2.3 Planning Competence of Pre-Service German Language Teachers

Conceptualization, Measurement, and Validation

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Abstract

The research project PlanvoLL-D carried out from 2016 to 2019 aimed at providing new insights into the modelling and measurement of teacher planning competence by analyzing pre-service teachers' written plans of demonstration lessons in a standardized way. In this chapter, we outline the theoretical framework of the PlanvoLL-D project and its study design. We provide insights into the conceptualization and measurement of per-service language teacher planning competence and give a summary of the project's major findings. Finally, we discuss implications for teacher education and give an outlook for further research.

Keywords

Language teaching, lesson planning, pre-service teachers, planning competence, teacher education

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1 Introduction

Planning lessons is part of the core tasks for the professional teacher. Teacher education programs in Germany and in many other countries worldwide intend to train pre-service teachers planning a single lesson or a unit of lessons, so that they can master the daily work of lesson planning when entering teaching (e.g., European Commission 2013; König et al. 2017a). Initial teacher education provides pedagogical, subject-specific and practical learning opportunities that also relate to the area of lesson planning. Numerous books exist offering theories or practical guidelines of lesson planning to pre-service teachers (e.g., John 2006; Scholl 2018) and teacher-certification procedures such as the state examination in the German induction phase ("Vorbereitungsdienst" or "Referendariat") usually require planning demonstration lessons (e.g., König and Blömeke 2010; Kärner et al. 2019; Pecheone and Chung 2007; Strietholt and Terhart 2009). However, empirical research on lesson planning as a skill for pre-service teachers and the development of such skills during initial teacher education is scarce (König et al. 2015; Cochran-Smith and Villegas 2016).

Against this background, between 2016 and 2019, the research project PlanvoLL-D was carried out. The PlanvoLL-D project is entitled "The Role of Professional Knowledge of Pre-Service German Teachers in their Lesson Planning" ["Die Bedeutung des professionellen Wissens angehender Deutschlehrkräfte für ihre Planung von Unterricht"]. PlanvoLL-D aimed at providing new insights into the modelling and measurement of teacher planning competence by analyzing pre-service teachers' written plans of demonstration lessons in a standardized way. In this chapter, we outline the theoretical framework of the PlanvoLL-D project and its study design. We provide insights into the conceptualization and measurement of per-service teacher planning competence and give a summary of the project's major findings. Finally, we discuss implications for teacher education and give an outlook for further research.

2 Theoretical Framework

2.1 Investigation into the Field of Lesson Planning

Although planning lessons belongs to the daily work of teachers (Hardwig and Mußmann 2018), empirical research in this area is scarce. Hardly any approaches exist that measure planning skills in a standardized way (König 2019). Early studies in lesson planning investigated specific aspects, for example, which planning

component a teacher pays attention to and the order in which a teacher works on such planning components (e.g. Clark and Peterson 1986; Zahorik 1975; Taylor 1970; Hill et al. 1983). For example, an in-service teacher survey conducted by Taylor (1970) provided evidence that during lesson planning teachers gave priority to student needs, learning content, goals, and methods. Teachers first started with thinking of the teaching context (comprising materials, resources), then with involving the specific student needs and learning dispositions, and finally thinking of curricular alignment. Hill, Yinger, and Robbins (1983) showed in a similar way that after selecting appropriate materials, teachers gave priority to planning decisions of how they can arrange these materials in the classroom so that their students use them as activities. Lesson planning procedures of this kind can be described as a problem-solving process (e.g., Yinger 1977; Bromme 1981), highlighting the decisions teachers make on the basis of available information during pre-active teaching (Shavelson and Borko 1979) and as part of their reflection on action (Parsons et al. 2018). Relevant skills can be considered as part of teacher competence and therefore should be an object of empirical investigation (König et al. 2015).

The research on the measurement of teacher competence has significantly increased over the last decade (Baumert 2016; Kaiser and König 2019; see also chapters by Kuhn et al.; Vogelsang et al.; Lemmrich et al. in this volume). Various research groups have developed standardized test instruments assessing teacher knowledge following the well-known classification by Shulman (1987): content knowledge (CK), pedagogical content knowledge (PCK), and general pedagogical knowledge (GPK). Moreover, recent research has started to assess teachers' situation-specific skills in the area of professional vision (Kaiser et al. 2015; Kaiser and König in this volume). However, to the best of our knowledge, situation-specific skills in the area of lesson planning has not been an object of investigation in the modelling and measuring of teacher competence.

