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Realizing theory-practice transfer in German teacher education: Tracing preliminary effects of a complexity reduced teacher training format on trainees from four subject domains on students' perception of 'self-efficacy' and 'relevance of theoretical contents for practice'

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Abstract

This paper introduces a novel teacher training format, the "Teaching and Learning Laboratory-Seminar" (*TLL-S*) which was first implemented at *Freie Universität* Berlin in 2016. The *TLL-S* serves as a response to the demand for both more and better field experiences during early teacher training. There is strong evidence to assume that field experience is most effective when linked to such theory inputs perceived by trainees as relevant and embedded into reflective field experiences. Thus, the *TLL-S*-intiatives delineated here were designed according to a common framework defining a fixed set of consecutive steps allowing teacher trainees to first familiarize themselves with didactic theories, exploring them in a sphere of reduced complexity, and eventually reflecting their experiences. Consequently, the main objective of this paper is to trace and report the effects of the *TLL-S* on teacher trainees' *self-efficacy* development and perception of *'relevance of theoretical contents for practice'* in four subject domains (i.e. didactics of English, History, Physics, and Primary Education). Preliminary results indicate that complexity reduction of the practice environment provided by the *TLL-S* allegedly stabilizes teacher trainees' *self-efficacy* even after repeated field experiences across all subject domains. Furthermore, 'relevance of theoretical contents for practice' was rated higher for the *TLL-S* than for previous university training formats.

Keywords

Field practice, teacher training, theory-practice transfer, self-efficacy, subject specificity

1 Teacher self-efficacy, transition shock, and overly complex field experiences

For the past few decades, various teacher education institutions in Germany have assessed the preferences and needs of university students. These investigations yielded clear evidence of a perceived lack in the relation between theory and practice by those trainees (Thiel & Blüthmann, 2009; Schumacher & Lind, 2000). Repeatedly, it was found that student teachers demand a supplementation of their university-based training with early field experiences (Hascher, 2005; 2011). However, caution should be exercised, as overemphasis on practice is assumed to lead to a disintegration of theory and practice

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(Baumert, 2007; Hascher, 2005; 2011). Teacher education discourses have also been concerned with the *transition shock* (Günther & Massing, 1980; Tschannen-Moran, Hoy & Hoy, 1998), a phenomenon associated with a decline of *teacher self-efficacy* after extensive field practice (Schumacher & Lind, 2000, Dicke et al., 2016; Schüle et al., 2016).

Teacher self-efficacy is often addressed in combination with the *transition shock* as a result of the liabilities and strains associated with beginning the teaching profession. The *transition shock* may result in burnout (Schmitz, 2000), overexertion (Mogg, 2013), or the emotional exhaustion (Dicke et al., 2016) of some teachers. Oftentimes, the *transition shock* is the outcome of a discrepancy between a teacher's perception and his or her pedagogical reality (Schmitz, 2000). The phenomenon is also said to profoundly shape teachers' professional career development (Mogg, 2013). It can either manifest itself in an inability to transfer university theory to school contexts, or in a mismatch between pupils' responses and the respective body of theory introduced in seminars at university (ibid.).

In the educational sciences and the subject-specific domains, *teacher self-efficacy* is often used as a construct to determine whether a *transition shock* has occurred or not (Schüle et al., 2017). The concept of *teacher self-efficacy* traces back to Bandura's socio-cognitive theory (Bandura, 1977; 1997) positing that "individuals do exhibit subjective assumptions about their skills" (Jerusalem, 2002, p. 8). Positive expectancy of self-efficacy stimulates the motivation and effort necessary to tackle new and challenging tasks, whereas negative self-beliefs might contribute to premature surrender and passiveness in the face of pedagogical demands (ibid.). So far, empirical evidence on the existence of a *transition shock* is heterogeneous and findings are highly ambivalent. Whereas some studies showed a decrease in teachers' stress perception, others evidenced stable, or increasing stress levels (e.g. Dicke et al., 2016).

In teacher education, robust self-efficacy of teacher trainees seems to be jeopardized most when field practice is designed as a "sink-or-swim experience" (Krofta & Nordmeier, 2014, p. 1). At the same time, a confidence drop during overly complex practice phases is specifically detrimental, as these early field experiences are particularly effective in building students' self-efficacy during academic training (Schmitz, 2000; Jerusalem & Schwarzer, 2002).

