow when the voice of the video and the writings are not consistent. The visuals are not enough. About the same topic there are much enjoyable/less boring videos on the internet."* (weak group)

*"First we had to submit assignments for two seminars at the same time but probably due to lack of my self-regulation skills it was difficult. I would recommend to split the assignment for different due days. Also, I didn't like the idea of writing 150-200 words at first, you struggle to write this amount but then anyway limited to much more less."* (strong group)

*"I think that a prompt is a good idea for learning in FC environment, however Dowl (the prompt) in this FC was too childish and to the fact that I skipped the prompts every time when possible."* (weak group)

*"The idea about flipped classrooms and prompts was great, but the design was not one of the best ones. With pre-test you achieved that I only focused in the video on these things, which I knew will be also asked in the post-test. Videos were too long and not so interesting (max 8 min) and Dowl was too long input."* (strong group)

## Chapter 5: Discussion and Conclusion

### 5.1 Discussion

Although literature supports effectiveness of the flipped classroom on learning outcomes and learner motivation (Abdullah, Hussin, & Ismail, 2019; McNally et al., 2017; Pérez et al., 2019; Souza & Rodrigues, 2015) our results indicated that there was a significant decrease in students' metacognitive skills, help-seeking skills, interest, and motivation (i.e. relevance) and insignificant change in time management, environmental structuring skills, and persistence after the flipped sessions. Therefore, the first hypothesis (*Compared to before the FC experience, students' use of self-regulated learning skills, interest and motivation (i.e. relevance) increase after the FC experience.*) was declined. A possible explanation for this finding could be that the students were challenged due to the nature of the flipped classroom method where the students are responsible for their own learning. The previous research also presented that the flipped classroom method can be challenging for students because they need to regulate their own learning (Lee, Lim, & Grabowski, 2010). Another possible explanation for this finding could be that the students overestimated their SRL skills, motivation and interest in the topic prior to their FC experience. Moreover, the teaching method was not quite familiar for most of the students which may have caused the misestimation of their skills.

The next hypothesis (*Compared to the pretest scores, students' posttest scores increase after the video lecture. Similarly, compared to the students' post-test scores, the follow-up test scores increase after the in-class session*) was partly supported and partly declined according to the findings. Compared to the pretest scores, students' posttest scores significantly increased after the video lecture. This supports the theory emphasizing the effectiveness of the flipped classroom on learning outcomes (Abdullah, Hussin, & Ismail, 2019; McNally et al., 2017; Pérez et al., 2019; Souza & Rodrigues, 2015). However, there was a significant decrease in the

follow-up test scores after the in-class sessions, compared to the post-test scores. A possible explanation for this could be inferred from a student's comment about follow-up tests: *"I do not know the reason why the questions from the previous week were repeated. At some point, it was boring to work on them."* So, it is possible that the students found the follow-up tests repetitive and they did not pay the required interest and attention while performing the follow-up tests. Moreover, another student mentioned that the workload of the class was too much *(First we had to submit assignments for two seminars at the same time but probably due to lack of my self-regulation skills it was difficult. I would recommend to split the assignment for different due days.)* which can be another possible explanation of the decrease in the post-test results.

Although many studies emphasized the effectiveness of using metacognitive prompts on learning outcomes and motivation (Aurah et.al., 2014; Bixler & Land, 2010; Lee et al., 2010; Peters & Kitsantas, 2009; Schworm & Gruber, 2012), our results suggested that SRL skills, interest and motivation of the participants insignificantly differed between the groups with different prompts which also declined the next hypothesis *(Compared to the weak group, motivation (i.e. relevance), interest and self-regulated learning skills of the strong group are higher.)*. Unlike the metacognitive skills, all the variables such as time management, help seeking, environmental structuring, persistence, relevance, and interest were insignificantly higher in the weak group. A possible reason for this result could be that the students in the strong group found the prompts too repetitive as they were exposed to the motivation prompts three times more often compared to the weak group *(“Videos were too long and not so interesting (max 8 min) and Dowl was too long input.”, "Dowl" was too repetitive, we memorized his lines unintentionally which made it annoying to see. The instructors were monotonous, didn't feel natural enough.)*. This finding may suggest that the overuse of the prompts can result in a negative effect on student motivation, interest as well as SRL skills.

These interpretations can also be supported by the following findings. The descriptive statistics suggested that the students found the prompts technique relatively not useful and their attitude towards the prompts techniques was relatively negative. Besides, there was no significant difference between the strong and the weak group with regard to the FC and the prompts acceptance. This also declined the last hypothesis of the study (*Compared to the students in the weak group, the students' attitude towards the prompts technique and the FC technology will be higher in the strong group. Compared to the students in the weak group, the students in the strong group find the pre-class activities and the prompts technique more useful.*) This can be also explained by the fact that some of the students claimed that they skipped the prompt parts of the videos because they found it not motivating. (*"That bird was so annoying. I have skipped it mostly."*, *"I skipped the prompts every time when possible."*) This result supports the finding of Van Alten who presented that the flipped classroom has a small positive effect on learning outcomes, but no effect on student satisfaction regarding the learning environment (Van Alten et al., 2019).

In contrast, the findings provided that the students found both the pre-class activities and in-class activities useful. Moreover, they found the FC method easy to use and their attitude to the FC was natural, and they found the FC method relatively useful. As the previous research suggested, there were contradicting opinions about the FC method. Also, our findings supported that there can be contradicting findings about the FC acceptance. Also from the comments of the students, it can be understood that their opinion about the flipped classroom method changed compared to their initial experience (*"Initially, the aim of FC was not clear to me as, found it boring. But after a couple of FC, began to understand the concept and found it used to me. It prepared me for the classes."*). This can suggest that a long term flipped classroom study may give different findings on student motivation. Also, the previous research showed that student

outcomes and active participation in class activities improved when the entire course rather than flipping a part of the course (McNally et al., 2017).

In addition, the student comments suggested that the FC method was useful however they were not happy with the presentation of the method (*“I think it's a good idea to use FC method, but for the motivation part, I can't say it motivated me a lot.”*, *“I think that a prompt is a good idea for learning in the FC environment, however Dowl (the prompt) in this FC was too childish and to the fact that I skipped the prompts every time when possible.”* *“The idea about flipped classrooms and prompts was great, but the design was not one of the best ones.”*) The agent that was used in this study was designed being based on the guide that was provided by Velersianos: Enhancing Agent Learner Interactions (EnALI) Framework (Veletsianos et al., 2013, p.180) With a different design of an educational agent, the motivation of the students could possibly differ from the findings of the current study. These findings supported the previous research that emphasizes the importance of the engaging design of the online lectures (Zappe, Leicht, Messner, Litzinger, & Lee, 2009) Moreover, we can agree with the findings that the flipped classroom requires a lot of commitment and preparation from an instructor ahead and it requires the students to be willing to take responsibility for their own learning (Houston & Lin, 2012) Therefore, further research is suggested to focus on the effective design of the flipped classroom.

## 5.2 Conclusion

This study focused on the quality evaluation of the FC method in higher education. There were two main aspects that were considered while evaluating the FC effectiveness. Firstly, to investigate the initial effects of the flipped classroom method on higher education students' learning outcomes (test scores), motivation, interest and SRL skills. Secondly, to investigate the students' attitude towards the flipped classroom and the prompting technique that was included in the video lectures. An experimental research method was implemented. The data collected via the online learning platform and the paper form questionnaires. The data collection period included the four weeks of the flipped sessions of the two seminars; BQA and QDP. The research sample consisted of the second-semester students of the international master program, "Research on Teaching and Learning (RTL)".

The findings of the study were contradictory. The results provided that there was a significant decrease in students' metacognitive skills, help seeking skills, interest, and motivation (i.e. relevance) and insignificant change in time management, persistence environmental structuring skills, and persistence after the flipped sessions. This could be explained by students' overestimation of the SRL skills, motivation and interest prior to the sessions. On the other hand, there was a significant increase in students' post-test scores compared to the pretest scores, However, their follow-up test scores decreased significantly, compared to the post-test scores. This can be explained by the lack of attention to the follow-up test due to the repetitive questions and the workload of the class.

Overall, the students found the FC method easy to use and their attitude to the FC was natural, and they found the FC method, the pre-class activities and in-class activities relatively useful. However, they found the prompts technique relatively not useful and their attitude towards the prompts techniques was relatively negative. Besides, there was no significant

difference between the strong and the weak group with regard to the FC and the prompts acceptance. As the literature suggested, there were contradictive findings of the FC method acceptance. These findings suggested that the design of the flipped sessions, especially for adult learners, is critical. More resources should be spared on the preparation of the online content for more effective results. A professional design of the agent to be used for adult learners is suggested. The video lecture content is suggested to be designed in a more interactive way.

The sample of this study was limited to 23 students and the study covered four weeks of flipped sessions only. Larger samples and longitudinal study designs are suggested for the generalization of the results.



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**APPENDICES**

**Appendix 1. The Flipped Sessions' Syllabus**

**Seminar 1: Basics of Quality Assurance (BOA)**

<b>Week</b>	<b>Topic</b>	<b>Literature</b>	<b>Session Type</b>
1 (08.05.2019)	Overview Task-assignments	No readings	Introductory session
2 (15.05.2019)	Quality in Education defined	Cheng, Y. C. & Tam, W. M. (1997). Multi-models of quality in education. <i>Quality Assurance in Education</i> , 5,1. (22 – 31)	FC
3 (22.05.2019)	Quality Management in Education	Sallis, E. (2005) <i>Total Quality Management in Education</i> . London: Kogan Page. (1-33) <b>Further reading:</b> OECD (2013). <i>Synergies for better Learning: An international perspective on Evaluation and Assessment</i> . OECD Reviews of Evaluation and Assessment in Education, OECD Publishing, Paris. (Executive Summary, 1-15)	FC
4 (29.05.2019)	Internal & External School Evaluation	Chapman, C. & Earley, P. (2010) School Inspection/External School Evaluation. In P. P. Peterson, E. Baker, and B. McGaw, (eds.), <i>International Encyclopedia of Education, Third Edition</i> , pp. 719-725. Oxford: Elsevier, 2010 MacBeath, J. (2010) School Based Evaluation: Purposes, Protocols and Processes. () In P. P. Peterson, E. Baker, and B. McGaw, (eds.), <i>International Encyclopedia of Education, Third Edition</i> , pp. 713-718. Oxford: Elsevier, 2010	FC
5 (05.06.2019)	Using Feedback from external Evaluations	Hellrung, K. & Hartig, J. (2012) Understanding and using feedback- A review of empirical studies concerning feedback from external evaluations to teachers. <i>Educational Research Review</i> .	FC

**Seminar 2: Quality Development by Professionalization (QDP)**

<b>Week</b>	<b>Topic</b>	<b>Literature</b>	<b>Session Type</b>
1 (08.05.2019)	Overview Task-assignments	No readings	Introductory session
2 (15.05.2019)	Teacher Professional Development and Its Importance for Quality in Education	Darling-Hammond, L. (2010). Teacher Education and the American Future. <i>Journal of Teacher Education</i> , 61, 35-47. <b>STAAR Project:</b> Borko, H., Jacobs, J., Eiteljorg, E., & Pittman, M. E. (2008). Video as a Tool for Fostering Productive Discussions in Mathematics Professional Development. <i>Teaching and Teacher Education</i> , 24(2), 417-436.	FC
3 (22.05.2019)	Standards in Teacher Education	Darling-Hammond, L. (2001). Standard setting in teaching: changes in licensing, certification, and assessment. In Richardson, V., Ed., <i>Handbook of Research on Teaching</i> (pp. 763-773).	FC
4 (29.05.2019)	Assessing TPD	Desimone, L. R. (2009) Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. <i>Educational Researcher</i> , 38, 181-198. <b>Further Reading:</b> Wilson, S. M. (2013). Professional Development for Science Teachers. <i>Science</i> , 340, 310-312.	FC
5 (05.06.2019)	Effectiveness of TPD Programs	Lauer, P. A., Christopher, D. E., Firpo-Triplett, R. & Buchting, F. (2013). The impact of short-term professional development on participant outcomes: a review of the literature. <i>Professional Development in Education</i> , DOI: 10.1080/19415257.2013.776619	FC

## Appendix 2. The Knowledge Tests

### Seminar 1: Basics of Quality Assurance

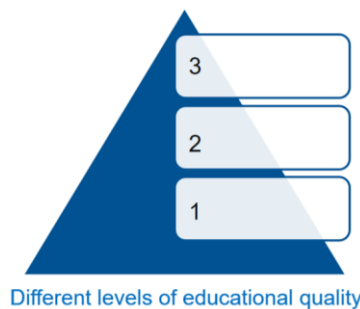
#### Session 1: Quality in Education Defined

##### Q.1. Complete from the brackets then drag

*[Institution level- Educational system level- Instructional/teaching level]*

Quality in Education can be assessed on different levels. On the broader basis, there is the (1)..... that is on political basis, then we have as a smaller level the (2)..... (like schools or universities or their leaders), and finally on a micro-level there is the (3)..... in class where we can assess students (for example their performance or critical thinking skills) or teachers (for example their use of methods regarding individual learning).

