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Teaching experience and the „Shift from teaching to learning“

Abstract

The “Shift from teaching to learning” emphasizes supporting self-regulated student learning. Metacognitive knowledge of teaching, a student-centered teaching approach, high self-efficacy, and the teacher’s own learning strategies are crucial. Currently, little is known about the relevance of teaching experience in this context. To address this knowledge gap, 81 university teachers at one institution were interviewed. The results show that longer teaching experience correlated more with high self-efficacy and a teacher-centered approach, and less with learning strategies. The results are discussed here in terms of the aims of a more student-oriented understanding of teaching and the necessity of qualification for teaching in higher education.

Keywords

teaching experience, shift from teaching to learning, teaching approaches, learning strategies

Lehrerfahrung und der „Shift from teaching to learning“

Zusammenfassung

Mit dem „Shift from teaching to learning“ wird die Erwartung verbunden, dass Hochschullehrende selbstreguliertes Lernen ihrer Studierenden stärker fördern. Metakognitives Lehrwissen, ein studierendenorientiertes Lehrkonzept, hohe Selbstwirksamkeit und eigene Lernstrategien sind wichtig. Welche Rolle die Lehrerfahrung in diesem Zusammenhang spielt, ist bislang unklar. Daher wurden 81 Lehrende an einer Universität befragt. Die korrelativen Befunde zeigen, dass bei erfahrenen Lehrenden eher eine hohe Selbstwirksamkeit und ein ausgeprägtes lehrerzentriertes Lehrkonzept vorliegen; eigene Lernstrategien hingegen stehen in einem eher negativen Zusammenhang zur Lehrerfahrung. Die Bedeutung dieser Ergebnisse für die Zielsetzungen einer studierendenorientierten Lehre sowie die Notwendigkeit einer Qualifizierung in der Hochschullehre werden diskutiert.

Schlüsselwörter

Lehrerfahrung, Shift from teaching to learning, Lehrkonzepte, Lernstrategien

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1 The "Shift from teaching to learning"

Characterized as the "Shift from teaching to learning" by BROWN & ATKINS (1990), the learning of students is defined as a constructive process. The "Shift from teaching to learning" replaces the instructional paradigm that explained learning as a cumulative and linear process effected by teachers' instruction (BARR & TAGG, 2000; WILDT, 2005). For the implementation of the "Shift from teaching to learning", an enhancement of university teachers' teaching knowledge, teaching approaches, and teaching skills is required. Besides scientifically based presentation and instruction, university teachers should be able to create demanding learning environments presupposing various students' learning strategies, to explain to the students the benefits of using these learning strategies, and to advise students in their individual knowledge acquisition (KEMBER, KWAN & LEDESMA, 2001; TRIGWELL, PROSSER & WATERHOUSE, 1999). Therefore, university teachers need a specific expertise (SHULMAN, 1986a, 1986b), a well-founded knowledge of teaching and learning, a student-centered teaching approach, a high self-efficacy, and various learning strategies at their disposal. It is further assumed that practicing teaching and becoming more and more experienced in teaching, is also a learning process for the university teachers; a process that encourages them in their teaching competence (DREYFUS & DREYFUS, 1986; MULHOLLAND & WALLACE, 2001), and further enhances their self-efficacy (BANDURA, 1997). By collecting teaching experience and reflecting on the scientific concepts related to these practical experiences, university teachers acquire new teaching skills, learn more about students' learning and learning strategies, and improve their teaching knowledge.

Furthermore, teaching experience plays a crucial role as factor for teaching positions at Universities, and Universities of Applied Science (FENDLER & GLÄSER-ZIKUDA, in press). The German education system is under control of 16 federal states; therefore there are some differences regarding the higher education acts. But all acts are based on the German Government Higher Education Act (Hochschulrahmengesetz) established in 1976. In its original term, the qualification as professor for teaching at universities or universities of applied science was defined as: "pedagogical aptitude, which is generally demonstrated by teaching experience or training" (HRG § 44 Abs. 2). In many federal states, pedagogical aptitude is still defined as teaching experience for university teachers, e.g. in Baden-Württemberg (LHG-BW § 47, Abs. 2, § 51, Abs. 2, § 51a, Abs. 2, § 56, Abs. 2), Bavaria (BayHschPG Art. 25, Abs. 2), and Thuringia (ThürHG § 83 Abs. 1).

