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Knowledge and beliefs of politics teachers at German *Gymnasien*: Findings of a study

ABSTRACT

Political didactics is a field that has long resisted examination of teaching efficacy. Of particular importance are questions concerning what teaching personnel know and where their content-based expert knowledge comes from, what is to be taught and how teachers deal with problems in understanding content. Teachers' professional knowledge can be divided into 'content knowledge' (CK), 'pedagogical content knowledge' (PCK) and pedagogical knowledge. Beliefs regarding teaching and learning processes, pupils have active or passive, receptive or constructive roles ascribed to them. These roles are generally distinguished as the basic positions of constructivist and transmission-based concepts of teaching and learning. This study collected the results for German gymnasium teachers (N=196). 38.6 per cent of respondents were female, on average the age of respondents stands at 43.5 years old (SD=11.4). The assumptions about the structure of subject-specific professional knowledge are checked by comparing a one-dimensional IRT model with various multidimensional ones. The model comparison shows a statistically significant model improvement

KEYWORDS

teachers' knowledge
constructivist orientation
lesson-based knowledge
professional competence
interest in politics
teaching and learning
politics teachers
civic teachers

for the two-dimensional model distinguishing between CK and PCK. PCK can be divided into normative political didactic discourses in one dimension and lesson-based items in a second dimension. Investigation of the structural assumptions shows that politics teachers' beliefs on teaching and learning can be integrated into overlapping belief syndromes. Cognitive constructivist orientations go hand in hand with greater subject interest, while transmission-based orientations tend to be related to less interest in politics. There is a slightly significant small negative correlation between a constructivist orientation and lesson-based knowledge (LBK). Those who have been teaching for a long time attain lower scores in the subject-specific didactic part of the test. Participation in further training only has an impact on normative and not on LBK.

RATIONALE AND AIMS

The quality of an education system depends to a large extent on the professional knowledge of teachers. Shulman (1986) emphasized this aspect and introduced a change in perspectives by discussing the dimensions of professional knowledge. He placed the focus on domain-specific processes of learning and instruction and distinguished three core dimensions of teacher knowledge: content knowledge (henceforth CK), pedagogical content knowledge (henceforth PCK), and general pedagogical knowledge (Shulman 1986). In the literature there is a consensus that CK and general pedagogical knowledge are key elements of professional knowledge (Bransford et al. 2005; Grossman and McDonald 2008; Hiebert et al. 2007). According to this model, a teacher's knowledge is obtained as expertise and is separate from the concept of the teacher's personality. It can be assumed that professional knowledge is a prerequisite of pupils' learning progress (see Baumert et al. 2010; Sadler et al. 2013).

This went hand in hand with the development of 'knowledge' as a psychological term (Anderson et al. 2004). As a result, psychological research also turned towards teachers' knowledge (Bromme 1992; Fenstermacher 1994), focusing primarily on the domains of mathematics and natural sciences (Wilson et al. 2001). In Germany, there has not yet been much research on teachers' political knowledge (CK) (Weschenfelder 2014).

Even more rarely is PCK the subject of research. This knowledge dimension represents the new factor in Shulman's model. It was not until this century that subject didactics (*Fachdidaktiken*) and pedagogy turned to this question. It is of central importance for subject didactics, which is considered an independent discipline in only a few countries. In Germany, subject didactics is a separate area of expertise for a domain-specific subject. Each subject has the task of developing and empirically verifying a domain-specific theory of the teaching and learning of politics, mathematics, biology, etc. This has revealed a number of gaps in research. Political didactics in Germany is one of many such fields that have long resisted examination of teaching efficacy. There is a lack of precise descriptions of professional knowledge, and indeed of appropriate methods for their empirical evaluation (Weisseno et al. 2014; Weisseno 2016).

German political didactics have produced a great deal of knowledge on objectives and goals, however. This knowledge is comprised of individuals' normative ideas of the desired learning results. Knowledge about learning obstacles, typical misconceptions, the pupils' previous knowledge of politics, etc., were seldom examined up to now. Consequences for teachers' actions

are also rarely discussed (Weisseno and Landwehr 2015; Weschenfelder 2014). For teachers, this knowledge is of importance for developing efficient teaching arrangements for improving pupils' competences. Teachers must be familiar with pupils' learning difficulties, but knowledge about objectives and desired results do not help in these cases (Leenders et al. 2008; Anderson et al. 1997).

Dimensions, but also profession-related beliefs are increasingly becoming the subject of research on teachers. Beliefs are related to something specific, here politics lessons and politics in general. For teachers, beliefs have a quasi-logical structure. They lead to statements being viewed as right or wrong. Beliefs are pedagogical views about teaching and learning, worldviews or value orientation. Changes in teachers' actions require a change of their beliefs. They guide the interactions, the selection of objectives and the interpretation of specific situations during school lessons (Calderhead 1996; Woolfolk Hoy et al. 2006). That is why they are said to be highly important for the quality of teaching.

In more recent models, beliefs are a dimension of professional competence (Baumert and Kunter 2006; Blömeke et al. 2008b, 2013). German political didactics have only looked into researching subject-related beliefs very recently (Weisseno et al. 2014; Oberle et al. 2014). One aspect of this is investigating the subjective theories on teaching and learning. For beliefs on teaching and learning, the lessons represent the specific frame of reference (cf. Müller et al. 2008: 253f.). They are divided into preferences for a certain lesson design such as pupil- or teacher-focused politics lessons, aspects of leading the class and ideas on objectives in politics lessons. Beliefs can be separated into the categories of transmissionist and constructivist. Teachers with transmissionist convictions assume that political knowledge is 'transmitted' to learners by authorities. In constructivist convictions, on the other hand, the importance of individually constructed learning processes is emphasized (Hofer and Pintrich 1997: 120). So far, no robust researching findings on politics teachers' beliefs have been presented.

