

STUDENT TEACHERS' MOTIVATION MATTERS!

Manuela KELLER-SCHNEIDER¹

Abstract: *This study is based on the approach that not only the quality of a course is significant for the learning output but also individual aspects of dealing with the requirements and of mastering them. It examines a situated and problem based learning arrangement of a course. Students have to acquire knowledge, analyse authentic situations at school, create a learning situation themselves and evaluate this lessons as an own case study, focused on the learning of the students and the fit of the support of the teachers to their learning. Based on a goal focused self-assessment, we investigate the effect of student teachers' evaluation of the quality of the course (1), their use of different learning settings and different learning strategies (2), their work motivation and their volition to reach the goals (3) on their learning output of the course. Results of regression analyses show that each of these approaches contribute to the explained variance of the learning output; the quality of the course explains 16% (1), the use of the learning opportunities 33% (2) and motivational factors 31% (3). A conclusion for teacher education is that good qualified courses are essential, but student teachers' motivation to deal with the requirements of a demanding learning arrangement is significant for their professionalization.*

Key words: *teacher education, professionalization, learning strategies, motivation, regression analyses.*

1. Introduction

The research is based on the approach that not only the high quality of a course and the talent of the students are significant for their learning output, but also their use of the learning opportunities and their individual characteristics to process their development of knowledge and skills (Helmke, 2003; Keller-Schneider, 2010). Courses of high quality are preconditions for the learning output of students (Hattie, 2009), but this quality may not guarantee students' success. The question is which learning settings and learning strategies are supportive and what influence has the learner and his motivation.

Teacher education in Switzerland focuses on goals, located on different levels of complexity (Anderson & Krathwohl, 2001). Focused on these goals students can prepare themselves to meet the requirements of the career entry phase (Keller-Schneider & Hericks, 2014). During teacher education periods with classes at the University are combined with pre-service teaching. Student teachers have to build up competencies to *apply* the acquired knowledge in their actions as a teacher, to *analyse* situations from

¹ Zurich University of Teacher Education, m.keller-schneider@phzh.ch

school reality, to create a synthesis of their knowledge for a deep *understanding* of complex situations and to *create* learning situations of high quality, with a high cognitive activating potential. So, student teachers have to take learning opportunities as a challenge and contribute in dealing with them to their professionalization. They have to prepare themselves for their career entry phase to enter school not as a novice, but as a competent beginner (Berliner, 2001; Keller-Schneider, 2014).

2. Theoretical Framework

Professional knowledge is an important precondition for school quality. According to Shulman (1987, p. 8) there are different categories of knowledge, such as general pedagogical knowledge, content knowledge, pedagogical content knowledge, curriculum knowledge, knowledge of learners and knowledge of educational contexts, which have to be acquired during teacher education. But professional competencies are not only promoted by knowledge; motives and goals, values and beliefs as well as self-regulation and involvement contribute to the development of competency (Zimmermann & Schunk, 2012).

To promote student teachers in their professional development, a fit between the complexity of a task as a demand and the individuals' skills has to be met. Tasks can focus on different knowledge dimensions (such as factual, conceptual, procedural and metacognitive) and require cognitive processes on different levels of complexity according to the revised taxonomy of Blooms' taxonomy with the six categories of cognitive activities: remember, understand, apply, analyse, evaluate and create (Anderson & Krathwohl, 2001 p. 5). Goals on a more complex level are more challenging. Student teachers have to involve themselves in their learning process to reach these goals on complex levels.

The specific course, the study is based on: Teacher education at Zurich University of teacher education focuses not only on factual and conceptual knowledge but also on procedural and metacognitive knowledge. The goals of this course aim to acquire knowledge and skills on students' learning processes to foster them in their learning processes. During the course, student teachers are obliged to apply their knowledge, to analyse situations and evaluate by observing students' and teachers' acting and interacting. In addition, student teachers have to create and teach learning settings as a teacher, based on their knowledge, acquired so far. They have to reflect and evaluate their thinking and acting themselves, but also together with peers and mentors. Student teachers have to tell and explain their reflections and conclusions they draw. At the end of the semester they get no grades and have no exam to pass. Their achievement is evaluated by specific approaches, based on their reflections. Student teachers have to show what they have learned, how they apply their knowledge and how they evaluate and reflect situations. They also determine and communicate their new goals and targets for the next period of their education.