1.1 Designing a high-quality teacher training format reduced in complexity

In accordance with the theoretical issues discussed above, the *Teaching and Learning Lab (TLL)* was conceived as a training format to allow for early field experiences (during the B.A. program) in order to encourage development of teacher trainees' self-efficacy. It was taken into account that the field experience should be challenging, albeit non-threatening to teacher trainees, should provide room for experimentation with new subject-specific teaching theories, and should be reduced in complexity.

The training environment of the *TLL* was designed for the subject-specific requirements of the respective disciplines, i.e. the didactics of English, History, and Primary Education according to a standardized theoretical framework (Rehfeldt et al., 2018) derived from

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earlier studies to improve Physics teacher training. In the four subjects, the *TLL* is based on the integration of a so-called *Pupils' Lab* (in German: "Schüler*innenlabor") and regular seminar sessions on theory and empirical findings in the respective domains. The fusion of a theoretical course and a *Pupils' Lab* yields the label *Teaching and Learning Lab Seminar (TLL-S).* All the *TLL-S* collectively focus on an individual subject-specific aspect (see 3., intervention design). Additionally, all *TLL-S* instructors at the *Freie Universität Berlin* agreed on the following definition of the format:

> *In a TLL-S, teacher trainees develop theory-grounded learning opportunities which are first put into practice with visiting learners in university spaces. Field experiences are then subject to reflection, theory-based optimization, and iterative exploration with learners.*

In addition to Physics, the *TLL-S* presented here were successfully piloted during the 2016 summer term. Since then they have been offered to teacher trainees of all four disciplines every term. The *TLL-S* are theoretically framed by subject-specific common objectives. From early on, teacher trainees gain high-quality field experiences, albeit under conditions of reduced complexity (Makrinus, 2013; Steffensky & Parchmann, 2007). Further, students have the opportunity to relate to practice by reflecting on domain-specific theories (Abels, 2011). Eventually, attempts are made to cultivate an 'inquiry-oriented habitus' in the participants (Fichten & Meyer, 2014; Helsper & Kolbe, 2002), as well as to develop didactic reflective skills (German Ministry of Education and Research, 2004; Abels, 2011). In addition, the *TLL-S* take account of the fact that field experiences during university training and after induction were shown to contribute to a *transition shock* (Dicke et al., 2016; Schüle et al., 2016). As delineated earlier, practice shock is accompanied by a decline of trainees' self-efficacy (ibd.). Accordingly, the complexity of the *TLL-S* mentioned here is reduced at various levels (see 1.2, intervention design). The format functions as both a learning environment which allows teacher trainees to explore the field, as well as a context for inquiry-based learning by the visiting pupils. In the following paragraph, we would like to present our subject-specific interpretations of the *TLL-S* in order to outline the domain-specific foci and research objectives of the individual initiatives from the departments of Physics, History, Primary Education, and English didactics:

The *TLL-S* in Physics didactics deals with pupils' preconceptions on climate change (Schuler, 2011) as part of the subject-specific focus on so-called *Conceptual Change* strategies (e.g. Posner et al., 1982). Learning how to cope with pupils' views makes a substantial contribution to a constructivist approach to Physics teaching (Müller et al., 2011). Beliefs about physics are conceptualized as notions developed through everyday learner experiences. Preconceptions are either verbally, visually, or structurally equivalent to a physical theory or parts of a theory. Strategies to handle these views can be discontinuous (e.g. confrontation of learners with opposing phenomena), or continuous (e.g. use of analogies as a bridging strategy) (Clement, 1993). Seeking connection to related concepts or to reinterpret terminologies also count as advisable strategies (Jung, 1986). In Physics didactics, the acquisition of such coping strategies is an integral part of the domain-specific teacher training at university in order to develop physically ade-

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quate world views in learners. These strategies also serve to equip pupils for participation in scientific discourses (Kircher et al., 2015). To date, however, only few teaching concepts have drawn explicit links from Physics teacher training to school practice (e.g. Fried & Trefzger, 2017).