As a consequence, assumptions about processes of lesson planning seem hardly be supported by empirical evidence. For example, it remains an open question, whether teachers presumably make use of their specific knowledge in the subject area, subject-specific pedagogy, and general pedagogy and relate it to the specific planning situation that is predominantly determined by factors such as characteristics of the learning group, specific curricular goals, and the classroom context. At least some evidence exists that didactical models – being predominantly prescriptive rather than evidence-based – are not necessarily applied by in-service teachers, although they may be given high priority in initial teacher education programs (John 2006; Scholl 2018).

Against this background of investigations into the field of lesson planning, the PlanvoLL-D project aimed at a valid measurement of pre-service teachers' skills in the area of lesson planning. However, due to the complexity of lesson planning as an object of investigation, only a particular, but highly relevant aspect was examined: Our focus is on the construct of *pedagogical adaptivity*, that is, the ways in which the assignments of the lesson matches the cognitive level of the learning group (König et al. 2015; for a more detailed description, see König et al. 2019).

2.2 Learning Dispositions of Students

The research on teacher expertise has proliferated important insights into the lesson planning of expert and novice teachers (Stigler and Miller 2018). Expert teachers plan their lessons in a process-driven way and are capable to consider several planning elements simultaneously. They rigorously relate the learning dispositions (e.g., domain-specific knowledge) of their students and the learning tasks chosen for the lesson to each other (Berliner 2004; Borko and Livingston 1989; Housner and Griffey 1985; Smith and Strahan 2001; Westermann 1991). Expert teachers are clearly aware of their students and are committed to involve student needs into their planning process. They perceive student learning dispositions as a key element of their teaching and know how to integrate diagnostic information from their students specifically into their lesson planning (Putnam 1987). When making decisions during the planning process they manage to integrate their conceptual and situation-specific knowledge (De Jong and Ferguson-Hessler 1996). Important aspects of the planning situation are identified and are progressively merged with teaching and learning activities (Ericsson 1996; Leinhardt and Greeno 1986; Schoenfeld 1998).

2.3 Planning Learning Tasks

When planning a lesson, teachers select and create learning tasks as part of student activities in the classroom. Here, teachers are also able to integrate a range of further decisions, for example regarding the selection of content and the specification of objectives that are part of the lesson (Bromme 1981; Kang 2017; Shavelson and Stern 1981; Yinger 1977; Zahorik 1975). Learning tasks usually reflect the objectives of a lesson, since they refer to what students should learn, what knowledge students should acquire, or which competencies students should elaborate. Classification systems or taxonomies support the analysis of learning tasks in relation to

specific cognitive and motivational requirements (Anderson and Krathwohl 2001; Commons et al. 1998; De Jong and Ferguson-Hessler 1996; Johnson 2003). At the same time, complex learning tasks can cover a range of difficulty levels in different dimensions, allowing an alignment to existing student dispositions and needs in a differentiated way. They therefore serve to implement teaching strategies of differentiated instruction and support teachers when they account for the existing knowledge of learners and guide learners into their "zone of proximal development" (Vygotsky 1978, p. 84). Learning tasks can therefore be regarded as an important instrument of adaptive teaching (Corno 2008; Parsons et al. 2018). The way a teacher deals with learning tasks during lesson planning might provide insight into his or her pedagogical adaptivity.

In the PlanvoLL-D project, we specifically look at those learning tasks students are required to work on during the lesson's main activity phase. These tasks represent the work that the teacher instructs his or her students to engage in. The work is expected to trigger in students cognitive activation and information processing (Neubrand et al. 2013). Students usually work on such tasks individually, in pairs, or sometimes in groups. Usually these tasks can be clearly identified in written lesson plans (König et al. 2015), as they emerge from the relevant lesson material (e.g., a worksheet or a number of differentiated worksheets) that guides student work.

2.4 Lesson Planning as Part of Teacher Competence

Due to little investigation into this field, empirical evidence on how teachers plan their lessons is fairly limited (Bromme 1981; Jacobs et al. 2008). Although some surveys or qualitative studies exist that provide relevant descriptive scientific knowledge, to generate explanatory knowledge, approaches that directly assess teacher skills in the area of lesson planning are necessary. An exception is the *Performance Assessment for California Teachers* (PACT): It requires pre-service teachers to complete several components related to planning lessons, teaching, assessing students, and reflecting on teaching, where they are asked to submit an outline for three to five lessons they are going to teach. The performance ratings are based on coding schemes with a 4-point continuum. For the task "planning", five guiding questions are used by the raters who have to score the quality of the instructional design (Pecheone and Chung 2007, p. 27). These are related to how the instructional design provides students to have access to the curriculum, how the curriculum is addressed in a coherent and balanced way, how the students' interest and needs are reflected and addressed, and how well learning goals, in-

struction, and assessments are aligned. PACT provides important insights into a teacher performance assessment that is very close to typical tasks teachers have to master. In a more recent analysis on predictive validity, Darling-Hammond et al. (2013) showed that the PACT overall scale, as well as subscales such as planning, can significantly predict student achievement. However, since information on the scaling procedure is limited (Pecheone and Chung 2007), we conclude that research on measuring and modelling lesson planning as part of teacher professional competence can still be regarded as a research desideratum.