**In the picture, you can see an overview of the different levels. Please drag the text to the corresponding parts, from the broader level at the bottom to the micro-level on the top.**



*Answers: 1-Education system level 2- Institution level 3- Instructional/teaching level*

##### Q.2. Insert the right words

*[process- explicit and implicit- satisfy]*

Cheng and Tam (1997) gives a general conception of quality in education. “Education quality is the character of the set of elements in input, (1)..... and output of the education system that provides services that completely (2)..... both internal and external strategic constituencies by meeting their (3)..... expectations”

*Answers: 1-process 2-satisfy 3-explicit and implicit*

**Q.3. Select one or more**

The Absence of Problems Model ...

1.  ...is very useful when clear criteria of quality are given.
2.  ...is in particular appropriate when institutions want to achieve excellent education, because then they can show that everything is all right.
3.  ...is in particular appropriate for institutions when there are no criteria of quality.
4.  ...is appropriate when strategies for improvement are needed.

*Answers: 3 and 4*

**Q.4. Select one or more**

There are different models of education quality. Each focuses on different aspects. One of them concentrates particularly on the **needs and wishes of relevant constituencies**. Here, it is often difficult to objectively measure educational quality, in particular when the target groups have different needs. Of which model are we talking?

1.  Process Model
2.  Legitimacy Model
3.  Satisfaction Model
4.  Goals and specification model

*Answer: 3*

**Q.5. Please answer shortly**

Why is it beneficial to consider more than one model of educational quality in order to achieve comprehensive quality?

**Session 2: Quality Management in Education**

**Q.1. True or False**

Total Quality Management takes place before and during the process, to prevent failure in the first place.

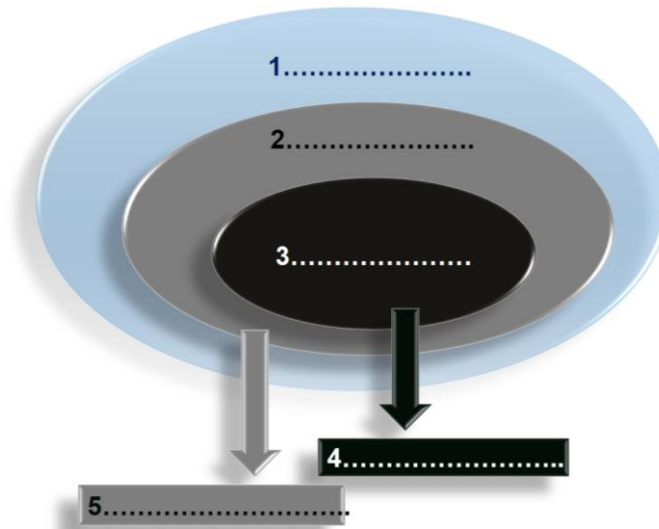
**True  False**

*Answer: False*

**Q.2. Drag the concepts to the right position**

[ *Quality assurance- Total quality management- Detection of failure- Prevention of failure- Quality Control*]

This diagram visualizes the different concepts of quality management.



*Answers: 1-Total quality management 2- Quality assurance 3-Quality control 4- Detection of failure 5- Prevention of failure*

**Q.3. Complete**

[*transformational- absolute- procedural- relative*]

1. The ..... concept of quality means that quality is not something that products possess, but that is ascribed to it.
2. The ..... concept of quality means that quality is a natural part of products that are things of perfection that cannot be surpassed.
3. The ..... aspect of quality ensures that those systems are efficiently operated and do what they are asked for. Hard facts are relevant here.
4. The ..... view is different. It has to do with continuous improvement and focuses on softer aspects.

*Answers: relative 2-absolute 3- procedural 4-transformational*

**Q.4. Select one or more**

Educational institutions are interested in quality activities for many important reasons. Those reasons can also be called ‘quality imperatives’.

One imperative states that teachers should be committed to the needs of students and feel an obligation to meet their needs by employing the most appropriate pedagogic practices. This is called the .....

- 1.  Moral imperative
- 2.  Competitive imperative
- 3.  Accountability imperative
- 4.  Professional imperative

Answer: 4

**Q.5. Give examples**

TQM is a strategic and systematic approach that includes all processes such as team work & quality chain and it aims for continuous improvement. Can you give examples for each aspect?

**Session3: Internal and External School Evaluation**

**Q.1. Link the right term with its definition**

[Parallel systems - Sequential systems- External evaluation]

- 1. (.....) are those in which, e.g., external bodies follow on from a school’s own evaluation.
- 2. (.....) means the assessment of the quality of structures and processes operating within a school as judged by an outside agency or perspective.
- 3. (.....) are those in which two evaluation systems run side by side, each with their own criteria and protocols.

Answers: 1- Sequential systems 2- External evaluation 3- Parallel system

**Q.2. Choose**

(a-self-inspection/ c-parallel evaluation/ b-sequential evaluation/ d-self-evaluation)

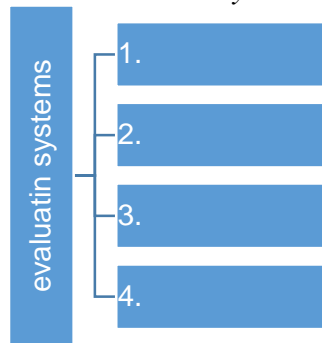
The balance of power between the inspection teams and school teams differs widely. But with the right balance of power, more self-evaluation is possible and less self-inspection takes place. In this regard, (1) ..... can be seen as a top-down process, (2) ..... as a bottom-up process.

Answers: 1- a, 2-d

**Q.3. Select to complete the diagram**

There are four major types of systems to evaluate schools:

*[monitoring system- sequential system- improvement system- cooperative system- parallel system- educational system- supporting system]*

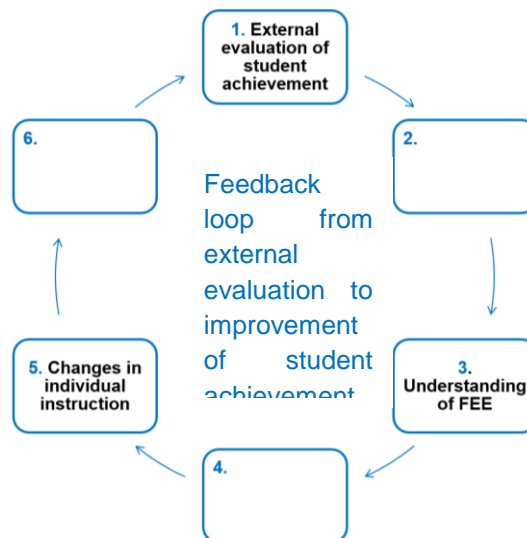


Answers: 1- Parallel system 2- Supporting system 3- Sequential system 4-Cooperative system

**Session 4: Feedback**

**Q.1. Feedback from External Evaluations (FEE) can be valuable. The feedback loop contains different stages. You can see it in the diagram below. Please drag the correct phrase to its correct place in the diagram.**

*[Use of FEE- Analysis of FEE- Improvement on student achievement- Feedback about student achievement to teacher]*



Answers: 2. Feedback about student achievement to teacher 4. Use of FEE 6. Improvement on student achievement

**Q.2. Fill in the gaps with the correct word:**

*[Internal evaluation- feedback- complex processes- a student's achievement]*

1. Summative evaluation is used to summarize ..... status and to measure what a student has learned at the end of a unit. A judgement is made according to criteria and standards, but usually it does not have an immediate impact on student learning
2. The ..... from external evaluations is the knowledge received from external evaluations to schools that provides information about their students' performance as a possible basis for school improvement.
3. Teachers cannot make an improvement on students' achievement without understanding and using the feedback from external evaluation appropriately. Students' achievement improvement includes ..... that teachers should consider.

*Answers: 1- a student's achievement 2- feedback 3- complex processes*

**Q.3. Choose from the words to complete the sentence.**

..... occurs when a student's performance is compared with the performance of other students, classes or schools in the same reference group.

1.  Norm-referenced evaluation
2.  Individual-referenced evaluation
3.  Criterion-referenced evaluation

*Answer: 1*

**Q.4. Choose from the words to complete the sentence.**

.....-stakes testing might lead to less use of FEE because teachers do not have consequences to fear, thus the time-consuming analysis of FEE might appear unnecessary to them.

1.  High
2.  low

*Answer: 2*

**Q.5. True or False**

External evaluations typically are formative.

1.  True
2.  False

*Answer: 2*



**Seminar 2: Quality Development by Professionalization (QDP)**

**Session 1: Teacher Profession Development**

**Q.1. Complete**

*[Teacher- students'- qualitative changes]*

Teacher professional development is a long-term complex process of (1) ..... in teaching aimed at (2) ..... performance improvement in the classroom and ensuring (3) ..... success.

*Answers: 1-qualitative changes 2- teacher 3-students'*

**Q.2. In your own words: Why is it important to have educated teachers? (about 100-150 words)**

**Q.3. Choose**

Effective TPD addresses the core areas of teaching-content, curriculum, assessment and instruction. In designing TPDs, the focus should be on building them as:

1. ....: E.g. Model learner-centered instruction so that teachers experience and reflect on the learning activities that they will lead.

a.  Assessment Centered b.  Knowledge Centered

c.  Learner Centered d.  Community Centered

2. ....: Use formative and summative evaluation for program improvement

a.  Assessment Centered b.  Knowledge Centered

c.  Learner Centered d.  Community Centered

3. ....: E.g. providing teachers opportunities to gain new knowledge and skills, reflect on changes in their teaching practice, and increase their possibilities over time

a.  Assessment Centered b.  Knowledge Centered

c.  Learner Centered d.  Community Centered

4. ....: Developing professional learning communities (PLCs) appears to hold considerable promise for capacity building for sustainable improvement

a.  Assessment Centered b.  Knowledge Centered

c.  Learner Centered d.  Community Centered

*Answers: 1 (c) – 2 (a) – 3 (b) – 4 (d)*

**Q.4. True or False**

*Teachers with a high motivation for teaching mathematics show higher instructional quality than teachers with a low motivation for mathematics.*

True  or False : The same results were found for teachers with a high motivation for the domain of mathematics.