In the department of History didactics, trainees participating in the *TLL-S* plan instruction according to the constructivist paradigm focusing on witness interviews of Shoa victims (Lücke & Barricelli, 2013). Instruction planning follows the rationale that History is made by human beings depending on their power and broader interests (Jenkins, 2003). In order to equip student teachers for that task, students enrolled in a B.A. program acquire a corpus of theory on principles of teaching History which has been deliberately simplified for the purpose of the *TLL-S* (Seixas & Morton, 2013). Core elements of this corpus are the principles of historical learning (Rüsen, 2007), namely (1) “relation to the present and orientation towards the future” ["Gegenwarts- und Zukunftsbezug”] (Bergmann, 2008, translated), “Multiperspectivity” (ibid.), as well as (3) “Narrativity” (Rüsen, 2007, translated). It is assumed that consideration and application of these principles in practice will stimulate teacher trainees to gain holistic and deep historical insights moving beyond mere subjectivity (von Borries, 1997). This way, trainees might realize that History is a narration of human origin which can be used for identification, while being highly dependent on location and interest (Meyer-Hamme, 2012). As a consequence, it is expected that trainees will gradually develop a pupil-oriented didactic theory. This rationale should preferably lead trainees to encourage pupils to question and contextualize historical events before jumping to premature conclusions (Wineburg, 2016).

In the didactics of Primary Education with a focus on the Natural Sciences, the *TLL-S* is theoretically framed by the teacher professionalism approach introduced by Combe and Kolbe (2008) as well as by the concept of *Inquiry Based Science Learning* (*IBSL*, Labudde & Börlin, 2013). In order to increase professionalism of teacher trainees for primary schools an ‘inquiring habitus’ (Helsper & Kolbe, 2002; Fichten & Meyer, 2014) is addressed. To achieve this goal, *IBSL* is experienced by trainees on three levels: Firstly, *IBSL* is practiced as part of students’ own ‘research’ on a physical phenomenon grounded in open inquiries (Banchi & Bell, 2008; Köster & Galow, 2014). Secondly, *IBSL* is realized in the *TLL-S* as part of the optimization of instructions for pupils’ visits during the term. Thirdly, action research occurs by observing trainees within the exploration of instruction designs (Köster et al., 2017).

In the department of English didactics at *Freie Universität Berlin*, the *TLL-S* has been implemented in all teacher training programs at the B.A.-level. The so-called *English Lab* (Sambanis & Klempin, 2018) primarily aims at the development of trainees’ didactic reflective skills. Didactic reflectivity is promoted as a connection to the professionalization of teacher trainees is widely assumed (Körkkö, et al., 2016). In this research project, reflection is conceptualized as a “conscious process of identifying problematic issues in [...] practice and pursuing solutions that bring about valued effects for student learning” (Kaasila & Laurialia, 2012, p. 77). In particular, three interventions in the *English Lab* are designed to develop student teachers’ reflective abilities: First, a cognitive apprenticeship based on the instructor's model occurs (Schädlich, 2015) and second, noticing trainings (Sherin & van Es, 2009) are carried out relying on observation protocols and short

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teaching video clips of the participants. Finally, two highly structured, and theoretically modelled reflective sessions (Barth, 2017) frame participants' field experiences. This *'reflection-on-action'* (Schön, 1983) provides trainees with the opportunity to look back on their *Lab*-experiences whilst referring to relevant theories when passing through the steps of the *'reflective cycle'* by Rodgers (2002). Individuals reflect independently as well as in peer tandems and with the mentoring instructor providing advice and assistance whenever required (Kaasila & Lauriala, 2012). Following reflection, the activities are revised for performance improvement throughout the second field trial. These revisions are based on findings from the first reflective session, peer feedback, and observation protocol notes the tandem partner took during the activity.

1.2 Intervention design based on a common conception model

The *TLL-S* in the four domains mentioned above were designed and implemented analogously, in line with a common conception model (Rehfeldt et al., 2018). An interdisciplinary approach was pursued to address urgent calls from the millennial turn to connect *TLL-S*-initiatives nationally and internationally in order to trace the format's effects on teacher trainees (Ringelband et al., 2002). Ringelband and colleagues specifically called for *TLL-S*-initiatives with "model character" (ibid., p. 121; translated) to ensure quality control and allow for nationwide comparisons and transfers of effective *TLL-S*-formats to other locations of teacher training. The conceptual framework of the *TLL-S* discussed here is primarily based on a process model for *"Teaching and Learning Labs (TLL)"* by Nordmeier (2014) which distinguishes five main steps:

a) Pre-selected theory input and supported planning of instruction (approx. 6 sessions)
b) Conduction and exploration of instruction plan (1 session)
c) Theory-based observation of peer exploration (occurs during b)
d) Theory-based reflection of field experience (1 session)
e) Theory-based adaption and modification of instruction plan (approx. 1-2 sessions)

After completion of this consecutive sequence, steps (b) and (d) are repeated and, if need be, additional theory inputs (a) are provided. Specifically, exploration in step (b) is characterized by multiple measures to establish reduction of complexity in action requirements for teacher trainees as compared to competing university training formats that too, provide field experiences (e.g. school internships). For instance, topics and materials to be taught are partially prepared by the instructor for adaptation and implementation by trainees. Furthermore, only one subject-specific focus for instruction planning, exploration, and observation is selected (e.g. the promotion of pupils' speaking competence in the *English Lab*). Eventually, the reduction of the mentoring rate to a minimum of four to seven pupils maximum per teacher trainee, the abandonment of the traditional 45-minute cycle, and the trainees' familiarity with the university are assumed to be contributing factors to decreased difficulty.

