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Investigating effects of the quality of field experiences and personality on perceived teaching skills in German pre-service teachers for secondary schools

Antje Biermann [a, *], Julia Karbach [a, c], Frank M. Spinath [b], Roland Brünken [a]

[a] Department of Education, Saarland University, Germany
[b] Department of Psychology, Saarland University, Germany
[c] Department of Psychology, Goethe-University Frankfurt, Germany

HIGHLIGHTS

- We investigated German student teachers for secondary schools in their first field experience.
- Personality and features of the field experience are correlated with teaching skills.
- Features of the internship explain more variance than personality factors.
- Linking theory and practice is the most important quality factor.
- We discuss methods for an effectively linking between theory and practice.

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ABSTRACT

Quality of field experiences during teacher education as well as individual characteristics of student teachers are considered important for the development of teaching skills. In the present study we investigated both organizational and individual predictors of self-rated teaching skills in student teachers for secondary schools in Germany (N = 443). As predictor variables for teaching skills after a field experience we assessed the perceived quality of the internship as well as personality traits, as control variables prior educational experiences and academic abilities. The assessed quality feature "linking theory and practice" explained more variance in the prediction of teaching skills than personality traits.

Over the last three decades, field experiences have been systematically integrated into many international teacher education programs. The National Research Council (NRC) in the U.S. considered these teaching internships as "one of the three aspects of preparation that have the highest potential for effects on outcomes for students" (NRC, 2010, p. 180). Even though international research has increasingly focused on the conditions and the efficiency of different forms of teaching internships, empirical evidence is still scarce (cf. Clift & Brady, 2006; Ronfeldt & Reininger, 2012). In the U.S., most older findings are based on case studies. Recent international work also relied on larger samples and reliable, valid measures, and conclusions drawn regarding a number of teacher and student outcomes, such as teaching skills or student achievement (Bach, Besa, & Arnold, 2014; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Darling-Hammond, Chung, & Frelow, 2002; Ronfeldt & Reininger, 2012; Schubarth, Gottmann, & Krohn, 2014). Moreover, we know that not only organizational conditions of the educational process but also individual characteristics of the teachers affect their teaching skills (cf. Kunter, Klusmann, et al., 2013; Rockoff, Jacob, Kane, & Staiger, 2011; Zumwalt & Craig, 2008). For instance, studies focusing on the selection of first-year students have emphasized the influence of stable personality traits on the instructional quality of prospective teachers (Mayr & Neuweg, 2006; Rockoff et al., 2011; Rothland, 2014; Rushton, Morgan, & Richard, 2007; Thornton, Peltier, & Hill, 2005). Still, only a few studies focus on both organizational

* Corresponding author.
E-mail address: a.biermann@mx.uni-saarland.de (A. Biermann).

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as well as individual predictors for the development of teaching skills in teacher education (cf. Ronfeldt, Reiniger, & Kwok, 2013; Schubarth et al., 2014).

The present study investigated how the quality of features of field experiences and stable personality traits of student teachers for secondary schools affect their self-rated teaching skills during the teaching internship while controlling for cognitive ability and the quantity of educational experiences prior to the academic teacher education.

1. Theoretical background

1.1. Teacher education and field experiences in Germany

Teacher education in Germany in general consists of two phases. A first, academic phase at universities includes the acquisition of knowledge according to Shulman's (1987) framework, i.e. two subject disciplines, pedagogical content knowledge, and pedagogical knowledge. The duration of this first phase differs for the graduation track which depends on the type of secondary school the student teacher wants to teach. In Germany two types of secondary school exist which lead to different qualifications. The graduation at the lower secondary school track (secondary level I) gives access to attendance at vocational schools or at the higher secondary track (secondary level II). The latter leads to the *Abitur* grade what is required to enter a university. Depending on the graduation track the student teachers choose, the first university phase lasts 4–5 years (longer for the teaching at the secondary level II). The second phase of teacher education consists of practical training focusing on the acquisition and practice of teaching skills and routines. It takes place at the so called *Studienseminar* for further instruction in didactics as well as at schools for the practical training. At this stage, the trainee teachers become individually responsible for their teaching, that is, they are supervised by experienced mentor teachers (*Fachleiter*) but they autonomously plan and perform their teaching. The duration of this second phase depends on the number and duration of practical phases during the first stage at university and lasts between 1.5 and 2 years. That is, the more practical phases are implemented in the first phase of teacher training, the shorter is the duration of the second phase of teacher education. (cf. Kortina & Thames, 2013 for more information about the German teacher education system).

As just described, students enrolled in teacher education gain some teaching experience in the first, academic phase of teacher education by completing many weeks of several mandatory internships. These field experiences provide the opportunity to integrate scientific educational and didactical knowledge and practical experience, thereby serving as an important link between academic studies and teaching profession. These internships afford the students the opportunity to apply theories acquired in university education in the classroom, critically reflecting experiences and observations from teaching situations with respect to theoretical knowledge. Moreover, students are encouraged to engage in school-based activities, reflect the complex tasks and responsibilities of teachers, and review their personal fit to the demands of the teaching profession. The fact that the first phase of teacher education includes several internships is expected to facilitate the successive development of teaching skills.

The investigated student teachers for secondary schools at Saarland University complete a total of five practical internships in the first, academic phase of teacher education. For each field experience, they enroll in preparatory and follow-up courses taught by university lecturers or specifically instructed experienced school teachers.[1] The courses for the first five-week internship, which is focused in the present study, include relevant educational theories about education, methods of instruction and planning, classroom management, teacher-student-interaction, methods for observing classes, and constructive teamwork. Furthermore in the follow-up courses the focus lies on an intensive reflection of the observations and experiences acquired in the classroom with regard to the theories. During the field experience, the student teachers work at two schools (two weeks at an elementary school and three weeks at a secondary school) yielding broad experiences in different classes and age groups and leading therefore a good assessment of the professional fit. They are supervised and coached by cooperating teachers at school. The student teachers are tasked with observing instruction and supporting the mentoring teachers (e.g., while students perform tasks in quiet time), and teaching some whole classes under the close supervision of their mentors. They are required to teach at least two lessons (at least one per school) during the internship. Given that the students perform the teaching internship in teams of 3–4 participants, both the mentors and the student peers continuously provide support and feedback. After the practical phase, student teachers have to write a report about their field experience with regard to the theories and contents from the preparatory class. In that report they should reflect their own experiences in planning and teaching a whole class as well as their observations about the instructional methods, the classroom management and the teacher-student-interaction of the teachers they accompanied.