*Answers: False*

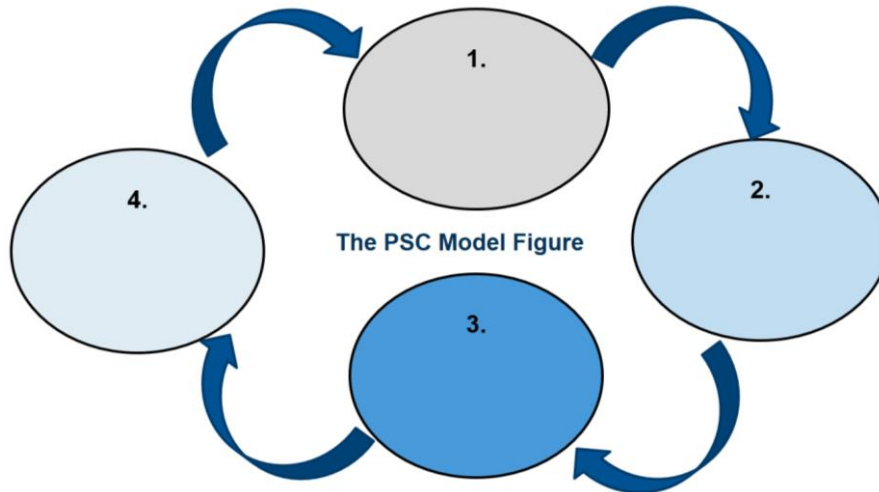
**Q.5. True or False**

True  or False : Teachers without special education, like practical trainings, lead to inequality in instruction.

Answers: True

**Q.6. Drag the following phrases into their right position in figure of the Problem-Solving Cycle Model:**

[Workshop: Student thinking- Videotaping the lesson: Implementation of the problem-  
Workshop: Solve problem and develop lesson plans - Workshop: The teacher's role]



Answers: 1- Workshop: Solve problem and develop lesson plans 2- Videotaping the lesson: Implementation of the problem 3- Workshop: The teacher's role 4- Workshop: Student thinking

**Session 2: Standards in Teacher Education**

**Q.1. True or False**

In general, standards are often established by authority as a rule for quality. In particular, teachers can refer to educational standards because standards provide direction for professional development over the long term of a career in teaching.

True / False

Answer: True

**Q.2. Read then select**

The Interstate Teacher Assessment and Support Consortium (INTASC) and the National Board Standards are established standards to certify teachers with the teaching profession. The InTASC standards also fit with the propositions of the NB standards.

The propositions of the NB Standards are:

- Proposition 1: Teachers are committed to students and their learning.
- Proposition 2: Teachers know the subjects they teach and how to teach those subjects to students
- Proposition 3: Teachers are responsible for managing and monitoring student learning.
- Proposition 4: Teachers think systematically about their practice and learn from experience.
- Proposition 5: Teachers are members of learning communities.

**Which of the InTASC principles (you can see them below) fit best with Proposition 4?**

- a.  Principle 8- Principle 9 - Principle 10
- b.  All Principles
- c.  Principle 2- Principle 3- Principle 5- Principle 8
- d.  Principle 8 - Principle 9

The 10 InTASC principles:

- *Principle 1:* The teacher understands the central concepts of the discipline(s) he or she teaches.
- *Principle 2:* The teacher understands how children learn and develop to support their development.
- *Principle 3:* The teacher understands how students differ in their approaches to learning.
- *Principle 4:* The teacher uses a variety of instructional strategies to encourage students' development.
- *Principle 5:* The teacher uses individual and group motivation and behavior to create active learning environment.
- *Principle 6:* The teacher uses effective communication techniques to foster active interaction in the classroom.
- *Principle 7:* The teacher plans instructions based upon knowledge of subject matter, students, and goals.
- *Principle 8:* The teacher uses formal and informal assessment strategies to evaluate the development of the learner.
- *Principle 9:* The teacher is a reflective practitioner who continually evaluates the effects of his/her actions on others (students, parents, and other professionals in the learning community).
- *Principle 10:* The teacher fosters relationships with school colleagues, parents, and agencies in the larger community.

Answer: (d)

**Q.3. Complete**

The National Board Standard Certification is based on four components. Please complete them.

*(assessment and collaboration- teaching practice- content knowledge- reflection)*

1. Assessment of .....
2. ....on student work samples
3. Video and analysis of .....
4. Documentation of the impact of .....on student learning.

Answers: 1-content knowledge 2- reflection 3- teaching practice 4- assessment and collaboration

**Q.4. Classify the phrases into a group of benefits and a group of challenges**

1. Standards describe a new vision of teaching

Benefit  Challenge

2. Standards stress that teachers build literacy and thinking skills

Benefit  Challenge

3. Getting the standards and assessments “Right”

Benefit  Challenge

4. Standards describe what effective teaching looks like

Benefit  Challenge

5. Politics, policy and governance disagreement

Benefit  Challenge

6. Standards list good guidelines for teachers from the beginning of their careers

Benefit  Challenge

7. Preparing teachers to meet the standards

Benefit  Challenge

8. Dilemmas of supply, standards and inequality

Benefit  Challenge

9. Practical for all educators regardless of length of experience

Benefit  Challenge

*Answers: Benefit: 1- 2- 4- 6- 9 / Challenge: 3- 5- 7- 8*

### **Q.5. Suggest in short words**

It is not easy to assess teachers’ conformance to standards. What kind of assessment would you suggest? Please write down your ideas in about 100 words.

## **Session 3: Assessing TPD**

### **Q.1. True or False**

Education reforms aim at improving student learning. Thus, examination of student learning is important. Is the next claim true or false?

Inquiry into teacher learning is not a critical target of education reforms.

True  / False

*Answer: False*

### **Q.2. Choose**

DeSimone’s theory identifies the key 1-..... (variables/ inputs/ outcomes) and intermediate and final 2-..... (variables/ inputs/ outcomes) that characterize the effects of professional development. It also identifies the 3-..... (variables/ inputs/ outcomes) that mediate and moderate professional development’s effects.

*Answers: 1-inputs 2-outcomes 3-variables*

**Q.3. Select one or more**

*Desimone (2009) identifies several* Core features of professional development, select what is considered as a core feature

1.  Background
2.  Consistency
3.  Content
4.  Continuity
5.  Active learning
6.  Multi-methodology
7.  Duration
8.  Collective participation

*Answers: 2- 3- 5- 7- 8*

**Q.4. Select one or more**

Research shows that intellectual and pedagogical change requires professional development activities to be of sufficient duration. Research has not indicated an exact “tipping point” for duration but shows support for activities that ...

1.  ...are spread over 3 months.
2.  .... include 60 hours of contact time.
3.  .... are spread over a year and include at 40 hours of contact time.
4.  ... are spread over a semester and include 20 hours or more of contact time.

*Answer: 4*

**Q.5. Select one or more**

There are different measures to examine TPDs.

Although each of the methods has its supporters and detractors, one seems to receive the most criticism. Which and why?

1. Surveys / Questionnaires are most criticized, because self-reports are likely to be biased.
2. Surveys / Questionnaires are most criticized, because of the high efforts you have to take into account.
3. Interviews are most criticized, because of the high effort you have to take into account.
4. Observations are most criticized, because they are likely to be biased.

*Answer: 1.*

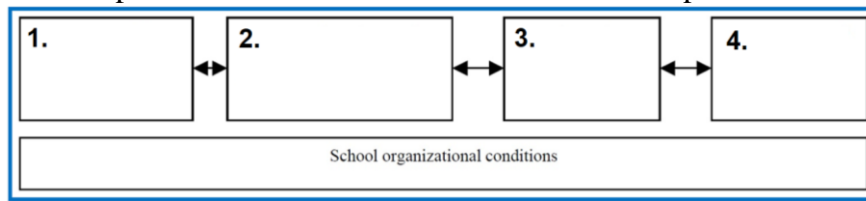
**Session 4: Effectiveness of TPD**

**Q.1. Put the phrases in the right order in the diagram**

*[Improvement of student results- Increase of teacher quality (e.g. knowledge, skills and attitude)- Features of the intervention- Change in teaching behavior]*

For studying the effects of Professional Development (DP) on teachers and students, we depend on studying at least four interactive and non-recursive relationships among different

processes in the TPD. These four relationships are:



Answers: 1-Features of the intervention 2-Increase of teacher quality (knowledge, skills and attitude) 3-Change in teaching behavior 4-Improvement of student results

**Q.2. Complete the definitions regarding Professional Development (PD) Programs**

[Theory of improvement- Theory of instruction- Theory of change- Theory of context]

1. .... refers to the assumed relationships between the features of the PD intervention and the change in teacher knowledge and/or change in instruction.
2. .... focuses on student results and refers to the relationships between the features of the PD intervention, the intended changes in teacher knowledge and instruction and the expected changes in student outcomes.
3. .... refers to the school organizational conditions necessary to implement and sustain successful PD in the school or in the classrooms.
4. .... studies the essential relationships between the different elements of a TPD through various questions related to the intervention supposed to do in a TPD, the participants, and the purpose.

Answers: Theory of change 2- Theory of Instruction 3- Theory of Context 4- Theory of improvement

**Q.3. Choose the right answer(s)**

1.  Preparations before TPDs like pre-homework have positive influence on participants learning.
2.  Duration of TPDs is always dependent on content complexity and desired learning outcomes.
3.  Duration of TPDs should always be as long as possible.
4.  Effectiveness of TPDs is linked to participants motivation to implement their knowledge in work settings.

**Q.4. True or false**

When participants receive follow-up support after a TPD, the follow up support should always be face-to-face.

True /  False

Answer: False

**Q.5. True or False:**

In terms of short-term TPDs, the concepts “transfer and implementation” are unrelated to each other.