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In order to actively guide the students and support their skill development, a competence model aiming at the perception and action of a professional teacher was employed (Barth, 2017). The skill facets illustrated by the model were incorporated into the five-step sequence by Nordmeier mentioned above (2014, see fig. 1). In total, Barth's model comprises six skill facets: I. *Knowing,* II. *Recognizing,* III. *Evaluating,* IV. *Generating*, V. *Deciding*, and VI. *Implementing. Knowing* concerns trainees' acquisition of the specific theories relevant for reasonable practice in the respective subject domain. The kind of epistemic knowledge necessary for meaningful action is addressed in the early phase of (a) as domain-specific didactic theory. *Recognizing* relevant lesson features constitutes the second skill facet required for the development of professional awareness. In this vein, noticing training (Sherin & van Es, 2009) is supported by reflective documents (i.e. observation protocols) and additional didactic theory input. Noticing might take place whenever one peer uses a pre-structured protocol to make observations on the strategies employed by another trainee to foster a subject-specific skill. Thereafter, *Evaluating* ensues as a reconstructive thinking process about the previously perceived subject-specific foci. Reconstructions occur primarily in the observational and reflective phases (c and d) of the *TLL-S*. Following the diagnosis of the situation, alternative strategies for action are developed and their potential outcomes are anticipated as part of the *Generating* phase. *Generating* is primarily addressed during reflections (d). Accounting for the fifth facet of the competence model, teacher trainees are asked to *decide* on strategies sensible for adaptation of instruction plans (e) and subsequent deployment to practice (b). The *Implementing* phase is designed to terminate or to trigger off a new cycle of processes aimed at the integration of theory and practice through reflection.

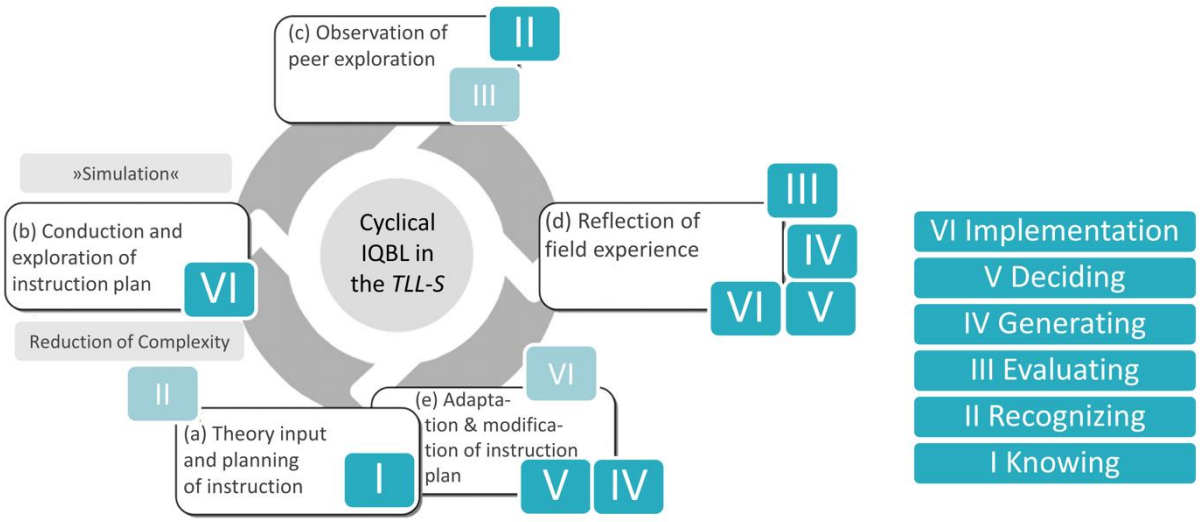

Fig. 1: *TLL-S* conceptual model: *TLL-S* as a learning environment for professional perception and action in a cyclical inquiry-based learning process (Rehfeldt et al., 2018). The darker the shade (I-VI), the more enhanced the focus on that particular skill during a *TLL-S* phase (a-e).