Because of the high relevance of teaching experience of the professors and teaching staff in German higher education, and the new requirements of the "Shift from teaching to learning", the aim of the study is to analyse how teaching experience is related to the "Shift from teaching to learning". In particular, the metacognitive knowledge regarding teaching and learning, teaching approaches, teachers' self-efficacy, and teachers' learning strategies are focused upon in the presented study.

1.1 Metacognitive knowledge about teaching and learning

University teachers have to deal with various demands and situations (WEGNER & NÜCKLES, 2011). It is assumed that university teachers with a well-founded teaching and learning metacognitive knowledge are able to use strategies that are appropriate for the particular teaching situation (PINTRICH, 2002). It allows teachers to identify students' learning strategies and their learning goals. Therefore, metacognitive knowledge of teaching and learning can be differentiated into teaching tasks, the teachers' knowledge of students, and the students' learning strategies, (ELSHOUT-MOHR, DAALEN-KAPTEIJNS & MEIJER, 2004; FLAVELL, 1979). Hence, the knowledge of students includes theoretical knowledge regarding the teaching and learning processes, and the goals, as well as the knowledge of the behaviour needed to accomplish learning tasks. Knowledge concerning students' learning strategies focuses on interdisciplinary knowledge of learning and problem solving strategies. Finally, knowledge regarding the contents, structure, and quality of teaching tasks is an aspect of teaching knowledge as well (ELSHOUT-MOHR et al., 2004). Teachers with a high level of metacognitive knowledge of teaching and learning are aware of these different teaching components; for example they are able to assess whether or not students will have difficulty in understanding a text, or whether a teaching task corresponds to the students' learning goals.

1.2 Teaching approaches

With the "Shift from teaching to learning", the research about teaching approaches becomes increasingly important. There is a close link between the teaching approaches of university teachers and the quality of students' learning (BRAUN & HANNOVER, 2008; KEMBER & KWAN, 2000; LÜBECK, 2010; TRIGWELL et al., 1999). Teaching approaches vary from teacher-centred approaches to student-centred approaches. The teacher-centred approach is characterized as the way of teaching where the teacher presents the knowledge, and students are considered to be passive recipients. The student-centred approach is described as the way of teaching which supports the construction of knowledge by the students as active learners. The role of the teacher is hereby seen more as a mentor and supervisor supporting the students' individual learning process. Therefore, TRIGWELL and colleagues (1999) demonstrated that those students whose teachers adopted a student-centred approach were more likely to show a deeper approach to learning than the students whose teachers adopted a teacher-centred approach, who were more likely to show a surface approach to learning. Beyond this, university teachers with more student-centred approaches offered students more time for problem solving and supported them in their individual learning process (KEMBER et al., 2001). Teachers with a more student-centred approach also got better feedback for the quality of their lectures (GIBBS & COFFEY, 2004).

1.3 Teachers' self-efficacy

Self-efficacy is an important aspect for successfully supporting students in their learning, and for the professional development of university teachers regarding the "Shift from teaching to learning" (LENT, BROWN & HACKETT, 1994;

STAJKOVIC & LUTHANS, 1997). Self-efficacy is defined by BANDURA (1997);*"beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments"* (p. 3), and the definition is based upon experiences gained by university teachers where previous situations influence the teaching (HAVITA & GOODYEAR, 2002; SCHWARZER & JERUSALEM, 2002). Following TSCHANNEN-MORAN, WOOLFOLK & HOY (1998) the self-efficacy of a teacher corresponds to that teacher's judgment of his or her abilities to produce desired outcomes of students' learning process, motivation, and performance. More often than not, experienced teachers have a high self-efficacy. For university teachers, self-efficacy in planning courses, and in assessing and supporting students' learning during courses, was shown to be relevant (FENDLER, 2012).

