

Changeability of pre-service teachers' beliefs about multilingualism: a person- and transition-centered approach

Lotta Kardel^a , Timo Ehmke^a  and Svenja Lemmrich^b 

^aInstitute of Educational Sciences, Leuphana University, Lüneburg, Germany; ^bInstitute of Mathematics and its Didactics, Leuphana University, Lüneburg, Germany

ABSTRACT

Teachers of all subjects and grades must remain aware of the linguistic and cultural diversity among their students, as second language learners often experience educational disadvantages. Therefore, (pre-service) teachers must acquire pedagogical language knowledge and skills in linguistically responsive teaching (LRT), and develop positive beliefs about multilingualism. To analyze the changeability of German pre-service teachers' beliefs about multilingualism, our study combined a person- and transition-centered approach with a longitudinal design. Pre-service teachers ($n=312$) from nine universities across Germany were surveyed before and after attending academic opportunities to learn (OTL) about LRT. We used a validated questionnaire to capture participants' beliefs about (1) valuing family languages other than German, (2) feeling responsible for language teaching, and (3) valuing multilingualism in class. Our findings showed a significant positive change in beliefs between the pre- and post-tests. Latent transition analysis demonstrated differences among beliefs; therefore, we identified three profiles of pre-service teachers: *the uninvolved criticals*, *the responsible controllers*, and *the consistent supporters*. Moreover, we identified different transition patterns: the OTL changed the beliefs of half of the participants to enable them to move between profiles (especially *the uninvolved criticals*).

ZUSAMMENFASSUNG

Lehrkräfte aller Fächer und Lehrämter müssen in der Lage sein, sprach- und kulturbewusst zu handeln, wenn sie mehrsprachige und kulturell vielfältige Schüler*innen unterrichten, insbesondere da Lernende mit Migrationshintergrund häufig unter herkunftsbedingten Bildungsnachteilen leiden. (Angehende) Lehrpersonen sollten daher pädagogisches Sprachwissen und Kompetenzen für sprachsensiblen Fachunterricht erwerben sowie positive Überzeugungen hinsichtlich Mehrsprachigkeit entwickeln. In der vorliegenden Studie wurde ein personen- und transitionen-zentrierter Ansatz angewandt und mit einem Längsschnitt-Design kombiniert, um die Veränderbarkeit der Überzeugungen angehender Lehrkräfte hinsichtlich Mehrsprachigkeit

ARTICLE HISTORY

Received 24 September 2023
Accepted 1 November 2024

KEYWORDS

Teachers' beliefs;
multilingualism;
linguistically responsive
teaching; opportunities to
learn; teacher education;
latent transition analysis

CONTACT Lotta Kardel  lotta.kardel@leuphana.de  Institute of Educational Sciences, Leuphana University, Universitätsallee 1, C1. 232, 21335, Lüneburg, Germany

© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

zu untersuchen. Lehramtsstudierende ($n=312$) neun deutscher Universitäten wurden befragt, bevor und nachdem sie an einer universitären Lerngelegenheit zum sprachsensiblen Fachunterricht teilgenommen hatten. Mit einem validierten Fragebogen konnten die Überzeugungen der Teilnehmenden auf drei Skalen gemessen werden: (1) Wertschätzung nicht-deutscher Familiensprachen, (2) Zuständigkeit für Sprachbildung und (3) Mehrsprachigkeit im Unterricht. Unsere Ergebnisse zeigten einen signifikanten Anstieg der Überzeugungen zwischen dem Prä- und Post-Test. Eine latente Transitionsanalyse verdeutlichte Unterschiede zwischen den Überzeugungen, woraufhin drei Profile von Lehramtsstudierenden bestimmt wurden: *die unbeteiligten Kritiker*innen*, *die verantwortungsbewussten Kontrollierenden* und *die stetig Unterstützenden*. Darüber hinaus waren verschiedene Bewegungsmuster zu ermitteln. 50% der Teilnehmenden veränderten ihre Überzeugungen in Folge der Lerngelegenheit, sodass sie zwischen den verschiedenen Profilen wechselten (insbesondere *die unbeteiligten Kritiker*innen*).

PLAIN LANGUAGE SUMMARY

Teachers of all subjects and grades must be aware of the linguistic and cultural diversity among their students, as children with migrant backgrounds often experience educational disadvantages. Teachers must thus acquire pedagogical language knowledge and skills in linguistically responsive teaching, and develop positive beliefs about multilingualism. In this study, we investigated the beliefs of 312 pre-service teachers from nine universities across Germany before and after participating in a linguistically responsive teaching course. A questionnaire was used to capture pre-service teachers' beliefs about (1) valuing family languages other than German, (2) feeling responsible for language teaching, and (3) valuing multilingualism in class. Our findings showed a positive change in the participants' beliefs about multilingualism after attending the course. Through an innovative analysis (latent transition analysis), we identified differences among beliefs, and distinguished three profiles of pre-service teachers: *the uninvolved criticals*, *the responsible controllers*, and *the consistent supporters*. Moreover, we found that the course changed the beliefs of half of the participants, which enabled them to move between the profiles. Most participants, who changed their positions, were members of *the uninvolved criticals*, and moved to a profile characterized by more positive beliefs. These results highlight the need for more linguistically responsive teaching courses in teacher education.

Introduction

Globalization and immigration worldwide have led to a linguistically and culturally heterogeneous society. Germany's history in terms of the refugee movement and migration following the Second World War has made it a multilingual and multicultural country, as the languages of migrant families have been passed on to younger generations (Berkel-Otto et al., 2021). In Germany, more than a fourth of the population has a migrant background, and many students grow up with knowledge of more than one family language (Berkel-Otto et al., 2021; Federal Office of Statistics (Statistisches Bundesamt/StBA), 2022). However, in