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2 Theoretical justification for the investigation of two overarching research questions

TLL-S-initiatives at *Freie Universität Berlin* pursue two overarching research questions: First, it is investigated how participants estimate the *'relevance of theoretical input for practice'* compared to prior training formats and contrasted to equivalent theory courses of the teacher training program. As mentioned before, teacher trainees have criticized the lack of opportunities to apply theory to practice during their academic training nationwide (Thiel & Blüthmann, 2009; Schumacher & Lind, 2000). Therefore, the *TLL-S* is explicitly designed as an intervention to enable teacher students to relate subject-specific theories to practice (Günther & Massing, 1980). This is meant to prevent the development of such knowledge which cannot be transferred into practice, also known as 'inert knowledge' (Seyfried et al., 2013, p. 118; cited from Whitehead, 1929). Theorefore, links between theory and practice can be established by trainees in all phases of the *TLL-S* (phases a-e; s. 3, intervention design). In contrast, traditional seminars that focus exclusively on theoretical input merely provide an introduction to relevant theories and in some instances, additionally allow for theory-based instruction planning (a). However, a comparable interconnection between theory and practice as offered by the *TLL-S* and which is realized by means of repeated exploration, reflection, and modification of instruction plans linked back to relevant theory cannot be realized in a regular training class. For further emphasis of '*theory relevance for practice'*, contents were also pre-selected according to their meaningfulness for planning instructions (i.e. subject-specific focus of contents).

Secondly, it is examined whether a *transition shock* can be mitigated after two trainee-pupil encounters in the complexity-reduced environment of the *TLL-S* (Haupt et al., 2013; Günther & Massing, 1980). The *TLL-S* serve to counteract the "transfer problem [which is] partly encouraged by training formats lacking application" (Günther & Massing 1980, p. 566; translated). By providing a training environment which is reduced in its complexity, it is hypothesized that exploration of theory in the field contexts provided by the *TLL-S* will become more likely (ibid.; Haupt et al., 2013). Complexity in the *TLL-S* thereby is mitigated on these five levels:

1. Setting a subject-specific theory focus (e.g. speaking competence in the *English Lab*)
2. Allegedly higher student motivation (Steffensky & Parchmann, 2007)
3. Familiar training and exploration environment for trainees
4. Prepared instruction materials for trainees
5. Reduced ratio of trainee-pupils (1:4) encounters

Every individual measure (in particular 3 and 4) helps to reduce the pressure on trainees to immediately decide and act on a particular instruction plan (Helsper, 2004; Neuweg, 2017; Berndt & Häcker, 2017). This is assumed to promote an orientation toward the learners resulting in pronounced support and improved cognitive activation. In addition, less immediate pressure to act may also reduce the probability of "choking" (Neuweg, 2017, p. 89; cited according to Burmeister, 1984). *Choking*, or failing in pressure-filled

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situations, is associated with heightened mindfulness and a compromised performance of teachers in overly stressful and demanding teaching situations. Preventing the *choking under pressure* phenomenon from occurring, thus, gives the trainees the time and space required to gain calm and confidence into building their pedagogical efficacy.

Eventually, individual research goals exist for the separate initiatives. For instance, in *Physics didactics* the question of whether and how far trainees' self-efficacy with respect to dealing with learners' preconceptions in planning and acting during Physics lessons on global warming undergo change (Helbig et al. 2018). In History didactics, an attempt is made to retrace participants' development during the span of the *TLL-S* along the developmental tasks proposed by Hericks (2006; Seibert, 2019). Primary Education didactics investigate the extent to which an *inquiry-based habitus* can be induced in teacher trainees while keeping track of the significance of their research process. Eventually, the initiative in English didactics is interested in measuring the development of didactic reflective skills of English teacher trainees in the *TLL-S* in comparison to participants of a more traditional, English teaching theory seminar (Klempin, 2019).

3 Research design and data analysis

The *TLL-S*-initiatives are explored quantitatively and holistically with respect to their efficiency on the earlier mentioned constructs *'perceived relevance for practice of theoretical contents'* and '*teacher self-efficacy'* across and within all four subject domains. *'Perceived relevance of subject-specific theory contents for practice'* by teacher trainees is elicited at pre and post points of measurements with an adaptation of the rating scale deduced from Prenzel and Drechsel (1996, see appendix). Pre data collection always occurs in the initial week of the term whereas post data was collected during the penultimate or ultimate session. For data analyses, missing values were replaced through multiple imputation (.*R: mice*). Currently, samples are not yet extensive enough for an adequate analysis of covariance within latent structural equations modeling ($N << 300$). Therefore, research pragmatism led to selection of the t-test for dependent samples for primary data analyses (.*R*). These preliminary results must be further considered within the limitations of a quasi-experimental design.