The present study seeks to address the lack of clarity concerning the overall state of scientific knowledge about professional knowledge and beliefs of politics teachers. It first pursues the question of how politics teachers' professional competence can be described theoretically. For this, various dimensions that are discussed in the literature are summarized to create a model. The model provides the theoretical framework for the present empirical study. In addition, it is necessary to describe more precisely the teaching-learning beliefs, the CK and PCK, as these are what will be empirically tested.

After this, an overview of the state of research on knowledge and subjective theories on teaching and learning is presented. The study will examine which research findings are relevant for this research design. After summarizing the theoretical and empirical research findings, the research questions will be formulated for the empirical survey.

Next, the questionnaire and research design are described. The validation of the test is done using the Rasch model of item response theory (Wilson 2013), and the descriptive and structural equation models are detailed. Finally, the findings are discussed in light of the research questions, and the outlook makes clear that this study only represents a starting point for systematic, theory-driving research into professional competences of politics teachers. It gives rise to a series of additional research questions and designs for political didactics research.

THEORETICAL BACKGROUND

The academic discussion on the dimensions, structure, emergence and development of professional competence follows various tracks (cf. Baumert and Kunter 2006: 369), and approaches can be differentiated into those that are pedagogical and those that are competence-theoretical. Pedagogy distinguishes between structuralist and sociological approaches (Helsper 2011), while psychology differentiates between trait theory and skills theory, drawing on the expert paradigm (Krauss 2011). Structuralist or sociological approaches concentrate on the structure of interaction and problems of pedagogical actions. They consider the communication of knowledge and norms but do not define the specific skills that these require.

Competence theory represents another approach to defining the professional skills of teachers, positing a repertoire that can be acquired and allows successful acting and the formulation of expectations regarding skills (see Baumert and Kunter 2006: 476). Spheres of competence are defined on the basis of the vocational demands of the teaching professional. These include permanently and successfully enabling teaching and learning, and securing and communicating cognitive and motivational prerequisites for exercising social rights of participation (see Baumert and Kunter 2006: 472).

The central questions focus on the propagation of knowledge and pupils' understanding (see Shulman 1987: 7), but also on aspects influencing the training and development of teachers. Of particular importance are questions concerning what teaching personnel know and where their content-based expert knowledge comes from, what is to be taught, how the selected content can be presented and communicated and how teachers deal with problems in understanding content (see Shulman 1986). Theoretical competence models are suited for systematic empirical research because here clearly defined areas have already been determined. Until recently, however, there was no corresponding competence model for politics teachers. The first such model was developed on the basis of the competence-theoretical approach in the framework of the research programme 'Professional Competence of Politics Teachers' (PCPT) (Karlsruhe-Göttingen).

The development of a subject-specific teaching competence model faces the difficulty of registering and locating within the field subject-related aspects such as knowledge, but also the many other aspects considered by general teacher research. Political didactics is connected to political science and general pedagogical and psychological teacher research. It is the role of political didactics to collate, select and structure these two related disciplines while considering teachers and pupils. Models of subject-specific professional competence are an essential foundation of empirical research. Hitherto there has been a lack of precise descriptions of political and political didactic professional competencies and appropriate methods for evaluating them empirically. Hence initiating research on teaching politics is of great importance.

The research programme takes up the dimensions of Shulman's comprehensive model (1987: 8). On the one hand it specifies the relevant categories from a political didactics perspective in a competence theory approach based on expertise research (Baumert and Kunter 2006; Blömeke et al. 2008a). On this basis competencies can be differentiated and established specific to politics. On the other hand it seeks to create a model describing the structure, forms and contexts of professional teaching competencies for the field of politics

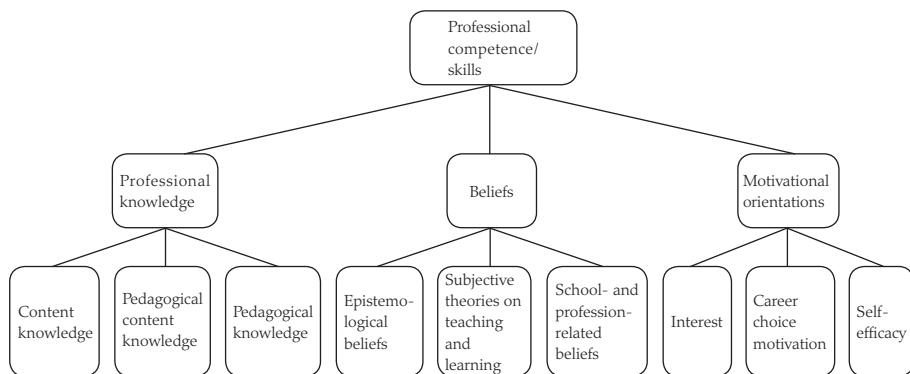


Figure 1: PCPT model of politics teachers' professional competence.

(Figure 1). The knowledge types relevant to subject-specific didactics are joined by further central prerequisites for acting as a politics teacher (Oberle et al. 2012a, 2012b; in greater detail Weschenfelder 2014).

