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“Transfer of Research and Research on Transfer in Subject-Matter Didactics”

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(How) Can didactic research find its way into the classroom? Results from a questionnaire survey on the lesson preparation and continuing professional development of German teachers

*Sarah Brommer *, Swantje Weinhold**
& Ronja Sowinski****

Abstract

The gap between research about education and teaching practice is well-known in most subjects/disciplines. A nationwide online questionnaire survey regarding which sources German-language teachers use for lesson preparation and what in-service training opportunities they perceive may shed light on how research findings can be incorporated into classroom practice.

These are some of the results from the 403 responses: In-service training courses are popular, but judged to be of little use. Social media offers are frequently used and assessed as helpful – despite the often poor quality, which teachers do not necessarily recognise. Therefore subject didactics should rethink certain traditions and explore new ways of reaching teachers. Because teachers' practices of lesson preparation tend to be idiosyncratic rather than determined by the subject matter, the findings from the survey are equally relevant and useful for all subjects and can contribute to a better alignment of subject science, subject didactics and teaching practice.

Keywords

didactics research, teaching practice, lesson preparation, individual professional development, teachers' continuing professional development (CPD), in-service training

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1 Introduction

The implementation of didactical research findings into classrooms has long been a huge challenge for education researchers as well as teachers. The literature often notes the distance between research and teaching practice contents (e.g. Ehmke et al., 2022; Korthagen, 2010, 2016; Rothland, 2020) and that newer research findings in German didactics are slow to impact the school lessons (Jagemann, 2019). The discrepancy between discipline research, didactics, and teaching practice in the subject of German is a fundamental problem. The reasons for this discrepancy are complex; we will deal with them later when we discuss the framework conditions of teacher education (see section 2). In any case, the situation described necessitates investigation into ways to overcome the gap.

To achieve this, we must consider all conceivable sources that teachers use to further educate themselves or to prepare their teaching (e.g. professional development formats, teaching materials). In order to reach teachers, it is necessary to find out which pathways teachers usually use. Within the framework of a nationwide questionnaire survey in Germany, these pathways were investigated regarding how German teachers¹ obtain further/continuing professional development and receive subject-specific and subject-didactic input. In this context, the supply and demand of both formal and informal teachers' continuing professional development (CPD) opportunities in the subject German were considered and the influence of teacher training courses, the education industry, and other sources for individual development, lesson preparation and lesson delivery was analysed. The results of the study can contribute to targeting German teachers more specifically in the future and to better tailoring CPD offers to their needs.

Even though our data and considerations are necessarily limited to the teaching of German in schools and the practices of German teachers in Germany, they have wider relevance: Firstly, this applies to the cross-curricular significance of our study. On the one hand, teachers generally teach several subjects, and individual practices of lesson preparation are similar across subjects – Behr (2017, p. 14) speaks of individual further training behaviour and Czerniawski (2013, p. 383) points out the complex field between teachers' biography, values as well as identity work in different environments as characteristic for teachers' CPD. On the other hand, the framework conditions of teaching and lesson preparation are comparable for different school subjects (e.g. time available, access to the internet, dominance of the education industry and textbook publishers). Consequently, it can be assumed that the situation in other subjects is not so different from the status quo in the subject German. Secondly, the wider relevance of the study applies in spatial terms. We indeed collected data only from teachers working in Germany; but certain questions are relevant to teachers across countries, regarding teaching and lesson preparation – namely whether one uses specialist journals, or obtains input on the internet, or attends CPD courses. In other countries with similar educational conditions (e.g. availability of digital content) as e.g. Sweden

¹ We use the term 'German teachers' to refer to teachers who teach German as a subject at school.

(Wermke, 2011), the survey results are not expected to be much different. Additionally, some findings have also relevance to countries all over the world as in most countries teachers' CPD is required (Tannehill et al., 2021; Widayati et al., 2021; Somantri & Iskandar, 2021). The findings therefore deserve serious attention in various respects and perhaps also should serve as a wake-up call. At best, they lead to a better alignment between subject science, subject didactics and teaching practice in these subjects as well.

In the following, we will first look at the framework conditions of teacher education in Germany (section 2). The focus here is primarily on the so-called third phase of teacher education: when trained teachers continue their education, for example through formal and/or informal CPD formats. We then explain our research questions (section 3) and the methodological approach (section 4). Section 5 presents the results of our study. First we address the motivation and reasons why teachers engage in continuing education (section 5.1). Then we take a look at lesson preparation; here we show which sources teachers mainly use to prepare their lessons (section 5.2). The next focus is on teachers' individual CPD habits: We reveal which CPD opportunities teachers prefer (section 5.3), how they become aware of these opportunities (section 5.4), and which attitudes they have towards formal and informal CPD formats (section 5.5). In addition, we show some correlations between the data (section 5.6). Finally section 6 discusses the implications of the results of our study.

2 The structure of teacher professional development and its research

2.1 The focus on the third phase of a three-part teacher education program in Germany

In Germany, teacher education includes three phases: (1) university studies, (2) preparatory service or traineeship and, as a special case, the qualification of lateral entrants, as well as (3) CPD. Even if we only refer to the third phase with the questionnaire, we would like to go into the three-part education program briefly at this point. Because it is important to know in which phases (prospective) teachers receive which subject input from which side, in order to be able to understand where one can start at all in order to convey current didactical research findings to the teachers.

The three phases are institutionally shaped by different responsible actors: In the first phase, the universities with their centres for teacher education and, secondarily, the practice partners for the practice phases are mainly responsible for the training of (prospective) teachers; in the second phase, it is the study seminars and training schools. In the third phase, teacher training is the responsibility of the State Institutes for School Quality and Continuing Education, independent continuing education providers and various other providers (for an overview cf. Pasternack et al., 2017, p. 349f.).²

² A basic distinction must be made between teacher professional development by *in-service* training

These three phases are interconnected to varying degrees. In particular, the third phase takes place in isolation and has practically no relation to the earlier phases of education (Pasternack et al., 2017, p. 21, p. 361). Regarding how closely teaching practice may align with the current state of (subject) didactic research, it is precisely this third phase of teacher education that comes into focus. The third phase is also becoming increasingly important in view of the rapidly changing “grammar of schooling” (Tyack, Torben, 1994, p. 454) in connection e.g. with inclusion, heterogeneity, digitalisation.

The third phase is the longest phase of teacher education in terms of time; it can be characterised as “learning on the job”. In this phase, teachers should continue their education and keep up to date. The Standing Conference of the Ministers of Education and Cultural Affairs of the German federal states (Kultusministerkonferenz) ensures quality education during this phase by adopting key points for the in-service training as part of the professionalisation in the curriculum. The CPD obligation is intended to ensure that teachers maintain and develop their professional competences throughout their entire educational biography (Wermke, 2011). CPD should bridge the gap between subject didactics and teaching practice and combine scientific basics and research findings with practical orientation – this is the claim. In reality, a differentiated picture of the third phase of teacher education in Germany emerges, as a look at the existing research also makes clear.

2.2 Research contexts

Learning and training opportunities, especially in the third phase of teacher education, are investigated from a variety of perspectives:

Transfer research examines ways of disseminating innovations in school. It is not primarily about the further training of individual teachers, but a change in school practice as a whole (e.g. Gräsel, 2010). Nevertheless, this helps to understand the dependent factors for innovations to find ways into practice and the essential role teachers play there for.