Teacher self-efficacy was measured at three points (pre, inter, and post) over the course of the *TLL-S* with a construct-validated scale based on Pfitzner-Eden, Thiel, and Horsley (2014, see appendix). This way, the development of trainees' self-efficacy across the *TLL-S* is traced from a pre-baseline to inter- and post-time of measurement right after learner visitations at university in order to track potential self-efficacy drops right after both field experiences.

In addition to quantitative research, qualitative investigations as well as *Mixed-Methods* (Kuckartz, 2014) were used on a domain level for an in-depth pursuit of subject-specific research questions. However, the respective research designs and preliminary results lie outside the scope of this article and will be discussed extensively elsewhere.

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4 Sample description

cohort	subject domain of the *TLL-S*	*N*	*N* of intervention group	*N* of control group
summer term 2016	Physics	22	15	7
	English	27	16	11
	History	17	17	0
	Primary Education	23	23	0
winter term 2016/2017	Physics	0	0	0
	English	19	19	0
	History	35	16	19
	Primary Education	57	57	0

Tab. 1: Description of the sample

Table 1 above provides insight into the sample from the 2016-cohorts (summer term 2016, winter term 2016/17) with a total sample of *N* = 200. Out of 200 subjects, 163 teacher trainees participated in a *TLL-S*. On average, participants of the *TLL-S* were enrolled in their fifth semester of a regular six-semester B.A. program (1st quantile: 4th semester; 3rd quantile: 5th semester).[1] Trainees' average age in the *TLL-S* was 22 years (1st quantile: 21; 3rd quantile: 27). Most *TLL-S* students had already encountered field practice (34% in private tutoring, 43% voluntary internships). 18% claimed to have had no practice experience whatsoever before registering for the *TLL-S*. 49% of teacher trainees were enrolled to train for Primary Education, 21% wanted to become English teachers, 20% History teachers, and 10% trained to graduate as Physics teachers. In summer term 2016, 71 student teachers participated in a *TLL-S*, and during winter term 2016/17 a total of 92 trainees attended the format.

The control group was comprised of 37 students in total, 18 from the summer term of 2016 and 19 from the winter term of 2016/17. Most of the students were enrolled in their fourth semester of a B.A. teacher education program at *Freie Universität Berlin* (1st quantile: 3rd semester; 3rd quantile: 6th semester). Students in the control group were on average 23 years old (1st quantile: 21; 3rd quantile: 26). Practice experience is analogous to the *TLL-S* students, as most of them did private tutoring and voluntary internships (either of them 47%) before the *TLL-S* experience, whereas 32% had no field experience prior to the theory course which is a slightly higher percentage than in the *TLL-S*-sample. History trainees dominated in the control group with 51%, followed by 30% English students, and 19% Physics students.

[1] Utilizing an electronic enrolment system, teacher trainees assigned themselves autonomously to either control, or experimental group. A complete random assignment of teacher trainees to either control, or experimental group would have been ethically unjustifiable, as we hypothesized postive effects of the intervention seminar (*TLL-S*).

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5 Preliminary results on the estimation of 'relevance of theory contents' and 'teacher self-efficacy' development