schools, German is the dominant, and in some contexts, the only legitimate language through which learning is imparted ('monolingual habitus', Gogolin, 2008), and teachers often do not feel well-trained to teach multilingual students or include non-German family languages in class (Becker-Mrotzek et al., 2012). Findings show that skills in the (academic) language of teaching are essential for educational participation and learning (e.g. Heppt et al., 2016; Townsend et al., 2012). Given that the language of instruction is mostly German, multilingual students with migrant backgrounds or German as a second language often experience educational disadvantages (Schroedler & Grommes, 2019). Therefore, preparing teachers to support the needs of multilingual learners has become a relevant task and research topic in teacher professionalization. (Pre-service) teachers need to develop competencies in *linguistically responsive teaching* (LRT), meaning pedagogical language knowledge and skills (e.g., principles of second language learning or identifying language demands of classroom tasks) to support, appreciate, and benefit their students' linguistic diversity (Lucas & Villegas, 2013). Educational researchers have emphasized that pre- and in-service teachers' views on how to deal with linguistically diverse learners guide their (prospective) teaching behavior in diverse classrooms (e.g. Hachfeld et al., 2015). As such, (pre-service) teachers also need to develop affirmative professional beliefs about multilingualism in school. In teacher education, appropriate opportunities to learn (OTL) are required where pre- and in-service teachers can obtain and apply pedagogical language knowledge and skills and are enabled to critically reflect on their underlying beliefs about multilingualism and multilingual learners (Lucas & Villegas, 2013). While this need has long been recognized in the USA where corresponding LRT-relevant OTL have been implemented in teacher education, it is 'a fairly new endeavor in Germany' (Hammer et al., 2018, p. 9), as well as other countries such as Finland, Norway or New Zealand (Alisaari et al., 2019b; Bonness et al., 2022). Several international studies discuss a lack of LRT-relevant OTL in teacher education (De Angelis, 2011; Llompарт & Birello, 2020; Vikøy & Haukås, 2021). In Germany, LRT-relevant course offerings differ regarding the number of OTL offered, their mandatory nature and content depending on the university, and the studied training courses or teaching subjects (Berkel-Otto et al., 2021; Paetsch & Heppt, 2021). As a result, while LRT-relevant OTL exist in the field of German teacher education, they are still not sufficiently implemented in a nationwide teacher education program for all training courses and school subjects (Ehmke & Lemmrich, 2018; Paetsch et al., 2023). To create a more appropriate LRT-relevant course offering, besides knowledge transfer, pre-service teachers' beliefs should be considered as a part of professional competency affecting the prospective actions of pre-service teachers (Blömeke, 2017; Kaiser & König, 2019).

The present study is based on a pre-post evaluation of different LRT-relevant OTL at various German universities. Pre-service teachers' professional beliefs about multilingualism were measured using a quantitative questionnaire. To gain new information on pre-service teachers' beliefs about multilingualism, this study applied a person- and transition-centered approach by conducting a latent transition analysis. This approach enabled us not only to classify pre-service teachers with similar beliefs about multilingualism into unique sub-groups, or profiles, within our sample, but also to investigate whether the profiles changed owing to the LRT-relevant OTL. Although there is no evidence of how people transition (or do not) from one belief-based profile to another, related research has shown that pre-service teachers' beliefs about multilingualism can change positively after attending LRT-relevant OTL (Fischer & Lahmann, 2020; Schroedler & Fischer, 2020). By analyzing the nature of the

belief-based profiles as well as their changeability between the times of measurement, we aimed to gain relevant information for teacher education, for example, the differences between profiles in terms of training courses or school subjects, and to what extent the beliefs of certain profiles could be changed positively through OTL. To the best of our knowledge, no studies exist on (pre-service) teachers' beliefs about multilingualism that combine a person-centered approach with a longitudinal design. By filling this research gap, our study aimed to evaluate and improve LRT-relevant OTL in teacher education.

Theoretical framework

(Pre-service) teachers' beliefs as a changeable concept?

Since the concept of beliefs has not yet been systematized, terms such as attitudes, beliefs, opinions, orientations, perceptions, values, and views are often used synonymously ('messy construct', Pajares, 1992). In educational psychology, beliefs are defined as 'understandings, premises or propositions about the world that are felt to be true' (Richardson, 1996, p. 103). In research on teacher professionalization, teachers' beliefs are conceptualized as an affective-motivational dimension within the model of professional teacher competency, interacting with teachers' knowledge and actions (Blömeke, 2017; Kaiser & König, 2019). Teachers' beliefs are perceptions and assumptions regarding school- and class-related phenomena, such as teaching, learning, learners, subject matter, and their role as teachers (Borg, 2001). As teachers consciously (explicitly) or unconsciously (implicitly) believe that they are true, their beliefs guide their actions in a professional context and can influence the quality of teaching (Buehl & Beck, 2014; Fives & Buehl, 2012). Therefore, in terms of teacher professionalization, it is important to determine whether teachers' beliefs are changeable. From a psychological perspective, Nespor (1987) described them as resistant and almost impossible to change. Haukås (2016) highlights that 'changes in teachers' beliefs and teaching approaches take time and depend on various factors' (p. 13). However, several studies in the field of multilingualism have shown that the systematic influence of knowledge from academic OTL can cause positive changes in pre-service teachers' beliefs (e.g. Fischer & Lahmann, 2020; Schroedler & Fischer, 2020). In the following subsection, we provide an overview of the previous research findings on pre- and in-service teachers' beliefs about multilingualism.

Research on pre- and in-service teachers' beliefs about multilingualism

In this study, the term multilingualism is based on Schroedler's (2021) inclusive understanding, which mostly covers hybrid forms of allochthonous migration-induced multilingualism, meaning the use of family languages other than German. Besides conceptual frameworks like LRT that suggest what teachers should know and how they should act to do justice to multilingual learners, the results of empirical research on pre- and in-service teachers' beliefs about multilingualism vary widely.

To date, several international studies have revealed general appreciation of multilingualism among pre- and in-service teachers, and some have even provided initial, cross-sectional classifications of (pre-service) teachers based on their beliefs. Quantitative studies in Finland and Germany identified positive beliefs about multilingualism and LRT among pre-service

teachers (Alisaari et al., 2019a; Brandt et al., 2024; Schroedler et al., 2023; Schroedler & Fischer, 2020). In her qualitative interview study, Edelmann (2006) identified different types of primary school teachers in Switzerland based on their beliefs about multilingual students, and their willingness to cooperate with colleagues and parents in this regard. She classified participants into types like 'dissociating-distanced', 'tacitly-acknowledging', and 'cooperative-language-oriented'. Riebling (2013) classified German science teachers' beliefs about multilingual students based on whether they were more or less 'language-oriented' using a questionnaire analysis. Hammer et al. (2016) conducted a questionnaire survey with German pre-service teachers and categorized them based on a latent class analysis (LCA) as 'subject-oriented with low experience', 'naive protector', and 'conscious supporter'. A comparative study between the USA and Germany revealed first cross-cultural differences in teachers' beliefs about multilingualism and LRT, with US-based teachers showing more positive beliefs (Hammer et al., 2018). Otwinowska (2014) found that, although Polish teachers viewed multilingualism as a resource, they lacked the training and confidence to practically implement it. Recent qualitative and mixed-methods studies in Norway reported similar findings, as Norwegian teachers were found to hold positive beliefs about multilingualism and LRT methods, but rarely adopted them in their actual teaching (Haukås, 2016; Lorenz et al., 2021; Xu & Krulatz, 2023).

However, several international studies revealed negative beliefs about multilingualism among pre- and in-service teachers as well. Pappamihiel's (2007) analysis of reflective journals of U.S. pre-service teachers found them to hold negative beliefs about multilingual learners, partly because they would require additional time resources. Further studies with pre-service teachers in Norway and Belgium showed participants' reservations about integrating non-instructional family languages or LRT methods in class (Lorenz et al., 2021; Pulinx et al., 2017; Young, 2014). Overall, many surveyed pre- and in-service teachers held monolingual beliefs, viewed multilingualism negatively or as a challenge (Pulinx et al., 2017; Tandon et al., 2017; Vikøy & Haukås, 2021), felt unprepared or insufficiently experienced to work with multilingual learners (Becker-Mrotzek et al., 2012; Paulsrud et al., 2023), or continuously overlooked their needs in class (Reeves, 2009).