2.5 Modelling of Planning Competence in PlanvoLL-D

Planning a lesson is dependent on the context in general (John 2006; Mutton et al. 2011). Therefore, it is important to account for the situation of planning that is determined by characteristics of the learning group, curricular goals, or the institutional setting. Following the model of "competence as a continuum" as suggested by Blömeke et al. (2015), we make the following assumptions that underlie our investigation of pedagogical adaptivity. First, in the project PlanvoLL-D, we define pedagogical adaptivity as a situation-specific teacher skill. Teacher professional knowledge as investigated as "cognitive disposition" (Blömeke et al. 2015) by previous studies should be a relevant antecedent of such a situation-specific skill. We consider situation-specific lesson planning skills as being more proximal to actual performance in class than teacher knowledge. Figure 1 illustrates this idea. It serves as a heuristic to locate the constructs of professional competence in the PlanvoLL-D project in an overall model.

In PlanvoLL-D, pre-service teacher professional knowledge needed for lesson planning was investigated using standardized tests measuring their content knowledge (CK), pedagogical content knowledge (PCK), and general pedagogical knowledge (GPK). By contrast, pedagogical adaptivity as a skill was investigated using the data of authentic lesson plans that de facto were enacted as demonstration lessons during the second phase of initial teacher education, i.e., the induction phase in Germany ("Vorbereitungsdienst" or "Referendariat"). The nature of pedagogical adaptivity as a situation-specific skill therefore is different from CK, PCK, or GPK as measured using the paper-pencil approach. Instructional practice as an indicator of classroom performance was captured using self-reports of pre-service teachers they were asked to provide for the specific lesson after performing that lesson (for further information on the instruments, see Section 3.4).

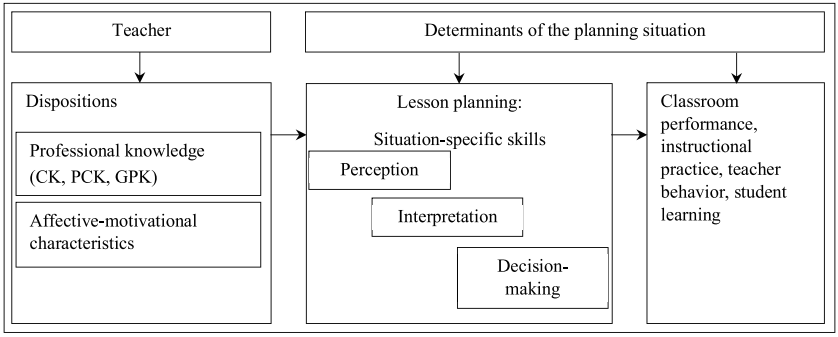


Figure 1 Heuristic of modelling lesson planning as part of teacher competence in PlanvoLL-D (following Blömeke et al. 2015, p. 7)

2.6 Lesson Planning as Part of Teacher Education

Teacher education programs intend future teachers to learn how to plan lessons. Corresponding opportunities to learn are provided by teacher education institutions in many countries. While courses in the academic setting often primarily aim at the acquisition of theoretical knowledge, in-school opportunities to learn give future teachers the chance to connect their knowledge to practical situations in the classroom (König et al. 2017a). Lesson planning might be a particularly complex challenge for novice teachers, as they are required to link their professional knowledge to the concrete learning group they are going to teach (John 2006). An analysis of how pre-service teachers, during induction, relate their lesson planning to previously acquired theoretical knowledge might, therefore, be a valuable contribution to the teacher education theory-practice discourse.