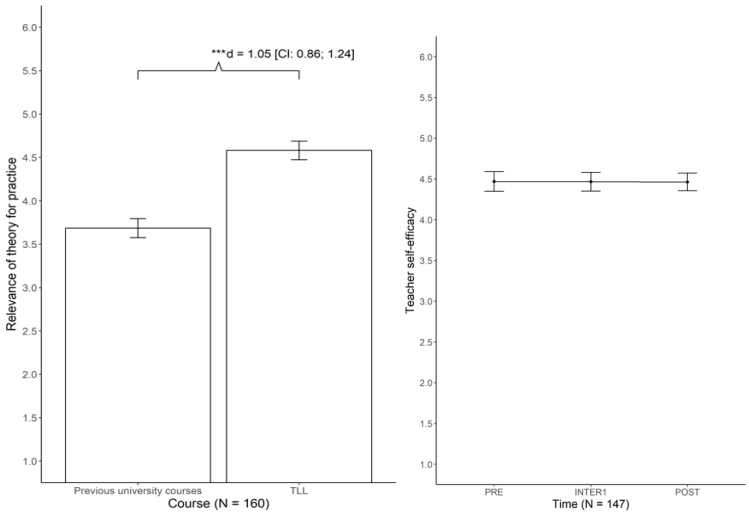

Fig. 2, left: *'Relevance of the TLL-S theory contents for practice'* as contrasted with previous university training courses. The scale ranges from 1 – "strongly disagree" to 6 – "strongly agree".
Fig. 3, right: *'Teacher self-efficacy'* of teacher trainees over the course of the *TLL-S*. Time of measurement "INTER 1" is post to pupils' visit at the university.

Figure 2 (left) depicts the results of the perceived *'relevance of theoretical contents of the TLL-S for practice'* (*N* = 160). Apparently, the *'practical relevance of theory'* presented in prior university training courses (*M* = 3.69, *SE* = 0.07) was rated lower than the practical value of the theoretical inputs introduced in the *TLL-S* (*M* = 4.58, *SE* = 0.06). With Cohen's *d* = 1.05 this counts as a high effect even within the confidence interval [0.86; 1.24].

When considering the *'relevance of theory contents'* for every domain, differences between *'relevance of theory contents'* of the *TLL-S* is significantly higher and with mostly high effect sizes as compared to theory content addressed during prior university training courses. The differences between the *TLL-S* and previous theory courses are detailed in table 2. Differences between control group seminars and previous university training were non-significant.

Subject domain	*N*	*'relevance of theory contents'* for *TLL-S*	*SE*	*'relevance of theory contents'* for previous university training	*SE*	*p*	*d*	CI (*d*)
English	35	4.81	0.12	3.85	0.15	***	1.14	[0.63; 1.66]
History	30	4.90	0.13	3.35	0.14	***	1.62	[1.03; 2.21]
Primary Education	80	4.33	0.09	3.69	0.10	***	0.67	[0.35; 0.99]
Physics	15	4.75	0.16	4.00	0.23	**	0.98	[0.19; 1.77]

Tab. 2: '*Relevance of the TLL-S theory contents for practice'* as contrasted with previous university training courses, divided by subjects. The scale ranges from 1 – "strongly disagree" to 6 – "strongly agree".

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Figure 3 (right) illustrates the development of *'teacher self-efficacy'* over time, i.e. over the span of the training format (*N* = 147, lower due to dropout). A decline in self-efficacy of *TLL-S* participants (pre, *M* = 4.47, *SE* = 0.06) can neither be ascertained right after the first field practice (inter1, *M* = 4.47, *SE* = 0.06), nor after the second field experience (post, *M* = 4.46, *SE* = 0.06). Even when looking at the subject domains separately '*teacher self-efficacy'* remains stable. Within comparably low error margins all means overlap notably. Mean values scatter on a six-point-scale with a measurement uncertainty of solely 0.5 points on the scale (fig. 4). The pre-post-development of the control group remained stable, also (p>.05).

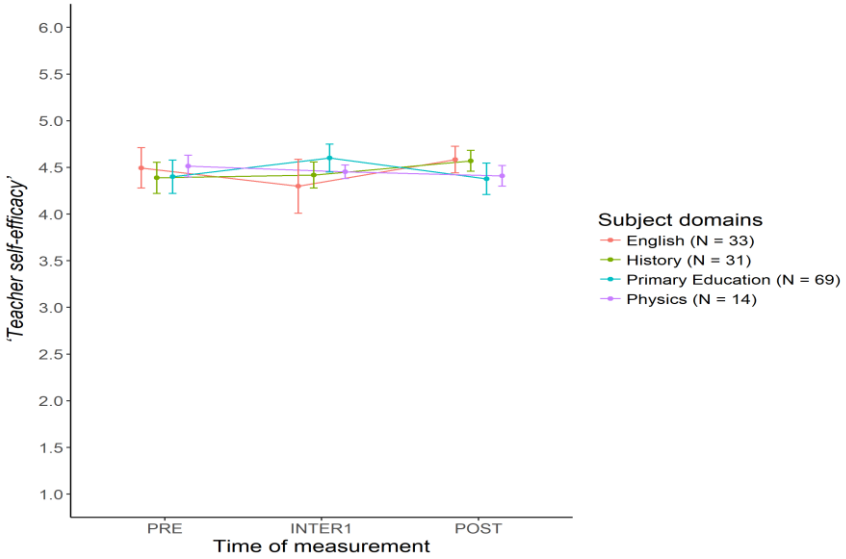

Fig. 4: *'Teacher self-efficacy'* of teacher trainees over the course of the *TLL-S*, divided by subject domains. Time of measurement "inter1" is post to pupils' university visit.