1.4 Teachers' learning strategies

One major task of teachers in the sense of the "Shift from teaching to learning" is to support the students' learning process regarding cognitive, metacognitive, and affective learning strategies. Therefore, it is important that university teachers themselves know and apply different learning strategies to explain these to students, and to create learning environments that require the application of these learning strategies (BRANSFORD, DERRY, BERLINER, HAMMERNESS & BECKETT, 2005). University teachers' knowledge of learning strategies may also support the soft-skills of their students which empower them for lifelong learning. Learning strategies are conscious or unconscious procedures of information processing selected by learners to achieve their goals: the ability to do so is characteristic for competent learners who are able regulate their learning (BROWN, BRANSFORD, FERRARA & CAMPIONE, 1983). There are various learning strategies that may be described, from simple rehearsal, to internal regulation of learners. For example, PINTRICH, SMITH, GARCIA & MCKEACHIE (1993) classify them by two major groups and five subgroups including strategies of elaboration, critical thinking, metacognition, organization, and rehearsal. Elaboration connects existing knowledge with additional information constructed by the learner. Critical thinking is an activity for identifying important contents of the learning material. Metacognition is defined as the self-awareness and the self-monitoring of a learner regarding his/her own capability in a learning domain. Organization includes activities of reviewing and restructuring learning material. Finally, rehearsal is a method of repeating important learning contents. Elaboration, critical thinking, and metacognition in particular are learning strategies which are described as deep level approaches to learning. Organization and rehearsal are surface level approaches to learning (TRIGWELL et al., 1999).

Numerous studies highlight the importance of learning strategies for successful learning and achievement (see for an overview MANDL & FRIEDRICH, 2006). In general, successful students apply more varied and rather demanding learning strategies than unsuccessful students (TAIT & ENTWISTLE, 1996). To develop and enhance the application of learning strategies, student-centred approaches are usually more effective than teacher-centred approaches (GIBBS & COFFEY, 2004; TRIGWELL et al., 1999).

1.5 Teaching experience and expertise

Teaching experience plays an important role for the effort and quality in teaching (STRAWITZ & MALONE, 1986; WEST, WATSON, THOMSON & PARKE, 1993). Experiences during university studies, and the first years of professional life have an influence on the understanding of teaching. For example, BECK and colleagues (2008) showed that school teachers with higher teaching experience had more teaching skills than teachers with less experience. Teaching experience may be seen as a component of teachers' expertise. Expertise has been defined and investigated according to specific abilities, (i.e. competences), years of studying or practicing in a domain (i.e. experience), and knowledge (i.e. cognition) (cf. BOSHUIZEN, BROMME & GRUBER, 2004). Differences between experts and novices in teaching have been analysed in many studies focusing on several domains (cf. review in school context ERICSSON & LEHMANN, 1996; SHULMAN, 2000). Furthermore, teaching experience has a powerful influence on the development of teachers' self-efficacy (MULHOLLAND & WALLACE, 2001; WOOLFOLK HOY & BURKE SPERO, 2005).

Although some studies showed no, or negative effects of teaching experience on teaching approach and further variables relevant for teaching (LÜBECK, 2009; NORTON, RICHARDSON, HARTLEY, NEWSTEAD & MAYES, 2005). POSTAREFF and colleagues (2007a) revealed in a survey conducted with 200 university teachers that University teachers with high teaching experience (13 years or more) scored highest on a teacher-centred approach scale and on a self-efficacy scale. Teachers with less than 2 years of teaching experience scored lowest on the scale for a teacher-centred approach. LINDBLOM-YLÄNNE and colleagues (2010) found similar effects in their study. Furthermore, WEGNER & NÜCKLES (2011) showed that teaching experience had no effect regarding the support of metacognitive teaching knowledge.

For a successful "Shift from teaching to learning" university teachers need a high metacognitive knowledge of their students, their students' learning strategies, and their teaching tasks. Therefore, this study focuses on the relationship between teaching experience and several important aspects of "Shift from teaching to learning". It is assumed that teaching experience is related to a high level of teachers' knowledge about students learning, students' learning strategies, as well as to teaching tasks. Furthermore it is expected that teachers' self-efficacy and their personal learning strategies are related to their teaching experience.

2 Method

2.1 Hypotheses

To analyse the relationship of teaching experience with important aspects of the "Shift from teaching to learning" we pursued the following research questions, respectively tested the hypotheses:

Teaching experience is related to all relevant aspects of the "Shift from teaching to learning" (metacognitive knowledge, teaching approach, teachers' self-efficacy,

and teachers' learning strategies). Particularly, it is expected that teaching experience positively correlates with metacognitive knowledge and teachers' self-efficacy. Furthermore, it is expected that teaching experience negatively correlates with a student-centred approach and with teachers' learning strategies (especially deep approaches to learning).