True /  False

Answer: False

**Appendix 3. The Prompts**

**Seminar 1: Basics of Quality Assurance (BQA)**

**Session 1: Quality in Education Defined**

<b>Type of the prompt</b>	<b>Prompt</b>	<b>Group</b>
Introductory	Hello! I am Dowl. I am here to help you with this course. We will also meet at Quality Development by Professionalization course.	Strong, weak
Motivational	<p>So, as you have seen this course is about Quality in Education. Maybe you don't know how important it is, but Dowl knows a lot about it. Here is the first hint from Dowl!</p> <p>Please give a pause the video and take your time to think about: Why is the learning material personally relevant for you at present or in the future?</p> <p>Now I'll give you an example: This course can be really effective for you in case you have any of those future plans:</p> <ul style="list-style-type: none"> <li>-working as an education researcher because you can work on evaluation studies</li> <li>or</li> <li>- studying a further degree about education, you may take a role in quality evaluation studies</li> <li>-working in a company for the learning and development department because you may need to assess the effectiveness of training</li> <li>-working as a teacher, syllabus developer, school director because you can evaluate the effectiveness of teaching.</li> </ul>	Strong, weak
Metacognitive	<p>Do not worry! I will help you to gain the most from this course! Dowl knows many hints!</p> <p>But before we continue here is the important step, pause the video and:</p> <ol style="list-style-type: none"> <li>1- consider the learning goals and your own learning expectations</li> <li>2- consider what strategy or plan you will follow if you did not understand something</li> </ol> <p>Pause the video and take your time to define your plans and goals, when you are done, continue watching!</p>	Strong, weak
Motivational	<p>Hi again! Dowl is back!</p> <p>Until here, what you have learned will help you to be able to make decisions about the level of education quality to be targeted and make the planning accordingly.</p> <p>Here is the hint! For instance, if you are a Research Assistant at a university and your department decided to assess the quality of their faculty's processes, you will be aware of the level of education quality, do your planning accordingly.</p>	Strong
Metacognitive	<p>By now, do you think you met some of your learning expectations you set at the beginning of the video?</p> <p>Are you able to explain the general conception of education quality?</p>	Strong, weak

QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

	If you think you are able to answer these questions, we are doing fine! If not, you better go back to watch the previous section again. You can also do some research (e.g. with the help of the literature/ Google scholar online). Or you can ask any questions to your lecturer.	
Motivational	Dowl is back with the hints! Knowing the different models of education quality will be helpful to match the process with the assessment purpose! For instance, you are working in the learning and development department of a company. You want to evaluate the quality of employee training. And you want to assess the satisfaction of the authorities with the training of the new starters. So you will be aware that the evaluation process will be designed according to the Satisfaction Model.	Strong
Metacognitive	Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)? You are able to differentiate between the models, aren't you? Pause here and take your time to answer this question. Are you able to explain their core in your own words? If you can, you've achieved a lot so far. If not, what about watching section (II) once again? You can also have a look at the suggested articles on Moodle. When you are done and able to distinguish the models, go to do the activities of the online task on Moodle. See you later!	Strong, weak

**Session 2: Quality Management in Education**

Type of the prompt	Prompt	Group
Introductory	Hi there! Dowl is here!	Strong, weak
Motivational	As you have heard, we will be focusing on quality management in education in this lecture. Now I will tell you why this lecture is important for you. Here is the first hint of the video! Please give a pause the video and take your time to think about: Why can quality management be personally relevant for you at present or in the future? Now I will provide you some cases to show how important it is. -being an education researcher because you will have a clear background knowledge about how business and education quality can be differentiated -working in a company as an education specialist, because you can set the goals for quality management specific to education and trainings -working as a teacher, syllabus developer, school director as you will be aware of the norms of high quality education	Strong, weak



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Metacognitive	<p>Let's do a quick check before I leave!</p> <p>Pause the video, and give yourself some time to think about the following points:</p> <p>1- consider the learning goals and your own learning expectations and then consider what strategy or plan you will follow if you did not understand something</p> <p>2- decide if you will use the same strategy you followed in the previous lecture, is there anything you want to change?</p> <p>Let's make sure we spend our time here effectively.</p> <p>When you are done, resume the video-playing!</p>	Strong, weak
Motivational	<p>Dowl has arrived!</p> <p>The hints have arrived!</p> <p>Knowing the nature of education quality will give you an insight into how to ensure quality in education.</p> <p>Knowing 4 imperatives of quality in education will provide you an understanding of the expectations of high quality in education.</p> <p>Let's make it clearer.</p> <p>Let suppose you are a teacher trainer and you need to plan a TPD program. These 4 imperatives can provide you a very good understanding of the need for teaching institutions so that you can define the objectives of your TPD Program.</p>	Strong
Metacognitive	<p>Now let's see where we are!</p> <p>After watching section (I), do you think you met some of your learning expectations you set at the beginning of the video?</p> <p>Are you able to explain the difference between the absolute, relative, procedural and transformational concepts of quality?</p> <p>What are the four imperatives of quality in education?</p> <p>If you think you are able to answer these questions, we are doing fine!</p> <p>If not, time to go back to the previous section as we are missing a lot.</p> <p>You know that you can also do your own research for the missing points!</p> <p>You will find the instructor in the class for further questions too.</p>	Strong, weak
Motivational	<p>Dowl is back with the hints!</p> <p>Knowing the definitions of quality management, quality assurance, and quality control are very important for any type of quality management processes! Because Dowl says. You may come across with quality management anywhere!</p> <p>The need for quality is always there.</p> <p>However, let's be specific and give an example.</p> <p>For instance, you are an education expert who is responsible for the quality management of a teacher training program.</p> <p>You will be aware of how to control and assure the quality to manage the resources properly, therefore, receive more effective results out of the program.</p>	Strong
Metacognitive	<p>Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)?</p> <p>Now let's pause here and see how far we achieved!</p> <p>take your time to answer this question.</p> <p>Do you think education is a product or service?</p>	Strong, weak

	<p>Are you able to distinguish between quality management, quality assurance, and quality control?                  If yes, then it means you are on the right track                  If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information!                  When you are confident about your knowledge of the section, you know what to do. Online tasks and posttest are waiting for you!                  See you later!</p>	
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**Session3: Internal and External School Evaluation**

<b>Type of the prompt</b>	<b>Prompt</b>	<b>Group</b>
Introductory	Hi again! Dowl is here!	Strong, weak
Motivational	<p>As you have listened to, the topic of this lecture is internal and external school evaluation.                  Now I will tell you why this lecture is relevant to you.                  If you have one of those future plans:                  -being an education researcher as you may conduct internal and external evaluation studies,                  -working in a company as a learning specialist, as you can design internal and external evaluation programs,                  -working as a teacher, instructor, school director as you can evaluate the objectives of an educational institution.</p>	Strong, weak
Metacognitive	<p>Let's do a quick check! Pause the video, and give yourself some time to think about the following points: consider the learning goals and your own learning expectations, decide if you will use the same strategy you followed in the previous lecture, is there anything you want to change?                  When you are done, resume the video-playing!</p>	Strong, weak
Motivational	<p>Dowl is Here!                  Knowing the nature of internal and external evaluation will give you an insight about how to assure quality in education.                  Let's see an example,                  Let suppose you are a research assistant at a faculty and you will take a role in faculty's internal and external evaluation processes. In this case, you need to be well informed about the difference between those two for more effective planning and performance.</p>	Strong
Metacognitive	<p>Now let's see where we are!                  After watching section (I), do you think you met some of your learning expectations you set at the beginning of the video?                  Are you able to explain the difference between external and internal evaluation?                  If you think you are able to answer these questions, we are doing fine!                  If not, time to back to the previous section as we are missing a lot. You know that you can also do your own research for the missing points! You will find the instructor in the class for further questions too.</p>	Strong, weak
Motivational	Dowl is back with the hints!	Strong

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	<p>Knowing the different models of Internal/External Evaluation will help you to balance between internal and external evaluation, therefore plan the evaluation more effectively and</p> <p>Let's go back to our previous example, for the internal/external evaluation of the faculty, you can decide on which systems to be used, according to the objectives /needs of the faculty.</p>	
Metacognitive	<p>Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)?</p> <p>Can you clarify the four models of internal/external evaluation (parallel, supporting, sequential, and cooperative systems)?</p> <p>Can you explain what is the balance of power in the school evaluation process?</p> <p>If you can answer those questions, you are doing well!</p> <p>If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information!</p> <p>When you are confident about your knowledge of the section, you know what to do. Online tasks and posttest are waiting for you! See you later!</p>	Strong, weak

**Session 4: Feedback**

Type of the prompt	Prompt	Group
Introductory	<p>Hi there! Dowl is here!</p> <p>As you have heard, this is our last session together, we will be focusing on “understanding and using feedback” in this lecture.</p>	Strong, weak
Motivational	<p>Let's see now why understanding feedback is personally relevant for you at present or in the future.</p> <p>Now I will provide you some cases to show how important it is,</p> <ul style="list-style-type: none"> <li>-being an education researcher you can provide effective implications as a result of your study,</li> <li>-working as a teacher trainer, you can formulate effective feedback for the teachers as a result of TPD programs,</li> <li>-working as a teacher, syllabus developer, school director as you can formulate your feedback efficiently to improve teaching.</li> </ul>	Strong, weak
Metacognitive	<p>As we always do, before you continue watching the video, you should: consider the learning goals and your own learning expectations decide if you will use the same strategy or plan you followed in the previous lecture whenever you did not understand something. Give yourself some time to think about it.</p>	Strong, weak
Motivational	<p>Dowl is here again!</p> <p>Knowing the different types of feedbacks will have you use the most efficient feedback according to your purpose.</p> <p>Knowing the key criteria of successful feedback will help you to formulate your feedback efficiently.</p> <p>Here is a quick example:</p>	Strong

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	Let suppose you are a teacher trainer and you implicated a TPD program. Having this information you can formulate effective feedback for the teachers as a result of the program.	
Metacognitive	<p>Now let's see where we are!</p> <p>After watching section (I), do you think you met some of your learning expectations you sat at the beginning of the video?</p> <p>If this is true, well done! If not, this time I will help! The previous section is beneficial for you to educate on:</p> <ul style="list-style-type: none"> <li>-the definition of feedback</li> <li>-the classifications of evaluation (summative, formative, and external)</li> <li>-the criteria of the feedback from external evaluations (understandability of FEE, use of FEE, and student achievement)</li> </ul> <p>If this is true, well done! If not, this time I will help! The main points of the previous section are:</p> <ul style="list-style-type: none"> <li>-the definition of feedback</li> <li>-the classifications of evaluation (summative, formative, and external)</li> <li>-the criteria of the feedback from external evaluations (understandability of FEE, use of FEE, and student achievement)</li> </ul> <p>If you think you If you think, you master these points, this is so great. If not, time to review the previous section. You know that you can also do your own research for the missing points! You will find the instructor in the class for further questions too.</p>	Strong, weak
Motivational	<p>Hey! Dowl is back!</p> <p>Knowing the three Features of Feedback from External Evaluation (FEE) will help you to formalize feedback fits for the purpose.</p> <p>Let's go back to our previous example, you are a teacher trainer and you implicated a TPD program. Before formulating your feedback for the teachers you can go through the features to define your feedback according to your objectives.</p>	Strong
Metacognitive	<p>Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)?</p> <p>If yes, you nailed it! If not, it is my job to tell you that the main point of section (II) was:</p> <ul style="list-style-type: none"> <li>-to identify the three Features of Feedback from External Evaluation (FEE). Can you remember those three features? Are you able to explain them? If yes, then it means you are on the right track</li> </ul> <p>If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information!</p> <p>When you are confident about your knowledge of the section, you know what to do. Online tasks and posttests are waiting for you!</p> <p>Take care of yourself!</p>	Strong, weak

**Seminar 2: Quality Development by Professionalization (QDP)**

**Session 1: Teacher Profession Development**

<b>Type of the prompt</b>	<b>Prompt</b>	<b>Group</b>
Introductory	Hello! I am Dowl. I am here to help you with this course. Maybe we have already met at the Basics of Quality Development and Quality Assurance course. As you listened, this lecture will teach you about “Teacher Professional Development (TPD)”.	Strong, weak
Motivational	So now, Dowl will explain to you why it is important to be here. This course can be very relevant for you in case you work as a -an education researcher, or do a further degree like a PhD in education. Because TPD is a very broad and important topic to conduct research Besides, -if you work as a teacher you can improve your teaching in a professional way, And also, -if you work as a school director you can improve education quality. -finally, if you work as an education specialist you can offer good solutions for teachers' needs.	Strong, weak
Metacognitive	Don't worry, Dowl will help you to take the best from this course! Before you continue, take your time to think about these points: 1- consider the learning goals and your own learning expectations 2- consider what strategy or plan you will follow if you did not understand something Pause the video and take your time to think. When you are done, continue watching!	Strong, weak
Metacognitive	Hi again! Dowl is back! By now, do you think you met some of your learning expectations you set at the beginning of the video? Can you define the Teacher Professional Development (TPD) in your words? Do you remember the types of TPD Programs? If you think you got the message of these questions, and you are able to answer them, this is great! If not, you better go back to watch the previous section again. You can also do some research (e.g. with the help of the literature/ Google scholar online). The option of writing questions to ask the instructor in the lecture is always available, too.	Strong, weak
Motivational	Do you know why you need all this information? Here is your hint from Dowl. Knowing the types of TPD Programs will help you to make better decisions considering the audience and the resources. For instance, you work as an education specialist and you are responsible for the teacher's development. By knowing the types of TPD's you can decide which program fits better for the teachers considering their needs and the resources education institution.	Strong