Such a competence model requires a subject-related 'interplay of specific, declarative and procedural knowledge steeped in experience (skills in a narrow sense: knowledge and proficiency), professional evaluation, beliefs, subjective theories, normative preferences and aims, motivational orientations and metacognitive skills and skills of professional self-regulation' (Baumert and Kunter 2006: 481).

Theory and research suggest that we can differentiate between political didactics knowledge (PDK) and political science knowledge (CK). The question remains whether these fields of knowledge are related or whether they can be differentiated further. Moreover, it can be assumed that beliefs regarding the theory of teaching and learning and subject interest are important predictors of teachers' knowledge.

The dimensions of knowledge, motivation and beliefs are therefore first to be approached from a theoretical perspective so as to describe and define them more precisely. The professional knowledge of teachers is an indicator of successful teaching practice (see Shulman 1986, 1987; Bromme 1997; Baumert and Kunter 2006, 2011). In the Anglo-American context, teachers' professional knowledge is divided into CK and PCK (see Shulman 1986, 1987). In analogy, in Germany every teacher is trained in political science, political didactics and pedagogy at university and during their subsequent teaching practice placements.

CK comprises the political knowledge acquired by politics teachers during their studies. This includes knowledge of how political science content is organized and how it is connected to related sciences (see Borko and Putnam 1996; Shulman 1986).

PCK is defined as a combination and integration of content and pedagogical knowledge. In Germany it is termed 'subject-specific didactics' and in this case as 'political didactics'. It researches, first, how subject content can be translated into fruitful opportunities for learning according to the interests and skills of learners (see Shulman 1987). Teachers select textbooks, are more or less proficient at categorizing pupils' contributions, pay attention to methodological variations, can structure lessons, recognize misconceptions,

possess more or less knowledge, etc. Second, in Germany there is a broad discussion about the classification of the aims of politics lessons. This discussion centres on the question of which aims and content of politics teachers should communicate via teaching practices deemed appropriate. The premise is formed by normative observations, which vary from author to author. Both dimensions contribute to PCK construction.

The concepts of professional competencies or their models form the foundations of political didactics as a scientific discipline in its own right, as an independent scientific discipline of learning and teaching about politics. It thus examines *inter alia* the field of professional knowledge that distinguishes not only teaching staff from pure subject specialists or pedagogues, but also politics teachers from teachers of other subjects. Both areas, CK and PCK, belong to political science and its didactics (see Grossman 1994; Shulman 1986). Pedagogical knowledge comprises knowledge on learning theory and learning methodology regardless of subject knowledge. It does not form the focus of this article. Our study contains only questions regarding CK and PCK. They were constructed according to the present model. An attempt was made to measure the two theoretically defined knowledge dimensions in an empirically valid way for politics teachers, as well.

Depending on beliefs regarding teaching and learning processes, pupils have active or passive, dependent or autonomous, receptive or constructive roles ascribed to them. These roles are generally distinguished as the basic positions of constructivist and transmission-based concepts of teaching and learning. Transmission-based theories understand learning as a passive process in which instruction has primacy. The emphasis is on conveying knowledge and the pedagogical value of formulas, procedures and results. Transmission-based epistemological beliefs hold that knowledge can be understood as a collection of objectively correct rules and procedures that pupils can acquire primarily through repetition, examples and repetitive practice (see Voss et al. 2011: 238–39).

Constructivist approaches seek to stimulate active engagement with and interpretation of new information on the basis of prior knowledge (see Handal 2003: 47–48). The focus is on creating nourishing learning environments by providing meaningful problems, support and advice (see Reinmann-Rothmeier and Mandl 1997: 366). The learners develop strategies for selecting and evaluating information and solving complex problems in social situations. The emphasis is on individual differences and the context-specificity of construction processes.

Extreme and moderate ideas exist within the constructivist camp. Constructivism is not a single entity, rather there are various constructivist positions, some of which display significant differences to each other (see Anderson et al. 1998: 229). Radical constructivism rejects the concept of realism in science and hence the possibility of objectivity and truth. In cognitive constructivism, the aim is that teachers and pupils ‘think and act like experts, whereby specific goals result from working through authentic tasks’ (Reinmann-Rothmeier and Mandl 1997: 366).

In motivation research approaches, there are various conceptualizations of interest. What they have in common is that they divide interest into the categories of situational and individual (cf. Daniels 2008). Situational interest is specific to the given situation and incentive-based. Individual (or personal) interest can be understood as a relatively constant, dispositional characteristic of a person (Schiefele 2009: 163f). The stronger the individual interest,

the less important situative conditions are. For experts, situational interest is less influential than in the case of novices, as the experts usually have more strongly developed individual interests and subject-specific competence (cf. Daniels 2008: 18). Interest is characterized by intrinsic ascriptions of feelings and values. It arises when something is linked to positive feelings and is seen to be personally meaningful or important.

So far we have shown that a model of professional competence can be constructed on the basis of knowledge, motivation and beliefs. The PCPT model allows us to translate the theoretically determined and reasoned aspects of competence into empirically testable hypotheses and tools. This is possible because the dimensions are distinctly separate from one another. In the following, the state of research on politics teachers' knowledge and actions will be reviewed. From these studies, additional information for constructing our tests can be gathered.