In order to gain more insight into pre- and in-service teachers' beliefs about multilingualism, previous studies explored the relationships between participants' personal and academic backgrounds and their beliefs. (Pre-service) teachers' university and teaching experience (Hammer et al., 2016), language teaching subjects (Paetsch et al., 2023; Riebling, 2013), primary school as training course (Martí Arandiz & Portolés Falomir, 2021), multilingual background (e.g. Bello et al., 2017; Llompert & Birello, 2020; Lorenz et al., 2021) and female gender (Schroedler et al., 2023; Schroedler & Fischer, 2020) seem to positively influence their beliefs about multilingualism. Moreover, few studies used longitudinal data to examine the effect of LRT-relevant OTL in pre- and in-service teacher education on participants' beliefs about multilingualism. Questionnaire-based studies in Germany demonstrated that pre-service teachers' positive beliefs about multilingualism increased after attending an LRT-relevant OTL (Fischer & Lahmann, 2020; Schroedler et al., 2023; Schroedler & Fischer, 2020). This is consistent with recent mixed-methods research conducted in Luxembourg and Austria, which revealed significant positive development of in-service teachers' beliefs about multilingualism through LRT-relevant OTL (Aleksić & Bebić-Crestany, 2023; Döll & Guldenschuh, 2024). Guler (2020) conducted a qualitative

study with U.S. in-service teachers attending an LRT-relevant online OTL, and similarly found a stronger understanding of English language learners' needs among participants due to the OTL.

Two important aspects emerge from the studies discussed above: First, there exist mainly cross-sectional findings in this research area, and second, the internationally measured pre- and in-service teachers' beliefs about multilingualism vary widely from highly positive to negative. By using a longitudinal design, the present study explored the impact of LRT-relevant OTL, as well as participants' personal and academic backgrounds, on their beliefs about multilingualism. To gain more information about the nature and changeability of these beliefs, we aimed to determine whether pre-service teachers can be classified into different profiles based on their beliefs about multilingualism, and whether their profile affiliation can be changed through LRT-relevant OTL.

Research questions

By not only classifying pre-service teachers into belief-based profiles, but also investigating whether participants could move between these profiles, the present study aims to fill a research gap in the field of teacher education. The combination of person- and transition-centering is an innovative approach that allows greater insight on how pre-service teachers' profiles differ, based on their beliefs about multilingualism, e.g. in terms of training courses or school subjects. The study also explores to what extent the beliefs of certain profiles could be changed positively through LRT-relevant OTL.

1. What professional beliefs do pre-service teachers hold about multilingualism before and after attending an LRT-relevant OTL?
2. What characteristics in the personal and academic backgrounds of pre-service teachers correlate with or predict their beliefs about multilingualism?
3. Which profiles exist among pre-service teachers based on their beliefs about multilingualism?
4. Are there transitions between pre-service teachers' profiles after attending an LRT-relevant OTL?

Methodology

To explore pre-service teachers' professional beliefs about multilingualism, we conducted a longitudinal study in the German research project *DaZKom¹-Transfer*.² The project focuses on the professionalization of pre-service teachers' competencies in LRT, as well as their professional beliefs about multilingualism. The present study was conducted with pre-service teachers at nine teacher-education universities across Germany in 2020 and 2021 (Lemmrich & Ehmke, 2024). We collected data from the eastern, western, northern, and southern regions. All participants provided informed consent, and the study was conducted according to the German Research Foundation guidelines. Data were collected during LRT-relevant teacher training in a pre-post design, which means that we evaluated pre-service teachers' beliefs in all semesters before and after OTL. The OTL was university seminars or lectures promoting multilingualism and LRT. As mentioned above, the structural and content-related framework of German teacher education in this field varies, depending on the university. Consequently,

there were courses with focus on German as a second language, linguistic diversity in schools, language in subject teaching, multilingualism, or language awareness in general, all depending on the university as well.

Sample description

The convenience sample comprised of $n = 312$ pre-service teachers. Table 1 shows their personal and academic backgrounds, including age, gender, training course, teaching subjects, and experience with LRT-relevant OTL. On average, the participants were 24 years old. 74% of them were female and 18.3% male. Training courses were broadly spread among primary schools, middle schools, high schools, and others, including vocational and special education. The teaching subjects were distributed as follows: 63.5% were studying one language subject, 24.7% were studying two, and 11.9% were studying no language subject. On average, the participants had dealt with several LRT-relevant sessions during their studies ($M = 2.09$, $SD = 0.78$).

Table 1. Sample description.

		$n (= 312)$	%	M	SD
Age (in years)				24.3	4.06
Gender	Female	231	74		
	Male	57	18.3		
	Missing	24	7.7		
Training course	Primary school	92	29.5		
	Middle school	46	14.7		
	High school	113	36.2		
	Other	60	19.2		
	Missing	1	0.3		
Teaching subjects	0 Languages	77	24.7		
	1 Language, 1 other	198	63.5		
	2 languages	37	11.9		
LRT-relevant OTL*				2.09	0.78

*0 = never, 1 = in one session, 2 = in several sessions, 3 = in a complete course, 4 = in several complete courses.

Quantitative questionnaire as the survey instrument

To explore pre-service teachers' beliefs about multilingualism, we used a quantitative questionnaire (Ehmke et al., 2018; Fischer & Ehmke, 2020). The instrument consisted of three parts: the pre-service teachers' beliefs about multilingualism on three scales, LRT-relevant OTL during participants' studies, and their personal and academic background (gender, age, training courses, and teaching subjects). The parts measuring pre-service teachers' beliefs and LRT-relevant OTL are explained below.

Pre-service teachers' beliefs about multilingualism

The participants' beliefs about multilingualism were measured with 21 items on three scales: (1) valuing family languages other than German, (2) feeling responsible for language teaching, and (3) valuing multilingualism in class (Fischer & Ehmke, 2020). The items were developed based on a comprehensive literature review focusing on the theoretical dimensions of professional teacher competency (Fischer et al., 2018). Participants were asked to

rate statements about multilingualism on a four-point Likert scale demonstrating their affirmation or disaffirmation: (0) strongly disagree, (1) rather disagree, (2) rather agree, and (3) strongly agree. Reversed-polarity items were recoded during data analysis. The Cronbach's Alpha-coefficients, which measure the internal consistency of the full-scale, present good reliability scores of $\alpha_{t1}=0.836$ for the first (t1) and $\alpha_{t2}=0.876$ for the second time of measurement (t2).

1. Valuing family languages other than German

The first scale included five items on epistemological beliefs about multilingual language use in learners' homes ($\alpha_{t1} = 0.786$, $\alpha_{t2} = 0.819$). This was introduced by a description of a student who speaks a family language other than German. The statements are implications regarding the learners' language development in a multilingual home like 'It is better if parents communicate with their children in German rather than their family language' (originating from Hammer et al., 2016; published in Fischer & Ehmke, 2019).