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Motivational	<p>Dowl is back with the hints!</p> <p>Let's be aware of what we learnt and why we learnt!</p> <p>Knowing the Problem Solving Cycle Model (PSC) will help you ... to define the problems of the target education system first and create better solutions for needs.</p> <p>Let's make it clearer with an example:</p> <p>For instance, you work as a ...</p> <ul style="list-style-type: none"> <li>-teacher trainer in your private business and you need to offer the best program for your customers,</li> <li>-if you are aware of the Problem Solving Cycle Model (PSC) you can offer the best solutions according to their needs, which will help both sides to save the resources of your customers.</li> </ul>	Strong
Metacognitive	<p>Almost done! But before you close this video, do you think you are able to summarize the main points of section (II)?</p> <p>Can you explain the key considerations to build TPDs?</p> <p>Can you discuss the Problem Solving Cycle Model (PSC)?</p> <p>You can pause the video and think about your answers.</p> <p>If you can answer those questions, you've achieved a lot so far. If not, what about watching section (II) once again? You can also have a look at the suggested articles on Moodle.</p> <p>When you are done and able to explain the key considerations and discuss the PSC, go to do the activities of the online task on Moodle.</p> <p>See you later!</p>	Strong, weak

**Session 2: Standards in Teacher Education**

Type of the prompt	Prompt	Group
Introductory	<p>Hi again! Dowl is online! As you remember, the previous lecture introduced to you "Teacher Professional Development". This lecture will teach you about "the standards in teacher education".</p>	Strong, weak
Motivational	<p>Here is the first hint of the video!</p> <p>Do you know why it is important to learn the standards in teacher education? Now I will provide you some cases to show how important it is.</p> <ul style="list-style-type: none"> <li>-as an education researcher, you can work on the evaluation of TPD programs effectiveness, in which you might need to have standards for assessment,</li> <li>-working as a teacher, syllabus developer, school director as you can evaluate the effectiveness of teaching is based on these standards.</li> </ul>	Strong, weak
Metacognitive	<p>Now time to learn the standards. However, as you know! Before we go pause the video, and give yourself some time to think about the following points: consider the learning goals and your own learning expectations, decide if you will use the same strategy you followed in the previous lecture, is there anything you want to change?</p> <p>When you are done, resume the video-playing!</p>	Strong, weak
Motivational	<p>Dowl is back!</p>	Strong

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	So knowing these standards will help you to identify the objectives of the TPD programs. Which is a very critical step to develop an effective TPD program. Let's give an example you work as a teacher trainer and you need to plan a TPD program. These 10 standards will help you to define the needs, therefore objectives of the program.	
Metacognitive	Time for a quick check! After watching section (I), do you think you met some of your learning expectations you set at the beginning of the video? Can you explain the importance of the teaching standards and can you recall the 10 principles? If you can, let's keep learning If not, you may watch the section another time and support yourself with a more effective learning strategy, like pausing the video from time to time and taking notes.	Strong, weak
Motivational	Dowl is back with the hints! Knowing the challenges will help you design a TPD program effectively Let's give an example. For instance, you are an education researcher and you are conducting a research about the evaluation of a TPD program. Knowing the challenges will help you to have a more controlled design for your study.	Strong
Metacognitive	Almost there! This time I would like to know if you are able to summarize the main points of section (II)? Can you identify the five core propositions of the National Board Standards for teachers and their benefits? Are you able to discuss four challenges associated with the standards? If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information! When you are confident about your knowledge of the section, go to do the activities of the online task and posttest on Moodle.	Strong, weak

**Session 3: Assessing TPD**

Type of the prompt	Prompt	Group
Introductory	Hi there! Dowl is here! As you know, the previous lecture introduced to you "standards in teacher education". This lecture will teach you about "assessing TPD".	Strong, weak
Motivational	Here is the first hint! Why can assessing TPD be personally relevant for you at present or in the future? No worries! Now Dowl will provide you some examples as usual! -being an education researcher as you may conduct an evaluation study, -working in a company as a teacher trainer, because you can design a TPD program, -working as a teacher you can evaluate your own performance.	Strong, weak
Metacognitive	You know what to do; Before you continue watching the video, you should: pause the video, and give yourself some time to think about the following points: 1- consider the learning goals and your own learning expectations	Strong, weak

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	2- consider what strategy or plan you will follow if you did not understand something. When you are done, resume the video-playing!	
Motivational	Dowl is back! The hints are back! Knowing 5 critical features for studying the effectiveness of professional development will help you to design and evaluate a TPD program effectively. Let's give an example, you are a researcher and you need to evaluate the effectiveness of a TPD program, you can use these features as the criteria for evaluation.	Strong
Metacognitive	Now let's see where we are! After watching section (I), do you think you met some of your learning expectations you set at the beginning of the video? Are you able to discuss how to measure TPD's effectiveness? Can you explain the critical features of studying TPD's effectiveness? If you think you are able to answer these questions, we are doing fine! If not, you know what to do. You may watch the section another time. You can also check other sources.	Strong, weak
Motivational	Dowl is back with the hints! Knowing the core theory of action for professional development will help you to analyze the TPD and evaluate its effectiveness. Let's be specific and give an example. For instance, you are an education Researcher and you need to conduct an evaluation study, so this model will help you testing both a theory of teacher change and theory of instruction.	Strong
Metacognitive	Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)? Are you able to explain the core theory of action for professional development? If yes, then it means you have achieved a lot so far! If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information! When you are confident about your knowledge of the section, you know what to do. Online tasks and posttests are waiting for you! See you later!	Strong, weak

**Session 4: Effectiveness of TPD**

Type of the prompt	Prompt	Group
Introductory	Hi there! Dowl is here! This our last lecture together! As you have heard, we will be focusing on the effectiveness of short-term TPDs. Now I will tell you why this lecture is important to you.	Strong, weak
Motivational	Here are some cases: -being an education researcher you can evaluate the effectiveness of short TPDs -working as a teacher trainer, you can design effective TPDs as well as evaluate their effectiveness.	Strong, weak



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	-working as a teacher, syllabus developer, school director as you will be aware of the theories of effective TPDs for effective teaching	
Metacognitive	As we do regularly before you continue watching the video, you should: pause the video, and give yourself some time to think about the following points: 1- consider the learning goals and your own learning expectations 2- consider what strategy or plan you will follow if you did not understand something When you are done, resume the video-playing! Decide if you will use the same strategy you followed in the previous lecture, is there anything you want to change? Let's make sure we spend our time here effectively. And then keep watching of course!	Strong, weak
Motivational	Dowl has arrived! Knowing what makes a short TPD effective can help you to design and evaluate a TPD program. Let's make it clearer. Let suppose you are a teacher trainer and you need to plan a short term TPD program. These 3 theories (Theory of Change, Theory of instruction and Theory of context ) will provide you a good basis.	Strong
Metacognitive	Now let's see where we are! After watching section (I), do you think you met some of your learning expectations you set at the beginning of the video? Can you define the short-term TPD? Are you able to discuss what makes a TPD effective? If you think you are able to answer these questions, we are doing fine! If not, you can go back to the previous section and watch it again. You know that you can also do your own research for the missing points! You will find the instructor in the class for further questions too.	Strong, weak
Motivational	Dowl is back with the hints! As Dowl mentioned before, knowing the 10 features for an effective short term TPD will help you to design and evaluate a TPD program efficiently. Let's provide a different case here. You are an education researcher and you want to conduct an evaluation study. So these features will provide you a good basis for defining your Evaluation criteria. You will be aware of how to control and assure the quality to manage the resources properly, therefore, receive more effective results out of the program.	Strong
Metacognitive	Almost done! But before you close this video, do you think you are able to summarize the main point of section (II)? Are you able to distinguish 10 features for designing an effective short-term TPD? Are you able to explain three main related issues to short-term TPD? Pause here and think about these questions. Do you have answers to these questions? Then well done! If not, I advise you to watch section (II) again. Remember that you always have the option to look for other sources of information! When you are confident about your knowledge of the section, you know what to do. Online tasks and posttests are waiting for you! Take care of yourself!	Strong, weak

**Appendix 4. The In-Seminar Activities**

**Seminar 1: Basics of Quality Assurance**

**Session 1: Quality in Education Defined**

<b>Activity Type</b>	<b>Task</b>	<b>Time</b>
Introductory	Feedback session for the writing tasks	5 min
	Recap: General Conception of Education Quality	5 min
Practice	<p>Group activity</p> <p style="text-align: center;"><b>A Pitch Creation on PowerPoint</b></p> <p><b>Task</b> The students are grouped to create a 4-minute pitch and present it. Each group creates a pitch considering one of the <u>seven models of quality in education</u> (Cheng &amp; Tam, 1997).</p> <p><b>An imaginary scenario</b> This scenario is introduced to the students on a PowerPoint slide to read carefully:</p> <p><i>“You are the staff of a consultancy specialized in education. Your consultancy has a long tradition and works exclusively with the (.....) <b>Model</b>, one of the seven models of the quality in education of Cheng &amp; Tam (1997). In an upcoming meeting with other consultancies and a potential customer (Bavarian School Network; BSN) you are given the following questions (random order) for preparation of a short statement (Your pitch presentation).</i></p> <p><i>What is the name &amp; slogan of your consultancy (related to the model)?</i> <i>Who is your ideal customer?</i> <i>How do you sell your model to the customer: why should they choose yours above others?</i> <i>What are the goals/criteria for the quality you work with?</i> <i>What are the specific indicators you look at?</i> <i>What might be critical questions from the customer concerning the limitations of your approach?”</i></p> <p><b>Instructions</b></p> <p>-The students are clustered into 7 groups. Each group will receive a printed copy of the “imaginary scenario” and a “call for proposals for quality development and assurance in Bavarian schools”. The call for proposals is announced by the Bavarian School Network for expert agencies to present their pitches.</p> <p>-Every group represents one agency dealing with one of the 7 models of educational quality. The model is mentioned in the “<u>imaginary scenario</u>” <u>sheet</u> that each group will receive.</p> <p>-Groups prepare the pitches in 45 minutes</p>	55 min