1.2. Determinants of professional teaching skills

The discussion of "what a good teacher should learn and be able to do" (Darling-Hammond & Bransford, 2005) led to normative guidelines for important teaching skills, with certain overlaps in core characteristics, such as principles for instruction and education, student assessment, evaluation etc. (e. g. National Council for Accrediation of Teacher Education, 2002; Oser & Oelkers, 2001; Terhart, 2002). The Swiss researchers Oser and Oelkers (2001) initiated the discussion of teaching standards in the German speaking countries and developed a set of 88 interdisciplinary standards of professional teaching comprising 12 thematic units (classified by the four major categories supportive behavior, classroom-management, and competences in instruction as well as in self-regulation).

One important aim of the research area is to identify variables supporting the development of teaching skills. Researchers from the field of organizational psychology have been interested in identifying stable personality traits (especially cognitive and personality characteristics) as indicators for success both in academic studies and in professional development (e. g. Barrick & Mount, 1991; Hurtz & Donovan, 2000; Kuncel, Hezlett, & Ones, 2004). Based on this approach, various hiring strategies have been designed to identify adequate individuals for specific positions and professions at very early stages of their careers. Still, only a few studies have examined the relationship between stable personality characteristics and teaching skills (Hanfstingl & Mayr, 2007; Mayr & Neuweg, 2006; Ripski, LoCasale-Crouch, & Decker, 2011; Rothland, 2014; Thornton et al., 2005). Another research perspective focused on the quality of teacher education, which is assumed to

[1] These teachers were nominated as high experienced and motivated teachers by their school leaders. Furthermore, they were instructed at the Center for Teacher Training belonging to the University *(Zentrum für Lehrerbildung)* about the contents and requirements of the courses and the field experience, and about effective teaching methods for instructing student teachers.

explain differences in teaching competencies independent from personality dispositions of beginning teachers (cf. Darling-Hammond, 2006a; Kennedy, Ahn, & Choi, 2008; Kunter, Kleickmann, Klusmann, & Richter, 2013). Findings from these studies were usually considered as a basis for optimizing teacher education.

Given that each of these approaches can only partly explain the development of teaching competencies, a recent model based on the *offer-and-use* model (Helmke, 2008) takes the complexity of developing these competencies into account and integrates the two research perspectives (Kunter, Kleickmann, et al., 2013). The original offer-and-use model focused on learning in schools, but its basic assumptions can be applied to different formal learning settings (Hascher & Kittinger, 2014). The learning context is considered a set of learning offers. As quality criteria for these offers are often mentioned for example instructional quality, quality of learning material, learning atmosphere, as well as competences and beliefs of the teachers or mentors. Both these quality criteria of the learning offers and individual preconditions of the learners influence how actively and reflexively the learners use these offers and thus determine the quality of their learning outcomes. Kunter, Kleickmann, et al. (2013), adapted the specifications of the offer-and-use model generally to the competence development in teacher education, while Hascher and Kittinger (2014) applied it specifically to learning processes during practical phases in teacher education. In order to account for the complexity of the development of professional behavior in teacher education, it is important to simultaneously consider both the quality features of education as well as the personality characteristics of prospective teachers.

1.3. Features of field experiences and teaching competence

The central aim of including more field experiences in the first, academic phase of teacher education is to support the development of teaching skills in prospective teachers. Thus, current research explores effective ways of structuring these internships and integrating them into the first phase of teacher education (cf. Arnold, Gröschner, & Hascher, 2014). Empirical evidence suggests that practical phases effectively prepare students for the teaching profession. Darling-Hammond et al. (2002) showed that teachers felt better prepared for their profession if they completed structured academic studies as compared to alternative educational programs that were not university-based. Ronfeldt and Reininger (2012) found that student teachers who rated the quality of their student teaching higher also felt better prepared for teaching. Researchers identified the level of structure and coherence (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005; Garet, Porter, Desimone, Birman, & Suk Yoon, 2001), an effective linking between theory and practice (Ball & Cohen, 1999; Cheng, Tang, & Cheng, 2012; Zeichner, 1990, 2010), and the collaboration of student peers (Baeten & Simons, 2014; Hudson, Miller, Salzberg, & Morgan, 1994) as relevant features of teaching internships. Furthermore, Hascher and Kittinger (2014) assumed in their offer-and-use model for field experiences that the quality of the mentoring at school and university is another important aspect of this learning environment. Ronfeldt et al. (2013) reported that the quality of the mentoring by cooperating teachers and university instructors during teaching internships was the best predictor for self-rated teaching skills among student teachers. Moreover, two German studies based on longitudinal samples of student teachers provided evidence for the positive association between the quality of mentoring by cooperating teachers during field experiences and students' self-rated teaching skills (Bach et al., 2014; Schubarth et al., 2014). In fact, student teachers reported that the collaboration with their mentors at school was a significant part of the internship (Hascher, 2006). The feedback provided by the mentors and the fact that they serve as role models was considered an important source for the development of teaching skills and competences (Consuegra, Engels, & Struyven, 2014; Hascher, 2006; for an overview see Hobson, Ashby, Malderez, & Tomlinson, 2008). Despite these positive findings, critics have argued that student teachers may adopt inappropriate teaching methods modeled by cooperating teachers and that theoretical models and teaching experiences may not be sufficiently connected (Alexander, Muir, & Chant, 1992; Consuegra et al., 2014; Felten, 2005; Ronfeldt & Reininger, 2012).