STATE OF RESEARCH AND QUESTIONS

The political didactics research on the professional skills of politics teachers that has been conducted hitherto is only of limited use to the present study. Scientific claims have been made on the basis of narrow empirical foundations. In qualitative research, several studies point to deficits in teachers' professionalization (e.g. Henkenborg 1998; Weisseno 1998). They often cite teachers' obsession with their own plans, the contradiction between their own liberal self-understanding and their manifest authoritarian approach, depoliticized lessons and teachers treating pupils as less intelligent than they actually are. The majority of qualitative investigations reach their conclusions on the basis of single-source evidence. The methodological demands of a rules-based scientific procedure are seldom met and are not reported with any consistency. In contrast, the recent pilot study by Manzel and Gronostay (2013) represents an auspicious enquiry on the basis of qualitative video material.

In the quantitative study by Harms and Breit (1990), politics teachers state that they seldom base their lessons and their preparation on a didactic theory, but employ their own didactics. The teachers interviewed consider combining teaching material from various organizations, textbooks and guidelines for teaching practice to be more meaningful than adhering to subject-specific didactics. Witsch-Rothmund (1990) interviews *Hauptschule* (general secondary school) teachers. He too observes a lack of orientation towards subject-specific didactic approaches. The overwhelming majority claimed to have nothing to do with subject-specific didactic theory. Almost all qualitative and quantitative studies posit shortcomings on the part of teachers.

The findings of studies in political didactics demonstrate the need for further study. It remains largely unclear however what knowledge, skills and beliefs politics teachers actually acquire and put into practice in their training and their profession. It was thus necessary to develop the test instruments for the PCPT research programme from scratch. Politics teachers were monitored as part of the wide-ranging study by Weschenfelder (2014) in the framework of the PCPT research programme. The present contribution adopts its partial findings.

Research in other subjects tells us that while deficiencies in CK do not have a negative impact on the performance of pupils, substantially higher pupil performance can only be demonstrated if mathematical knowledge and

knowledge of mathematics-specific didactics are combined (see Blömeke et al. 2008b: 126–27). CK is also important for the development of certain aspects of PCK. It is the latter however that is responsible for shaping nourishing learning environments, teaching practices and pupil performance (see Krauss et al. 2008). Teachers with a greater professional knowledge appear to place more value on cognitive activation in lessons and on achieving more effective classroom management (see Brunner et al. 2006). PCK thus has an indirect impact on a cognitively nourishing learning environment, adaptive support in lessons and types of classroom management (e.g. Hill et al. 2005).

There is no political didactic research on beliefs about teaching and learning. Psychological research indicates however that the best pupil performance is achieved when teachers combine cognitive constructivist and transmission-based beliefs (Askew et al. 1993). Beliefs influence *inter alia* the extent to which teachers design their lessons in terms of cognitive activation and support learners (Voss et al. 2011). Cognitive constructivist beliefs have been shown to be particularly beneficial for both lesson design and motivation. It is considered necessary to marry instruction and construction (Reinmann-Rothmeier and Mandl 2006: 638). It thus appears to be desirable for a cognitive constructivist approach to nevertheless embrace transmission-based beliefs to some degree (Voss et al. 2011: 249).

A review of the studies showed that research on knowledge and beliefs about teaching and learning in other subjects is more advanced. There, the findings of the theoretical assumptions postulated in this study have been confirmed and demonstrate the importance of professional competence. Research on politics teachers, however, has so far been unsystematic and has often lacked methodological complexity. Many disparate, subjective interpretations have resulted that this present study cannot use as a basis. That is why the findings of the studies from other subjects are more helpful to use for our research questions.

Drawing on findings in other subjects, the following research questions will therefore be examined in this study:

- Regarding the structure of CK, in line with the theoretical conceptualization it is expected that a multi-dimensional structure will be found. CK and PCK will be plainly distinguishable as in other subjects. At the same time, both dimensions should be clearly linked with one another.
- Based on the findings, we assume that transmissionist beliefs about teaching and learning are positively correlated with each other and constructivist beliefs are positively correlated with other constructivist beliefs. In all, the constructivist belief aspects are then expected to be negatively correlated with transmissionist beliefs.
- Analogous to interest and motivation research approaches, here we expect that politics teachers' increasing interest in politics conditions increasing CK.

STUDY DESIGN AND EVALUATION TOOLS

Because as yet no measurement tools for CK and PCK of politics teachers exist, they must be developed for this research programme and tested as to their validity. Measuring professional convictions and interest also requires the development or adaptation of items due to a lack of previous work on

this topic in the area of didactics in politics lessons. With the scales that were developed and modified according to the needs of the subject, the theoretically developed competence structure for politics teachers can be systematically evaluated. Reliable and valid measurement tools allow us to answer questions about the extent, dimensionality and correlations of the competences we are investigating.

The cohort for the following partial study consists of politics teachers working at *Gymnasien* (grammar schools) who have studied politics at university. This study collected the results for *Gymnasium* teachers ($N=196$). The entire cohort ($N=332$) of respondents also included *Realschule* (secondary school) teachers. 38.6 per cent of respondents in the present partial study were female. Participating teachers were aged between 25 and 71. The average age of respondents stands at 43.5 years old ($SD=11.4$). On average the teachers have been teaching for 14.45 years ($SD=11.8$). In terms of general sociodemographic data (sex, age), the sample shows comparable figures. The teachers surveyed represent an accidental sample. Data collection was conducted under the supervision of trained student test leaders and took 90 minutes. Test leaders informed participants of the survey's purpose and procedure and of the fact that respondents would remain anonymous.