2.7 Context of the PlanvoLL-D Project

The German teacher education system has a consecutive structure with two separate phases, a theoretical at university and a practical at small teacher training institutions operated by state governments (König and Blömeke 2013). Pre-service teachers finish their first phase at university with a master of education nowadays, requiring coursework that emphasizes the acquisition of theoretical knowledge in the teaching subjects, both subject-specific as well as general pedagogical knowledge (König et al. 2017a). By contrast, most practical learning opportunities are

then provided in the 1.5-year second phase. This phase serves as induction for the pre-service teachers who then work part-time at schools and attend courses in general pedagogy and subject-related pedagogy. They are assessed by their teacher educators and mentored by one or two teachers at school. Lesson performance is usually based on a written lesson plan comprising detailed information about a large number of planning aspects such as objectives, teaching methods, the learning group, activities, time schedule, and embedding the lesson into the larger teaching unit. For this, pre-service teachers are required to have observed or even taught the learning group in advance, so that they are familiar with the students and had the opportunity to learn about the students' prior knowledge and motivation. Pre-service teachers are required to give demonstration lessons and to submit the relevant written plan at regular intervals over the duration of the second phase. This phase ends with a state examination consisting of a practical part including at least two lessons performed in two different subjects.

3 Study Design

3.1 Research Questions

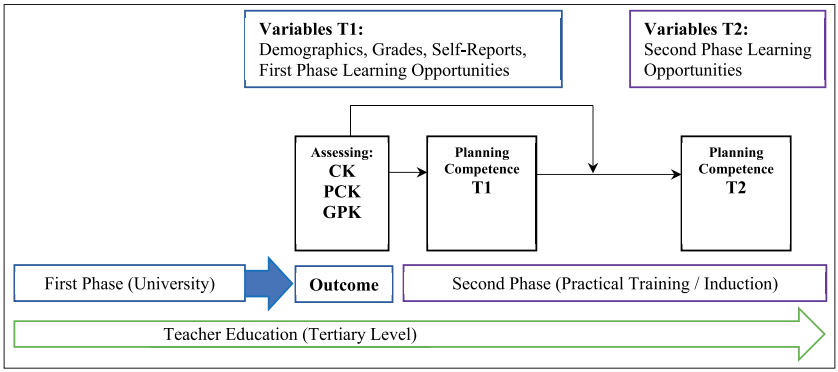
The PlanvoLL-D project aimed at the investigation of the planning competence of pre-service teachers for German during induction ("Vorbereitungsdienst" or "Referendariat"). We focused on two major research questions:

1. Is it possible to differentiate the planning competence of pre-service language teachers into generic and subject-specific lesson-planning skills?
2. What are potential factors influencing the pre-service teachers' planning competence, such as specific aspects of their learning opportunities during the second phase of initial teacher education (i.e., the induction phase) or the professional knowledge they had acquired during the first phase of initial teacher education at university?

3.2 Research Model

To examine our research questions, we decided to carry out the PlanvoLL-D project in the second phase of initial teacher education that serves as induction for pre-service teachers. In our research model (Figure 2), professional knowledge of pre-service teachers is defined as an outcome of the first phase of teacher prepa-

ration at university. That knowledge was tested at the beginning of the second phase, using the tests measuring CK in linguistics and literature, PCK, and GPK (Bremerich-Vos et al. 2019; König et al. 2011; König and Bremerich-Vos 2019). Moreover, pre-service teachers' planning competence was measured at two time points: We asked pre-service teachers to submit the written plans of the lessons they demonstrated at the very start and the very end of their practical training. In the latter case, the demonstration lesson was part of the certification procedure (state examination). This approach enables us to examine planning competence at two time points, and also to analyze potential influencing factors such as professional knowledge and learning opportunities. Pre-service teachers were asked to report on the learning opportunities they had been exposed to, using different scale inventories that relate to the first phase at university and the induction phase (Glutsch et al. 2019; König et al. 2017). Table 1 provides an overview of the instruments used in the PlanvoLL-D project.



Abbreviations: CK – German Content Knowldge, PCK – Pedagogical Content Knowledge, GPK – General Pedagogical Knowledge; T1 – Time Point 1, T2 – Time Point 2

Figure 2 Research model of the PlanvoLL-D project

Table 1 Overview of the instruments used in the PlanvoLL-D project

Name of instrument	Type of instrument	Reference for further reading
CK – German Content Knowledge	Paper-Pencil Test	Bremerich-Vos, König, & Fladung 2019; König & Bremerich-Vos 2019
PCK – Pedgogical Content Knowledge	Paper-Pencil Test	Bremerich-Vos, König, & Fladung 2019; König & Bremerich-Vos 2019
GPK – General Pedgogical Knowledge	Paper-Pencil Test	König & Bremerich-Vos 2019
Planning Competence	Sample Work Analysis	König, J., Bremerich-Vos, A., Buchholtz, C., Fladung, I., & Glutsch, G. 2019
Opportunities to Learn	Questionnaire	Glutsch, N., Bremerich-Vos, A., Buchholtz, C., König, J., Fladung, I., Lammerding, S., Strauß, S., & Schleiffer, C. 2019; König et al. 2017a