	<p><b>A call for proposals</b></p> <p style="text-align: center;"><i>Call for Proposals</i></p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p>Quality Development and Assurance in Bavarian Schools</p> </div> <p><i>The Bavarian School Network (BSN) supports Bavarian <b>schools to implement promising quality development initiatives</b>. The present project is part of the state's efforts to support Bavarian schools so that these initiatives are implemented well, and that teachers and school leaders but also students get the support they need. The goal of this project is to implement ways of developing and assuring educational quality in Bavarian schools.</i></p> <p><i>Organizations focusing on quality development and assurance will be considered for funding.</i></p> <p><i>Applicants are invited to <b>present their proposals</b> during the agency pitch on April 20, 2017 (5 min).</i></p> <p style="text-align: center;"><i>We're looking forward to your proposals</i>  <i>Stephanie Moser</i>  <i>Bavarian School Network</i></p> <p><b>Note</b>  The students have access to the paper of Cheng &amp; Tam (1997) on TUM Moodle. Some students maybe need to revise some information about the seven models of quality in education.</p>	
<p>Other actions to consider in the lecture:</p> <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (5 min).</li> <li>- Instructions regarding the upcoming students' input (10 min)</li> <li>- Instructor's and audience's comments between activities (5 min)</li> <li>- Instructions and groupings (5 min)</li> </ul>		<p>25 min</p>
	<p><b>Total time</b></p>	<p><b>90 min</b></p>

**Session 2: Quality Management in Education**

Activity Type	Task	Time
Introductory	Feedback session for the writing tasks	5 min
	Recap: Seven models of quality in education	5 min
Practice	Present! Please pitch your approach!	60 min
	Recap: Importance of Quality in Education: 4 Imperatives	10 min
Other actions to consider in the lecture: <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (3 min).</li> <li>- Instructions and groupings (7min)</li> </ul>		10 min
<b>Total time</b>		<b>90 min</b>

**Session 3: Internal and External School Evaluation**

Activity Type	Task	Time	
Introductory	Feedback session for the writing tasks	5 min	
	Individual Activity <b>Puzzle word</b> The instructor distributes a puzzle word on a sheet of paper. The students have to make up 10 words related to the topic.  <div style="text-align: center; font-family: monospace; font-size: 0.8em;">                     s f e e j i n e x t e r n a l n l s s y                      b e i i u n w o i q f p e j o m r n c p                      o s l w t t g p i n u y k i e h o o h b                      v j f f l e a b n t s a t z g z e i o l                      r p b h i r d n q q a a l y v f r t o u                      a j a g q n y n i p c u m i f q z c l y                      q u w n j a s l r u d x l e t e r e r z                      d p u g p t r p d o b v c a a y o p j k                      c a x k t i m e e p d t a m v n b s q o                      l w r p k o w b h c i z s b u e z n f i                      a m m p q n z h j v t r w x g j c i q a                      b d j k n a h q e t l i z k e g o y x b                      f z x y f l c n n o i h o t s m y m p w                      z c w z e g e h d w c k e n u k q l h f                      n z p v d s w q q c d u q g o a v g w i                      h w i l s a v f n k w b p s v q o z m l                      f d z l x e b c r v e k v m f m j c b d                      z p s a f m m q t n e m e v o r p m i u                      q p x i i y v c s z k i f e z m n j m x                      m q i w r g e k t y j b l n f e l m q d                 </div>	10 min	
	<b>Answers:</b> education, effectiveness, evaluation, external, improvement, inspection, international, quality, school and self-inspection		
	Individual and peer activity: Brainstorming:		20 min

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	1. Internal evaluation What are purposes? What are the advantages? What are the problems? 2. External evaluation What are purposes? What are the advantages? What are the problems?	
Practice	<p>Group Activity</p> <p><b>Court Game</b></p> <p>-The instructor is the moderator of the Game.</p> <p>-Three students play the role of judges who want to make a decision between two cases: External School Evaluation and Internal School Evaluation. They think about relevant questions to ask, critical comments, etc. Further, the judges think about the balance of power and the combination between external and internal evaluation.</p> <p>-The other students are divided into two teams. Each team represents one of the two cases.</p> <p>-Each team should work hard to make its case win. The team should complete the rival by presenting the core elements of its school evaluation type. i.e. features, importance, procedures, outcomes, etc.</p> <p>-Teams are allowed to surf the internet for any information that might support their case.</p> <p>-An Example from the internet: Chapter 1 and 2 from this report (<i>Assuring Quality in Education: Policies and Approaches to School Evaluation in Europe, 2015</i>)  <a href="http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/178EN.pdf">http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/178EN.pdf</a></p> <p>-At the end of the time. The two teams stand in lines against each other. Each team attempts to win the case by presenting the case and arguing with the other team and the judge.</p> <p>-Conclusion: The judges emphasize that internal and external school evaluations work together to improve education. (BALANCE OF POWER)</p> <p>-Preparation: 10 min; Court Game 20 min.</p>	30 min
Take-home-message	Conclusion: The judges emphasize that internal and external school evaluations work together to improve education. (BALANCE OF POWER)	5 min
Other actions to consider in the lecture:		20 min
<ul style="list-style-type: none"> <li>-Opening the session at the lecture beginning (3 min).</li> <li>-Instructor's and audience's comments between activities (10 min)</li> <li>-Instructions and groupings (7 min)</li> </ul>		
<b>Total time</b>		<b>90 min</b>

**Session 4: Feedback**

<b>Activity Type</b>	<b>Task</b>	<b>Time</b>
Introductory	Feedback session for the writing tasks	5 min
	Recap: Criteria and Features of Feedback from External Evaluations (FEE)	15 min
Practice	<p>Group activity</p> <p style="text-align: center;"><b>Positive washback</b></p> <p>Evaluations and tests should bring positive washback. This means that the results should have a positive influence and improve teachers' and students' performance, for example. But "Pressed to solve significant problems quickly, many educators take the swift route: look at a table or two, make a judgment based on what they already think is true, and decide to address a problem that they can solve easily and that doesn't require much change on their part." (Minz, Fiarman &amp; Buffet, cited after Anderson &amp; Wall, 1993)</p> <p>Imagine yourself as a principal, who is highly interested in making the best of external evaluations to achieve a positive washback. What would you do / which actions would you take to assure an ideal output of the evaluation? (e.g., regarding the preparation of the teachers and or regarding the communication with the agency for example). Think about the key criteria and features of successful FEE (and also Feedback Loop) and try to give some practical advice/examples. How can you assure positive washback and avoid negative washback?</p> <ul style="list-style-type: none"> <li>- Understandability</li> <li>- Use of Feedback</li> <li>- Student achievement</li> <li>- Stakes in testing</li> <li>- Reference of time</li> <li>- Frames of reference</li> </ul>	50 min
Take-home-message	Final Saying	5 min
	<p>Other actions to consider in the lecture:</p> <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (3 min).</li> <li>- Instructor's and audience's comments between activities (10 min)</li> </ul>	15 min
<b>Total time</b>		<b>90 min</b>

**Seminar 2: Quality Development by Professionalization (QDP)**

**Session 1: Teacher Profession Development**

Activity Type	Task	Time
Introductory	Feedback session for the writing tasks	5 min
	<p>A video show</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> No More Bad Coffee: Professional Development That Honors Teachers: Sheryl Chard at TEDxABQED □ Sofia TPD center</li> <li>• <b>Link:</b> <a href="https://www.youtube.com/watch?v=aiW0s6_83dw">https://www.youtube.com/watch?v=aiW0s6_83dw</a></li> <li>• <b>Length:</b> 7:48</li> <li>• <b>Purpose:</b> Students watch the video to answer and discuss the following questions:                             <ul style="list-style-type: none"> <li>- What does she call teaching and why? (fine art/craft)</li> <li>- What is the basic principle for the design of her TPD center? (treat teachers with respect!)</li> <li>- Name some of her innovative ideas for TPDs?</li> </ul>                             (Allow teachers to connect with local experts and other educators, explore their roles in education through art and personal expression, and provide teachers with opportunities to grow in a professional environment that recognizes the indispensable role they hold in our society.)                         </li> </ul>	15 min
	Recap: Teachers as experts in teaching	10 min
Practice	<p>Group activity</p> <p><b>Task:</b> Each group should plan a TPD program about one topic from own choice related to teacher professionalization. Then talk about it in public and present a poster about it.</p> <ul style="list-style-type: none"> <li>• <b>Tips:</b> <ul style="list-style-type: none"> <li>- Each group should take into account the role of teachers and the role of researchers.</li> <li>- Both views should consider the greatest strengths of teachers and the importance of teacher professional development. They should also speak about which areas do teachers need to develop in their teaching to help students achieve better!</li> <li>- In the end, each group ought to select one topic/ issue and roughly design a TPD program considering it. Remember the types of TPDs and the key considerations that were presented in the online-lecture.</li> </ul> </li> <li>• <b>Presentation elements:</b> <ul style="list-style-type: none"> <li>Selected topic/issue? Who do you address (novice/expert teachers)? Why is your important? Describe your TPD type?</li> <li>What considerations did you make to plan it?</li> </ul> </li> </ul>	40 min
<p>Other actions to consider in the lecture:</p> <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (3 min).</li> <li>- Instructor’s and audience’s comments between activities (10 min)</li> <li>- Instructions and groupings (7min)</li> </ul>		20 min
<b>Total time</b>		<b>90 min</b>

**Session 2: Standards in Teacher Education**

Activity Type	Task	Time
Introductory	Warm-up activity: If you are a teacher (or if you were one), would you love to use the INTASC principles?	5 min
	Feedback session for the writing tasks	5 min
Practice	<p>Peer Activity</p> <p><b>An application of the principles</b></p> <p>Again with your partner!</p> <ul style="list-style-type: none"> <li>• <b>Task:</b> Design a specific context in an application of one of the principles. (25 min)</li> <li>• <b>Tips:</b> <ul style="list-style-type: none"> <li>- Each group selects one principle out of the ten. Each group chooses one subject to work on, e.g. language, science, history, etc.</li> <li>- Then the group thinks of specific actions in relation to the subject and creates a context where they implement typical actions in an attempt to consider the principle they selected.</li> <li>- When all groups are done with the task, they present their work very shortly. They give each other constructive feedback concerning their success in implementing the chosen principle with the presented context.</li> <li>- Presentation elements: (20 minutes time for some groups to present)</li> <li>- Which principle? Which subject? Which topic? Where? Context or lesson description and actions/activities</li> </ul> </li> </ul> <p><b>For example</b>, one group may select principle 4 which is about:  <i>Multiple Instructional Strategies The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem-solving, and performance skills.</i></p> <ul style="list-style-type: none"> <li>- The group decides to choose Physics as its subject. After that, they want to design one lesson on the conservation of energy. The task now is how to design a lesson/implement actions that consider creating a teaching and learning environment that promotes critical thinking and problem solving (principle 4 focus). E.g., students receive a computer-simulation showing a skater on a ramp. They have to find out why the skater becomes slower on his/her way down the ramp and what this has to do with energy conservation. Different kinds of energy are shown as graphics while the students play with the skater in the simulation.</li> </ul>	70 min
	<p>Other actions to consider in the lecture:</p> <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (3 min).</li> <li>- Instructions and groupings (7min)</li> </ul>	10 min
	<b>Total time</b>	<b>90 min</b>



**Session 3: Assessing TPD**

<b>Activity Type</b>	<b>Task</b>	<b>Time</b>
Introductory	Feedback session for the writing tasks	5 min
	Recap: Critical Features for TPD's effectiveness	10 min
	A video show • <b>Title:</b> A TPD study on Research on Teacher's Classroom Management Practices. • <b>Link:</b> <a href="https://www.youtube.com/watch?v=r5BdXfZc2hY">https://www.youtube.com/watch?v=r5BdXfZc2hY</a> • <b>Length:</b> 5: 23 • <b>Purpose:</b> Students watch the video to answer and discuss the following questions: - What are the DV and IV of the study? - What methodology is used to conduct it? - What were the main findings? - What recommendations does the study give?	15 min
Practice	Group Activity <b>Task:</b> Form 6 groups. Each group selects a measuring instrument so that at the end of the session each measuring instrument 2x is presented. Think of a TPD that seems to be relevant for you (e.g. developing digital competences). How you can measure the TPDs efficiency in relation to the "Core Theory of Action". Please also consider the advantages and disadvantages of your instrument. -Preparation: Please present your results on a poster sheet (30 Min. Preparation Time) Group 1 & 3: Survey Group 2 & 4: Observation Group 5 & 6: Interview Presentation: Gallery Walk! First, Group 1, 2 and 3 stay with their poster, the other walk around and ask questions. Then we change.	50 min
	Other actions to consider in the lecture: - Opening the session at the lecture beginning (3 min). - Instructions and groupings (7min)	10 min
<b>Total time</b>		<b>90 min</b>