In this course with elements of situated and of problem-based learning, student teachers work in a group of four to five persons. During the first part they have to acquire and understand knowledge on students' learning (1) and teachers' support during this process (2). They have to observe learning situations (3) and to analyse them according to the focus of the course (4), enriched by a self-study of different literature and teacher handbooks (5). In the second part of the semester they develop a learning situation of

their own and they teach a class. This learning situation is observed by the other student teachers of the group. Their focus of observation is on the acting of the students, the support of the teacher and its effect on the students. This lesson will be used as a case study (6). The participants of the group show their acquired competencies and insights, related to the goals of the course, based on this case study.

To finalise the semester, student teachers have to explain their case in a written document and present core elements of their work to the plenary, both tasks are done in a group work. In addition, they have to reflect their learning process and their findings in an individual report. For this task, composed of these three elements, student teachers get a goal-focused feed-back, but no grade. If their work meets the demands, they pass the course, if not, they have to revise and improve their assignment.

Perception of requirements: Students have to take the requirements of the course as a challenge. They have to work to achieve the goals and involve themselves in their own learning process. They have to be motivated or to motivate themselves, to meet the requirements of the course and to advance in their process of professionalization. Several components are significant for this process. Fig. 1 shows a model with the interaction of several components on the learning output of students the referred study is based on. Learning situations of high quality are supposed to have an effect on the learning output of the students (1). As a second factor, the learners' use of learning opportunities is significant as well (2). As a third group of components, individual characteristics of the students and their biographic background maintain the learning output (3). This three groups of components facilitating the learning process, are situated in a specific context, such as cultural and institutional factors.

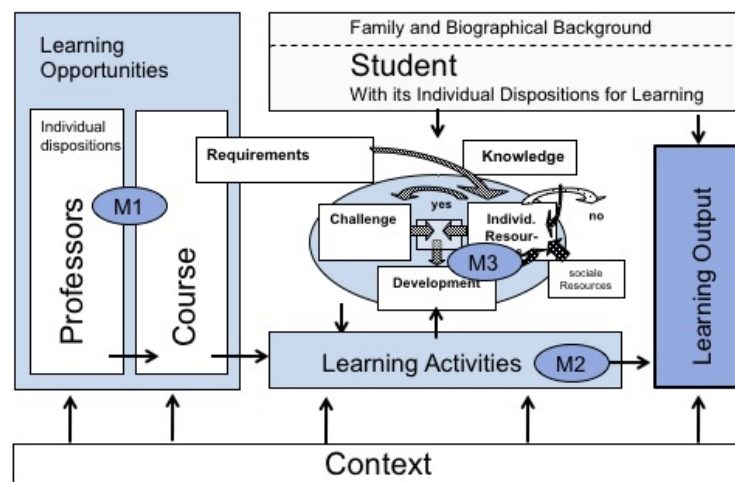


Fig. 1. *Process model of the interplay between the learning situation, the context, students' resources and the process of perception of demands as a challenge and its impact on the students' learning output*

The dynamic model of dealing with requirements to build up competencies in the centre of this model (Keller-Schneider 2010, 2014) is based on the transaction model of stress and coping of Lazarus (Lazarus & Folkman, 1984). To progress in their

professionalization, student teachers have to perceive requirements as challenges; they have to get themselves involved in coping with the learning activities. According to the processes of primary and secondary appraisal, requirements, given by the learning opportunities of the course, have to be perceived as important and manageable, to be taken as a challenge, so they can lead through a demanding process to further development (see arrow to the left in the core element of fig. 1). Individual resources, such as knowledge and competency, motives, beliefs and self-regulation have an influence on these appraisals. Depending on the result of this dynamic process of evaluation, students take requirements as a challenge and get in a demanding process, to work on the problem-based task and get new insights.