Research on CPD successfully searches for characteristics of good and sustainable CPD (e.g. Lipowsky/Rzejak, 2018, 2019; Tannehill et al., 2021; Parker & Patton, 2017). Within the study of Czerniawski (2013) the findings reveal a discrepancy between teachers’ needs and interests on the one hand and the value of CPD for their classes on the other hand. Regarding the content, among other things, a subject-specific/subject-didactic focus and a subject-specific depth are above all shown to be effective for learning. Reusser (2011) emphasises in this context that dealing with clearly defined subject content, which the teachers actually teach, is significantly more effective than general

opportunities/formats/courses on the one hand and *further* training opportunities/formats/courses on the other hand: Further training aims at additional qualifications (for example, when fields of activity change). In-service training in contrast, impart new knowledge related to one’s own job in order to develop or improve within this job. Since we are concerned in the following with the implication of current subject didactic knowledge in teaching practice, we speak of in-service training and not of further training.

topics. Focusing on addressing students' content-specific understanding processes and learning difficulties is also particularly effective. According to this result many studies, as for example Tannehill et al. (2021) and Czerniawski (2013), found the importance of focussing on teachers needs as an important factor for succesfull CPD formats. Additionally, it is important to highlight the fact that formal CPD formats are well researched contrairely to informal CPD formats (Kyndt et al., 2016). Therefore, we focussed on informal as well as formal CPD formats within our study.

Research on knowledge communication provides helpful answers on how subject-specific scientific content can be transferred into pedagogical practice. It turns out that practitioners more often prefer texts when linguistically adapted formats are used to communicate complex research knowledge (Mohajerzad, Krzeminski, & Schrader, 2022). Demski (2018) shows that among the multitude of sources of evidence, teachers cite journals, in addition to student and peer feedback, as particularly helpful, provided they have a concrete subject-related reference. These practitioners particularly prefer journals that can be received in a very short time, and aim to make work easier.

Our study can be located at the interface of the outlined research directions: Starting from the question of transfer and knowledge communication (How can new subject-specific and subject-didactic knowledge be communicated to teachers?), we focus on the third phase of teacher training namely from the perspective of the teachers: their viewpoints, habits and practices.

As mentioned, the third phase of teacher education (unlike phase one and two) does not follow a set system (Behr, 2017, p. 255-257; Oelkers, 2015, p. 8), and it is not recorded in what formal and informal ways teachers continue their education.³ Furthermore, in-service training is associated with difficulties and problems rooted in structural quality, process quality, orientation quality and result quality (Pasternack et al., 2017, p. 356f.). Therefore, the reach of CPD cannot be measured, and it is unclear to what extent in-service training (can) impact everyday teaching.

Regardless of the variety of CPD opportunities und the obvious differences in how teachers train themselves and receive inspiration for their teaching, the following can be stated:

The relevant literature notes a considerable discrepancy between didactics research on one hand, and teaching practice in German as a subject on the other hand (Abraham, 2019; Gräsel, 2010; Jagemann, 2019; Winkler, 2019). Studies unrelated to Germany (e.g. Cain, Allan, 2017; Vanderlinde, van Braak, 2010; Tannehill et al., 2021; Singh et al., 2020) have also shown that relatively few teachers consult educational research to shape their teaching practice. So far, research has not answered why this is so, and there are still

³ The distinction between formal and informal in-service training is of particular importance in the context of our study. Tynjälä and Heikkinen (2011) state that teachers have acquired most of their professional and technical knowledge in the school environment or outside institutional, formal education. Informal in-service training opportunities therefore play a central role, which is why they are examined in more detail in the study described here.

considerable gaps in previous research (cf. Heinemann, 2018; Pasternack et al., 2017, p. 222; Tannehill et al., 2021): Even though there are studies on effective professional development characteristics (Popova et al., 2018; Lipowsky, Rzejak, 2018, 2019), only selective surveys for example are conducted on the quality of the offers (Demski, 2018). There is also a lack of quantitative data on continuing education and training offers; and reliable statements on the relationship between supply and demand are also not possible from the existing literature. With our project we hope to help close this research gap, finding answers to the following questions.

3 Research questions

The above-described starting point as well as the state of research lead to our research questions and aims. Up to now, research lacks an empirical insight of German teachers' behaviour with respect to class preparation and participation in teachers' CPD. Therefore, we aim to outline these aspects as well as analyse possible correlations between some of the German teachers' characteristics and their attitudes and behaviours towards different CPD opportunities. As a result, suggestions can be made on how current research findings in didactics can be brought to teachers for implementation.

To reach these goals, we try our best to answer the following research questions:

R1) Which continuing professional development opportunities are used by German teachers and what are their sources for preparing their teaching practice?

R2) Which media and/or communication channels are used by German teachers for formal and informal continuing professional development?

R3) Based on 1 and 2: What possibilities emerge for reaching German teachers regarding implementation of new research findings in the classroom?

The research questions were pursued using the questionnaire survey described below.

4 Methodological approach

4.1 *Sample and data collection*

Data collection occurred between September '21 and June '22. We distributed our questionnaire in various in-practice teacher journals, online platforms, and teacher associations. In total, 403 German teachers (83.0% female; average age between 40-49 years) from all over Germany participated in the study. Most of the teachers had teaching experience of at least 21 years.⁴ Slightly more than half (52.6 %) are employed full-time with a full teaching load. They work in German elementary (39.4 %) and (higher)

⁴ We asked for time ranges: The average work experience is between 21 and 30 years (the statistical standard deviation is 1,248).

secondary schools⁵ (44.5 %) as well as vocational schools (16.1 %) in 14 different federal states of Germany. Thus, the study captures the different school framework conditions in the individual federal states and covers all grades and levels at schools.

4.2 Survey instrument

The desired data were collected via an internet-based questionnaire (cf. Cohen Manion, & Morrison, 2011). The questionnaire was built up with the tool Lime Survey and includes items about four topics: 1. demographical data, 2. schools as a teaching environment, 3. sources for class preparation, and 4. formal and informal CPD opportunities.

To build each survey topic, we used items from former questionnaires about teacher professional development (Behr, 2017; Richter, Schellenbach-Zell, 2016; Lehrer*innenfortbildung Baden-Württemberg, n.d.; Kultusministerium Baden-Württemberg, 2017; types of informal learning topics: literature review by Kyndt et al., 2016) and adjusted them for our participants (e.g. type of school). In addition, data were collected about German teachers' attitudes about formal as well as informal CPD opportunities using 4-point Likert scales. The reliability of both scales was tested during piloting phase and calculated within the main study as well. We reached a Cronbachs α of 0,768 (attitude about formal CPD) and 0,724 (attitude about informal CPD), which is appropriate. Furthermore, we extended the questionnaire with free text fields and asked, for example, for comments on 'lesson preparation' and 'in-service training opportunities'.⁶

4.3 Analysis

SPSS was used to perform various statistical analyses on the data. To get a first overview, we carried out descriptive analyses to calculate frequencies, e.g. about demographical data, German teachers' sources for class preparation, and personal reasons for teacher professional development.

For deeper insight, we conducted correlation analyses. Using t-test, a comparison between attitudes about formal and informal teachers' CPD for example enables us to see preferences between those two types of teachers' CPD.

⁵ In Germany, with its multi-part school system, these include the so-called Hauptschulen, Werkrealschulen, Realschulen, and Gymnasien.