2.2 Design

To test these hypotheses, we asked university teachers from different disciplines at the Friedrich-Schiller-University Jena (Germany) three times (October 2010, July 2011, and April 2012) to complete an online-questionnaire. Due to the high fluctuation of university teachers, a comparison of the university teachers over the whole period of the survey was not possible. All the participants responded to the questionnaire at least one time.

2.3 Sample

The sample consisted of university teachers without any training in higher education, who ran their own teaching course at the Friedrich-Schiller-University, Jena (*n* total = 81 university teachers). The age ranged from 23 to 67 years (mean age: 36 years, standard deviation: 10.2). In total, 40.7 % males and 59.3 % females participated in the study. Their teaching experience varied from a few months up to 65 semesters (32,5 years). 50 % of the participants had less than 6 (Median split) semesters of teaching experience. Most of them were research assistants who conducted their own teaching courses (70.4 %), or university professors (14.8 %). Only a few participants (6.2 %) were university teachers with a high amount of teaching courses (more than 9 semester week hours), 4.9 % were scholarship holders offering their own teaching courses, and 3.7 % were other employees running their own teaching courses. A relatively large part of the sample was in a scientific qualification phase (doctoral and post-doctoral qualification). The participants taught in different subjects. 51.4 % of the participants taught in social science, 25.1 % in natural science, 12.5 %, in medicine 12.5 %, and 10.0 % of the participants taught in economical science. Only for one person were we not able to identify their teaching domain.

2.4 Inventory

The questionnaire consisted of 62 Items, including information concerning age, gender, and the type of employment. For measuring teaching knowledge, we adapted a version of the Awareness of Independent Learning Inventory (AILI) (ELSHOUT-MOHR et al., 2004). It consists of three scales, each including five items: Knowledge about students (α = .54), e.g. "*I think it is also important that students learn from each other during the course.*", knowledge about students' learning strategies (α = .77), e.g. "*If students do not work systematically, I can't think of any solutions*.", and teaching tasks (α = .70), e.g. "*I can tell by looking at a program whether, or not this will fit with students' learning objectives.*". The teaching approach was measured with a German version of the Approaches to Teaching Inventory (ATI) (TRIGWELL & PROSSER, 2004) with 11 items for the

teacher-centred approach (α = .78), e.g. "*I feel it is important to present a lot of facts in the classes so that students know what they have to learn for this subject*.", and 11 items for the student-centred approach (α = .81), e.g. "*I feel a lot of teaching time in this subject should be used to ask for students' ideas.*" In addition, teachers' self-efficacy was measured (JOHANNES, FENDLER, HOPPERT & SEIDEL, 2011) using three scales, each consisting of three items: skills for planning courses (α = .70), e.g. "*For a course, I can estimate well how much time I need for a subject area.*", skills for teaching during courses (α = .76), e.g. "*I can flexibly react on unexpected events.*", and skills for assessment and support of students' learning (α = .64), e.g. "*If I have to design exam questions, I'm sure how to do it.*". To measure university teachers' learning strategies, an adapted version of the Motivated Strategies for Learning Questionnaire (MSLQ) (PINTRICH et al., 1993) was applied using the scales elaboration: (α = .67) with three items, such as "*For new concepts I imagine practical applications*."; critical thinking (α = .70) with three items, e.g. "*I examine critically what I learn*."; metacognition (α = .55) with four items, e.g. "*Before learning something new, I think about how I can proceed most effectively*."; organization (α = .80) with three items, such as "*I sum up important terms and definitions in separate lists.*"; and rehearsal (α = .50) with three items, e.g. "*I read my notes several times*."

3 Results

To test the hypothesis, Kendall Tau correlations were calculated. For each aspect of the "Shift from teaching to learning" the significance levels were calculated using the Holm–Bonferroni method. The correlations between teaching experience and important aspects of the "Shift from teaching to learning" (metacognitive knowledge concerning teaching and learning, teaching approach, teachers' self-efficacy, and teachers' learning strategies) are described herein. The results show different correlations between teaching experience and the tested aspects (see Table 1).