2. Feeling responsible for language teaching

The second scale included nine items containing beliefs about teachers' responsibilities for language facilitation in the teaching process ($\alpha_{t1} = 0.698$, $\alpha_{t2} = 0.748$). This was preceded by a fictional conversation in an online forum in which a teacher asked for help in including children who spoke practically no German. The statements represented imagined answers and comprised statements, such as 'Language support is not a task of content class' (originating from Riebling, 2013; published in Fischer & Ehmke, 2019).

3. Valuing multilingualism in class

The third scale consisted of seven items regarding participants' beliefs about multilingualism in the teaching and learning process ($\alpha_{t1} = 0.784$, $\alpha_{t2} = 0.823$). An example is 'When children in the classroom speak other languages besides German, it negatively affects the class atmosphere' (originating from Maak et al., 2015; published in Fischer & Ehmke, 2019).

LRT-relevant OTL

In the last section of the survey, participants were asked about the number and type of thematic LRT-relevant OTL they experienced during their studies. This part of the instrument consisted of nine items, such as 'During the course of your university studies, how often were topics such as second language acquisition phenomena addressed?' ($\alpha_{t1} = 0.880$, $\alpha_{t2} = 0.925$) as adapted from Ehmke and Lemmrich (2018). Participants responded to the items on a five-point Likert scale: (0) never, (1) in one session, (2) in several sessions, (3) in a complete course, and (4) in several complete courses.

Methods of analysis

Data entry and analyses were conducted using the SPSS software (IBM, 2021). Descriptive analyses as well as correlation and regression calculations were performed to investigate the pre-service-teachers' beliefs about multilingualism, and possibly related characteristics in their personal and academic backgrounds (Research Questions 1 and 2). In order to explore

distinct profiles among pre-service teachers based on their beliefs about multilingualism and to investigate transition patterns between these profiles, after the participants attended an LRT-relevant OTL (Research Questions 3 and 4), we conducted a latent transition analysis (LTA) as an extended version of latent profile analysis (LPA) using MPlus6 (Muthén & Muthén, 1998–2017). We identified three models that divided the participants into two, three, and four distinct, non-overlapping subgroups (profiles) based on their average responses to the items of the three scales clarified above. The distinct models were compared in terms of their fit indices and proportions of participants. To gain more information about the different profiles of the best model fit, the MPlus data were linked to the SPSS data. We conducted descriptive analyses and analyses of variance on the personal and academic backgrounds of each profile member. To explore the changeability of the participants' beliefs, we examined the probabilities of different transition patterns from one belief-based profile to another in between the two times of measurement using MPlus6. We then classified the participants as either *movers* or *stayers*.

Findings

General beliefs of German pre-service teachers about multilingualism

Pre-service teachers' professional beliefs about multilingualism were captured on the three scales clarified above. [Table 2](#) shows the central results of the first (t1) and the second time of measurement (t2) for each scale separately as well as the values for the total instrument of all 21 items.

Table 2. Scales description.

Scale	<i>t</i>	<i>M</i>	<i>SD</i>	Δ	<i>t</i> -Test	<i>d</i>
Valuing family languages other than German	t1	1.83	0.59	0.16	***	0.37
	t2	1.98	0.60			
Feeling responsible for language teaching	t1	2.32	0.38	0.15	***	0.42
	t2	2.47	0.38			
Valuing multilingualism in class	t1	1.94	0.52	0.21	***	0.44
	t2	2.15	0.54			
Beliefs in total	t1	2.03	0.38	0.17	***	0.58
	t2	2.20	0.41			

Notes: *t*: time of measurement; *M*: Mean; *SD*: standard deviation; Δ : mean difference; *** $p < 0.001$; *d*: Cohen's *d*.

To answer Research Question 1, 'What professional beliefs do pre-service teachers hold about multilingualism before and after attending an LRT-relevant OTL?', the average mean scores were inspected and compared between t1 and t2. [Table 2](#) shows that the pre-and post-test values increased for all three scales, as well as for the total number of items. In addition to descriptive data, *t*-tests were conducted. The average mean scores improved significantly for all scales, and the most positive change was noted for the scale valuing multilingualism in the class. General beliefs, that is, the average values for the total number of items, also increased significantly from 2.03 at t1 ($SD = 0.38$) to 2.2 at t2 ($SD = 0.41$). Cohen's *d* values range from 0.37 to 0.58, indicating small to medium effects (Cohen, 1988).

Identifying explanatory variables

In response to Research Question 2, 'What characteristics in the personal and academic backgrounds of pre-service teachers correlate with or predict their beliefs about multilingualism?', we conducted correlation and regression analyses for the following variables based on the theoretical assumptions and research results: gender, training courses (primary school, middle school, high school, or other), and experience with LRT-relevant OTL. Moreover, the calculations included whether the participants were studying a language as a teaching subject (0 languages; 1 language, 1 other; and 2 languages). Tables 3 and 4 present the results for t1 and t2, respectively, while Table 5 illustrates the findings for t2, controlling for pre-service teachers' beliefs at t1.

Table 3. Correlations, regressions, and relative weight analysis regarding the pre-service teachers' beliefs about multilingualism at t1 and their personal and academic backgrounds.

	Beliefs t1				
	Correlation	Regression	Relative weight analysis		
	<i>r</i>	beta	Raw	%	Rank
Gender (0 = male, 1 = female)	0.191**	0.122	0.024	25.370	1
Training course					
Primary school	0.130*	0.098	0.012	12.874	3
Middle school	-0.156**	-0.065	0.012	12.679	4
High school	-0.121*	–	–	–	–
Other	0.144*	0.140	0.019	20.148	2
Teaching subjects					
0 Languages	-0.174**	–	–	–	–
1 language, 1 other	0.080	0.069	0.006	6.056	7
2 languages	0.113*	0.104	0.011	11.334	6
LRT-relevant OTL	0.137*	0.075	0.011	11.539	5
<i>R</i> ²	9.4%				

Notes: * $p < 0.05$; ** $p < 0.01$; – = Reference group.

Significant positive correlations at t1 were shown between pre-service teachers' beliefs and female gender, primary school and other as a training course, studying two language subjects, and dealing with LRT-relevant OTL. There were negative correlations between the beliefs and middle or high school as a training course as well as studying non-language subjects.

Table 4. Correlations, regressions, and relative weight analysis regarding the pre-service teachers' beliefs about multilingualism at t2 and their personal and academic backgrounds.

	Beliefs t2				
	Correlation	Regression	Relative weight analysis		
	<i>r</i>	beta	Raw	%	Rank
Gender (0 = male, 1 = female)	0.109	0.046	0.006	6.257	6
Training course					
Primary school	0.136*	0.083	0.011	11.389	3
Middle school	-0.131*	-0.045	0.008	7.950	5
High school	-0.092	–	–	–	–
Other	0.077	0.073	0.006	5.894	7
Teaching subjects					
0 Languages	-0.214***	–	–	–	–
1 language, 1 other	0.129*	0.115	0.014	14.255	2
2 languages	0.093	0.102	0.009	9.870	4
LRT-relevant OTL	0.239***	0.179	0.042	44.385	1
<i>R</i> ²	9.5%				

Notes: * $p < 0.05$; *** $p < 0.001$; – = Reference group.