The present study examines the psychometric aspects of the tests on the subject-related areas of knowledge and the assumed structure of these areas by means of probabilistic test models using ConQuest. The study concentrates on analysis of the between structure. In the case of between-item multidimensionality or simple structure, each item loads on one of the latent dimensions.

Items were selected on the basis of difficulty indices ($5 < Pi < 95$), weighted model deviations ($MNSQ < 1.20$, $t < 1.96$), item total correlation (> 0.25) and reliability analyses. Differential item functioning (DIF) analyses were conducted in order to ensure that the test design does not produce different response probabilities for the respective skills measured in men and women and for *realschule* and *gymnasium* teachers displaying the same performance levels. The resulting scale for capturing field-specific scientific knowledge (CK) comprises a total of 30 items, while the scale for capturing PCK comprises 43.

Sample item for the CK test:

Great Britain has a majority voting system. What are the implications?

- Large parties are underrepresented in relation to their share of the vote.
- There is greater pressure to form coalitions.
- An absolute majority of votes is required for government.
- There is a strong discrepancy between the distribution of parliamentary seats and the number of votes.

Sample item for normative political didactics knowledge (henceforth PDK):

What is a main concern of constructivist political didactics?

- Consideration of the three aspects of the head, heart and hands.
- Negotiating the meaning of terms and content during the lesson.
- Activity orientation as a central principle of teaching.
- Learning to offer constructive criticism and to speak democratically.

Sample item for lesson-based knowledge (henceforth LBK):

In class the pupils critically discuss the EU.

Chantal says:

The elections for the European Parliament are not important, because the European Parliament cannot decide anything.

Under which misconception is Chantal labouring?

- She does not know that the European Parliament consists of representatives from the national parliaments.
- She does not realize that the European Parliament usually has the right to veto EU law.
- She does not know that the point of elections is to increase interest in politics.

The assumptions about the structure of subject-specific professional knowledge developed on the basis of theory are checked by comparing a one-dimensional IRT model with various multidimensional ones. The general factor model is compared to a two-dimensional model distinguishing between CK and PCK. The model comparison is conducted using the χ^2 -distribution of final deviation while considering reliability scores. The model comparison shows a statistically significant model improvement for the two-dimensional model.

It is also important to test whether political didactic knowledge is one-dimensional in and of itself or whether it can be divided into normative and curriculum-compatible knowledge. To this end we test a three-dimensional model summarizing normative political didactic discourses (PDK) in one dimension and lesson-based items in a second dimension (LBK). This result was not what was initially expected.

This model shows a statistically significant improvement in its goodness of fit and in comparison with both the general factor model and the two-dimensional model. The reliability scores range from satisfactory to good. The lower WLE reliability in the CK (WLE=0.64) of normative discourses is acceptable given its EAP reliability of 0.72. The latent correlations ($r=0.58$, $r=0.74$, $r=0.63$) indicate sub-dimensions with clear differences but which are nevertheless related. The manifest correlations of the WLE scores are lower than the latent scores, since the measurement bias of the latent models can be taken into consideration and connections can be estimated more precisely. CK and PCK correlate on a manifest level to $r=0.49$, CK and LBK to $r=0.56$ and the two subject-specific didactic dimensions to $r=0.43$. The results correspond to the assumptions of knowledge taxonomies. Knowledge is subdivided into independent dimensions that are strongly associated with one another (see Shulman 1986; Bromme 1992). The additional latent three-factor model in Mplus confirms this model. The model fit demonstrates that the model reflects the data in acceptable fashion ($\chi^2[242]=348.38$, $p<0.01$, CFI=0.90, RMSEA=0.04). Further analyses of the validation of the test scores can be found in Weschenfelder (2014).

As in the case of the knowledge dimensions, latent constructs were extrapolated from the predictors measured for the belief dimensions. Configural, metric and scalar measurement invariance can also be observed for the models of beliefs concerning teaching and learning (Weschenfelder 2014).

| | Final deviance | WLE | EAP/PV |
|---------------------------------------|-----------------------|---|----------------|
| General factor M1 | 28226.03 (75) | 0.87 | 0.87 |
| Two-factor model M2 (CK/PCK) | 28074.18 (77) | 0.80/0.79 | 0.84/0.81 |
| Difference (M1-M2) | | 151.85 for df=2 ($p<0.001$) | |
| Three-factor model M3 (CK/PDK/LBK) | 27996.73 (80) | 0.80/0.64/0.71 | 0.87/0.72/0.79 |
| Difference (M1-M3/M2-M3) | | 229.3 for df=5 ($p<0.001$)/ 77.45 for df=3 ($p<0.001$) | |

Table 1: Goodness of fit of different measurement models for comparing subject-related test performance.

Beliefs on teaching and learning were captured using items from *MT21* in modified form (see Müller et al. 2008; Schmidt et al. 2010, 2011). The items chosen are combined with two scales to form a pupil-oriented and teacher-centric lesson design from the KESS 7 study (see Bos et al. 2009). Sample items for capturing the transmission-based dimension are 'Pupils must be taught precise procedures so that they can solve political problems' (Blömeke et al. 2008b: 229) and 'Pupils gain the best understanding of phenomena in politics lessons from the explanations and portrayals given by their teachers' (Bos et al. 2009: 234). Examples of constructivist beliefs are 'Pupils benefit from discussing various approaches to solving a political issue' (Blömeke et al. 2008b: 228) or 'Pupils understand politics lessons best when they discover explanations for phenomena for themselves' (Bos et al. 2009: 235).