Therefore, the effective linking of theory and teaching experiences is considered a crucial aspect in the process of developing teaching skills and competences (Darling-Hammond et al., 2005; Zeichner, 2010; cf. Cheng et al., 2012). However, empirical evidence within field experiences is scarce. In a German study, Schubarth et al. (2014) investigated if the amount of practical connection between theory and practice measured by perceptions of the student teachers in the context of a six month practical semester is associated with higher teaching skills. The authors found no association between the amount of integration of theory and practice in educational courses and self-rated teaching skills while including assessment of mentoring and organization at schools as other quality aspects of the field experience. Thus, this link does not seem to be established automatically and prolonged phases of teaching internships, which are assumed to support the link between theory and practice, do not necessarily foster the development of teaching skills (Dieck et al., 2010; Ronfeldt & Reininger, 2012; see also Cheng et al., 2012). For example, Dieck et al. (2010) reported that teaching skills from student teachers who participated in an extended teaching internship (a full year during the university phase with a close cooperation between university and schools) were similar to those of the student teachers in the regular curriculum with five short internships. For a reflected integration of theory and practice, directed guidance from mentors at schools or from university instructors is needed (Arnold et al., 2014; Cochran-Smith & Lytle, 1999; Darling-Hammond et al., 2005; Korthagen & Kessels, 1999; see also Cheng et al., 2012).

In addition to mentors, student peers can support the development of skills during field experiences. Clement and Vandenberghe (2000, p. 84) pointed out that "collegiality is often considered a necessary condition for professional development". Provided that the members of a team have the necessary level of autonomy and that the risk for competition does not exist, collective participation during professional development can have significant advantages. Collaboration includes the opportunities to share material, to discuss the needs and particularities of pupils, to support team members in planning and designing lessons and to give feedback, to discuss theoretical concepts and problems, and to provide emotional support (Clement & Vandenberghe, 2000; Garet et al., 2001; for an overview see Baeten & Simons, 2014). A review by Hudson et al. (1994) indicated that observation and feedback from peers during field experiences usually increased effective and reduced ineffective classroom behavior. The positive effect of team teaching can be explained by a socio-constructivist view of learning due to the fact, that the interaction with others fosters the knowledge construction process. Thus, changes in behavioral routines require reflected communication and exchanges while working and learning in a team (cf. Baeten & Simons, 2014; Gräsel, Fussangel, & Parchmann, 2006).

In sum, theory-based reflection of the experiences acquired in the classroom guided by university or school mentors as well as constructive feedback from mentors and peers are considered important organizational aspects of teaching internships that can support the development of teaching skills in prospective teachers.

Whether all of these features are equally important is still an open question.

1.4. Personality traits and teaching skills

Personality traits, which are not specific for a certain profession, are of general interest in aptitude diagnostics research (cf. Barrick & Mount, 1991; Hurtz & Donovan, 2000; Poropat, 2009), but especially in teacher recruiting research (Rockoff et al., 2011; Rothland, 2014; Rushton et al., 2007; Thornton et al., 2005). The assumption that stable personality characteristics assessed at an early stage of teacher education predict academic and vocational success is of particular importance in this research field (cf. Rothland, 2014; Rushton et al., 2007). Several meta-analyses have provided evidence for significant associations between personality characteristics and general academic or vocational performance. The strongest predictor for performance measures is usually conscientiousness (Hurtz & Donovan, 2000; Poropat, 2009; Trapmann, Hell, Hirn, & Schuler, 2007). Moreover, smaller but stable associations have been reported between emotional stability as well as agreeableness and interpersonal facilitation (helpful, considerate, and cooperative behavior) across different vocational domains (Hurtz & Donovan, 2000).

Researchers in the field of teacher professionalism assume that specific personality traits of teachers "predispose an individual to interpret events in a particular way" (Ripski et al., 2011, p. 77). Thus, given that these characteristics can support or hinder teacher-student-interactions as well as instructional performance in classrooms they are considered important for student outcomes (cf. Fisher, Kent, & Fraser, 1998; Mayr & Neuweg, 2006; Ripski et al., 2011; see also Zumwalt & Craig, 2008). Nevertheless, only a few studies investigated this relationship. The Austrian researchers Hanfstingl and Mayr (2007) reviewed studies from German speaking countries published since the 1990s focusing on the relationship between personality characteristics and general teaching competencies. They found moderate positive associations between conscientiousness and extraversion and self-rated teaching skills as well as negative associations between neuroticism and the quality of teaching behavior both from student and professional teachers. Rockoff et al. (2011) also showed positive associations between extraversion and conscientiousness and teaching skills of novice teachers assessed by their mentors. Ripski et al. (2011) on the other hand, found no associations between extraversion and an overall scale of teaching skills in a group of pre-service teachers. When considering emotional states (e.g., depression) simultaneously, the authors found a negative association between both extraversion and depression and the outcome variables, what probably reflects a negative suppressor effect (Tabachnik & Fidell, 2007). In the overview of Hanfstingl and Mayr (2007), the authors reported less stable associations for agreeableness and openness to experience. Associations with agreeableness were found only at the university, with openness only in professional teachers (Hanfstingl & Mayr, 2007). When considering management behavior as a more differentiated aspect of teaching, Mayr and Neuweg (2006) showed that in a group of experienced teachers particularly pupil-oriented communication correlated with extraversion and openness to experience, while the association with controlling behavior was less pronounced.

In sum, there is some evidence regarding the prediction of teaching skills from an individual as well as an organizational perspective, even if some findings are not consistent across studies. Furthermore, it is still an open question, which characteristics of field experiences and which stable personality traits of students enrolled in teacher education explain incremental variance in the prediction of teaching skills while controlling for other relevant variables, such as academic ability and prior educational experiences.