For t2, there were significant positive correlations between beliefs and primary school as a training course, studying a single language subject, and LRT-relevant OTL. There were significant negative correlations between beliefs, and middle school as a training course, as well as studying non-language subjects. The highest correlation coefficients were found to be positive for LRT-relevant OTL at t1 and t2, and negative for studying no language subjects at t1 and t2.

To explore this further, three regression models with participants' beliefs as the dependent variable were built: one for each time of measurement and one with the control of the beliefs at t1 as the independent variable. To show which variables predict pre-service teachers' beliefs and which have the most relevance, a relative weight analysis was conducted (Mizumoto, 2023). The results illustrated in Tables 3 and 4 demonstrate that almost all the personal and academic characteristics of pre-service teachers were small positive predictors of their beliefs about multilingualism at both times of measurement. Only middle school as a training course was a small negative predictor at t1 and t2. Inspecting the ranking of the different variables, it can be assumed that the participants' gender and training courses in vocational or special education were the most relevant in predicting their beliefs about multilingualism at t1. LRT-relevant OTL have the greatest impact on predicting beliefs at t2, followed by studying one language subject or primary school as a training course.

Table 5. Correlations, regressions, and relative weight analysis regarding the pre-service teachers' beliefs about multilingualism at t2 and their personal and academic backgrounds with control of the beliefs at t1.

	Beliefs t2				
	Correlation	Regression	Relative weight analysis		
	<i>r</i>	beta	Raw	%	Rank
Beliefs t1	0.727**	0.710	0.483	88.429	1
Gender (0 = male, 1 = female)	0.109	-0.045	0.005	0.849	7
Training course					
Primary school	0.136*	0.014	0.006	1.189	4
Middle school	-0.131*	-0.003	0.005	0.997	6
High school	-0.092	–	–	–	–
Other	0.077	-0.024	0.003	0.611	8
Teaching subjects					
0 Languages	-0.214**	–	–	–	–
1 Language, 1 other	0.129*	0.081	0.010	1.782	3
2 languages	0.093	0.042	0.006	1.051	5
LRT-relevant OTL	0.239**	0.086	0.028	5.092	2
<i>R</i> ²	54.6%				

Notes: * $p < 0.05$; ** $p < 0.01$; – = Reference group.

Table 5 shows that with control of the pre-service teachers' beliefs at t1, the predictors at t2 regarding their personal and academic backgrounds decrease both in value and relevance. The pre-service teachers' beliefs at t1 have by far the most impact on predicting their beliefs at t2. Besides that, the number of LRT-relevant OTL is a relevant (positive) predictor.

To sum up, the results regarding Research Question 2 demonstrate that female participants show slightly more positive beliefs about multilingualism. Moreover, it can be assumed that participants who study to be primary, vocational or special education teachers have slightly more positive beliefs than those who will be middle or high school teachers. Also, participants who study one or two language subjects tend to hold more positive beliefs than those who study no language subjects. The most relevant factor was identified to be

attendance of LRT-relevant OTL by pre-service teachers, with high attendance leading to a more highly positive belief about multilingualism.

Pre-service teachers' beliefs and their changeability: insights from latent transition analysis

To answer Research Question 3, 'Which profiles exist among pre-service teachers based on their beliefs about multilingualism?', we identified latent profiles as the first step in the latent transition analysis. An initial run of two to four profiles was analyzed with three indicator variables regarding pre-service teachers' beliefs about multilingualism: (a) mean score of the first scale 'valuing family languages other than German'; (b) mean score of the second scale 'feeling responsible for language teaching'; and (c) mean score of the third scale 'valuing multilingualism in class'. To determine which of the three possible models best fit the data, we compared Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (BIC), and the consistent Akaike information criterion (CAIC) (lower values indicate a better fit). Table 6 shows that the four-profile solution had the smallest AIC, but a higher BIC and CAIC than the three-profile solution. Since the three-profile solution had lower AIC, BIC, and CAIC values than the two-profile solution, we considered it the best model (see the bold column in Table 6).

Table 6. Model fits of the latent transition analyses.

	<i>n</i>	Parameters	Deviance	AIC	BIC	CAIC
2 Profiles	312	21	2193.442	2235.441	2314.044	2335.044
3 Profiles	312	44	2018.430	2106.430	2271.122	2315.122
4 Profiles	312	81	1806.284	1968.284	2271.467	2352.467

Notes: AIC: Akaike's information criterion; BIC: Schwarz's Bayesian information criterion; CAIC: consistent Akaike information criterion.

Three profiles of pre-service teachers based on their beliefs about multilingualism

To show the differences between the identified profiles, Figure 1 illustrates the mean scores of the three scales that quantified the pre-service teachers' beliefs about multilingualism for the second time of measurement.

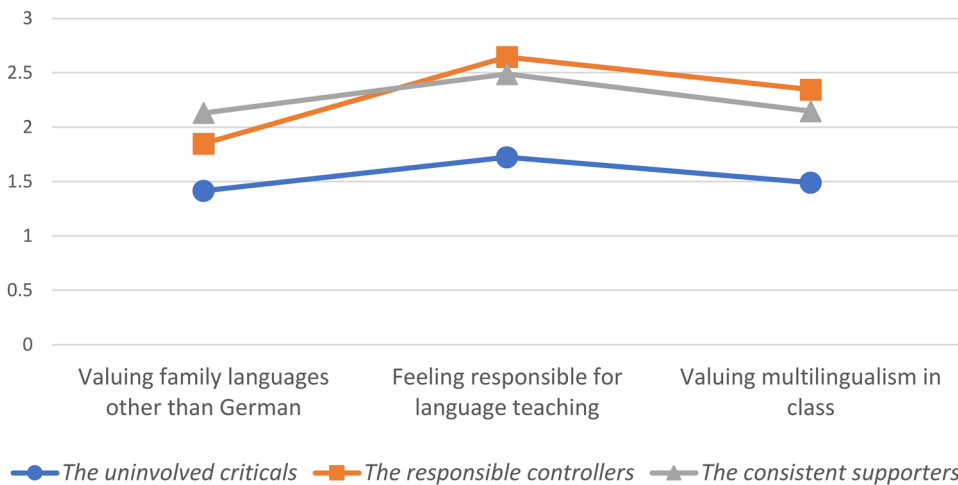


Figure 1. Three-profile solution at t2. Notes: 0 = strongly disagree; 1 = rather disagree; 2 = rather agree; 3 = strongly agree.

The profiles showed three distinct patterns in terms of the general level of acceptance towards multilingualism. All the profiles hold the most approval towards the scale 'feeling responsible for language teaching', but they indicate different patterns for the scales 'valuing other family languages than German' and 'valuing multilingualism in class'. A one-way Welch ANOVA determined a statistically significant difference in participants' average beliefs scores for the different profiles at the second time of measurement ($p < 0.001$). To gain more information about the three profiles, the data were combined with the pre-service teachers' personal and academic backgrounds. Table 7 presents the profile-specific distribution of participants' gender, training course, teaching subject, and experience with LRT-relevant OTL. Furthermore, it illustrates the results of a two-way ANOVA analysis, that was performed to compare the average beliefs between the participants of the different profiles in relation to their characteristics.