3.3 Sample

Data was collected in two federal states, North Rhine-Westphalia and Berlin. Our target group was defined as pre-service secondary teachers for German who had entered the second phase of teacher education in spring 2016. Two teaching types were included in North Rhine-Westphalia: Pre-service teachers attending a teacher education program that would qualify them as lower secondary teachers only (*Haupt-/Real-/Gesamtschule*) or as lower and upper secondary teachers (*Gymnasium/Gesamtschule*). In Berlin, the corresponding teacher education program focused on was a comprehensive teacher education program that would qualify pre-service teachers as lower and upper secondary teachers (*Integrierte Sekundarschule/Gymnasium*). A random sample of training units was drawn for the lower and upper secondary teacher education program in North Rhine-Westphalia, whereas, due to smaller populations, a census was applied for the other two programs. Participation rate on the level of training units was good (92 % in North Rhine-Westphalia) or at least acceptable (70 % in Berlin). Within these training units, all pre-service teachers were included in the survey. Participation rate on the individual level was good (91 % in Berlin) or at least acceptable (68 % in North Rhine-Westphalia). The sample of this first time point (T1) consists of 378 pre-service teachers (Figure 3).

Research assistants of the project team administered a paper-pencil questionnaire that the pre-service teachers completed under observation. This questionnaire included the standardized test to assess pre-service teachers' PCK and GPK as well as other instruments (e.g., on learning opportunities at university; for more details, see Glutsch et al. 2019; König et al. 2017a). Data collection was continued online, also comprising a third test to assess pre-service teachers' CK (Figure 2). After the survey, pre-service teachers were asked to submit a copy of the written plan of their first demonstration lesson and to complete a short questionnaire related to the execution of that lesson (Figure 3). With 172 plans and questionnaires submitted that finally could be linked with the previous survey data of 378 pre-service teachers, participation rate was moderate (46 %); however, a drop out analysis did not show sample bias.

About 1.5 years later, pre-service teachers were re-examined, resulting in a second time point (T2) with 138 pre-service teachers who submitted a copy of the written plan from their last demonstration lesson (state examination) and again completed a short questionnaire (Figure 3). They were asked finally to participate in another online survey in which they had to report on their second phase learning opportunities. 130 pre-service teachers participated in this final survey (Glutsch et al. 2019). Lesson plans from first and second time point allow us to analyze a panel of 116 pre-service teachers.

Additional data collection was carried out in North Rhine-Westphalia only between the two time points (Figure 3): Pre-Service teachers were another time asked to submit a copy of an intermediate written plan of a demonstration lesson, but this was also linked to the requirement to apply a short questionnaire on instructional quality as rated by their students. 27 pre-service teachers and 564 school students participated in this additional data collection component (for the first findings, see König and Bremerich-Vos 2019).

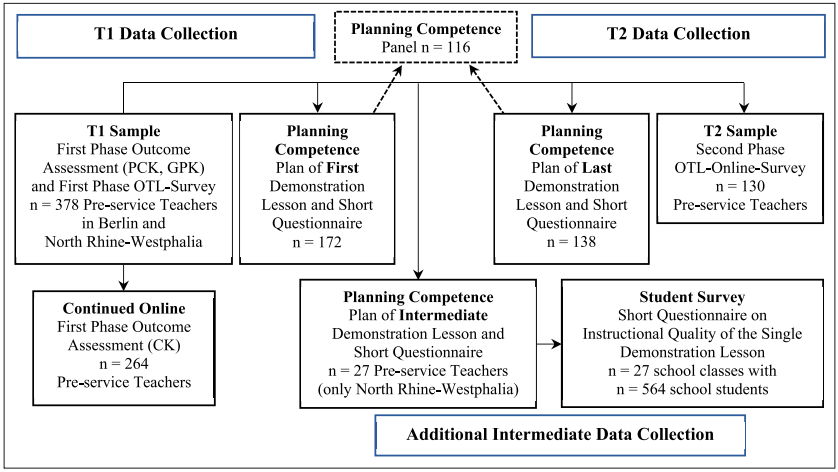


Figure 3 Data collection components of the PlanvoLL-D project

3.4 Instrument: Pedagogical Adaptivity in Written Plans of Demonstration Lessons

PlanvoLL-D builds on a previous study on planning competence: „*Planungskompetenz von Lehrerinnen und Lehrern*“ (PlanvoLL) (König et al. 2015; Buchholtz and König 2015). In the PlanvoLL project, we provided a first approach on measuring and modelling lesson planning competence, by analyzing written plans of demonstration lessons (“Lehrproben”) in a standardized way. Applying this methodological approach to the planning process implies that the pre-service teachers are required to relate their knowledge to a concrete, real learning group. It thus differs from standardized knowledge tests that require pre-service teachers to respond to test items capturing aspects of lesson planning in a de-contextualized way. However, with the innovative approach developed in the PlanvoLL project, pedagogical adaptivity was captured irrespective of the subject only. Since the purpose of lesson planning is always related to a specific subject, the domain-specific modelling and measuring of planning competence remains a research gap.