1.5. Aim of the study and assumptions

The *first* aim of the present study was to test how characteristics of the field experience and stable personal characteristics of the student teachers for secondary schools are associated with their self-rated teaching skills. *Second*, we aimed at identifying predictors of teaching skills at an early stage of teacher education while controlling for academic abilities and prior educational experiences.

We expected that a better quality of the field experience to be associated with higher self-rated teaching skills. We also assumed that a higher perceived quality of mentoring (Bach et al., 2014; Ronfeldt et al., 2013; Schubarth et al., 2014) as well as of working with peers (Hudson et al., 1994) affect teaching skills in a positive way. It is an open question if there is a positive association between integrating theory and practice and teaching skills because earlier studies found no such correlations (Schubarth et al., 2014).

In terms of personality, we expected positive associations between conscientiousness and all aspects of teaching skills (Hurtz & Donovan, 2000; Mayr & Neuweg, 2006; Rockoff et al., 2011). According to Mayr and Neuweg (2006), we expected a positive correlation between openness to experiences and the aspects of teaching skills that include communication and pupil orientation. Given that Hurtz and Donovan (2000) found meta-analytic evidence for positive associations between interpersonal facilitation and personality traits in several professions, we furthermore assume a correlation between skills of teacher-student-relationship and agreeableness (positive) as well as neuroticism (negative). For extraversion, previous findings were inconsistent (Mayr & Neuweg, 2006; Ripski et al., 2011; Rockoff et al., 2011). Furthermore, it is an open question which predictors may explain incremental variance in the prediction of teaching skills while controlling for academic ability and prior educational experiences.

2. Method

2.1. Participants and design

A total of 443 students enrolled in teacher education for secondary schools participated in the present study (mean age = 21.07, SD = 3.02; 63.2% female). The investigation is part of the German longitudinal study SioS-L (Study about individual and organizational influences on academic achievement in teacher education) investigating individual and organizational influences on academic success and professional competence in teacher education (Biermann et al., in press). 69.3% of the participants enrolled in teacher education are aiming for secondary track II, 26.4% for secondary track I, and 4.3% for the vocational school track. This distribution is representative for the total population of students enrolled in teacher education.

In the first semester, we collected demographic data and personality by means of paper-pencil tests (see below). At the end of the first or second semester, student teachers completed their first five-week field experience in groups of 3–4 students. The self-rated teaching skills of the student teachers and the perceived quality of the field experience were assessed immediately after the practical phase by means of questionnaires (see below). The student teachers were recompensed with money or Credit Points for their studies in an elective compulsory section. They were informed that the participation is anonymous and voluntary and did not result in any disadvantages.

2.2. Measures

2.2.1. Personality

We applied the German translation of the NEO-Five-Factor Inventory (NEO-FFI, Borkenau & Ostendorf, 2008), including the five scales neuroticism, extraversion, openness to experience, conscienctousness, and agreeableness. The 12 items per scale were rated on a 5-point *Likert scale* ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scales showed satisfactory internal consistencies with a range from .70 to .86 (see Table 1).

2.2.2. Self-perceived teaching skills

To assess self-rated teaching skills, we applied a questionnaire developed by Oser and Oelkers (2001), which was modified for our study. In the present study, we only applied items directly referring to teaching activities in the classroom, because these activities had been introduced in the preparation class and were likely to be exhibited by student teachers in their first field experience. According to Oser (2001), both a professional knowledge base and the real professional actions are inherent in his definition of teaching standards. Thus, four category groups of teaching skills, each one including a knowledge component ("I know how to…") and an action component ("I am able to…") were rated on a 6-point Likert scale (1 = *not at all*, 6 = *absolutely*): "Teacher-student-relationship" ("… provide motivating feedback to students"), "handling of problem behavior" ("… deal with problem behavior"), "instructional methods and planning" ("… adapt learning goals to the knowledge requirements of students"), and "educational assessment" ("… apply different forms of educational assessment", see Table A1). The internal consistencies of the four scales ranged from .62 to .81 (see Table 1).

2.2.3. Quality of the field experience

The student teachers rated the quality of the teaching internship on a self-constructed scale including three quality scales: "Quality of organization/mentoring" ("I perceived the mentoring as supporting."), "linking theory and practice" ("During the field experience I learned to transfer theoretical ideas to the practice"), and "teamwork with peers" ("Working in our team was effective", see Table A2). The items were rated on a 6-point Likert scale (1 = *not at all*, 6 = *absolutely*). Each scale showed a satisfactory internal consistency (range from .73 to .90, see Table 1).

2.2.4. Control variables

Previous research on the influence of academic abilities on teaching skills is ambiguous. While some studies found positive associations (Ferguson & Womack, 1993; Hanfstingl & Mayr, 2007), others did not (Kane, Rockoff, & Staiger, 2008; Kunter, Klusmann, et al., 2013). In the present study, we therefore controlled for academic performance by including the self-reported secondary school grade point average (GPA; in the present study we took the German Abitur grade). Moreover, we controlled for the amount of educational experiences acquired prior to enrolling in teacher education (e.g., by teaching private lessons, see Table A3). Even though Ronfeldt et al. (2013) found no associations between prior educational experiences and the level of instructional preparedness, Mayr (2006) reported that prior educational experiences facilitated teaching skills during the first practical phases, but could not find significant long-term effects in his study. Given that the present study focused on first-year student teachers performing their first teaching internship, we decided to control the influence of prior educational experiences (cf. Mayr, 2006). Because we found differences in the self-rated teaching skill "teacher-student-relationship" between student teachers of the secondary levels I and II, we included the graduation track as a further control variable.