Table 7. Personal and academic characteristics of the profiles' members in percentage and means, and analysis of variance (ANOVA) results of the beliefs at t2 regarding different characteristics (C), and profile affiliation (P).

Characteristics (C)	Profile affiliation (P)						ANOVA
	The uninvolved criticals (n = 28; 9%)		The responsible controllers (n = 93; 30%)		The consistent supporters (n = 191; 61%)		C x P F
	%	M	%	M	%	M	
Gender							0.6
Female	71.4		77.4		72.8		
Male	25		15.1		18.8		
Training course							1.06
Primary school	10.7		30		31.9		
Middle school	28.6		12		14.1		
High School	50		37		34		
Other	10.7		22		19.4		
Teaching subject							2.84*
0 Languages	46.4		22		23		
1 Language, 1 other	46.4		63		66		
2 Languages	7.1		15		11		
LRT-relevant OTL		1.61		1.96		2.23	0.71
Beliefs at t1		1.71		2.24		2.21	
Beliefs at t2		1.54		2.28		2.26	

Notes: * $p < 0.05$.

Inspecting the different patterns illustrated in Figure 1, as well as the profile-specific personal and academic backgrounds presented in Table 7, the three profiles can be described as follows:

Profile 1: The uninvolved criticals. With 9% profile 1 formed the smallest group at t2, whereas it was the second largest group at t1 with 36.9% of the participants. Therefore, this profile had the highest drop among members after the pre-service teachers attended LRT-relevant OTL. With a total average score of 1.71 for t1 and 1.54 for t2, this profile is characterized by rather negative beliefs about multilingualism, since a score of 1.5 is located between 'rather agree' and 'rather disagree'. Therefore, after attending the OTL, participants' beliefs who stayed members of this profile, on average, not only did not change positively, but also degraded. A Games-Howell *post hoc* test found participants of this profile to demonstrate statistically significantly lower belief scores compared to the

other profiles ($p < 0.001$). Inspecting the different values of scales 1 and 3, this profile shows the most critical beliefs about valuing non-German family languages and multilingualism in class. At the same time, members of this profile feel the least responsible for language teaching (scale 2), and so, we labeled them *the uninvolved criticals*. In comparison to the other profiles, *the uninvolved criticals* had the highest proportion of men (25%). Most of the pre-service teachers in this profile were pre-service teachers in high schools (50%) or middle schools (28.6%) with one (46.4%) or no language subjects (46.4%). With an average score of 1.61 ($SD = 0.82$), they had dealt with something between one and several sessions on multilingualism during their studies, which was the least experience compared to the other profiles.

Profile 2: The responsible controllers. Profile 2 represented 30% of the participants at t2, whereas it formed the smallest group at t1 with only 9%. Therefore, this profile showed the largest increase in members after the LRT-relevant OTL. With a total average score of 2.24 for t1 and 2.28 for t2, this profile is characterized by high beliefs, since a score of 3 is the maximum. For holding the most positive beliefs about valuing multilingualism in class and feeling responsible for language teaching, members of this profile show a surprisingly low acceptance of valuing non-German family languages, although they improved the most on this scale ($\Delta = +0.29$). These lower belief scores could be related to the fact that, unlike multilingualism in class, they cannot control the language use at home through language teaching. Therefore, members of this profile are called *responsible controllers*. This profile had the highest percentage among women (77.4%). Most of *the responsible controllers* were pre-service teachers in primary (30%) and high schools (37%), with mainly one language teaching subject (63%). They had participated, on average, in several sessions on LRT-relevant topics ($M = 1.96$, $SD = 0.73$).

Profile 3: The consistent supporters. With 54% at t1 and 61% at t2, profile 3 represented the highest number of participants at both times of measurement. In contrast to the other profiles, members of this group showed positive beliefs among all three scales, with an average score of 2.21 at t1 and 2.26 at t2 (considering that each mean score is higher than 2, which represents agreement). Therefore, we labeled them *consistent supporters*. The personal and academic backgrounds of this profile are similar to *the responsible controllers*. A Games-Howell *post hoc* test revealed no statistically significant difference between the beliefs of *the responsible controllers* and *the consistent supporters* ($p = 0.787$). Most of *the consistent supporters* were female pre-service teachers (72.8%) who studied as primary (31.9%) or high school teachers (34%) with one language subject (66%). They had dealt with the most LRT-relevant OTL ($M = 2.23$, $SD = 0.76$), which means that, on average, they had participated in several sessions with LRT-relevant topics.

Inspecting all three profiles, a two-way ANOVA (Table 7) demonstrated that although there was no significant interaction effect between profile affiliation and the characteristics of gender, training course and LRT-relevant OTL, there was for studying at least one language subject ($p = 0.025$). This means that the profile-related differences between the average beliefs about multilingualism is influenced by studying at least one language subject ($F(4) = 2.84$).

Transition patterns between the profiles due to the LRT-relevant OTL

To answer Research Question 4 on whether pre-service teachers changed between the belief-based profiles after attending an LRT-relevant OTL, we identified possible transition patterns as the second step in the latent transition analysis. Table 8 lists the different transition patterns between the profiles from the first (t1) to the second (t2) time of measurement, including their frequencies (%).

Table 8. Transition patterns between the profiles from the first (t1) to the second time of measurement (t2).

	t1	t2	%
Movers (50.3%)	Uninvolved criticals	Consistent supporters	28.5
	Consistent supporters	Uninvolved criticals	0.6
	Consistent supporters	Responsible controllers	21.2
Stayers (49.7%)	Uninvolved criticals	Uninvolved criticals	8.3
	Responsible controllers	Responsible controllers	8.7
	Consistent supporters	Consistent supporters	32.7

Six different patterns were detected for all nine possible transitions, which were subdivided into *movers* and *stayers*. Participants whose beliefs changed such that they transitioned from one profile to another were categorized as *movers*. Participants whose beliefs were stable and remained in the same profile were called *stayers*. The number of *movers* (50.3%) and *stayers* (49.7%) was balanced. Nevertheless, this means that half of the participants' beliefs could be changed by the LRT-relevant OTL in such a way as to enable them to move between profiles.

By inspecting different transitions of the *movers*, two patterns were observed at high frequencies. On the one hand, 28.5% of the participants moved from *uninvolved criticals* to *consistent supporters*, and on the other hand, 21.2% of the participants changed from *consistent supporters* to *responsible controllers*. Considering the subgroup of *stayers*, it becomes clear that with 32.7% most of the pre-service teachers who stayed in one profile remained *consistent supporters*. Almost no movements to *the uninvolved criticals* (0.6%) occurred, and only a few participants remained in this profile (8.3%).

Discussion

The present study contributes to the research on pre-service teachers' beliefs and professionalization regarding multilingualism and LRT. In the following section, we discuss the scientific relevance of this study, its limitations, suggestions for further research, and practical implications.