To investigate pedagogical adaptivity of pre-service teachers in their written lesson plans as a situation-specific skill, the written plans of demonstration lessons were analyzed and indicators created on the basis of the existing coding system developed in PlanvoLL. The coding system differentiates indicators into four components (Figure 4): On a descriptive level, written plans are analyzed whether the

learning group is described (component 1) and whether descriptive information is given for the learning task that primarily governs students' activities during the lesson (component 2). On an analytical level, plans are analyzed whether the descriptions given by a pre-service teacher for his or her specific learning group and the learning task or tasks planned are logically and pedagogically consistent (component 3). This application of the given descriptions to the specific situation comprises the examination whether the learning task is adapted to the cognitive level of students following the "zone of proximal development" (Vygotsky 1978, p. 84). Therefore, it is necessary that the lesson plan contains an outline that shows how the task (or even a differentiated set of tasks) given to the students connects with what the students (or groups of students) have learned so far, for instance, in a preceding lesson of the unit that contextualizes the plan of the demonstration lesson. The connection between tasks and prior knowledge of students needs to be addressed by the pre-service teacher and he or she should relate this connection to the situation of the particular lesson. Finally, plans are analyzed to determine whether such adaptive teaching is linked to other important elements of planning such as the connection to learning goals (component 4). As an innovative element of the PlanvoLL-D project, analogous to the generic indicators, subject-specific indicators were created to measure pre-service teachers' elaboration on content-specific planning (Figure 4). For example, a statement like "The learning group (…) consists of 29 students, twelve girls and 17 boys." appears as a quite short description of the learning group in one lesson plan without a content-specific planning. In another lesson plan, by contrast, a pre-service teacher shows his ability to detail the subject-specific characteristics of his learning group: „(…) The students are familiar with writing poems of different types according to criteria from the previous grade. Using a sample poem for writing has already been trained in the course of the unit and is also familiar from the previous grade." (for more coding examples, see König et al. 2019).

Altogether, the coding scheme in Figure 4 consists of 23 indicators (13 generic and 10 subject-specific). Since frequency distribution showed that a subject-specific indicator was fulfilled less frequently than the corresponding generic indicator, we constructed partial-credit items (Masters 2016) with scoring category 1 (generic indicator fulfilled) and 2 (subject-specific indicator fulfilled). Therefore, our scaling analysis comprises 13 items (10 partial-credit, three dichotomous) making up a reliable scale (*EAP* reliability .79, comparable with *Cronbach's alpha*). Missing values (code 9) were made explicit in the scaling model and adequately accounted for in the IRT scaling analysis (for more details on the IRT scaling procedure, see König et al. 2019).

Component	Sample generic indicator	Number of generic indicators (items)	Number of subject-specific indicators (items)
(1) Description of situation-specific factors	The teacher describes inter-individual differences in cognitive preconditions of the learning group.	4	4
(2) Description of the learning task	The learning task explicitly comprises different cognitive levels (explicit instruction of student differentiation).	4	3
(3) Applying descriptions to the specific situation	The teacher describes the specific cognitive levels of students (student differentiation) towards the learning tasks following the „zone of proximal development“.	2	2
(4) Connecting elements of planning	Learning task(s) and lesson objective(s) is/are connected.	3	1

Figure 4 Coding scheme for analyzing pedagogical adaptivity in written plans of demonstration lessons using generic and subject-specific indicators

4 Summary of Project Findings

4.1 Generic and Subject-Specific Lesson Planning

Figure 5 shows the distribution of item threshold parameter from one-dimensional IRT scaling, indicated by a circle for each item. To facilitate reading, the distribution of items is split up into generic item thresholds (left side) and into subject-specific item thresholds (right side). Each specific median is indicated by a rectangle. Subject-specific code thresholds are generally in the upper range of item difficulty. The median of their threshold values is about one logit higher (Mdn = 1.03) than the median of the threshold values of generic codes (Mdn = –.13). Using the *Mann-Whitney U test* as a non-parametric test, mean difference is significant (asymptotic p[two-tailed] = .042).