2.2.5. Data analysis

Given that the scales of the instruments applied in the present study had different gradations, we used z-standardized values for the statistical analyses. In order to test the role of personality and quality of the field experience for the level of teaching skills, we first report correlational data, followed by hierarchical regression analyses for each of the four dimensions of teaching skills. Missing values in the data set occurred completely at random ($p > .05$; Little's MCAR-test). We therefore imputed them using multiple imputation in SPSS 21 (m = 20 complete data sets with a mean of 14% missings per variable) (Graham, Olchowski, & Gilreath, 2007).

3. Results

Descriptive statistics for all variables are provided in Table 1. The student teachers in the present study had only a few prior pedagogical experiences but a high GPA. Inspection of the personality data showed that the student teachers exhibited the lowest means for neuroticism and comparable means for the other four scales.

Table 1
Intercorrelations, reliability, means, and standard deviations of control variables, personality, perceived quality of the field experience, and self-rated teaching skills.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	M	SD
Control variables																
1. GPA	–														2.25	0.63
2. Prior educational experiences	−.02	–													2.36	1.23
Personality traits																
3. Neuroticism	−.01	.03	(.84)												2.69	0.60
4. Extraversion	.02	.11*	−.42**	(.77)											3.54	0.49
5. Openness to experience	−.08	−.01	−.04	.14**	(.70)										3.33	0.50
6. Agreeableness	−.10*	.06	−.21**	.40**	.13*	(.86)									3.63	0.49
7. Conscientiousness	−.22**	.06	−.27**	.28**	.09	.33**	(.76)								3.64	0.60
Quality of the field experience																
8. Organization/mentoring	.01	.05	−.07	.10*	−.00	.05	.04	(.90)							4.82	1.26
9. Linking theory and practice	.08	.04	−.02	.11*	.02	.14**	.17**	.27**	(.73)						4.33	0.87
10. Teamwork	.02	.00	−.11*	.08	−.04	.16**	.06	.06	.15**	(.94)					5.16	0.83
Self-rated teaching skills																
11. Teacher-student-relationship	.05	.01	−.06	.11*	.07	.08	.19**	.10*	.39**	.08	(.71)				4.55	0.54
12. Handling of problem behavior	.06	.07	−.14**	.13**	.08	.11*	.16**	.12*	.25**	.11**	.65**	(.77)			4.36	0.68
13. Instructional methods and planning	−.01	.02	−.13**	.10*	−.01	.11*	.25**	.11*	.37**	.13**	.64**	.58**	(.81)		4.67	0.55
14. Educational assessment	.01	.05	−.12*	.04	.02	.01	.20**	.08	.31**	.09	.65**	.55**	.72**	(.62)	4.34	0.61

Notes: The intercorrelations are based on z-standardized values; reliability, means and standard deviations are based on the raw values. GPA: 1 = best to 5 = worst; Prior educational experiences: *Max* = 6; Personality: 1 = *strongly disagree* to 5 = *strongly agree*; Quality of field experience and self-rated teaching skills: 1 = *not at all*, 6 = *absolutely*. Reliability estimates (Cronbach's α) appear on the diagonal. *p < .05, **p < .01.

The quality of the field experience was rated relatively high, with lower ratings for the categories "linking of theory and practice" and higher ratings for "teamwork with peers". Teaching skills are also rated very high across all four scales. The intercorrelations between the scales of the quality of the teaching internship were only small (or even zero). Thus, the features of the field experience assessed in this study appear to be distinct and relatively independent. In contrast, the dimensions of self-rated teaching skills were moderately to highly correlated.

All correlations between the dimensions of quality of the field experience and self-rated teaching skills were positive; almost all were significant, except for the associations between the quality category "teamwork" and the skill categories "teacher-student-relationship" as well as "educational assessment", and between "organization/mentoring" and "educational assessment". However, the correlations were only small to moderate and we found the strongest relations between self-rated teaching skills and the quality aspect "linking of theory and practice".

Some correlations between personality measures and self-rated teaching skills were significant but relatively small. We found the largest positive associations between conscientiousness and all categories of teaching skills, while openness to experience was not related to the teaching skills. Small, but significant correlations existed between agreeableness and the categories "handling of problem behavior" as well as "instructional methods and planning". Neuroticism is negatively linked with all categories of teaching skills except with "teacher-student-relationship". Neither GPA nor prior educational experiences were related to self-rated teaching skills in the first field experience.

As a next step, we performed hierarchical regression analyses to test the predictive validity of personality and quality of the field experience for self-rated teaching skills. We performed four analyses, one for each dimension of teaching skills (see Table 2). Results show that the quality aspect "linking of theory and practice" was the best predictor for all four aspects of teaching skills with 6–15% explained variance. This finding indicates that student teachers who perceive more links between theory and practice rated all of their teaching skills higher. Moreover, conscientiousness added 2–4% incremental variance in the prediction of the three skill categories "teacher-student-relationship", "instructional methods and planning", and "performance assessment". Prospective teachers, who were more conscientious, assessed their own teaching skills higher. Neuroticism negatively affected the categories "handling of problem behavior" and "educational assessment" (with additionally 1–2% explained variance). In sum, the organizational (quality of the field experience) and individual (personality) measures explained only a small portion of the total variance, with the largest amount of variance explained for the categories "instructional methods and planning" and "teacher-student-relationship" (with 16 and 17% explained variance, respectively, see Table 2).

4. Summary and discussion

4.1. Relations between organizational as well as personality factors and teaching skills

Our findings support and extend previous results showing correlations between the quality of the field experience and teaching skills in prospective teachers (Bach et al., 2014; Hudson et al., 1994; Ronfeldt & Reininger, 2012; Ronfeldt et al., 2013; Schubarth et al., 2014). All three quality categories of the teaching internship assessed in the present study were significantly related to some teaching skills, with the highest associations with "linking of theory and practice" in contrast to the study of Schubarth et al. (2014), who found no correlation between the theory-practice-integration and teaching skills. Thus, our findings provide first empirical evidence for this relationship. The factor "quality of organization/mentoring" is positively associated with three categories of skills ("teacher-student-relationship", "handling of problem behavior", and "instructional methods and planning"). The correlations can be considered relatively low, even though the mentoring aspect was a significant predictor in previous research (Bach et al., 2014; Ronfeldt et al., 2013; Schubarth et al., 2014). This difference may be related to the measures applied in the present study, which were more global compared to instruments applied in other studies.