Scientific significance of the study

Despite increasing attention towards pre-service teachers' beliefs about multilingualism, only a few quantitative studies have evaluated the changeability of these beliefs. The present study addresses this research gap not only by offering a longitudinal design, but also by combining it with an innovative person- and transition-centered approach that allows more insight into

the theoretical concept of pre-service teachers' beliefs. First, we obtained new information regarding the changeability of pre-service teachers' beliefs owing to LRT-relevant OTL by identifying significantly improved mean scores and movements between the different profiles. Second, the application of an innovative approach allowed for further differentiation between distinct types of pre-service teachers' beliefs about multilingualism, which can be used to create more appropriate OTL that promote LRT. Third, this innovative approach highlighted the potential for further analyses of changes in pre-service teachers' beliefs.

Based on our findings for Research Question 1, we describe the participants' beliefs about multilingualism as mediocre when compared to studies that used similar instruments (Fischer et al., 2018; Schroedler et al., 2023; Schroedler & Fischer, 2020). The results also demonstrated a significant improvement between t1 and t2 on each scale as well as in total. Although Schroedler and Fischer (2020) found no such changes in overall beliefs, Fischer and Lahmann (2020) as well as Schroedler et al. (2023) reported similar results to ours. To some extent, our findings suggest that LRT-relevant OTL have a significant impact on pre-service teachers' beliefs about multilingualism. Therefore, in terms of the theoretical structure of beliefs, we support the assumption that (some) pre-service teachers' beliefs can change (Haukås, 2016).

Our findings regarding Research Question 2 indicate that primary school as a training course, language teaching subjects, and LRT-relevant OTL correlate positively with pre-service teachers' beliefs about multilingualism. Middle school as a training course and studying non-language subjects showed negative correlations. Inspecting the predictive power of the different variables, the participants' gender and training courses in vocational or special education had the greatest relevance at t1. OTL has, by far, the greatest impact on predicting beliefs at t2, besides studying one language subject and primary school as a training course. Remarkably, LRT-relevant OTL gained predictive power over the time of measurement. This highlights the importance and need for teacher training. Most of those results appear to be in line with previous findings that were illustrated further above (e.g. Martí Arandiz & Portolés Falomir, 2021; Schroedler et al., 2023; Schroedler & Fischer, 2020). The fact that (pre-service) teachers' (non-)language subjects affect their beliefs about multilingualism seems plausible, as reported by Paetsch et al. (2023) and Riebling (2013). In terms of teacher training, students with language subjects may receive more LRT-relevant input through OTL on subject-specific teaching methods and didactics, or their interest in language may simply be high. The positive impact of primary school as a training course or teaching degree was also discovered by Martí Arandiz & Portolés Falomir (2021). Dealing with younger students who have no reading or writing skills may sensitize (pre-service) teachers to language education. As pre-service teachers' beliefs seem to be changeable (Research Question 1), by creating more LRT-relevant OTL for all pre-service teachers in all training courses and teaching subjects, these academic differences could be compensated.

With regard to Research Questions 3 and 4, we expanded this study using a latent transition analysis. We identified three profiles: *The uninvolved criticals*, *the responsible controllers*, and *the consistent supporters*. Contrary to Brandt et al.'s (2024) findings, pre-service teachers' beliefs about multilingualism were not positive for all profiles. This is plausible, as we focused only on beliefs, while Brandt et al. (2024) used them as one variable in addition to multilingual competency and LRT-relevant OTL. *The uninvolved criticals* are characterized by rather negative beliefs about multilingualism. The personal and academic background of this profile coincide with the explanatory variables explained above; it has the highest percentage among men, and pre-service high or middle school teachers with one or no language

subject(s). In comparison to the other profiles, *the uninvolved criticals* had the least experience with LRT-relevant OTL. This profile shows similarities to ‘the subject-oriented with low experience’ by Hammer et al. (2016) as well as the ‘dissociating-distanced’ by Edelmann (2006), and ‘the less language-orientated type’ by Riebling (2013). In contrast, *the consistent supporters* had positive beliefs about multilingualism, which were reflected in all three scales. This profile mostly comprised pre-service female teachers in primary or high schools with a single language subject. These characteristics are consistent with the aforementioned findings. As *the consistent supporters* have the most experience with LRT-relevant OTL, they are comparable to ‘the conscious supporter[s]’ by Hammer et al. (2016) and ‘the explicitly language-oriented type’ by Riebling (2013). *The responsible controllers* were characterized by feeling very responsible for language teaching, seeing the high relevance of valuing multilingualism in class, but showing a surprisingly lower acceptance of valuing non-German family languages. For this reason, we call these *controllers*, because the language use at home cannot be controlled, in contrast to multilingualism in class. We did not find similar findings in previous studies.

Our latent transition analysis showed that half of the participants’ beliefs about multilingualism could be changed due to the LRT-relevant OTL to enable them to transition to a similarly positive or more positive profile. This clarifies the importance of and need for such OTL. We found that most pre-service teachers either moved from *uninvolved criticals* to *consistent supporters*, transitioned from *consistent supporters* to *responsible controllers*, or remained in the profile of *the consistent supporters*. As there were almost no transitions to *the uninvolved criticals* but most movements away from this profile, our findings highlight the positive change in pre-service teachers’ beliefs due to the LRT-relevant OTL.

Limitations and further research

Despite its theoretical contributions and empirical insights, this study had some limitations. One of these is the sample size of $n=312$ which is a limiting factor for the application of advanced analyses. In terms of latent transition analysis, an increase in the data could prevent the small size of some profiles and, therefore, would be more informative. The main limitation of our study concerns the seminar concepts explained above. The LRT-relevant OTL was not the same for all participants, as they were studying at different German universities. The thematic input received by the participants could not be controlled; therefore, the impact of LRT-relevant OTL must be considered with caution. However, our findings provided information about pre-service teachers’ beliefs about multilingualism and how they intend to engage with it. It must be noted that the measured beliefs do not represent the pre-service teachers’ actual professional actions in classrooms, which may differ from our results and conclusions.

This study has several implications for future studies. First, we extended this investigation to a mixed-methods design by conducting qualitative interviews with the participants of each profile. Second, more longitudinal research is required to evaluate the changes in pre-service teachers’ beliefs. Third, we need to gain more information about the professional actions of (pre-service) teachers. In this sense, pre- and in-service teachers’ beliefs about multilingualism can be measured in a performance-oriented manner using video sequences. This would allow for greater focus on the conative component of professional teachers’ beliefs. We also recommend conducting experimental studies on the changeability of pre-service teachers’ beliefs through LRT-relevant OTL.