Preferences regarding teaching methodologies are captured using the three scales of traditional directive instruction, pro-active learning and group work. A sample item is: 'As a teacher I would like to explain and solve political tasks on the board' (Blömeke et al. 2008b: 257). Here the objectives of politics lessons refer to communicating political content ('I would like my pupils to learn to explain or express political ideas' [Blömeke et al. 2008b: 252]). Beliefs about classroom management were ascertained for instance by the question 'With which measures would you react to disruptions to lessons? I would tell the pupils that anyone creating disturbances will be punished' (Blömeke et al. 2008b: 260).

In the following it will be investigated whether beliefs about teaching and learning coincide with a common background in theory of learning in characteristic belief syndromes, that is, in transmission-based and constructivist orientations (see Voss et al. 2011: 242–45). For the latent model, total scores are created for the individual belief facets. The model (Figure 2) shows an acceptable adaptation to the data ($\chi^2(19)=54.55$, $p<0.01$, CFI=0.96, RMSEA=0.08). The loads on all dimensions stand at over 0.53 and can thus be considered substantial (Weschenfelder 2014: 216).

Both dimensions have a clear negative correlation to one another ($r=-0.65$), which indicates that they are not independent from each other, rather politics teachers with constructivist beliefs tend to display less orientation towards transmission-based approaches. Additionally, comparison with a general factor model monitors whether the paradigms are two poles of one dimension or two distinct dimensions (cf. Voss et al. 2011). The general factor model has a poor model fit ($\chi^2(43)=191.46$, $p<0.01$, CFI=0.86, RMSEA=0.10) and represents

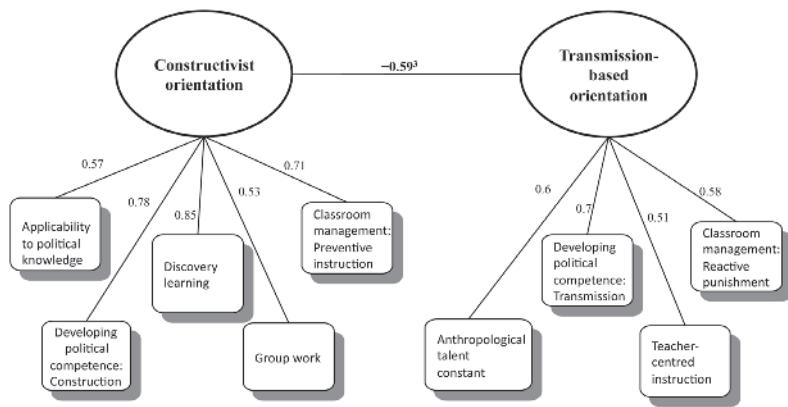


Figure 2: Paradigms of politics teachers' beliefs concerning theory of learning.

a significant decline in comparison with the two-factor model (difference: $\chi^2(1) = 78.25, p<0.01$). That means that the dimensions are not mutually exclusive categories but two distinct dimensions with a negative correlation.

In addition to the manifest subject-related knowledge and belief dimensions, interest in politics is investigated. Subject interest is captured using four items, in line with Köller et al. (2000) (sample item: 'I simply enjoy thinking about a problem relating to political lessons'). The scale displays good reliability and fit scores for the *gymnasium* teachers ($\chi^2[2]=2.10, p=.35, CFI=1.00, RMSEA=0.02, \alpha=0.80$).

DESCRIPTIVE RESULTS

Testing the quality factor and the dimensionality of the knowledge and belief models in the previous chapter demonstrates that the instruments fulfil the factors of reliability, validity and measurement invariance. Hence the following data can be analysed for their characteristics and interaction using descriptive and multivariate evaluations.

The differences between beliefs concerning teaching and learning are relatively small. The teachers place more emphasis on learning argumentation. There is greater rejection of classroom management based on reaction and punishment than rejection of transmission-based teaching and learning processes and traditional directive instruction. In summary, the mean comparisons for the knowledge dimensions display greater differences while those for the belief dimensions display small differences.

| | Female | | | Male | | | Diff. | Effect size |
|-----|--------|------|------|------|------|------|------------------|-------------|
| | N | M | SD | N | M | SD | | |
| CK | 128 | 47.7 | 9.9 | 204 | 51.5 | 9.8 | 3.8 ³ | 0.39 |
| PDK | 128 | 49.9 | 9.9 | 204 | 50.0 | 10.1 | 0.1 | 0.01 |
| LBK | 128 | 49.1 | 11.4 | 204 | 50.6 | 9.0 | 1.5 | 0.15 |

^[1] $p<0.05$, ^[2] $p<0.01$, ^[3] $p<0.001$.