The main results indicate that the more experienced university teachers are, the less student-centred is their teaching approach (-.15*), and the less learning strategies (especially metacognition (-.26*) and organization (-.18*)) they apply. Positive significant correlations were found, as expected, between teaching experience, teacher-centred approach (.18*), and for all dimension of teachers' self-efficacy. In particular, teachers' self-efficacy in planning courses (.27*) and students' assessment (.28*), show the strongest correlations with teaching experience. All dimensions of metacognitive knowledge and three dimensions of learning strategies (elaboration, critical thinking, and rehearsal) showed no significant correlations with teaching experience, although tendencies in correlations may be seen, at least with teaching experience for metacognitive knowledge (knowledge of students and about teaching tasks).

Variable	*N*	T	*p*
Metacognitive knowledge			
About students	79	*-.15*	*.04*
About students‘ learning strategies	79	*.04*	*.33*
About teaching tasks	79	.13	.05
Teaching approach			
Teacher-centred	81	*.18**	*.01*
Student-centred	81	*-.15**	*.02*
Teachers‘ self-efficacy			
Planning courses	81	*.27**	*.00*
During courses	81	*.16**	*.03*
Assessment and support of students learning	80	*.28**	*.00*
Teachers own learning strategies			
Elaboration	81	*.04*	*.29*
Critical thinking	80	*-.08*	*.19*
Metacognition	81	*-.26**	*.01*
Organization	80	*-.18**	*.01*
Rehearsal	79	*-.14*	*.05*

Table 1: Correlations between teaching experience and tested constructs (*N* = Numbers of participants, *r* = correlation, *p* = significance, *Level of significance Holm-Bonferroni separated for each aspect)

Important to note is that there are correlations between the different variables of the “Shift from teaching to learning“, especially between the teaching approach and self-efficacy, between metacognitive knowledge and learning strategies, and between self-efficacy and learning strategies. Absolutely no significant correlations exist between the two teaching approaches and learning strategies. We found significant Kendall Tau correlations between the teacher centred approach and self-efficacy regarding planning courses (.25*), during courses (.24*), and a statistical tendency for assessment of students’ learning (.22; n.s.). But there were no significant correlations between the student-centred approach and self-efficacy; just for self-efficacy during courses (.21; n.s.) a statistical tendency may be described. Furthermore, we found significant correlations between metacognitive knowledge (about students) and learning strategies (elaboration: .26*; metacognition: .29*, and organization: .27*. A statistical tendency was found for critical thinking: .21, n.s.). Metacognitive knowledge (about students’ learning strategies) correlated with learning strategies (elaboration: .24*, and critical thinking: .29*), as well. Finally, self-efficacy (planning courses) correlated with learning strategies (critical thinking: .25*); self-efficacy (during courses) with elaboration (.40*), and with critical thinking (.29*). Finally, self-efficacy (assessment of students’ learning) correlated with elaboration (.30*).

4 Discussion and Conclusion

The results of this study indicate that teaching experience should not be seen as a promising promoter for the "Shift from teaching to learning". On the one hand, teaching experience correlated positively with teachers' self-efficacy, and confirms the relevance of teaching experience for the individual perception of competence. But on the other hand, teaching experience correlated positively with a teacher-centred approach, and negatively with a student centred-approach; and furthermore, negatively with more deep level learning strategies. These results confirm for example findings of LINDBLOM-YLÄNNE and colleagues (2010) and POSTAREFF and colleagues (2007a) who also found correlations between teaching experience and teacher-centred approaches. Agreeing with WEGNER & NÜCKLES (2011) in this study, we also found no correlations between teaching experience and metacognitive knowledge. However there are some interesting statistical tendencies: a small negative correlation between teaching experience and metacognitive knowledge about students, and a small positive correlation between teaching experience and metacognitive knowledge regarding teaching tasks. One interpretation may be that novice teachers focus more on their students' knowledge, their learning processes (including learning strategies), and knowledge to accomplish learning tasks. Conversely, it is argued that experienced university teachers focus more on planning courses, creating teaching tasks, and the assessment of students. It may be assumed that university teachers with more experience focus on instruction as knowledge transfer, and follow therefore a teacher-centred approach. One reason is probably that experienced university teachers do not aim at further qualification, and are therefore less in the role of a learner themselves. It is assumed that they are also less motivated to participate in advanced trainings in higher education than novice teachers (PÖTSCHKE, 2004). Another reason may be that adequate incentives offered by universities are still widely missing or not sufficiently known.