⁶ Excerpts of the questionnaire with respect to the results later on can be found in the appendix. One more note on terminology: We use the term 'CPD' in our paper because this is the technical and all-encompassing term in the professional discourse to refer to all forms of continuing professional development. In everyday language the more concrete term 'in-service training' is more common; therefore, we use this term to translate the questions from the questionnaire.

5 Results & Discussion

5.1 What motivates teachers to develop themselves?

As mentioned (cf. section 2), former studies have focused on teachers' CPD as an opportunity to implement recent research results into class. Hence we asked German teachers their reasons for taking up CPD opportunities. Figure 1 shows the reasons given.

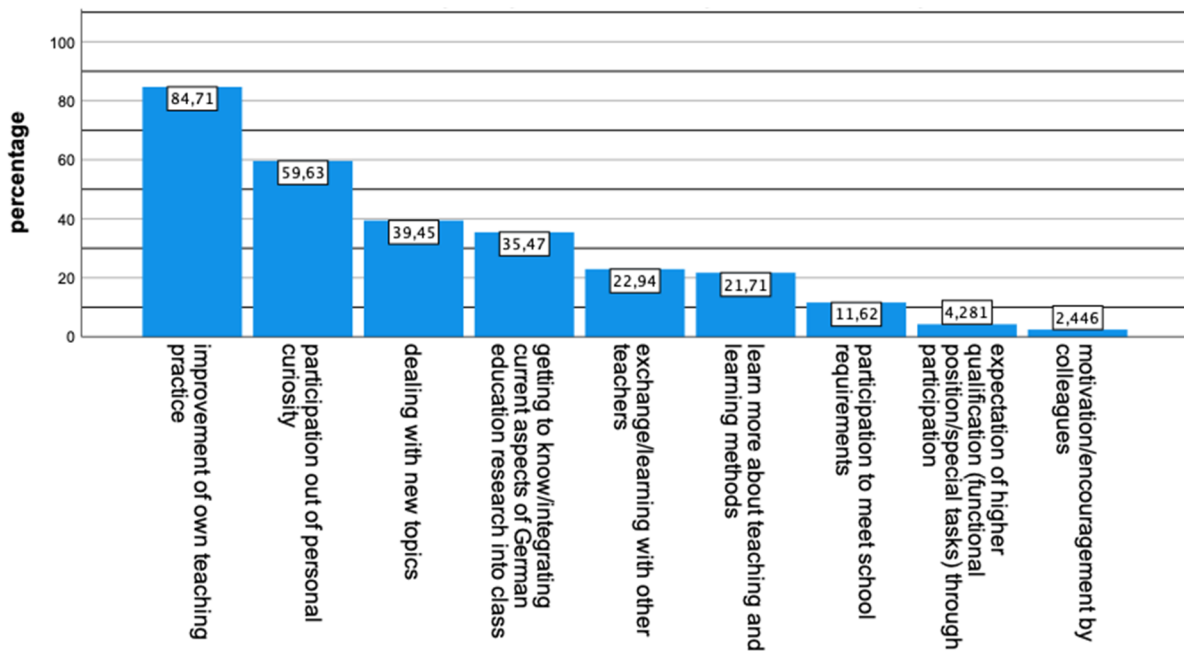


Fig. 1 Reasons for take up CPD offers. The percentage given is applied on the total number of answers to this multiple-choice question (see also the question from the query, figure 7 in the appendix).

It is good news for German didactics that teachers continue their education primarily because they are interested in the subject and new developments in the subject, and not only due to system structure (e.g. obligation for in-service training). This means that teachers are, in principle, open to new didactic or subject-related content (at least those undergoing further training). The difficulty of incorporating research into teaching practice is therefore not due to disinterest. Hence the issue is reaching the interested teachers in the first place. On the other hand, the offer must be designed such that it can be accepted by teachers and implemented in practice (on the aspects of lack of acceptance, credibility and practical relevance, cf. Cain, 2017; Reusser, Fraefel, 2017, p. 14; Steinig, Huneke, 2022, p. 21; Zabka, 2019).

5.2 Which sources do German teachers use for lesson preparation?

Regarding how the findings of German didactics find their way into classroom practice, we must first understand how teachers prepare their lessons. Therefore, we focused on the materials and sources German teachers use for class preparation. We also asked to what extent the frequency of use changed in the wake of the Covid 19 pandemic. But the differences before and during/after Corona are not statistically significant. In fact it

is quite remarkable that the Covid 19 pandemic did not lead to any significant changes. Therefore, we address here which sources are relevant for lesson preparation in general, without diachronic comparison. Figure 2 summarizes the frequencies of different sources. Within this item the participants were able to choose a maximum of 5 different answer options. Therefore, the percentages given in Figure 2 represent combined frequencies of different sources.

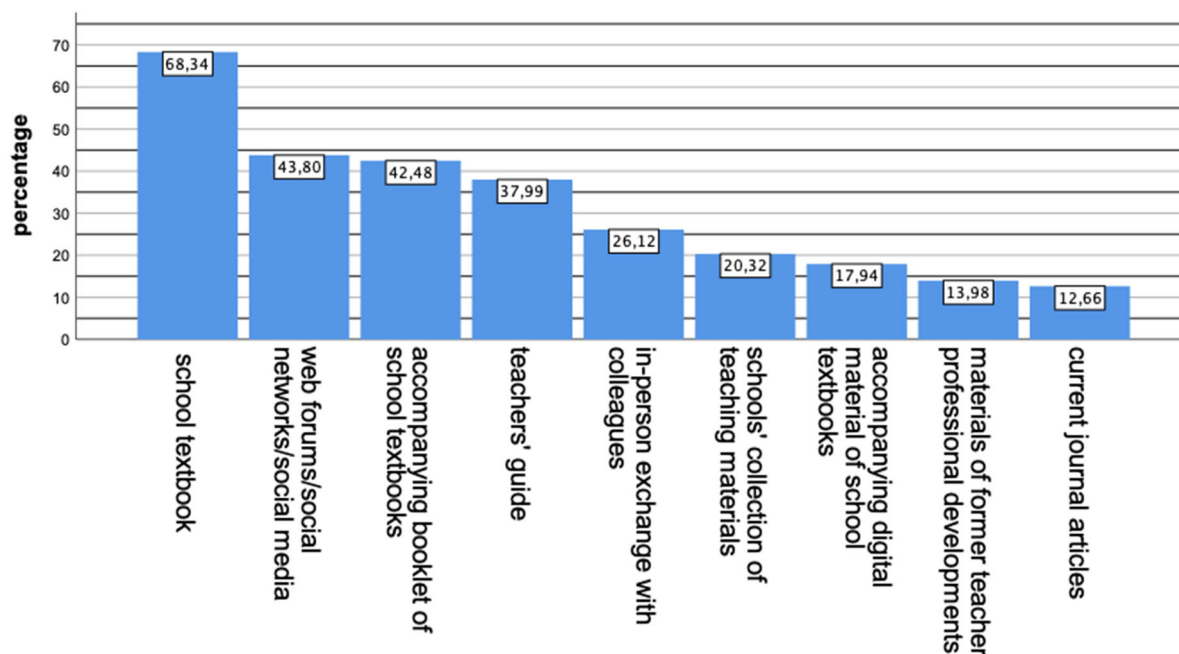


Fig 2 Frequencies of sources of German language teachers' class preparations, given in percentage (see also the question from the query, figure 8 in the appendix).