6 Implications and perspectives

With regard to pending covariate analyses, both results demonstrate that the *TLL-S* which was modeled on the conceptual design by Rehfeldt and colleagues (2018) is able to meet its own objectives. The *'practical relevance of the theoretical contents'* achieves much higher scores for the *TLL-S* than for previous university experiences of the participating student teachers. Moreover, trainees' stable self-efficacy serves as an indicator that a *transition shock* (Günther & Massing, 1980; Tschannen-Moran et al., 1998, see section 1) was probably cushioned, as a decline of self-efficacy right after field practice does not emerge from the data. The research questions can be – with all reservations in the face of possible limitations – answered as follows:

1. The perceived *'practical relevance of the theoretical contents'* of the *TLL-S* is considerably elevated as compared to the *'practical relevance'* of previous university teaching formats.
2. Occurrence of a *transition shock* appears less probable for the participants of the *TLL-S*.

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In conclusion, it can be reported that the adaptation of the *TLL-S* format to the requirements of the didactics of English, History, and Primary Education according to a common conceptual model was successful. Furthermore, data analyses showed that the *transition shock* was apparently prevented due to the repeated field experiences gathered by trainees in a protected sphere of reduced complexity. In addition, the *TLL-S* accounted for the lack of practical experiences in university-based teacher education since trainees perceived the theoretical inputs introduced during the *TLL-S* as ultimately relevant to the teaching context. In consequence, this might increase the probability of those teacher trainees to later make inferences between domain-specific epistemic knowledge and concrete teaching situations they might encounter during practice.

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APPENDIX

Rating scale descriptions

A.1 "Relevance of the (TLL-S or previous university training courses) theory contents for practice"

N = 160 from *TLL-S*

- Descriptives: M (SE): M_{study} = 3.67 (0.07), $M_{TLL\text{-}S}$ = 4.58 (0.06)
- Reliability: Cronbach´s α = .85
- Correlation with teacher-self-efficacy:

Correlation Pearsons r	$RelLI_{TLL\text{-}S}$	$RelLI_{prior\ courses}$
swe_{pre}	0.10	0.39
swe_{inter1}	0.25	0.26
swe_{post}	0.45	0.27

RelLI: 'Relevance of theory contents'; SWE: *teacher self-efficacy*

Items after completion (post) of *TLL-S* (translated from German):

In the *TLL-S*…

1. …it was pointed out that the course contents are important for my future work as a teacher.
2. …it became clear to me that the course contents are relevant for other important contents/activities in teacher training (e.g. subject-specific courses, school internships etc.).
3. …it was illustrated through examples or problems how important the course contents are for high-quality teaching.
4. …I was introduced to situations in which I came to realize how important the course contents are for teaching.
5. …I experienced that I can use what I have learnt in other subject domains than the didactic domain.
6. …it was clarified which role the course contents play for planning teaching instructions.
7. …I came to realize that I can also do something with the course contents outside the teaching profession.

Items at the onset (pre) of the *TLL-S* (translated from German):

During prior teacher training courses…

1. …it was pointed out that the course contents are important for my future work as a teacher.
2. …it became clear to me that the course contents are relevant for other important contents/activities in teacher training (e.g. subject-specific courses, school internships etc.).

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3. …it was illustrated through examples or problems how important the course contents are for high-quality teaching.
4. …I was introduced to situations in which I came to realize how important the course contents are for teaching.
5. …I experienced that I can use what I have learnt in other subject domains than the didactic domain.
6. …it was clarified which role the course contents play for planning teaching instructions.
7. …I came to realize that I can also do something with the course contents outside the teaching profession.

A.2 'Teacher self-efficacy'

N = 145 from the *TLL-S*

- Descriptives: M (SE): M_{PRE} = 4.46 (0.12), M_{INTER} = 4.46 (0.06), M_{POST} = 4.46 (0.06)
- Reliability: α_{PRE} = .76, α_{INTER} = .75, α_{POST} = .75

Items at all times of measurement (pre, inter, and post)

1. I could come up with an alternative explanation or find another example if students would not understand something.
2. I could adapt the difficulty level to the proficiency level of individual students.
3. I could estimate in how far students do understand lessons contents.
4. I could come up with adequate challenges for high-performing students.

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