**Session 4: Effectiveness of TPD**

<b>Activity Type</b>	<b>Task</b>	<b>Time</b>
Introductory	Feedback session for the writing tasks	5 min
	Recap: Effective Design Features of Short-Term TPD	5 min
Practice	Group Activity: (Groups of 3) A closer look at research papers regarding short-term TPDs	40 min

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	<p><b>Tips:</b></p> <ul style="list-style-type: none"> <li>- The instructor provides each student with a research paper related to short-term TPDs in printed form.</li> <li>- Each group has to take a closer look at the TPD and try to find out about Effective Design Features and basic issues that are associated with effective TPDs</li> <li>- Further, the students have to report about the results of the paper.</li> <li>- The paper: <i>Doherty, I., 2011. Evaluating the impact of professional development on teaching practice: research findings and future research directions. US-China education review, A (5), 703–714.</i></li> </ul>	
<p>Other actions to consider in the lecture:</p> <ul style="list-style-type: none"> <li>- Opening the session at the lecture beginning (3 min).</li> <li>- Instructor’s and audience’s comments between activities (10 min)</li> <li>- <b>Post-Questionnaire at the end of the session</b> (30 min)</li> </ul>		40 min
<b>Total time</b>		<b>90 min</b>

**Appendix 5. Coding Sheet**

<b>No</b>	<b>Student Name</b>	<b>Surname</b>	<b>CODE</b>	<b>Group</b>
1				
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25				
26				

## **Appendix 6. Writing Tasks**

### **Seminar 1: Basics of Quality Assurance**

#### **Session 1: Quality in Education Defined**

In order to understand the **complex nature of education quality** and to develop management strategies for achieving it, it seems necessary to review the **different expectations** explicitly or implicitly held by concerned constituencies in practice or by scholars in research.

Can you think of two different groups of people or institutions who might hold different views of education quality?

Please give an example for each perspective. Write about **150** words.

#### **Session 2: Quality Management in Education**

For educational purposes, education should be considered as a service rather than a product. Comment on this statement from your own perspective explaining why you agree or why you don't. Justify with examples when it is possible. Write about **150** words.

#### **Session3: Internal and External School Evaluation**

What type of school evaluations do you think your country follows? What type of models are used there? (e.g. parallel, supporting, sequential, cooperative or a mixture of systems) You can also reflect on what kind of change you wanted to do in case you were a person of authority. Write a max of 100-150 words.

#### **Session 4: Feedback**

Every one of us is exposed to receive feedback at school, work, or anywhere else. Write about a positive or negative feedback you have ever received. How did you feel about? Why did or didn't you like it? Why was/wasn't it useful? Write about 150 words.

### **Seminar 2: Quality Development by Professionalization (ODP)**

#### **Session 1: Teacher Profession Development**

Teacher professionalization can have different forms. Can you name 3 types of TPD activities and give a practical example for each type?

#### **Session 2: Standards in Teacher Education**

If you are a teacher (or if you were one), would you love to use the **INTASC principles**? Answer this question based on your own perspective. Justify with examples when it is possible. Please write about **150-200** words.

#### **Session 3: Assessing TPD**

You have heard about the five critical features of TPD's effectiveness. Identify them and write your opinion about why you think (or you don't) that they are useful to measure the effectiveness of TPDs. Clarify with examples when it is possible. Write about 100-150 words.

**Session 4: Effectiveness of TPD**

„The duration of the TPD program influences the effectiveness of the TPD the most.”  
Comment on this statement from your own perspective explaining why do or don't you agree. Justify with examples when it is possible. Do also think your claims from the last lecture.

Please write about 150 words.

Appendix 7. Questionnaires

**Pre-Questionnaire**

**Your Passcode:**

To ensure anonymity, please enter your 6-digit passcode here:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

It consists of six characters.

**Characters 1 and 2:** the first two letters of your mother's first name (in uppercase letters), (E.g. IN for Inge IN\_ \_ \_ \_)

**Characters 3 and 4:** sum of the day and month of your mother's birthday (*if you don't know this information, write xx*),

(E.g. 25 January = 25 + 1 = 26 IN26\_ \_)

**Characters 5 and 6:** sum of the day and month of your birthday, (E.g. March 4 = 4 + 3 = 7 IN2607)

Note: For numbers less than 10, please set a 0 before the number.

Please enter the code into the frame above.

**1. Demographic Information**

**1.1.** Gender (select):

- 1)  Male
- 2)  Female
- 3)  Other
- 4)  No answer

**1.2.** Age: \_\_\_\_\_

**1.3.** What is the most recent academic degree you received? (select)

- 1)  Bachelor
- 2)  Master
- 3)  PhD
- 4)  Other
- 5)  No answer

**1.4.** Are you a native English speaker? (select)

1)  Yes

2)  No

3)  No answer

**1.5.** Have you ever experienced studying in a flipped classroom? (select)

1)  Yes

2)  No

3) If yes, for how long? \_\_\_\_\_ (count by weeks)

**1.6.** Select ONLY if you answered Question 1.5. as yes:  
Did you like the flipped classroom experience?

1)  Yes

2)  No

**1.7.** Select ONLY if you answered Question 1.5 as yes:  
Do you prefer studying in the flipped classroom (FC) or in a traditional classroom (TC)?

1)  FC

2)  TC

**1.8.** Do you face serious technical problems when working in online-based environments, especially the TUM Moodle (answering online tests, downloading materials, uploading files, and watching videos)?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<i>Not at all</i>				<i>very serious problems</i>

The following questions ask about your general motivation, attitudes, learning strategies and study skills during learning. Think of previous seminars you had in the RTL master program that were almost structured the same as the current seminars “Basics of Quality Assurance” and “Quality Development by Professionalization”.

**Remember there are no right or wrong answers. Just answer as accurately as possible.** Use the scale below to answer the questions. If you think the statement is very true for you, select 5; if a statement is not at all true for you, select 1. If the statement is more or less true for you, find the number between 1 and 5 that best describes you.

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<i>Not at all</i>				<i>Very true</i>
<i>true for me</i>			<i>for me</i>	

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<b>2. Metacognitive skills</b>					
	Not at all				Very True
<b>2.1.</b> I think about what I really need to learn before I begin a task.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.2.</b> I ask myself questions about what I am to study before I begin to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.3.</b> I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the whole seminars).	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.4.</b> I set goals to help me manage my studying time.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.5.</b> I set specific goals before I begin a task.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.6.</b> I think of alternative ways to solve a problem and choose the best one.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.7.</b> I try to use strategies that have worked in the past.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.8.</b> I have a specific purpose for each strategy I use.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.9.</b> I am aware of the strategies I use when I study.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.10.</b> I try to distribute my studying time evenly across days.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.11.</b> I periodically review to help me understand important relationships.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.12.</b> I find myself stopping regularly to check my comprehension.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.13.</b> I ask myself questions about how well I am doing while learning something.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.14.</b> I think about what I have learned after I finish studying.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.15.</b> I ask myself how well I accomplished my goals once I finished studying.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.16.</b> I change strategies when I do not make progress while learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>



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<b>2.17.</b> I find myself analyzing the usefulness of strategies while I study.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.18.</b> I ask myself if there were other ways to do things after I finish learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>3. Time management</b>					
	Not at all				Very True
<b>3.1.</b> I find it easy to stick to a study schedule during learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.2.</b> I make sure I keep up with the weekly readings and assignments.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.3.</b> I make sure other activities do not take from my learning time.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>4. Environmental structuring</b>					
	Not at all				Very True
<b>4.1.</b> I choose the location where I study to avoid too much distraction.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.2.</b> I find a comfortable place to study.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.3.</b> I know where I can study most efficiently.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.4.</b> I have a regular place set aside for.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.5.</b> I know what the instructor expects me to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

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<b>5. Persistence</b>					
	Not at all				Very True
<b>5.1.</b> When I am feeling bored studying for these seminars, I force myself to pay attention to.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.2.</b> When my mind begins to wander during a learning session, I make a special effort to keep concentrating.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.3.</b> When I begin to lose interest, I push myself even further.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.4.</b> I work hard to do well even if I don't like what I have to do.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.5.</b> Even when materials are dull and uninteresting, I manage to keep working until I finish.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>6. Help seeking</b>					
	Not at all				Very True
<b>6.1.</b> When I do not fully understand something, I ask other course members in the seminars for ideas.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.2.</b> I share my problems with my classmates, so we know what we are struggling with and how to solve our problems.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.3.</b> I am persistent in getting help from the instructor.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.4.</b> When I am not sure about some materials, I check with other people.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.5.</b> I communicate with my classmates to find out how I am doing.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

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During this semester, you will study in two separate seminars some topics related to “Basics of Quality Assurance (BQA)” and “Quality Development by Professionalization (QDP)”. Answering the following questions will be helpful to know about your interest in these topics.

<b>7. Interest in the topic</b>					
	Not at all				Very True
<b>7.1.</b> I think I will enjoy studying the topics of these seminars.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.2.</b> I think the topics are personally important to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.3.</b> I like to get new knowledge about the topics of these courses.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.4.</b> I will be interested in the topics.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>8. Relevance</b>					
	Not at all				Very True
<b>8.1.</b> I think I will find examples in the seminars to make the content relevant to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.2.</b> I think I will find explanations in the seminars to make the content relevant to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.3.</b> I think I will find exercises in the seminars that demonstrate the importance of the content.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.4.</b> I think I will find statements about how the material relates to my career goals or my life in general.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.5.</b> I think the seminar content linked to other content areas.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.6.</b> I think these seminars will make me apply content to my own interests.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.7.</b> I think the course will include assignments that involve the application of the content to my career interests.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.8.</b> I think the seminars will help me to understand the importance of the content.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

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<b>8.9.</b> I think I will find real-life experiences in the class material.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.10.</b> I think I will use own experiences to understand a concept.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.11.</b> I think the seminars will include discussions to help me to understand the relevance of the topic.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.12.</b> I think the seminars will include current events to apply a topic.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**End of Pre-Questionnaire**

**Thank you for your cooperation**

**Post-Questionnaire**

**Your Passcode:**

To ensure anonymity, please enter your 6-digit passcode here:

_	_	_	_	_	_
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

It consists of six characters.

**Characters 1 and 2:** the first two letters of your mother's first name (in uppercase letters), (E.g. IN for Inge IN\_ \_ \_ \_)

**Characters 3 and 4:** sum of the day and month of your mother's birthday (*if you don't know this information, write xx*),

(E.g. 25 January = 25 + 1 = 26 IN26\_ \_)

**Characters 5 and 6:** sum of the day and month of your birthday, (E.g. March 4 = 4 + 3 = 7 IN2607)

Note: For numbers less than 10, please set a 0 before the number.