Regarding the state of research (see above), our survey results confirm that German teachers mainly draw from materials of school textbook publishers for their class preparations (school textbook: 68.3 %; accompanying booklet of school textbooks: 42.5 %; teachers' guide: 38.0 %). Second most utilized are web sources from forums as well as social networks/media (43.8 %).

This is a worrying result, because according to previous studies, subject-specific and subject-didactic analyses of the teaching materials repeatedly show qualitative deficiencies such as a lack of plausibility and validity (e.g. Schäfer, Savatz, 2016). On the other hand, the materials of educational publishers are not rare of poor quality relative to current research findings (cf. Ott, 2019).

Therefore, it can be assumed that the use of such publishers' materials does not optimally support teachers in implementing research-informed practices, in part due to lack of alignment between such materials and current research (Jagemann, 2019). This behaviour observed also clarifies the presumption that teachers are more likely to reproduce well-established knowledge as mentioned by Abraham (2019).

Next to publishers' materials, digital sources like platforms and social media are particularly used for class preparations. Our research focused only on the use of these

platforms and not on kinds of use, as for example in the research by Conze et al. (2020), which focused on Twitter as a platform for exchange, or research by Altrichter (2010), which focused on the use of other digital platforms for material exchange. What is certainly most worth considering in this finding is that digital sources that are accessible in forums or social networks are not subject to any quality controls. To make matters worse, materials and sources developed with researchers, and which are therefore empirically proven, are used least often (the results thus confirm earlier studies, e.g. Cain, Allan, 2017; Vanderlinde, van Braak, 2010).

5.3 Which (formal and informal) CPD opportunities and formats do teachers prefer?

Regarding German teachers' preferences of different CPD opportunities and formats (multiple choice question), most answers were about formal CPD opportunities as in-person events. Only 16.5 % of the participating German language teachers said that they (also) prefer informal ways of CPD.

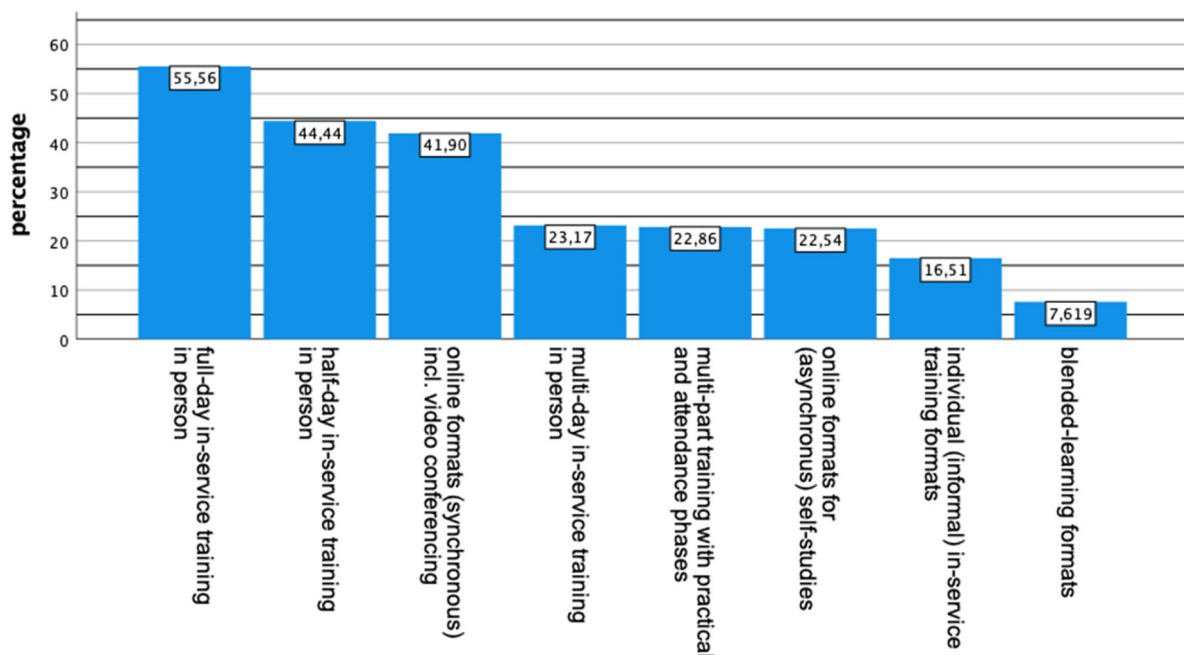


Fig. 3 Preferred CPD formats (independent of the Covid 19 pandemic), given as percentage (see also the question from the query, figure 9 in the appendix).⁷

It is striking that online offers are less favoured by teachers compared to face-to-face offers, and this is independent of the Covid 19 pandemic. Our results thus contradict the study by Wassermann and Migdal (2019), which found teachers tend to prefer online offerings. It is possible that a development is emerging here, that teachers recognize that online formats are not an equivalent substitute for face-to-face formats.

⁷ Multiple answers were possible. Therefore, the percentages given in Figure 2 are presenting the frequencies of different sources in a combined way.

The popularity of the classic in-service training course and the low preference for informal CPD opportunities is remarkable insofar that teachers state elsewhere in the questionnaire that they benefit less from formal CPD courses, but more from informal CPD opportunities (see below, section 5.5).

Even though informal CPD opportunities are obviously not preferred, teachers use informal offers as a stimulus and for lesson preparation, and even do so regularly. Therefore, we will look further into informal ways of teacher professional development and would like to outline what opportunities for informal learning and in-service training teachers utilize:

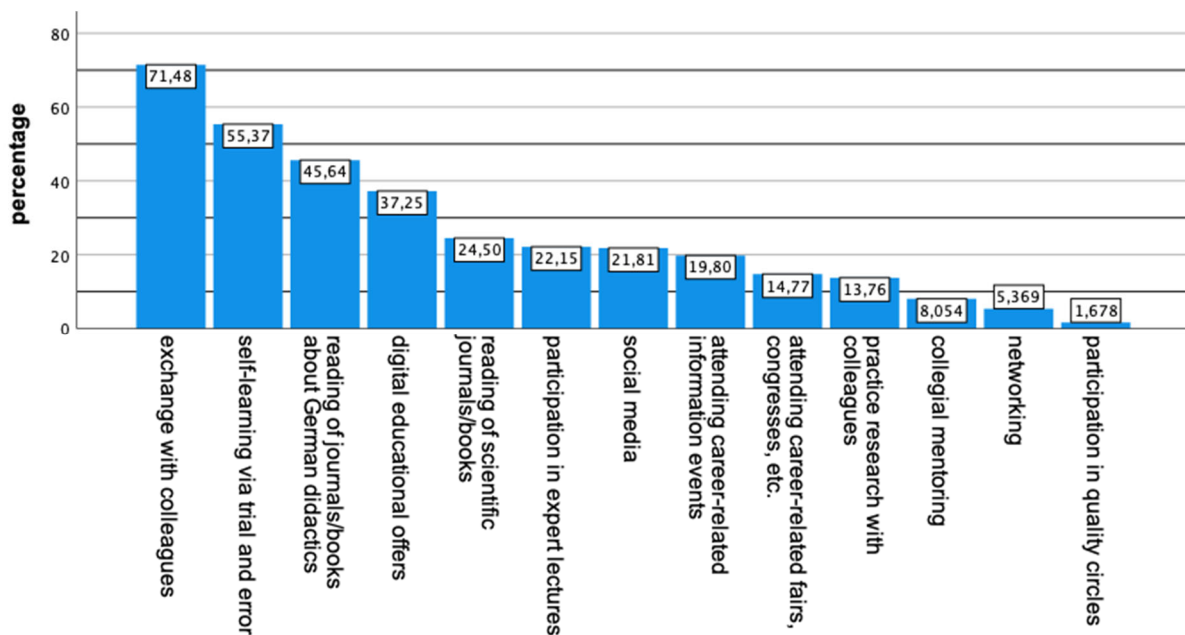


Fig. 4 Informal CPD opportunities used by teachers (independent of the Covid 19 pandemic) given in percentage (see also the question from the query, figure 10 in the appendix).⁸

It becomes clear that our participants prefer exchanging with colleagues (71.5 %), learning by themselves via trial and error (55.4 %) and reading journal articles about German education (research) (45.6 %). Seeing this, there is a difference between using journal articles as a source for class preparation (see above, section 5.1) and for personal teaching improvement as informal teacher professional development. In order to link research findings with classroom practice, it might help to clarify for teachers how lesson preparation and in-service training opportunities for professional development are interrelated.