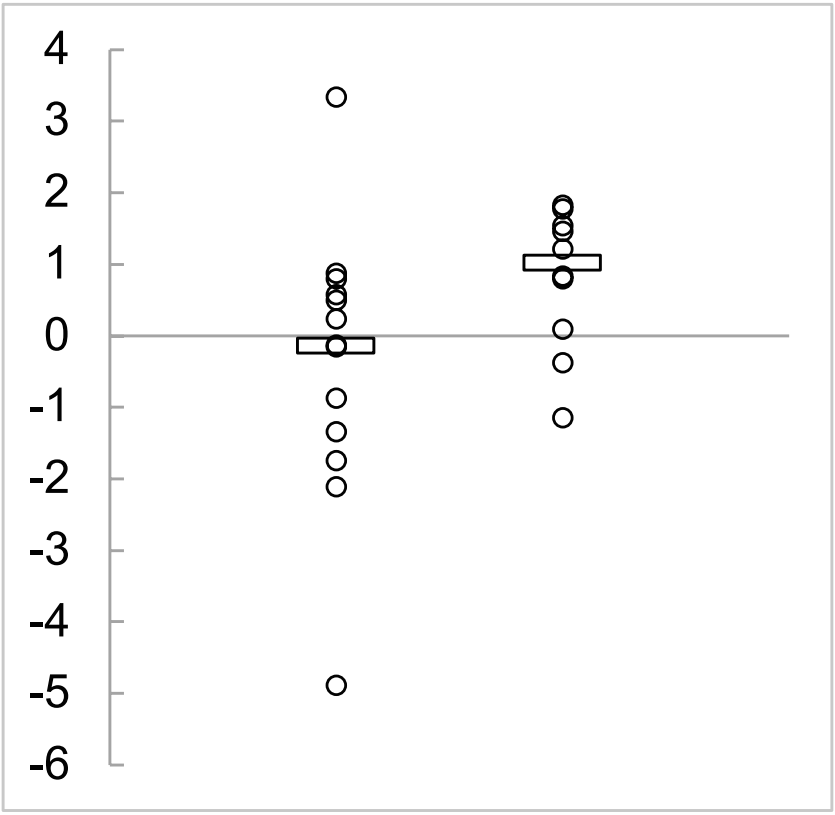


Figure 5 Item threshold parameter (circles) and median (rectangle) from one-dimensional IRT-scaling, split into generic indicators (left side) and subject-specific indicators (right side)

4.2 Learning Progress during Induction

We used ability estimates from one-dimensional IRT scaling to indicate generic and subject-specific planning skills demonstrated in the written plans to time point one (first plan) and time point two (last plan). We used the item threshold parameter medians to cut the ability continuum into three section: High ability estimates reflect both generic and subject-specific lesson planning skills (Level II), moderate ability estimates reflect generic skills only (Level I), and low estimates

do not sufficiently fulfill the requirements defined by our coding scheme (Figure 4). As Figure 6 illustrates, at the beginning of induction, less than 10 % of lesson plans fulfill subject-specific requirements and about two third of all plans do not even reach the generic requirements sufficiently. At the end of induction, about 40 % of lesson plans reach the level of subject-specific lesson planning demands and there is hardly any plan not sufficiently fulfilling generic requirements (less than 5 % below Level I).

This gain in planning skills over a time span of about 1.5 years can be confirmed using continuous scores (for more details, see König et al. 2019). Scores for the last written plan are almost two standard deviation higher than for the first plan. Using the panel sample of pre-service teachers who not only had submitted their lesson plans from two time points, but who could be matched (n = 116), mean differences are significant (t[1,115] = 13.31, p < .001) and practically relevant (d = 1.6). These statistical findings altogether show a substantial learning progress in lesson planning skills among pre-service language teachers during the second phase of initial teacher education (induction phase).

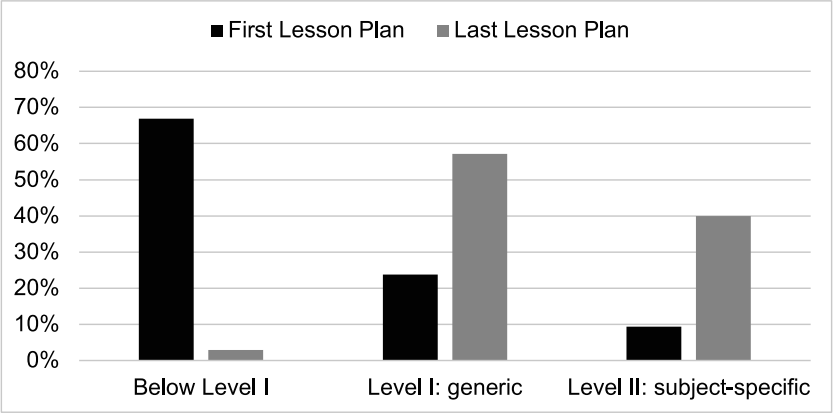


Figure 6 Distribution on planning competence level at each time point

4.3 Factors Influencing the Planning Skills

To analyze potential factors influencing planning skills, two linear regression analyses were conducted, one for each time point (for details, see König et al. 2019). At time point 1, 41 % variance of planning competence as the dependent variable could be explained. At time point 2, 19 % variance of planning competence could