The following questions ask about your experience in the seminars “Basics of Quality Assurance” and “Quality Development by Professionalization”. You will notice that you have answered many of them in the beginning of the semester. **However, this time you should answer them in reference to your whole experience in the flipped classroom (last four sessions including online video lectures and classroom tasks).**

**Remember there are no right or wrong answers. Just answer as accurately as possible.** Use the scale below to answer the questions. If you think the statement is very true for you, select 5; if a statement is not at all true for you, select 1. If the statement is more or less true for you, find the number between 1 and 5 that best describes you.

1       2       3       4       5

*Not at all*

*Very true*

*true for me*

*for me*

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<b>1. Metacognitive skills</b>					
	Not at all				Very True
<b>1.1.</b> While learning in the flipped classroom, I thought about what I really needed to learn before I began the video task.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.2.</b> I asked myself questions about what I was to study before I began to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.3.</b> I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the whole videos).	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.4.</b> I set goals to help me manage my studying time.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.5.</b> I set specific goals before I began the video task or the other online tasks.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.6.</b> I thought of alternative ways to solve a problem and choose the best one.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.7.</b> I tried to use strategies that have worked in the past.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.8.</b> I had a specific purpose for each strategy I used.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.9.</b> I was aware of what strategies I used when I studied.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.10.</b> I tried to distribute my studying time evenly across days.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.11.</b> I periodically reviewed to help me understand important relationships.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.12.</b> I found myself pausing regularly to check my comprehension of the video task.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.13.</b> I asked myself questions about how well I was doing while learning via the video task.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.14.</b> I thought about what I have learned after I finished working on tasks.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.15.</b> I asked myself how well I accomplished my goals once I was finished working on tasks.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

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<b>1.16.</b> I changed strategies when I did not make progress while learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.17.</b> I found myself analyzing the usefulness of strategies while studying.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>1.18.</b> I asked myself if there were other ways to do things after I finished learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>2. Time management</b>					
	Not at all				Very True
<b>2.1.</b> I found it easy to stick to a study schedule during learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.2.</b> I made sure I kept up with the weekly tasks and assignments.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>2.3.</b> I made sure other activities do not take from my learning time.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>3. Environmental structuring</b>					
	Not at all				Very True
<b>3.1.</b> I chose the location where I studied to avoid too much distraction.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.2.</b> I found a comfortable place to study.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.3.</b> I knew where I could study most efficiently.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.4.</b> I had a regular place set aside for studying.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>3.5.</b> I knew what the instructor expected me to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

<b>4. Persistence</b>					
	Not at all				Very True
<b>4.1.</b> When I was feeling bored studying for these seminars, I forced myself to pay attention to.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.2.</b> When my mind began to wander during a learning session, I made a special effort to keep concentrating.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.3.</b> When I began to lose interest, I pushed myself even further.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.4.</b> I worked hard to do well even if I didn't like what I had to do.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>4.5.</b> Even when materials in these seminars were dull and uninteresting, I managed to keep working until I finish.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>5. Help seeking</b>					
	Not at all				Very True
<b>5.1.</b> When I did not fully understand something, I asked other members in these seminars for ideas.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.2.</b> I shared my problems with my classmates, so we knew what we were struggling with and how to solve our problems.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.3.</b> I was persistent in getting help from the instructor.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.4.</b> When I was not sure about some materials, I checked with other people.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>5.5.</b> I communicated with my classmates to find out how I was doing.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>



## QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

By now, you have been experiencing studying in two separate seminars; “Basics of Quality Assurance (BQA)” and “Quality Development by Professionalization (QDP)”. Answering the following questions will be helpful to know about your interest in these topics.

<b>6. Interest in the topic</b>					
	Not at all				Very True
<b>6.1.</b> I think I enjoyed studying the topic of these seminars.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.2.</b> I think the topics were personally important to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.3.</b> I liked to get new knowledge about the topics.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>6.4.</b> I was interested in the topics.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

While answering the following questions, please remember to consider the content of in-class sessions as well as the video lectures including the prompts (hints) provided by the “owl” picture (named Dowl).

<b>7. Relevance</b>					
	Not at all				Very True
<b>7.1.</b> I think I found examples in the seminars to make the content relevant to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.2.</b> I think I found explanations in the seminars to make the content relevant to me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.3.</b> I think I found exercises in the seminars that demonstrate the importance of the content.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.4.</b> I think found statements on how the material relates to my career goals or my life in general.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.5.</b> I think the seminar content linked to other content areas.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.6.</b> I think these seminars will make me to apply content to my own interests.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.7.</b> I think the course included assignments that involve the application of the content to my career interests.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

<b>7.8.</b> I think the seminars helped me to understand the importance of the content.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.9.</b> I think I found real-life experiences in the class material.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.10.</b> I think I had the chance to use own experiences to understand a concept.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.11.</b> I think the seminars included discussions to help me to understand the relevance of the topic.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>7.12.</b> I think the seminars included current events to apply a topic.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

The following questions ask more about your personal experience in the flipped classroom environment. Your answers will be helpful to know how useful you found the flipped seminars, how easy or difficult they were in your opinion, and what attitude you have towards them.

<b>8. Perceived usefulness of the FC technology</b>					
	Not at all				Very True
<b>8.1.</b> Having the flipped seminars in the curriculum enabled me to learn more efficiently.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.2.</b> Flipped seminars improved my academic performance.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

<b>8.3.</b>	Flipped seminars enhanced the effectiveness of my learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.4.</b>	Flipped seminars made it easier to learn in university.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.5.</b>	Flipped seminars gave me greater control over learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>8.6.</b>	Overall, I found the flipped seminars to be advantageous to my learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>9. Perceived ease of use the FC technology</b>						
		Not at all			Very True	
<b>9.1.</b>	Learning to operate the flipped seminar online system was easy for me.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>9.2.</b>	I believe that it was easy to get the flipped seminar online system to do what I wanted to do.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>9.3.</b>	The process of using the flipped seminar online system was clear and understandable.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>9.4.</b>	It was easy for me to become skillful in using the flipped seminar online system.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>9.5.</b>	Overall, I believe that the flipped seminar online system was easy to use.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>10. Attitude to the FC technology</b>						
		Not at all			Very True	
<b>10.1.</b>	Flipped seminars were fun.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>10.2.</b>	Using flipped seminars was a good idea.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>10.3.</b>	Flipped seminars system provided an attractive learning environment.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>10.4.</b>	Overall, I like the flipped system seminars.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

While learning in the flipped classroom environment, you have experienced pre-seminar activities (*e.g. videos, online tasks, literature, etc.*) and in-seminar activities (*e.g. group work, audience discussion, take-home-message, etc.*). The following questions elicit your opinion about the activities.

<b>11. Activities usefulness</b>	Not at all				Very often
<b><i>The pre-seminar activities...</i></b>					
<b>11.1.</b> ... were helpful to my learning	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.2.</b> ... motivated me to learn more	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.3.</b> ... enabled me to learn at my own pace	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.4.</b> ... prepared me for the in-seminars activities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b><i>The in-seminar activities helped me to...</i></b>					
<b>11.5.</b> ...clarify what I had learned in the pre-seminars activities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.6.</b> ...apply what I had learned in the pre-seminars activities	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.7.</b> ...develop problem-solving skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.8.</b> ...improve my group work skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.9.</b> ...develop better learning and studying skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>11.10.</b> ...improve my communication skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

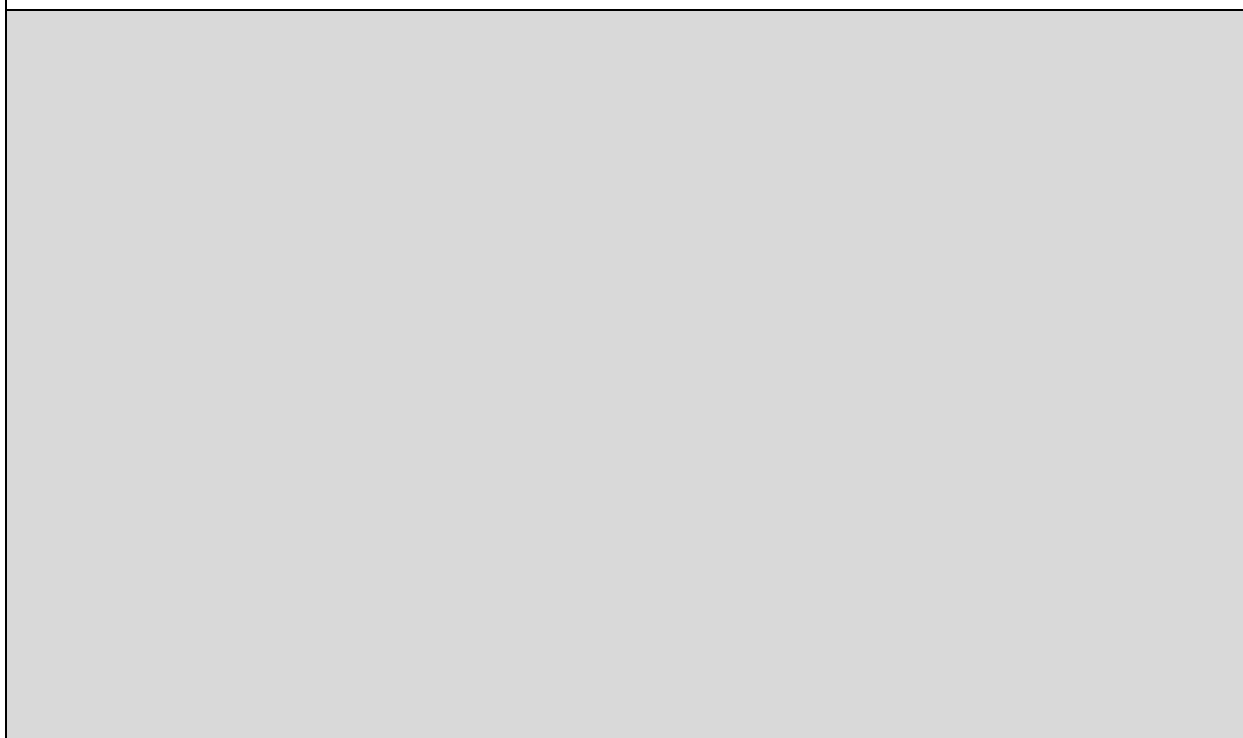
QUALITY EVALUATION OF THE FLIPPED CLASSROOM TEACHING METHOD

The following questions ask more about your personal experience in learning with the **prompts** (hints), the “owl” picture (named Dowl) with instructional messages appeared occasionally in the video lectures on Moodle. Your answers will be helpful to know how useful you found the prompts, how easy or difficult they were, and what attitude you had towards them.

<b>12. Perceived usefulness of the prompts technique</b>					
	Not at all				Very True
<b>12.1.</b> Having the prompts in the videos enabled me to learn more efficiently.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>12.2.</b> The prompts improved my academic performance.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>12.3.</b> The prompts enhanced the effectiveness of my learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>12.4.</b> The prompts made it easier to learn in university.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>12.5.</b> The prompts gave me greater control over learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>12.6.</b> Overall, I found the prompts to be advantageous to my learning.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

<b>13. Attitude to the prompts technique</b>					
	Not at all				Very True
<b>13.1.</b> The prompts were fun.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>13.2.</b> Prompting was a good idea.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>13.3.</b> The prompts provided an attractive learning environment.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>13.4.</b> Overall, I liked learning with the prompts.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**14. If you do have any comments on the FC method, you can state it here.**



**End of Post-Questionnaire**

**Thank you for your cooperation**