The quality category "teamwork with peers" was only related to the skill categories "handling of problem behavior" and to "instructional methods and planning". Baeten and Simons (2014) concluded in their overview of different models of team teaching that giving professional feedback and support needs a certain amount of knowledge and expertise. In the preparation class, the student teachers dealt intensively with the two aspects mentioned above. It can be assumed that the student teachers felt better prepared to observe these aspects and give more detailed feedback on these behaviors than on "educational measurement" or "teacher-student-interaction".

The relations between teaching skills and personality were only partly consistent with our expectations. Conscientiousness had the strongest positive association with all aspects of teaching skills, a finding that is consistent with several findings in general

Table 2
Regression analyses predicting self-rated teaching skills by the perceived quality of the field experience and student teacher personality.

Teacher-student-relationship		Handling of problem behavior		Instructional methods and planning		Educational assessment	
Step 1		Step 1		Step 1		Step 1	
Linking theory and practice	$\beta = .39^{**}$	Linking theory and practice	$\beta = .25^{**}$	Linking theory and practice	$\beta = .34^{**}$	Linking theory and practice	$\beta = .29^{**}$
Explained variance	$R^2 = .15^{**}$	Explained variance	$R^2 = .06^{**}$	Explained variance	$R^2 = .12^{**}$	Explained variance	$R^2 = .08^{**}$
Step 2		Step 2		Step 2		Step 2	
Linking theory and practice	$\beta = .37^{**}$	Linking theory and practice	$\beta = .25^{**}$	Linking theory and practice	$\beta = .31^{**}$	Linking theory and practice	$\beta = .27^{**}$
Conscientiousness	$\beta = .13^{**}$	Neuroticism	$\beta = -.13^{**}$	Conscientiousness	$\beta = .21^{**}$	Conscientiousness	$\beta = .14^{**}$
Additional explained variance	$\Delta R^2 = .02^{**}$	Additional explained variance	$\Delta R^2 = .02^{**}$	Additional explained variance	$\Delta R^2 = .04^{**}$	Additional explained variance	$\Delta R^2 = .02^{**}$
						Step 3	
						Linking theory and practice	$\beta = .27^{**}$
						Conscientiousness	$\beta = .11^{**}$
						Neuroticism	$\beta = -.09^{*}$
						Additional explained variance	$\Delta R^2 = .01^{*}$
Total explained variance	$R^2 = .17^{**}$	Total explained variance	$R^2 = .08^{**}$	Total explained variance	$R^2 = .16^{**}$	Total explained variance	$R^2 = .11^{**}$

Note: The regression analyses are based on z-standardized values. $^{*}p < .05$, $^{**}p < .01$.

organizational research as well as in research of teacher education (Hurtz & Donovan, 2000; Mayr & Neuweg, 2006; Rockoff et al., 2011). In our study, we found that high levels of neuroticism had detrimental effects for several aspects of teaching skills, which is also consistent with findings of previous studies (Hurtz & Donovan, 2000; Mayr & Neuweg, 2006). Lower emotional stability hinders good performance especially in stressful and new situations and can be considered a problematic factor for individuals in social professions (Mayr, 2009). Consistent with previous studies (Hanfstingl & Mayr, 2007; Rockoff et al., 2011), extraversion was positively associated with several teaching skills. However, this finding was not consistent with the results of Ripski and collegues (2011), but as mentioned above, we assume a methodical bias in their study. Moreover, openness to experience was not associated with teaching skills at this early stage of teacher education. In their literature review, Hanfstingl and Mayr (2007) found associations between openness to experiences and teaching behavior only in experienced teachers but not in student teachers. A possible explanation may be that the first teaching internship is usually highly structured and well instructed by the mentor teachers and the individual scope of action may therefore be limited. Furthermore, in the present study we found small positive associations between agreeableness and "handling of problem behavior" as well as "instructional methods and planning", but not with "teacher-student-interaction", a pattern that is inconsistent with the study of Hurtz and Donovan (2000). That and the fact that the intercorrelations between stable personality measures and self-rated teaching skills were relatively small in contrast to other studies (cf. Mayr & Neuweg, 2006, who found moderate associations) may be explained by the *bandwidth-fidelity-dilemma* (Ones & Viswesvaran, 1996). Basically, higher associations can be expected if predictor and criterion are at an equal level of abstraction. That was the case in the study of Mayr and Neuweg (2006), who used the more differentiated revised version of the NEO-Personality Inventory (NEO-PI-R, German version by Ostendorf & Angleitner, 2004). In contrast, the NEO-FFI used in the present study is a broader assessment instrument.

In general, the personality values of the investigated group of student teachers are consistent with findings from German speaking countries. Compared with the standard values of the age cohort, student teachers had lower values for neuroticism and higher values for the other dimensions of the Big Five, confirming a rather positive selection of student teachers (cf. Rothland, 2014).