be explained. Regarding learning opportunities during induction, a scale measuring planning-aspects requirements turned out to influence planning skills significantly at both time point 1 ($\beta = .37$, $p < .001$) and time point 2 ($\beta = .18$, $p < .05$). The scale refers to aspects that the pre-service teachers' teacher educators required them to cover in their written plans. It comprises five items (e.g., "accounting for learning dispositions for students" and "providing instruction allowing inner differentiation of students"), each with four categories of agreement (using a Likert scale). The more concrete the requirements are – according to which, a pre-service teacher had to write his or her lesson plan – the better the skills he or she provides in the written plan. The plan length also significantly predicts planning skills when looking at the first demonstration lesson plan ($\beta = .23$, $p < .01$). We could not find other important variables such as teaching experience or teaching type (for more details on teaching types in our sample, see Section 3.3) as being significant predictors for planning skills. On the level of professional knowledge, the pre-service teachers' pedagogical knowledge significantly predicts planning skills at the first time point ($\beta = .19$, $p < .01$).

5 Discussion and Outlook

Lesson planning of teachers as a research field has received little attention so far in terms of modelling and measuring relevant competences. However, as lesson planning constitutes a substantial part of a teacher's daily work and teacher education provides relevant learning opportunities for future teachers to develop correspondent planning skills, teacher competence research in this area is clearly needed. In the PlanvoLL-D project, we developed and applied a standardized method for analyzing written lesson plans, which highlights the demand for pedagogical adaptivity – both on a generic and on a subject-specific level. We investigated a competence model and the measurement of this planning competence skill using a database of more than 300 written plans of pre-service teachers' demonstration lessons from two time points during induction. Out of this material, we reconstructed planning decisions and created indicators that served to quantify teacher candidates' skill of adaptive lesson planning. Findings show that pre-service language teachers are more highly challenged with subject-specific lesson planning than with generic lesson planning. During induction, pre-service teachers' skill of adaptive lesson planning increases significantly and to a large extent (large effect). Certain factors influencing pre-service planning skill such as pedagogical knowledge acquired during university or learning opportunities during induction could be identified. These findings may enrich the discussion on learning adaptive teaching (König et

al. 2019), and they also inform about the validity of the measurement instrument capturing situation-specific lesson planning skills.

One major limitation of our approach might be that the written plans are part of the examination and certification process during the German induction phase. To some extend it still remains an open question how pre-service teachers' planning decisions are influenced by institutional requirements or teacher educators' preferences regarding demonstration lessons. Moreover, planning is not only restricted to a single lesson. Even pre-service teachers during induction in Germany are required to plan units of lessons. Our measurement approach does not fully account for such a long-term scope of planning.

The research agenda of the PlanvoLL-D project started with a particular focus on pedagogical adaptivity, i.e., the ways in which the assignments of the respective lesson fit with the cognitive level of the learning group (König et al. 2015; 2017b; König 2019). Taking this as a central demand that teachers have to master, our competence model comprises both generic and subject-specific aspects. Adaptivity is, however, only one aspect of lesson planning. We therefore increased the scope and extent of our lesson planning competence framework by adding another demand: structuring of the lesson, i.e., how a teacher plans the lesson sequencing to fulfill didactic functions and effective time management. We have started analyzing written lesson plans and created indicators to quantify teachers' planning decisions in this new area (e.g., Krepf and König 2019).

As part of the transfer activities of the PlanvoLL-D project, demands of pedagogical adaptivity and structuring the lesson have further been reflected in the development of a test design framework that can be used for a standardized test measuring lesson planning. Currently, such a test development has started as part of the Cologne project funded by the BMBF program for increasing the quality of teacher education (Qualitätsoffensive Lehrerbildung, Project *ZuS – Zukunftstrategie Lehrer*innenbildung Köln*). The test comprises several vignettes, each providing a planning situation as a complex stimulus followed by several test items measuring perception, interpretation, and decision-making in such simulated planning situations. First findings will be available in the near future, therefore continuing the research agenda put forward by the PlanvoLL-D project.

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