5.4 How do teachers become aware of CPD opportunities?

To answer how to reach teachers, we must know how teachers find out about CPD opportunities. Richter and Vigerske stated more than 10 years ago that the information

⁸ Multiple answers were possible. Therefore, the percentages given in Figure 3 combine the frequencies of different sources.

situation must be regarded as ambivalent and that offers only reach their target audience to a limited extent (cf. Richter, Vigerske, 2011, p. 13). This situation seems to have improved overall, certainly also because more information channels are used today as a matter of routine.

The following overview shows that teachers become aware through various means of CPD opportunities or are informed about the opportunities.

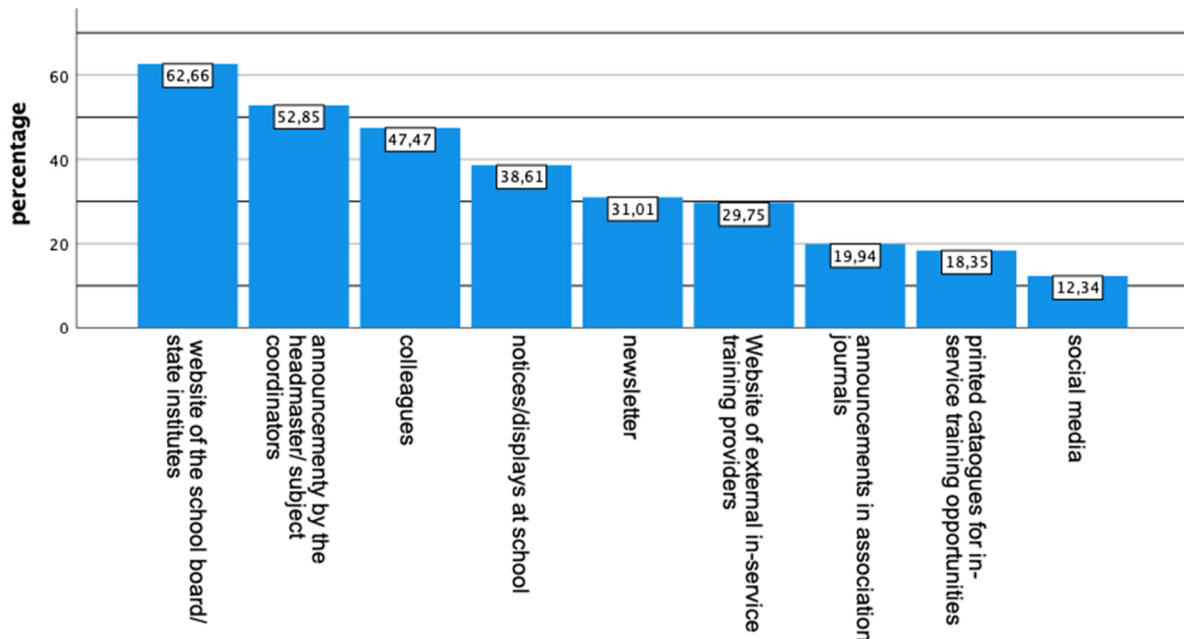


Fig. 5 Frequencies of channels through which teachers become aware of or are informed about CPD opportunities, given as percentage (see also the question from the query, figure 11 in the appendix).⁹

The questionnaire results also highlight that there is not one single way to reach teachers, but that CPD offers have to be spread widely and that both conventional channels and digital forms of communication, e.g. social networks, have to be used for this purpose.

5.5 What attitudes do teachers have towards formal and informal CPD opportunities?

In order to find out whether teachers tend to use formal or informal CPD opportunities, we asked them about their perceptions and attitudes.¹⁰ The following overview (an extract from the query and a juxtaposition of the responses; the original questions from the query can be found in the appendix, see figure 12, and 13) shows the extent to which

⁹ Multiple answers were possible. Therefore, the percentages given in Figure 4 combine the frequencies of different sources.

¹⁰ As already mentioned, we use the term 'in-service training' (and not the scientific term 'CPD') to translate the questionnaire (cf. Tab. 1).

teachers agree with different statements regarding formal CPD courses versus informal CPD opportunities.¹¹

Tab. 1 t-test between the mean of items about attitude about formal as well as informal teacher professional development of German teachers. M = mean; ΔM = difference between both means; SD = standard deviation; df = degrees of freedom; p = significance

		M	ΔM	SD	T	df	p
Pair 1	By attending formal in-service training courses for the subject German, I have received impulses that I can/could use for my teaching.	3,01	-,230	,781	-4,799	264	<,001
	Through informal in-service training opportunities, I have received impulses that I can/could use for my teaching.	3,24					
Pair 2	I get concrete teaching suggestions through formal in-service training courses that I can easily implement into class.	2,75	-,259	,792	-5,293	262	<,001
	I get concrete teaching suggestions through informal in-service training opportunities that I can easily implement into class.	3,01					
Pair 3	I have already used teaching impulses for the subject German from further formal in-service training courses in class.	3,06	-,181	,810	-3,639	264	<,001
	I have already used teaching impulses for the subject German from informal in-service training opportunities in class.	3,25					
Pair 4	The effort of class preparation has been reduced for me thanks to content from formal in-service training courses.	2,14	-,307	,773	-6,404	260	<,001
	The effort of class preparation has been reduced for me thanks to content from in-service training opportunities.	2,48					
Pair 5	I feel that I get access to new insights in German didactics through formal in-service training courses.	2,74	-,023	,810	-,459	259	,646
	I feel that I get access to new insights in German didactics through informal in-service training opportunities.	2,77					
Pair 6	I feel that I teach (can teach) according to the current state of the art of German didactics through my formal in-service training courses.	2,68	-,035	,708	-,792	257	,429
	I feel that I teach according to the current state of the art of German didactics through my informal in-service training.	2,72					

The mean of each item ranges between 2,14 and 3,25. Therefore, it becomes clear that the participants are more or less neutral to the statements as they do not fully disagree or agree. Thereby, it is important to have a look on the standard deviations of 0,708 to 0,810, which show probably different perceptions and attitudes with regard to the teachers. However, no significance according to correlations between different teacher characteristics and their perceptions and attitudes in this case can be reached.