Table 2: Gender-specific differences in the normed WLE scores ($M=50, SD=10$) for measuring subject-specific knowledge.

| | Years of service | Years of service | <i>d</i> 1–2 | Years of service | <i>d</i> 1–3 | <i>d</i> 2–3 |
|------------------|-------------------------|-------------------------|--------------|-------------------------|--------------|--------------|
| | 1–5 (1) | 6–20 (2) | | 21–40 (3) | | |
| | N=95 | N=138 | | N=95 | | |
| | M (SD) | M (SD) | | M (SD) | | |
| CK | 48.5 (10.6) | 50.4 (10.2) | 0.18 | 51.0 (9.1) | 0.25 | 0.06 |
| PDK | 51.9 (10.8) | 50.8 (9.2) | 0.11 | 46.8 (9.8) | 0.50 | 0.42 |
| LBK | 48.7 (11.2) | 50.8 (9.3) | 0.20 | 50.3 (9.5) | 0.15 | 0.05 |
| Subject interest | 2.91 (0.67) | 3.12 (0.57) | 0.34 | 3.31 (0.58) | 0.64 | 0.33 |

Table 3: Transformation of means for knowledge and subject interest by years of service.

STRUCTURAL EQUATION MODEL

In order to explain the influence of various predictors on the individual knowledge and belief dimensions, the theoretical assumptions are translated into a structural equation model. The advantage of this approach is that both direct and indirect effects can be investigated and models can be created for various dependencies. In the following, the connections and influences on the knowledge and belief facets are represented in a path model (Weschenfelder 2014: 254).

Investigation of the structural assumptions shows that politics teachers' beliefs on teaching and learning can be integrated into overlapping belief syndromes. A distinction is made between constructivist and transmission-based orientations. Since the syndromes are formed by various beliefs on teaching and learning, a model is created for their correlations. The strong correlation between a constructivist orientation and interest in politics is particularly noticeable ($r=0.81$). The negative correlation between transmission-based orientations and subject interest is also remarkable, although not quite as pronounced ($r=-0.60$). Influence in the subject has a moderate influence on professional knowledge and the manifest background variables. The background variables captured have no effect on the constructivist or transmission-based orientation of the politics teachers at *Gymnasien*. In summary, this means that cognitive constructivist orientations go hand in hand with greater subject interest, while transmission-based orientations tend to be related to less interest in politics. There is a barely noticeable, slightly significant small negative correlation between a constructivist orientation and LBK.

The model (Model fit: $\chi^2(107)=183.53$, $p<0.05$, CFI=0.93, RMSEA=0.06) confirms the positive correlations between the knowledge facets displayed by the measurement model. The results are as anticipated. Since manifest WLE scores were used for the calculations, the correlations are less pronounced than in the latent model. The strength of the correlations between the knowledge dimensions is particularly interesting. There is a positive correlation between CK and the two PCK facets ($r=0.45/r=0.50$). The low correlation between the two PCK components ($r=0.29$) is surprising. There appears to be a stronger correlation between teachers' LBK and CK than between their PCK facets.

Greater subject interest appears to have a positive influence on politics teachers' CK ($\beta=0.21$), normative PDK ($\beta=0.30$) and LBK ($\beta=0.23$). This corresponds to motivation theory, according to which greater subject interest impacts on effort and performance (see Wigfield and Eccles 2002). Teachers'

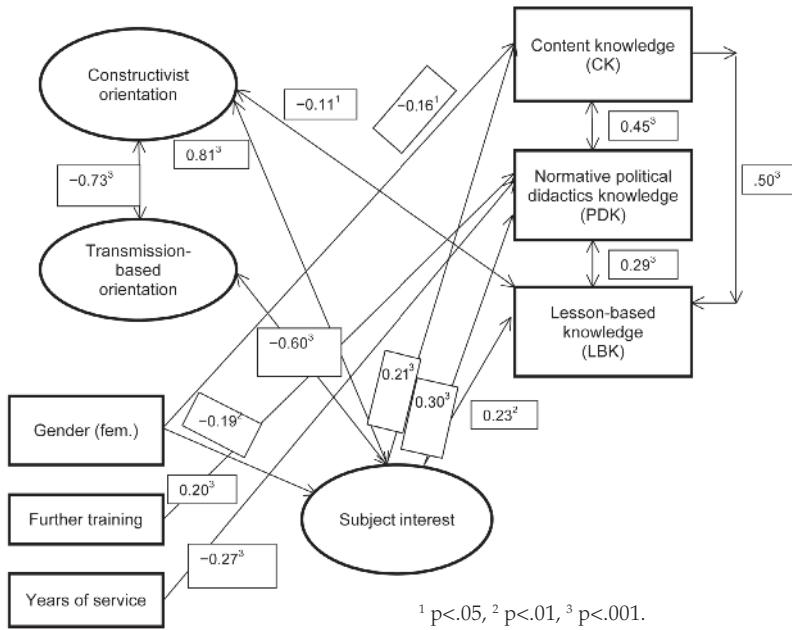


Figure 3: Structural equation model illustrating the correlations between beliefs concerning theories of learning and subject interest and professional knowledge and the influence of manifest background variables for gymnasium teachers.

beliefs about teaching and learning with a constructivist background display the anticipated positive correlation with subject interest, while transmission-oriented beliefs have a negative correlation.

Regarding the influence of background variables, only gender, length of service and attending further training events display significant effects on the subject-specific knowledge dimensions. Grades for the *Abitur* and teacher training degrees (*Staatsexamina*) and reading specialist journals do not appear to explain levels of subject-specific knowledge. If the scores for female and male politics teachers are compared, the only difference is that male teachers score moderately higher for knowledge of political science. The politics teachers surveyed do not differ in terms of their performance in the sections of the test related to subject-specific didactics.

Along with gender, length of service has an influence on the professional knowledge and subject interest of the politics teachers surveyed. The number of years' service only has a negative impact on normative PDK. Of the politics teachers surveyed, those who have been teaching for a long time attain lower scores in the subject-specific didactic part of the test.