The GPA served as a measure for academic ability and was not related to teaching skills (Kane et al., 2008; Kunter, Klusmann, et al., 2013; Kunter, Kleickmann, et al., 2013), indicating that high academic achievement may not be a necessary prerequisite for successful teaching behavior. This result may have been caused by a limited variance in GPA caused by the fact that at the Saarland University the number of students enrolled in teacher education is restricted by their Abitur grade *(Numerus Clausus)*. Moreover, it has been suggested that standardized ability test scores as proximal indicators may be more appropriate for the prediction of instructional teaching behavior, even though such findings are heterogeneous (Aloe & Becker, 2009; Kuncel et al., 2004). In the present study, prior educational experiences were also unrelated to self-rated teaching skills in the first field experience. Our data suggest that these prior educational experiences were very heterogeneous and therefore not considered advantageous for the teaching behavior. Indeed, a more fine-grained analysis revealed that only prior experience in terms of private lessons (which is most similar to teaching in the classroom) showed a small correlation with the skill category "educational assessment" ($r = .12$, $p < .05$). Moreover, the lack of associations between prior educational experiences and teaching skills may be caused by the way prior experiences were measured. The students were only asked whether they had certain experiences, but the frequency and intensity of these experiences were not measured. Adding this information in future studies may therefore yield a different pattern of results.

4.2. Predictors of teaching skills in a first field experience

The quality aspect "linking of theory and practice" during the field experience consistently explained the largest amount of variance across all domains of teaching skills. That finding is inconsistent with Schubarth et al. (2014) who found no predictive validity of that factor. Similar to the present study, the authors included several characteristics of the teaching internship into one prediction model. However, the assessment of the integration of theory and practice in the study of Schubarth et al. (2014) consisted of only a few dichotomous items assessing if a theory-practice-integration existed or not. In contrast, the assessment in the present study was more differentiated. The perceived "quality of organization/mentoring" did not explain additional variance to self-rated teaching skills. As mentioned above, this could be explained with the more global measurement in the present study. Aside from organizational variables, the personality trait conscientiousness explained incremental variance in the prediction of three domains of teaching skills ("teacher-student-relationship", "instructional methods and planning", "educational assessment"; 2–4% additionally explained variance) and neuroticism explained incremental variance in the prediction of "handling of problem behavior" and "educational assessment" (1–2% of additionally explained variance).

Considering organizational and individual predictors in the same model showed that the organizational variable "linking theory and practice" was the most powerful predictor for teaching skills. This finding lends further support to the importance of an effective linking of theory and practice during teaching internships. Higher levels of perceived integration were associated with higher levels of self-rated teaching skills, while personality traits appeared to be less relevant.

Overall, it should be kept in mind that the correlations between the measures were relatively small, even though they were based on self-reports collected at the same time (i.e., right after the end of the field experience). These small correlations may be partly due to the small variance in most of the measures. Moreover, the amount of total explained variance was also relatively low (8–17%), especially regarding "handling of problem behavior" and "educational assessment" (with 8 and 11% explained variance, respectively). When interpreting the results for the latter scale, it should be kept in mind that the internal consistency of this scale was also low. However, these aspects are likely to be less relevant and to occur less frequently in the first field experience because the students teach only a few classes. Furthermore, according to state-of-the-art models of teacher education (Kunter, Klusmann, et al., 2013; Kunter, Kleickmann, et al., 2013) the present study only assessed a small part of possibly relevant predictor variables, a fact that probably also reduced the total amount of variance explained. Moreover, given the complexity of teaching and other activities during practical phases, it is hard to control for other events and interactions that may have influenced the perceived quality of the internship and the self-rated teaching skills. Arnold et al. (2014, p. 19) pointed it out: "practice is often […] regarded as a kind of a black hole of unpredictable events and a highly complex area of diverse interactions (between student teachers and mentors, principals, students, parents, other student teachers)".

4.3. Study strengths and limitations

A definite strength of the present study is the fact that it included both organizational and individual variables in the prediction of teaching skills. Thus, it allows conclusions regarding the relative significance of both types of predictors.

A limitation, however, is the fact that the sample was limited to university students and that the quality of the field experience and the teaching skills were rated at the same time. Thus, the data do not allow conclusions regarding a causal relationship, because the perceived quality of the internship may have been influenced by the self-rated teaching skills (and vice versa).

4.4. Theoretical and practical implications

Despite these limitations, the present study provided new and important insights. Firstly, we found that features of the field experience, particularly "linking of theory and practice", were better predictors for teaching skills than stable personality characteristics. This finding has important implications for research on student selection for teacher education. A focus on stable personality traits as selection criteria in teacher education may be useful if these traits predict professional outcomes in studies and profession (e.g., Rothland, 2014). Earlier studies focusing on personality factors as single predictors for teaching skills confirmed this assumption (Hanfstingl & Mayr, 2007; Mayr & Neuweg, 2006; Rockoff et al., 2011). However, the findings of the present study suggest that organizational factors may be even better predictors for teaching skills than stable personality characteristics. Future work should add other relevant individual predictors, such as motivation, self-regulation, or professional knowledge (cf. Kunter, Kleickmann, et al., 2013) and apply longitudinal approaches including competence ratings at different times of measurement (Bach et al., 2014; Ronfeldt et al., 2013; Schneider & Bodensohn, 2014).

Self-assessments concerning professional behavior have been criticized, especially because of a self-serving bias and several authors argue for involving other perspectives (external observers or students) to assess teachers' classroom behavior (cf. Wubbels, Brekelmans, & Hooymayers, 1992). In contrast to the mentioned bias, Pham et al. (2012) showed that teachers assessed their own skills as lower than their students or colleagues. However, by now there is a broad consensus that every perspective has its own important validity (Clausen, 2002; Fauth, Decristan, Rieser, Klieme, & Büttner, 2014; Könings, Seidel, Brand-Gruwel, & Merriënboer, 2014). The self assessment of teachers is a relevant information basis due to the fact, that they are the actors in planning and structuring the lessons and persons with other perspectives can not assess that information. In the present study, the perspective of the student teachers was utilized, because they were able to provide the best assessment of their own professional behavior. As mentioned above, the student teachers in the present study completed their internship at two different schools and in some cases observed and assisted many lessons by different teachers. Nevertheless, despite the disadvantages of self-assessments and the relevance to integrate different perspectives of observing behavior in classrooms, a triangulation with several methods and perspectives in assessing teaching skills is of high importance (e.g., Darling-Hammond, 2006b). However, it should be kept in mind that different raters have to rate on an equal basis (same observation period, equal comprehension of the items etc., cf. Koziol & Burns, 1986; Pham et al., 2012).