If they can master the requirement with routine or if they avoid to work on it (see arrow to the right in fig. 1), no stressing process will follow and no possibility to acquire further competency results. So, teacher education is forced to create demanding learning situations that lead to insights that are crucial for further professionalization as a future teacher. Results of this interplay between learning opportunity and its use by the individual based on its resources will be presented in this article.

3. Research Questions

Following the transactional model of stress and coping as a dynamic process to perceive and cope with requirements of learning opportunities, we investigate on different effects on the learning output of the teacher students, attending a specific course, described above. Courses of high quality are important preconditions for high learning outcomes (Hattie, 2009), but they cannot guarantee them (Helmke, 2011). The individual resources of the learners, like motives and goals are crucial as well. Student teachers have to get involved in their learning. To perceive tasks as challenges and maintain the commitment to work on them is significant. Derived from this theoretical framework, we assume that not only courses with high quality lead to high learning output but also the learning activities of student teachers; their effective uses of learning strategies and individual resources have an impact on the extent of the learning output. The following questions will be investigated:

- 1) Which effect has the individually evaluated quality of the course on the self-evaluated learning output of the student teachers in this course?
- 2) Which effect have the use of the learning opportunities, measured by the intensity of the use of different learning arrangements and the use of different learning strategies, on the learning output of the student teachers in this course?
- 3) Which effects have motivational factors on the learning output of the student teachers in this course?

4. Method

Design and data collection: The study evaluates student teachers' learning in the course about learning strategies of the students and the supporting activities of the teacher, located in the second semester of teacher education. It is arranged in a pre-post-design, using an electronic survey. At the beginning and at the end of the course, the student teachers were asked to evaluate the teaching quality of the course, the intensity of their use of specific learning settings as a source for their learning, their frequency of the use of specific learning

strategies, their work motivation and their intention to reach the goals of the course.

Participants: 768 students did respond to the survey (respondent rate 73.70%). 603 of them are female (78.5%), 165 are male (21.5%). The average age is 22.79 years ($SD = 4.1$) with a minimum of 18 and a maximum of 48 years.

The instruments, developed for this study, are shown in Table 1, illustrated with an example, the inner consistency (Cronbachs' alpha) and the number of items of the scale.

Instruments with examples, Cronbach Alpha and results of descriptive analyses Table 1

Scale and • Subscales	Examples: one Item per scale	Alpha (Items)	M/SD
Output (goal-oriented)¹	How well have you reached the goal to recognise the learning strategies in students' actions?	.87 (7)	4.69/ .72
Quality of the course¹	How do you evaluate the quality of the course in serving you to reach your goals?	.90 (5)	4.30/1.11
Setting of learning activities (sources)²			
• Self study	How much have you contributed to your success?	.72 (3)	4.48/.79
• Group work	How great was your engagement in group work?	.82 (3)	4.93/.75
• Plenary, Coaching	How intensively did you use the counselling by the lecturers?	.73 (3)	3.90/.95
• Documents, Material	How intensively did you use the material, prepared on the electronic platform?	.75 (3)	4.05/.99
Learning strategies²: How often do you use the following learning strategies?			
• Elaboration	I try to find concrete examples of specific learning content.	.85 (6)	4.56/ .75
• Organisational	I write brief summaries of the most important content.	.86 (6)	4.36/ .98
• Rehearsal	I learn rules, terms or formulas by heart.	.85 (6)	4.26/ .89
• Metacognition	I examine critically whether I'm doing things in a right way.	.89 (17)	4.22/ .67
• Emotional motivational	If a task is not interesting, I can motivate myself to do it nevertheless.	.93 (5)	4.55/ .83
• Use of indiv. resources	I keep on working, even when the task is difficult.	.82 (16)	4.19/ .73
• Use of social resources	I compare my notes with those of my colleagues.	.86 (6)	3.95/ .99
Motivation³: It is important to me, ...			
• challenge	to have a challenging work, which expects a lot of different skills.	.83 (6)	5.20/ .60
• relevance	to have a work, which is useful for others.	.73 (4)	5.29/ .62
• autonomy	To carry out my work independently.	.82 (6)	5.12/ .61
• relatedness	To have a work, which expects a close collaboration with my colleagues.	.80 (4)	5.08/ .69
Volition to reach the goals²	You worked hard to reach the goals.	(1)	4.32/1.10
Likert scale: ¹ 1=very low/6=very high; ² 1=very little/6=very much; ³ 1=very little/5=very much M= mean, SD= standard deviation, Alpha= Cronbach Alpha, (Item)= number of items			