Additionally, teaching experience correlated highly with teachers' self-efficacy. It may be assumed that experienced university teachers don't see any need for changing their teaching strategies. Rather, their high self-efficacy confirms their teaching strategies as being oriented towards teacher-centered approaches.

It therefore also may be assumed that the interest of experienced university teachers in students' learning is lower. The negative correlations between teaching experience and a student-oriented approach support this assumption. It should also be taken into account however, that experienced university teachers are more often involved in courses, respectively lectures with a large number of participants. Generally, this type of course is associated with a more teacher-centred way of knowledge instruction. Traditionally, a student-centred approach focusing on students' activation and learning strategies is rather less possible in lectures because of personal, technical, and further resources.

University teachers with less experience were more focused on the characteristics of the "Shift from teaching to learning". We assume that novice university teachers have a more student-centred view because of their own learning strategies, and because of the experiences as students which they remember still well. Moreover,

because of the personal aim of further qualification, they still understand themselves as learners. This perspective certainly influences their teaching approach in supporting the individual learning process of their students (KEMBER et al., 2001). The significant negative correlation for metacognition and organization especially supported this interpretation.

The inter-correlation between all relevant aspects of the "Shift from teaching to learning" may be interpreted in different ways. For example, university teachers with a high teacher-centred approach seem to tend more to plan, prepare, and proof the learning of their students. This understanding of teaching includes also the selection of instructional and learning material. As a result, feeling well-prepared contributes to the experience of high self-efficacy. On the other hand, learning strategies correlated with self-efficacy. Knowing and using learning strategies may support the experience of self-efficacy, as well (cf. ZIMMERMAN, 2000). Furthermore, metacognitive knowledge correlated with learning strategies. This relation may be interpreted as the "Shift from learning to teaching" because the support of students' learning process presupposes knowledge of the learning process, in general, and of learning strategies, in detail. Therefore it is assumed, that university teachers with metacognitive knowledge regarding teaching and learning are able predict their performance as teachers in monitoring students' learning process and outcomes (PINTRICH, 1987, 2002).

Methodologically, some limitations of the study have to be discussed. The influence of teaching experience on different variables was proven by a cross section design. Causal conclusions may not be formulated. As a next step, a longitudinal study should be carried out to test causal effects of teaching experience on teaching approach, metacognitive knowledge, self-efficacy, and learning strategies.

It has to be considered that the correlations are weak. Because of the voluntary participation in this study, the sample was relatively small. Therefore, the results of the interrogation are not at all representative, and have therefore to be carefully interpreted. Moreover, the majority of the participants were university teachers with less experience and a smaller amount of teaching courses. It would be interesting to have a well-balanced sample regarding type of employment (professor, research assistants, and non-independent teaching staff who run a high number of courses) teaching experience, and amount of courses. For a following study with a well-balanced sample a regression analysis should be used for explaining or modelling the relationship between teaching experience, and the metacognitive knowledge, teaching approaches, teachers' self-efficacy, and teachers' learning strategies. Furthermore, the capabilities of the different instruments to capture motivational and cognitive processes in a reliable and valid way at different grain sizes must be taken into consideration - for metacognition known as the grain size problem. Self-report instruments such as questionnaires are less able to capture the relevant processes at a very micro-level grain size in terms of the actual cognitive processes used of students. But self-report instruments may be able to measure general aptitudes to use different self-regulatory processes. To draw a more detailed and context specific picture, a video based observation of lecturers or teaching courses with a systematic coding system could also be appropriate (SEIDEL & HOPPERT, 2011).

Summarizing, teaching experience in the light of "learning by doing", is not sufficient to promote and to implement the "Shift from teaching to learning". Rather, more experience in teaching seems to hinder a student oriented focus on teaching and learning. University teachers therefore need a systematic support system in their professional learning process, similar to that enjoyed by school teachers. We propose higher education courses and certificates, especially for experienced university teachers. There is already empirical evidence that higher education courses and certificates have positive effects on the professional learning process (FENDLER, 2012; JOHANNES, FENDLER & SEIDEL, 2012; POSTAREFF et al., 2007a; POSTAREFF, LINDBLOM-YLÄNNE & NEVGI, 2007b). Finally, and this development might also be recognized in the different Higher Education Acts throughout Germany; in Bremen and Berlin for example a specific qualification in higher education is expected in connection with an application for a professorship or teaching position at university.

5 References

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