According to Oser (2001), the scales of teaching skills measured in the present study included both a knowledge and an action component. Considering the low number of items per scale splitting in two subscales (knowledge and action scale) was not possible. However, the internal consistencies of most scales including both aspects were satisfactory. Nevertheless, future research may consider whether knowledge and action scales have different predictive values for different aspects of teaching skills.

Regarding the design of field experiences in teacher education, the present findings provide the empirical base for the frequently discussed importance of integrating theory and practice that should be stimulated and instructed by the mentors at schools and universities (Cheng et al., 2012; Cochran-Smith & Lytle, 1999; Darling-Hammond et al., 2005). However, theory-based reflections (e.g., during debriefings) are rare in cooperating schools as compared to universities (Hascher & Moser, 2011; Schüpbach, 2005), but specific training for the cooperating teachers seem to be successful (Crasborn, Hennissen, Brouwer, Korthagen, & Bergen, 2010; Hobson et al., 2008). Considering the high overall strain in teachers (De Heus & Diekstra, 1999), particularly in mentoring situations (Gröschner & Seidel, 2012), the university context may be a more appropriate context for specific theory-based reflections. For this academic context, many methods exist to enhance the theory-practice-integration. For example, the Belgian researchers Korthagen and Kessels (1999) developed a model describing the ideal process of reflection. Based on this model they implemented the *realistic approach* as a new program for teacher education in the mid-1980s, designed to foster the link between theory and practice. Consistently, Brouwer and Korthagen (2005) reported that the university-based academic education was rated more positively if students were encouraged to reflect on practical teaching experiences in class. Another effective and innovative way to implement these reflections are learning diaries that can be used to document practical experiences and reflect on them based on theoretical models (cf. Hascher & Kittinger, 2014). In the study of Boyd et al. (2009), the authors investigated the effectiveness of so called *capstones* (mandatory final reports including a theory-based reflection of the experiences acquired during the teaching internship) and reported an improved academic performance in the classroom. Such theory-based final reports were also mandatory for the participants of the present study. Furthermore, teaching videos may be used to foster theory-based reflections in university classes (Blomberg, Sherin, Renkl, Glogger, & Seidel, 2014; Krammer, Lipowsky, Pauli, Schnetzler, & Reusser, 2012). On a more general level, the effective and well-organized communication between universities and cooperating schools is of major importance for a successful integration of field experiences in the academic phase of teacher education (Gröschner & Seidel, 2012) and the coherence of both phases of teacher education (e. g. Darling-Hammond, 2006c).

Although organizational factors explained most variance in the prediction of teaching skills in the present study, the incremental variance explained by neuroticism is relevant in the light of the field of teacher burnout. Especially the handling of problem behavior in classes is a tremendous stress factor for beginning teachers (e. g. Chaplain, 2008; Veenmann, 1984). At the same time it is known that teachers with high values of neuroticism show more disadvantageous coping strategies and some authors see benefits in interventions for these student teachers (Reichl, Wach, Spinath, Brünken, & Karbach, 2014; Connor-Smith & Flachsbart, 2007). Appropriate interventions should include the identification of maladaptive coping strategies, training of more functional strategies dealing with stress in general and in stressful situations in classrooms, and an intensive counseling of beginning student teachers with high values in neuroticism (cf. Reichl et al., 2014; Chaplain, 2008; Kokkinos, 2007).

Ethical approval

The study was approved by the ethics committee of the German Psychological Association (*DGPs*).

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Appendix

Table A1
Overview of items applied to assess self-rated teaching skills

Teacher-Student-Relationship	I am able to put myself into the position of students
	I know how to provide motivating feedback to students
	I know different options to reward students
	I know how to give assurance to anxious students
	I am able to formulate positive expectations toward students
Handling of problem behavior	I know how to deal with problem behavior
	I know how to guard students from violations (mortifications, laughing at someone etc.)
	I am able to perceive classroom disruptions at an early stage
	I am able to observe and describe conflicts
Instructional methods and planning	I am able to follow my planned schedule, but can also react in a flexible way
	I am able to formulate and constitute learning goals
	I am able to arrange learning contents in a meaningful order
	I know what matters by giving homework
	I know different teaching methods
	I am able to constitute the didactic reasons why I am chosing a teaching method
	I am able to adapt learning goals to the knowledge requirements of students
	I am able to design interesting and diversified learning tasks
	I am able to observe and evaluate lessons
Educational assessment	I know how to apply different forms of educational assessment
	I am able to formulate transparent requirements to the students
	I know how to observe learning difficulties of students
	I am able to develop learning tasks with different specifications

Table A2
Overview of items applied to assess perceived quality of the field experience

Organization/mentoring	Mentoring at practice school was well organized.
	I perceived the mentoring as supporting.
Linking theory and practice	During the field experience I had the opportunity to deal with different theoretical approaches.
	Because of the field experience I'm motivated to dealing with topics of pedagogical content knowledge for myself
	Because of the field experience I'm more interested in pedagogical knowledge.
	In the field experience I learned to transfer theoretical ideas to the practice.
Teamwork	In our team the working atmosphere was pleasant.
	In our team we did get on well together.
	In our team we communicated in an open way.
	In our team we handled conflicts constructively.
	In our team we worked together intensely.
	Working in our team was effective.
	In our team we made decisions together.
	I perceived the cooperation within the team as supporting
	In our team we evaluated group processes and group achievements regularly

Table A3
Overview of items applied to assess previous educational experiences

Childcare (e.g. siblings, own children, babysitting)
Giving private lessons
Organization of leisure activities for children and adolescents
Sports trainer
Nursery school teacher
Miscellaneous (adult education, trainer in church sector, charity organizations etc.)

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