To evaluate the *learning output* of the course, questions were derived from the goals, the course focuses on. The use of the *learning opportunities* differentiates between the

possibilities offered to the student teachers. To assess the use of *learning strategies*, an adaptation of the instrument of Wild & Schiefele (1994) is used. This adaptation points out some characteristics of the learning during teacher education (less questions on technics of rehearsal, more on metacognitive strategies). For *work motivation* an instrument was developed, based on the basic needs of Deci and Ryan (2002), which are competence, autonomy and relatedness. As a fourth factor challenge was added. The intention to work on the goals (*volition*) was asked with a specific question.

Procedure: To proceed the data, the statistic package SPSS is used. To prove the *reliability* of the scales the inner consistence is tested by Cronbachs' alpha. Results of *descriptive statistics* (M = mean and SD = standard deviation) will be reported (see Tab. 1). The impact of the investigated factors on the learning output will be examined by *regression analysis*: Effects of the quality of the course (M1), of the use of the learning opportunities and the learning strategies (M2), and effects of individual characteristics such as motives and volition (M3). Finally, all predictors will be tested in one model (M4). Table 2 shows the results of the regression analyses per model: standardised Beta coefficients, the explained variance (r^2), the F-value, its level of significance ($* \geq .05$, $** \geq .01$, $*** \geq .001$), and the Durbin Watson coefficient for testing the autocorrelation in the residuals from a regression analysis ($1.5 \leq DW \leq 2.5$, Brosius 2006, 575)

5. Results

Results will be presented according to the research questions. We start with the learning output as the dependent variable. Mean and standard deviation are presented in Table 1, the results from regression analyses in Table 2.

Learning output: Student teachers evaluate their *learning output* as quite high ($M = 4.69$). At least 2/3 of them reached the goals according to their goal-focused self-evaluation ($M - SD > 3.5$). The standard deviation ($SD = .72$) shows, that not all of them evaluate their learning output as sufficient. It can be assumed, that student teachers evaluate their learning output quite critical, as a demanded achievement, quite free from social desirability.

Quality of the course (M1): The mean shows an average in the upper part of the scale, most of the students evaluate the course as good ($M = 4.30$). But the standard deviation is quite large ($SD = 1.11$) and indicates, that some of them evaluate the quality of the course quite low. Results of the regression analyse (M1) show, that the quality of the course has quite a strong effect on the learning output (Beta.40***) and explains 16% of the variance.

Learning settings and the learning strategies (M2): In this specific course that demands self-regulation and cooperation in groups, student teachers evaluate their use of the group work ($M = 4.93$, $SD = .75$) and the intensity of self-study ($M = 4.48$, $SD = .79$) as quite high. The intensity of the use of learning material ($M = 4.05$, $SD = .99$) and the use of plenary and coaching sessions ($M = 3.90$, $SD = .95$) are not that high, but the means are also in the upper part of the scale. The quite large standard deviations show individual emphasis in the use of specific learning settings. Investigated by regression analyse (M2a) 29% of the variance of the learning output can be explained. The use of the plenary and coaching sessions shows the highest effect (Beta .26***), followed by the self-study (Beta .20***).