To get an insight about differences between perceptions and attitudes towards the different types of CPD (formals versus informal), similar items of the scales were analysed by a paired t-test. Seeing the pairs 1 to 4, the approval ratings are significantly higher for the statements that refer to informal development opportunities. Even though there is no significant difference between the means in pairs 5 and 6, a tendency to a higher rating for the statements about informal development opportunities can be seen. This evaluation is particularly remarkable in that teachers also stated that they prefer formal in-service training courses compared to informal in-service training opportunities (cf. section 5.3).

¹¹ The answer options were: 1 = not at all true; 2 = rather not true; 3 = rather true; 4 = completely true.

5.6 Correlations between sources for class preparation and attitudes towards informal in-service training opportunities

We also investigated possible correlations between sources used for class preparation and teacher attitudes about informal CPD opportunities as visualised in figure 6. We concentrate on the informal field, because especially there the range of opportunities is varied and continually growing, and attractive for their low threshold. Besides, teachers value informal in-service training opportunities as useful and helpful.

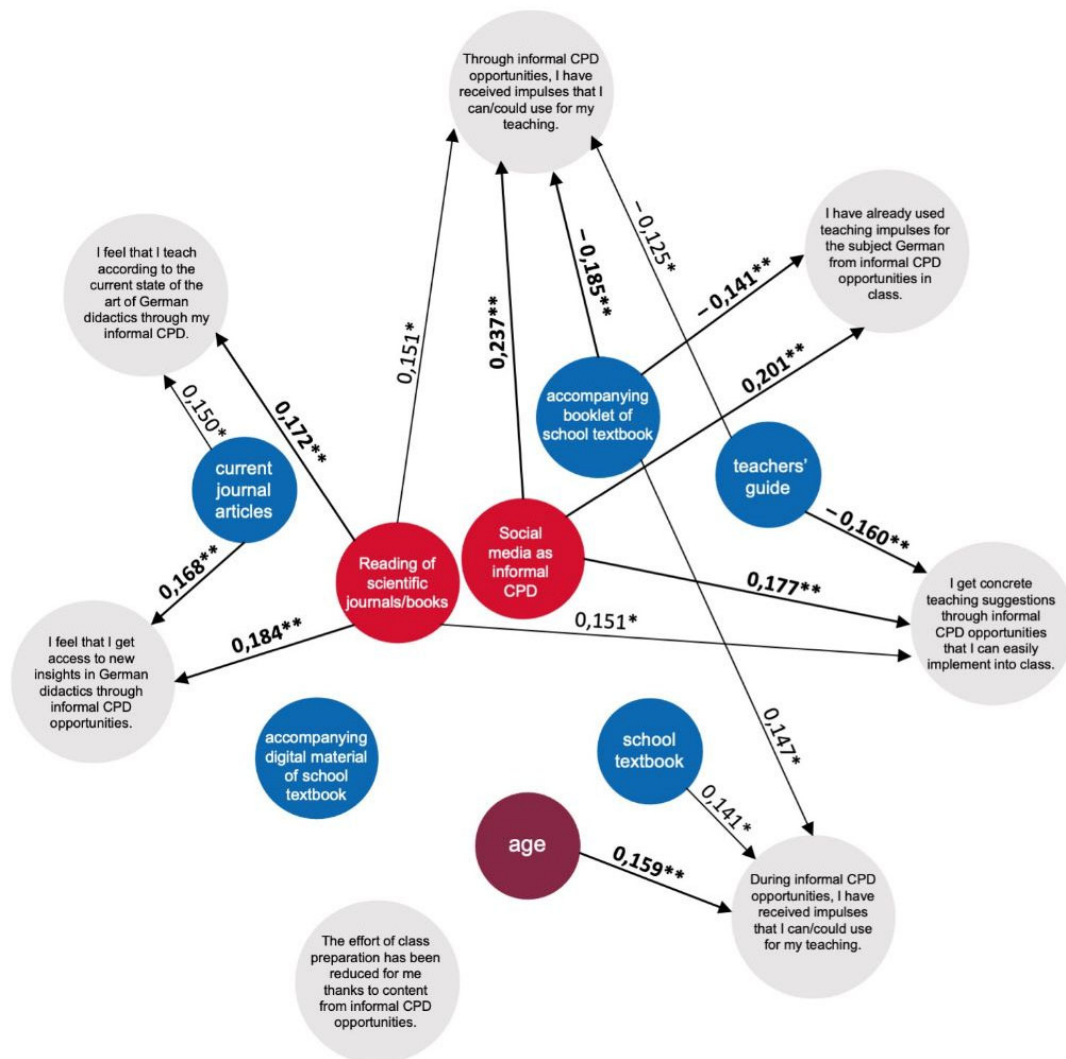


Fig. 6 Pearson correlation between items about perceptions and attitudes towards informal CPD, sources for class preparations, age of the teachers as well as used opportunities of informal CPD. Significances were marked with * (significant; $p < 0,050$) resp. ** (highly significant; $p < 0,010$).

Despite small effect sizes of the correlations ($r = 0,115 - 0,237$), some important implications emerge:

It becomes clear, upon closer inspection of correlations between sources and other statements, that on the one hand teachers using teachers' guides are more likely to disagree with statements about the value of impulses received through these informal training: "Through informal CPD opportunities, I have received impulses that I can/could

use for my teaching.” ($r = -0,185$; $p = 0,002$)¹² and “I have already used teaching impulses for the subject German from informal CPD opportunities in class.” ($r = -0,141$; $p = 0,021$). On the other hand, it was surprising that digital materials accompanying school textbooks in particular show positive correlation with the agreement to statements about formal CPD opportunities, and not about other publisher materials like school textbooks and teachers’ guides. It can be assumed that digital materials of school textbooks may be implemented in some formal in-service training courses.

Our data also show that teachers do believe that reading recent journals helps them both in informal CPD and lesson preparation.¹³ There is a positive correlation between reading journal articles for the purpose of lesson preparation and agreement with the statements “I feel that I get access to new insights in German didactics through informal CPD opportunities.” ($r = 0,168$; $p = 0,006$) and “I feel that I teach according to the current state of German didactics through my informal CPD.” ($r = 0,150$; $p = 0,014$). So teachers feel that professional journals help keep them up-to-date. However, as seen in the results above, teachers do not use this source for informal CPD that often. There are comparable positive correlations regarding journal articles as a means of informal CPD and agreement with statements emphasising the benefits and value of informal CPD. Overall, it is clear that the reading of journals is perceived very positively by teachers.

Seeing the results of correlations between the attitudes and perceptions of informal CPD with opportunities, which teachers use for informal learning, the use of social media for informal CPD correlates positively to agreement with these statements: “During informal CPD opportunities, I have received impulses that I can/could use for my teaching.” ($r = 0,237$; $p < 0,001$); “I have already used teaching impulses for the subject German from informal CPD opportunities in class.” ($r = 0,201$; $p < 0,001$); “I get concrete teaching suggestions through informal in-service training opportunities that I can easily implement in class.” ($r = 0,177$; $p = 0,004$). Social media are therefore also important for the preparation of lessons and informal CPD training.

Based on the survey results and the correlations between the data, we now present some conclusions emerging from our study.

6 Conclusions & Implications

For lesson preparation, teachers still primarily use the offerings of textbook publishers. Teachers also indicate that they prefer the traditional format of the formal CPD course. However, they estimate the benefit they can draw from it to be low. The transfer into teaching practice thus seems unsuccessful. In contrast, teachers state that they make more frequent use of informal CPD opportunities (especially social media offerings) and that they benefit much more from these (especially from reading journals). Regarding

¹² A negative r-value means a negative correlation. In this case, it can be stated that the more the teachers use handouts, the less often they say that they have used/ can use impulses for their teaching from informal learning.