Participation in further training only has an impact on normative and not on LBK. These findings are surprising. It is possible that the structure of further training is yet to be tailored to the demands of the teaching profession.

DISCUSSION

The separate analyses have generated differentiated findings regarding the interplay of the various competence facets. The structures of professional

knowledge theorized for politics teachers was confirmed by the data. At the same time, the PCK dimension could be separated into two aspects. There is a positive correlation between teachers' CK, normative knowledge and LBK. The correlations fall in a midrange. The positive correlations correspond to the assumptions of research on expertise, according to which knowledge becomes increasingly interlinked with increasing expertise. They also correspond to findings in mathematics (see e.g. Blömeke et al. 2008b; Krauss et al. 2011). Teacher's CK and their LBK correlate more strongly with each other than the two PCK facets. That might indicate that normative PCK has fewer advantages for teachers in terms of allowing them to recognize flawed ideas, opportunities to offer support and the structure of concepts. Perhaps CK and normative PCK are less strongly associated. The question thus arises whether an academic grounding in a specialist subject is perhaps beneficial for certain elements of the PCK collected here and that didactics has potentially paid too little attention to these aspects. The results for the correlations between the subject-specific knowledge facets indicate however that subject-specific didactics must acknowledge the significance of CK.

One predictor is subject interest. It can be assumed on the basis of their chosen studies that politics teachers are interested in politics. As anticipated, subject interest has a positive impact on CK, PDK and LBK. Politics teachers demonstrating a higher degree of interest in politics appear tend to score more highly in subject-related knowledge tests. Subject interest seems to have just as strong an impact on PCK as it does on CK. A possible explanation is that teachers' own subject interest goes very much hand in hand with their desire to communicate their knowledge to pupils.

Correlations between subject interest and subject-specific knowledge facets are also evident for the subject-related beliefs about teaching and learning of the politics teachers surveyed. These findings are only partly as anticipated. Since there are relatively few theoretical prior studies and empirical findings concerning beliefs on teaching and learning, models are created for correlations rather than positive effects. Student teachers studying politics display a similar belief syndrome to politics teachers (Weissenö et al. 2013).

The correlations between the belief and knowledge facets are not particularly consistent. There is a negative correlation between a constructivist orientation and LBK. The unexpected negative correlations suggest that politics teachers with greater LBK place less emphasis on constructivist and self-active teaching and learning processes. Transmission-based beliefs on teaching and learning are clearly less connected to interest and professional knowledge. The few and partially inconsistent correlations with knowledge may indicate that teachers do not systematically adopt and connect beliefs during their studies. Due to the strong correlations between politics teachers' constructivist beliefs about teaching and learning and their subject interest, indirect effects can also be considered possible.

Teachers with a number of years' service clearly know less about normative political didactic conceptions. This negative correlation may be due to several circumstances. Perhaps these knowledge facets reflect tired knowledge that loses significance over the course of a career. An alternative explanation is the changes in subject-specific didactic study programmes. Younger politics teachers may have broader knowledge in this dimension due to having completed their studies more recently and due to their exposure to a greater number of courses in subject-specific didactics. Time and future studies will tell

whether changes to teacher training will result in greater reception of didactic principles in teachers' everyday professional life or whether they will be diluted by the selective use of didactic concepts in professional practice.

This study represents a start of researching the PCPT in a systematic, theory-led manner. Based on reliable and valid tools, we were able to obtain first insights into the structure, extent and correlations of various aspects of competence. It should be noted, however, that this partial study is just a first attempt at systematically measuring politics teachers' professional competence. The data upon which the study is based does not allow for any generalizing conclusions. Still, it suggests various starting points for future research and theory-building in the area of didactics in politics lessons.

OUTLOOK

The study gives rise to a number of new stimulating questions for political didactic research. It would be interesting to examine whether and to what extent the skills aspects captured impact on teaching and pupils' performance. The development of knowledge during training and on the job is yet to receive sufficient attention as a field of research. While the PKP research programme can only provide cursory suggestions, investigation of actual transformations and conditions requires a longitudinal design. It will only be possible to determine whether different manifestations and correlations of teaching skills can be observed in a qualitatively different type of teaching when classroom actions and lesson design are taken into consideration. Follow up studies might complement the standardized collection of knowledge and beliefs with teacher's evaluation of teaching situations, classroom observations, pupil ratings or interviews. The constructs should be examined using various instruments in line with a mixed methods approach. It is particularly interesting for political didactics to consider how subject-specific didactic ability develops and how it relates to pupil performance.

The present study is intended to contribute to the long-term compilation of a database. It is only via use of data that teaching skills can be considered in an evidence-based approach. The task of political didactics is to further develop political didactic theory by describing skills and teaching and learning processes. It is to be welcomed that political didactics has an increasing amount of results obtained systematically that debunk previous conclusions reached on the basis of isolated observations. A more realistic picture of the reality of teaching politics can only be gained through theory-led empirical research. The aim of such research, also relevant to political didactics, is described by Anderson et al. thus:

If progress is made to a more scientific approach, traditional educational philosophies will be found to be like the doctrines of folk medicine: They contain some elements of truth and some elements of misinformation. This is true of the radical constructivist approach. Only when science of education develops that sorts truth from fancy – as it is beginning to develop now – will dramatic improvements in educational practice be seen.

(1998: 255)

Now political didactics has also set out down this path.

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