The effects of the intensity of the use of the documents, prepared for the course (Beta .13**) and the group work (Beta .09*) are less.

Concerning the intensity of the use of specific learning strategies, elaboration ($M = 4.56$, $SD = .75$) and self-motivation ($M = 4.55$, $SD = .83$) show the highest values, followed by the other primary and strategies: organisational and structuring strategies ($M = 4.36$, $SD = .98$), rehearsal strategies ($M = 4.26$, $SD = .89$) and metacognitive strategies ($M = 4.22$, $SD = .67$). Secondary strategies, such as the use of individual ($M = 4.19$, $SD = .73$) and social resources, show lower means ($M = 3.95$, $SD = .99$). The intensity of the use of different learning strategies ($M2b$) explains 17% of the learning output, elaboration strategies and strategies of self-motivation show significant effects (both Beta .19***).

Testing all factors of the use of the learning opportunity in one model (M2), the explained variance reaches 33% (Durbin Watson=1.77 acceptable autocorrelation of the residuals, Brosius, 2006, 575). The intensity of the use of learning settings as proximal factors shows higher effects than the use of specific learning strategies. The primary strategy of elaboration is still significant; the effect of self-motivation is not significant any more.

Results of the regression analyses

Table 2

	M1	M2a	M2b	M2	M3a	M3b	M3	M4
Course: Quality	.40***							.14**
Source of know.								
• Self study		.20***		.16**				n.s.
• Group work		.09*		.08				n.s.
• Plenary, Coaching		.26***		.21***				n.s.
• Documents		.13**		.14**				n.s.
Learning strategies								
• Elaboration			.19***	.16**				.15**
• Organisational			n.s.	n.s.				n.s.
• Rehearsal			n.s.	n.s.				n.s.
• Metacognition			n.s.	n.s.				n.s.
• Emot. motivational			.19***	n.s.				n.s.
• Use indiv. resourc.			n.s.	n.s.				n.s.
• Use social resourc.			n.s.	n.s.				n.s.
Motivation								
• challenge					.19***		.14**	.08*
• relevance					.10*		n.s.	n.s.
• autonomy					n.s.		n.s.	n.s.
• relatedness					.11*		n.s.	.08*
Volition to reach the goals								
					.49***	.40***		.27***
r^2	16%	29%	17%	33%	15%	24%	31%	41%
F with p	128.2***	67.84***	18.97***	26.71***	31.26***	219.4***	62.05***	24.46***
Durbin Watson	1.66	1.75	1.64	1.77	1.51	1.74	1.64	1.79

Motivation and volition (M3): Factors of *work motivation* in general show very high means (see Tab. 1). They explain 15% of the variance of the learning output ($M3a$). The motive of challenge has the most significant impact (Beta .19***), followed by the motive of relevance (Beta .10*) and relatedness (Beta .11*). The motive of autonomy contributes with

a non-significant effect to the learning output of the course.

Volition to work on the goals shows a quite high mean ($M = 4.32$, $SD = 1.10$) with a large standard deviation. Even though this question could be influenced by social desirability, the large standard deviation indicates a serious evaluation. The explained variance of the learning output is 24% ($M3b$), with a significant and quite strong effect (Beta .40***).

Motivation and volition tested together ($M3$) explain a variance of 31%.

What matters? – effects on the learning outcome: According to the theoretical model (see fig. 1) several factors are supposed to have an effect on the learning outcome. Within the last model ($M4$) the investigated factors, such as the quality of the course ($M1$), the intensity of the use of the learning opportunities and learning strategies ($M2$) and motivational factors ($M3$), are proved together in one model. They explain 41% of the variance with significant effect of the evaluated quality of the course (Beta .14**), the use of elaboration strategies (Beta .15**), the work motives of challenge (Beta .08*) and relatedness (Beta .08*) and the volition, with the strongest effect (Beta .27***).