¹³ There is no correlation here with the factor “journal subscriptions at school”. The teachers must therefore have obtained the magazines privately.

these informal offers, teachers also have the impression that they are teaching according to the current state of German didactics. However, the problem remains that only a few teachers read journals at all and, conversely, social media offers are often of questionable quality.

What consequences can be drawn from this? First of all, we must re-examine the idea that CPD of teachers takes place predominantly in institutionalised settings (cf. Behr, 2017, p. 13); the bulk of such education happens informally. If such training is provided as a traditional CPD course, attention should be paid to improved implementation (the lack of practical relevance has long been criticised for this format). However, the majority of teachers cannot be reached in this way anyway. For this, German didactics would have to provide low-threshold offers – and this will be equally true for the other subject didactics. The results of our study underline the significant potential of journal-reading and that a first goal should be to promote this better and in a more targeted way. On the other hand, it shows to what extent teachers use social media offers (and mistakenly think that these are offers of high quality). A second goal should therefore be that the subject didactics develop a qualitatively tested social media offer that meets teachers' current needs.

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Figure captions¹⁴

- Figure 1: Reasons for take up in-services training offers
- Figure 2: Frequencies of sources of German language teachers' class preparations
- Figure 3: Preferred in-service training formats
- Figure 4: Informal in-service training opportunities used by teachers
- Figure 5: Frequencies of channels through which teachers become aware of or are informed about in-service training opportunities
- Figure 6: Pearson correlation between items about perceptions and attitudes towards informal CPD, sources for class preparations, age of the teachers as well as used opportunities of informal CPD
- Figure 7: Excerpt from the questionnaire on the question "Which are the reasons for you to participate in in-service training opportunities?"
- Figure 8: Excerpt from the questionnaire on the question "What sources do you primarily use to prepare for lessons in German?"
- Figure 9: Excerpt from the questionnaire on the question "Which training formats do you usually prefer?"
- Figure 10: Excerpt from the questionnaire on the question "What opportunities for informal in-service training do you use most of the time?"
- Figure 11: Excerpt from the questionnaire on the question "How do you usually become aware of in-service training offers or are you informed about the possibilities?"
- Figure 12: Excerpt from the questionnaire on the statements about formal CPD
- Figure 13: Excerpt from the questionnaire on the statements about informal CPD

¹⁴ All figures shown are from the research project WiDiSch (Wissenschaft – Didaktik – Schule, translated: Science – Didactics – School).

Appendix

In the following, excerpts of the questionnaire used are shown. The excerpts are shown chronically depending on the mention within the results section (section 5).

Which are the reasons for you to participate in in-service training opportunities?

You can choose up to 3 reasons.

<input type="checkbox"/> Participation out of personal curiosity	<input type="checkbox"/> Getting to know/integrating new aspects of German education research into class
<input type="checkbox"/> Participation to meet school requirements	<input type="checkbox"/> Learning more about teaching and learning methods
<input type="checkbox"/> Expectation of higher qualification (functional position/special tasks) through participation	<input type="checkbox"/> Motivation/encouragement by colleagues
<input type="checkbox"/> Improvement of own teaching practice	<input type="checkbox"/> Exchange/learning with other teachers
<input type="checkbox"/> Dealing with new topics	<input type="checkbox"/> Other reasons: <input type="text"/>

Warum bilden Sie sich fort?

Bitte wählen Sie max. 3 Gründe.

<input type="checkbox"/> Teilnahme aus persönlicher Neugier	<input type="checkbox"/> Kennenlernen/ Einbinden aktueller deutschdidaktischer Aspekte in den Unterricht
<input type="checkbox"/> Teilnahme, um Anforderungen der Schule zu erfüllen	<input type="checkbox"/> Mehr über Lehr- und Lernmethoden erfahren
<input type="checkbox"/> Erwartung an höhere Qualifikation für eine Funktionsstelle oder für besondere Aufgaben durch Teilnahme	<input type="checkbox"/> Motivation/ Ermutigung durch Kolleg*innen
<input type="checkbox"/> Verbesserung der eigenen Unterrichtspraxis	<input type="checkbox"/> Austausch/Lernen mit anderen Lehrkräften
<input type="checkbox"/> Beschäftigung mit neuen Themen	<input type="checkbox"/> andere Gründe: <input type="text"/>

Fig. 7 Excerpt from the questionnaire on the question “Which are the reasons for you to participate in in-service training opportunities?” (above the English translation, below the German original).

What sources do you primarily use to prepare for lessons in German?
You can choose up to 3 sources.

☐ School textbook

☐ Accompanying booklet of school textbooks

☐ Accompanying digital material of school textbooks

☐ Teachers' guide (lecture keys, teaching models as e. g. EinFach Deutsch)

☐ Web forums/social networks/social media (e. g. 4teachers, sofatutor, Twitter)

☐ Schools' collection of teaching materials

☐ Materials of former teacher professional developments

☐ Current journal articles

☐ In-person exchange with colleagues

☐ Other sources:

Welche Quellen nutzen Sie meistens zur Unterrichtsvorbereitung im Fach Deutsch?
Bitte wählen Sie max. 3 Quellen.

☐ Schulbuch

☐ Begleithefte zum Schulbuch

☐ digitales Begleitmaterial zum Schulbuch

☐ Lehrerhandreichungen (Lektüreschlüssel, Unterrichtsmodelle wie z. B. EinFach Deutsch usw.)

☐ Internetforen/ -portale/ soziale Medien (z. B. 4teachers, sofatutor, Twitter)

☐ Materialsammlungen der Schule

☐ Materialien aus vergangenen Fortbildungen (schulintern/ -extern)

☐ aktuelle Zeitschriftenbeiträge

☐ Offline-Austausch mit Kolleg*innen

☐ andere Quellen:

Fig. 8 Excerpt from the questionnaire on the question “What sources do you primarily use to prepare for lessons in German?” (above the English translation, below the German original).

Which training formats do you usually prefer (regardless of Corona)?
You can choose up to 3 formats.

☐ Half-day in-service training in person

☐ Full-day in-service training in person

☐ Multi-day in-service training in person

☐ Multi-part training with practical and attendance phases

☐ Online formats for (asynchronous) self-studies

☐ Online formats (synchronous) incl. video conferencing

☐ Blended-learning formats

☐ Individual (informal) in-service training formats

☐ Other formats:

Welche Fortbildungsformate bevorzugen Sie in der Regel (unabhängig von Corona)?
Bitte wählen Sie max. 3 Fortbildungsformate.

☐ halbtägige Präsenzfortbildungen

☐ eintägige Präsenzfortbildungen

☐ mehrtägige Präsenzfortbildungen

☐ mehrteilige Fortbildungen/ Fortbildungsreihen mit Praxis- und Präsenzphasen

☐ Online-Angebote für asynchrones Selbststudium

☐ Online-Angebote für synchrone Veranstaltungen mit Videokonferenz

☐ Blended-learning Angebote

☐ individuelle (informelle) Fortbildungsmöglichkeiten

☐ anderes Fortbildungsformat:

Fig. 9 Excerpt from the questionnaire on the question “Which training formats do you usually prefer?” (above the English translation, below the German original).

What opportunities for informal in-service training do you use most of the time?

You can choose up to 5 opportunities.

<input type="checkbox"/> Reading of journals/books about German didactics	<input type="checkbox"/> Participation in expert lectures
<input type="checkbox"/> Reading of scientific journals/books	<input type="checkbox"/> Digital educational offers (e. g. educational software, educational broadcasts, podcasts)
<input type="checkbox"/> Exchange with colleagues about new teaching methods	<input type="checkbox"/> Social media for exchange, reflection or inspiration
<input type="checkbox"/> Collegial mentoring	<input type="checkbox"/> Self-learning via trial and error
<input type="checkbox"/> Practice research with colleagues (e.g. specific development, testing and evaluation of new teaching concepts)	<input type="checkbox"/> Participation in quality circles
<input type="checkbox"/> Attending career-related information events	<input type="checkbox"/> Networking
<input type="checkbox"/> Attending career-related fairs, congresses etc.	<input type="checkbox"/> Other opportunities: <input type="text"/>

Welche Möglichkeiten informellen Lernens nutzen Sie meistens?

Bitte wählen Sie max. 5 Möglichkeiten.

<input type="checkbox"/> Lesen von fachdidaktischen Zeitschriften/ Büchern	<input type="checkbox"/> Teilnahme an Fachvorträgen
<input type="checkbox"/> Lesen von fachwissenschaftlichen Zeitschriften/ Büchern	<input type="checkbox"/> Digitale Bildungsangebote (u. a. Lernsoftware, Bildungssendungen, Podcasts)
<input type="checkbox"/> kollegialer Austausch über neue Vorgehensweisen im Unterricht	<input type="checkbox"/> Soziale Medien zum Austausch, zur Reflexion oder Inspiration
<input type="checkbox"/> kollegiales Mentoring	<input type="checkbox"/> Selbstlernen durch Beobachten und Ausprobieren neuer Unterrichtsformen/-inhalte
<input type="checkbox"/> gemeinsame Praxisforschung mit anderen Kolleg*innen (z. B. gezielte Entwicklung, Erprobung und Evaluation neuer Unterrichtskonzepte)	<input type="checkbox"/> Teilnahme an Qualitätszirkeln
<input type="checkbox"/> Besuch berufsbezogener Informationsveranstaltungen	<input type="checkbox"/> Netzwerken
<input type="checkbox"/> Besuch berufsbezogener Fachmessen, Kongresse etc.	<input type="checkbox"/> andere Möglichkeiten: <input type="text"/>

Fig. 10 Excerpt from the questionnaire on the question “What opportunities for informal in-service training do you use most of the time?” (above the English translation, below the German original).

How do you usually become aware of in-service training offers or are you informed about the possibilities?
You can choose more than one answer.

- ☐ Website of the school board/state institutes
- ☐ Website of external in-service training providers
- ☐ Printed catalogues for in-service training opportunities
- ☐ Announcements in association journals
- ☐ Notices/displays at school
- ☐ Announcements by the headmaster/subject coordinators
- ☐ Colleagues
- ☐ Newsletter
- ☐ Social Media
- ☐ Other ways:

Wie werden Sie in der Regel auf Fortbildungsangebote aufmerksam bzw. über die Möglichkeiten informiert?
Mehrfachnennungen sind möglich.

- ☐ Website der Schulbehörde/ Landesinstitute
- ☐ Website von externen Fortbildungsträgern
- ☐ gedruckte Fortbildungskataloge
- ☐ Ankündigungen in Verbandszeitschriften
- ☐ Aushänge/ Auslagen in der Schule
- ☐ Ankündigungen durch die Schulleitung/ Fachschaft
- ☐ Kolleg*innen
- ☐ Newsletter
- ☐ soziale Medien
- ☐ Sonstiges:

Fig. 11 Excerpt from the questionnaire on the question “How do you usually become aware of in-service training offers or are you informed about the possibilities?” (above the English translation, below the German original).

To what extent do the following statements apply to you?

	completely true	rather true	rather not true	not at all true
By attending formal in-service training courses for the subject German, I have received impulses that I can/could use for my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get concrete teaching suggestions through formal in-service training courses that I can easily implement into class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have already used teaching impulses for the subject German from further formal in-service training courses in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During formal in-service training opportunities, I have received impulses that I can/could use for my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The effort of class preparation has been reduced for me thanks to content from formal in-service training courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I get access to new insights in German didactics through formal in-service training courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I teach (can teach) according to the current state of the art of German didactics through my formal in-service training courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Inwieweit treffen die folgenden Aussagen auf Sie zu?

	stimmt völlig	stimmt eher	stimmt eher nicht	stimmt überhaupt nicht
Ich habe in den besuchten formellen Fortbildungen für das Fach Deutsch Impulse erhalten, die ich für meinen Unterricht nutzen kann/ könnte.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe Unterrichtsimpulse aus formellen Fortbildungen für das Fach Deutsch bereits im Unterricht eingesetzt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich bekomme in formellen Fortbildungen konkrete Unterrichtsvorschläge, die ich einfach umsetzen kann.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich kann Unterrichtsimpulse aus formellen Fortbildungen erst zukünftig einsetzen, weil ich den Stoff noch nicht unterrichtet habe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Aufwand für die Unterrichtsvorbereitung ist durch die von mir besuchten formellen Fortbildungen geringer geworden.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe das Gefühl, dass ich durch formelle Fortbildungen einen Zugang zu neuen Erkenntnissen der Deutschdidaktik bekomme.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe das Gefühl, dass ich durch meine formellen Fortbildungen nach aktuellem Stand der Deutschdidaktik unterrichte(n) (kann).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 12 Excerpt from the questionnaire on the statements about formal CPD (above the English translation, below the German original).

To what extent do the following statements apply to you?

	completely true	rather true	rather not true	not at all true
Through informal in-service training opportunities, I have received impulses that I can/could use for my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get concrete teaching suggestions through informal in-service training opportunities that I can easily implement into class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have already used teaching impulses for the subject German from informal in-service training opportunities in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During informal in-service training opportunities, I have received impulses that I can/could use for my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The effort of class preparation has been reduced for me thanks to content from in-service training opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I get access to new insights in German didactics through informal in-service training opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I teach according to the current state of the art of German didactics through my informal in-service training.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Inwieweit treffen die folgenden Aussagen auf Sie zu?

	stimmt völlig	stimmt eher	stimmt eher nicht	stimmt überhaupt nicht
Ich habe durch das informelle Lernen Impulse erhalten, die ich für meinen Unterricht nutzen kann/könnte.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe Unterrichtsimpulse für das Fach Deutsch aus informellen Lerngelegenheiten bereits im Unterricht eingesetzt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich bekomme durch informelles Lernen konkrete Unterrichtsvorschläge, die ich einfach umsetzen kann.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich kann Unterrichtsimpulse aus informellen Lerngelegenheiten erst zukünftig einsetzen, weil ich den Stoff noch nicht unterrichtet habe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Der Aufwand für die Unterrichtsvorbereitung ist durch die Inhalte meiner informellen Lerngelegenheiten geringer geworden.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe das Gefühl, dass ich durch informelles Lernen einen Zugang zu neuen Erkenntnissen der Deutschdidaktik bekomme.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe das Gefühl, dass ich durch mein informelles Lernen nach aktuellem Stand der Deutschdidaktik unterrichte(n) (kann).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 13 Excerpt from the questionnaire on the statements about informal CPD (above the English translation, below the German original).