6. Discussion

According to the goal-focused *learning output*, the student teachers did learn quite a lot in this course. The findings are based on the self-evaluation – social desirability can be expected. Derived from the fact, that the average of the learning output is not very high, the inter-individual differences are quite big (large standard deviation) and the averages of the answers show a range from 1.5 to 6, the results can be interpreted as quite valid and independent of social desirability. It can be assumed, that student teachers evaluate their learning output in a very serious way and reflect their acquired knowledge according to the goals of the course. This interpretation can be underpinned by two facts, characteristic for Zurich University of teacher education: (1) The student teachers are obliged to reflect their learning and acting in a portfolio and to explain their insights with examples, even at the final exam. Therefore, they are used to reflect their learning as a process. They are not expected to do everything perfect. To analyse situations and their own acting to derive the next goals they decide to work on is a demanded achievement. Secondly (2), student teachers get no grades at the end of the semester. Their learning process is important, not their formal achievement. These two facts, as characteristics of the formal criteria of the context, in which the course is embedded, can facilitate a quite critical self-evaluation of the learning output of the student teachers at the end of this course. But, we do not know, how the student teachers attribute the reasons of their learning output (Weiner, 1986). Is it their fault or their achievement to have reached the goals or to have missed them? At least some of them attribute externally, according to their remarks within the survey.

The presented results show, as assumed and proved by other research (Cochran-Smith, 2003), that the high *quality of a course* is significant for the learning output of the students. The results show as well, that the quality of a course predicts only a part of the learning output; other factors are crucial as well.

The *intensity of the use of different settings of learning opportunities* contribute to the explained variance quite much. Students' use of challenging learning opportunities and the fit to their learning style are crucial. To motivate students – and to force them – to get themselves involved in their learning process is an important facilitator of their professionalization. To support and foster student teachers in their self-regulated learning,

different learning opportunities are significant. The significance of offering several learning opportunities without pointing out the best way can be derived as a conclusion from this finding.

In addition, the use of specific *learning strategies*, suitable to the characteristic of the task, is relevant as well. The course, this study investigates on, focuses on goals to create learning situations for the students, based on a synthesis of different approaches, and to evaluate this created situation according to the approaches acquired in the course. The learning arrangement asks for quite a high amount of self-regulation. The task is arranged as a situated and problem based learning situation. To master this specific requirement, strategies of *elaboration* are adequate. The high amount of self-regulation asks also for strategies of *self-motivation*. The finding, that these two strategies have an impact on the learning output shows, that a fit between the goals of a task and the strategies a student teacher works with, is relevant. To support student teachers to reflect on their learning-styles and strategical approaches can foster them to find adequate ways to process the task.

The individual perception of requirements can be shaped by *motives*, as several studies show. In this study the motives to meet basic needs (Deci & Ryan, 2002), modified as motives to reach them through work, are very important to the student teachers; the averages are very high. The work motives of challenge and relatedness have a specific effect on the learning output. As a conclusion, challenging tasks to work on, in a setting of high self-regulation, with possibilities of choosing different learning settings, are crucial, if students have to take their professionalization in their hands and be the architects of their professional development.

As a further conclusion, based on these findings, a high quality of a course is significant – but if the student does not challenge himself by perceiving a requirement as a challenge, a learning output cannot be guaranteed. So, student teachers' motivation to use learning opportunities and to decide to work on the goals of a course is significant for their learning output and for their process of professionalization to become a teacher.

In this research the learning output and the quality of the course were evaluated by the students themselves. We don't know, if objective measurement leads to the same results. From the perspective of biographical learning and professionalization, subjective assessments are crucial as well for development. The result of the perceived quality, in contrast to an objective measured one, affirm the relevance of the fit of a course to the individual preferences (see Blömeke 2008, Fives & Buehl, 2012, Leder et al., 2002). Student teachers have to be involved in their learning – their perspective on the requirement, based on their individual resources, takes a role in their learning process and has to be included in their professional development – student teachers' motivation matters!

Other information may be obtained from the address: m.keller-schneider@phzh.ch

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