Implications for practice

As we have lived in a linguistically and culturally heterogeneous society for decades, universities and schools must fulfill their responsibility of preparing pre-service teachers to act responsibly when teaching multilingual and multicultural students. Our study highlights the importance of promoting affirmative beliefs about multilingualism among pre-service teachers through teacher education. By analyzing the changeability of pre-service teachers' beliefs about multilingualism through a person- and transition-centered approach, we were able to identify different profiles and transition patterns among participants. We demonstrated that most participants transitioned to either similarly positive or more positive profiles through LRT-relevant OTL, particularly moving away from the profile of *uninvolved criticals*, which was characterized by rather negative beliefs about multilingualism. Our analysis provided a deeper understanding of this specific group of pre-service teachers in need of developing more positive beliefs: It typically has a higher proportion of men, either studying one language, or not studying any language, and engaged in a high school or middle school training course. Consequently, curricula used in teacher education programs should be altered to incorporate LRT-relevant OTL, primarily in teacher training courses for high schools and for middle schools. Moreover, teacher education should prioritize implementing LRT-relevant OTL in study programs of non-language subjects. Considering that a few pre-service teachers remained in the *uninvolved criticals* profile even after attending the LRT-relevant OTL, the question arises of how to reach this target group in the future. Therefore, teacher education should continue to develop and evaluate new designs of LRT-relevant OTL that enable more reflection on pre-service teachers' beliefs about multilingualism, to help them become linguistically responsive teachers.

Ethical approval

The German Research Foundation (DFG) states that a study requires ethical approval whenever the participants have to endure high emotional or physical strains and cannot be fully informed about the purpose of the study, such as patients who undergo functional Magnetic Resonance Imaging (fMRI) or Transcranial Magnetic Stimulation (TMS) during the course of the study (https://www.dfg.de/foerderung/faq/geistes_sozialwissenschaften/). The authors stated that this study did not affect any of the above-mentioned conditions and therefore did not require ethical approval. However, the participants signed a declaration of consent that contained information about the purpose of the study, the handling and processing of data, and data protection information.

Notes

1. *DaZKom* 'Professionelle Kompetenzen angehender LehrerInnen (Sek I) im Bereich Deutsch als Zweitsprache (DaZ)' (2015–2017). Applicants: Timo Ehmke, Barbara Koch-Priewe, Anne Köker, Udo Ohm. Funded by the BMBF.
2. *DaZKom-Transfer*: Transfervorhaben zu 'DaZKom-Video – Performanznahe Messung von Deutsch-als-Zweitsprache-Kompetenz bei (angehenden) Lehrkräften' (2020–2022). Applicants: Andrea Daase, Timo Ehmke, Barbara Koch-Priewe, Anne Köker, Udo Ohm. Funded by the BMBF.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This study was a part of the research project D-2320-0030-0008-2100, which was supported by the 'Federal Ministry of Education and Research', Germany, under [01PK19001B].

ORCID

Lotta Kardel  <http://orcid.org/0009-0003-4696-2061>

Timo Ehmke  <http://orcid.org/0000-0001-9572-2185>

Svenja Lemmrich  <http://orcid.org/0000-0003-2196-1962>

References

- Aleksić, G., & Bebić-Crestany, D. (2023). Translanguaging stance of preschool teachers working with multilingual children in Luxembourg. *International Journal of Multilingualism*, 20(1), 50–67. <https://doi.org/10.1080/14790718.2022.2143506>
- Alisaari, J., Heikkola, L. M., Commins, N., & Acquah, E. O. (2019a). Monolingual ideologies confronting multilingual realities. Finnish teachers' beliefs about linguistic diversity. *Teaching and Teacher Education*, 80, 48–58. <https://doi.org/10.1016/j.tate.2019.01.003>
- Alisaari, J., Vigren, H., & Mäkelä, M. L. (2019b). Multilingualism as a resource: Policy changes in Finnish education. In S. Hammer, K. M. Viesca & N. L. Commins (Eds.), *Teaching content and language in the multilingual classroom* (pp. 29–50). Routledge.
- Becker-Mrotzek, M., Hentschel, B., Hippmann, K., & Linnemann, M. (2012). *Sprachförderung in deutschen Schulen – die Sicht der Lehrerinnen und Lehrer: Ergebnisse einer Umfrage unter Lehrerinnen und Lehrern*. Mercator-Institut für Sprachförderung und Deutsch als Zweitsprache.
- Bello, B., Leiss, D., & Ehmke, T. (2017). Diversitätsbezogene Einstellungen von Lehramtsstudierenden mit und ohne Migrationsgeschichte. *BzL - Beiträge zur Lehrerinnen- und Lehrerbildung*, 35(1), 165–181. <https://doi.org/10.36950/bzl.35.1.2017.9480>
- Berkel-Otto, L., Hammer, S., Hansen, A., Lemmrich, S., & Schroedler, T. (2021). Multilingualism and teacher education in Germany. In M. Wernicke, S. Hammer, A. Hansen, & T. Schroedler (Eds.), *Preparing teachers to work with multilingual learners* (pp. 82–103). Multilingual Matters.
- Blömeke, S. (2017). Modelling teachers' professional competence as a multi-dimensional construct. In S. Guerriero (Ed.), *Pedagogical knowledge and the changing nature of the teaching profession* (pp. 119–135). OECD.
- Bonness, D. J., Harvey, S., & Lysne, M. S. (2022). Teacher language awareness in initial teacher education policy: A comparative analysis of ITE documents in Norway and New Zealand. *Languages*, 7(3), 208. <https://doi.org/10.3390/languages7030208>
- Borg, M. (2001). Teachers' beliefs. *ELT Journal*, 55(2), 186–188. <https://doi.org/10.1093/elt/55.2.18>
- Brandt, H., Ehmke, T., Kuhl, P., & Leutner, D. (2024). Pre-service teachers' ability to identify academic language features: The role of language-related opportunities to learn, and professional beliefs about linguistically responsive teaching. *Language Awareness*, 33(1), 70–93. <https://doi.org/10.1080/09658416.2023.2193409>
- Buehl, M. M., & Beck, J. S. (2014). The relationship between teachers' beliefs and teachers' practices. In H. Fives & G. M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 66–84). Routledge.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum.
- De Angelis, G. (2011). Teachers' beliefs about the role of prior language knowledge in learning and how these influence teaching practices. *International Journal of Multilingualism*, 8(3), 216–234. <https://doi.org/10.1080/14790718.2011.560669>

- Döll, M., & Guldenschuh, S. (2024). Special issue 20/1: Development of 'deficit perspectives' among primary school teacher students in Austria. *International Journal of Multilingualism*, 21(4), 2325–2339. <https://doi.org/10.1080/14790718.2022.2155655>
- Edelmann, D. (2006). Pädagogische Professionalität im transnationalen sozialen Raum. Eine Studie über Sichtweisen und Erfahrungen von Primarlehrpersonen in Bezug auf die kulturelle Heterogenität ihrer Schulklassen. In C. Allemann-Ghionda, & E. Terhart (Eds.), *Kompetenzen und Kompetenzentwicklung von Lehrerinnen und Lehrern*. (pp. 235–249). Beltz.
- Ehmke, T., Hammer, S., Köker, A., Ohm, U., & Koch-Priewe, B. (2018). *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. Waxmann.
- Ehmke, T., & Lemmrich, S. (2018). Bedeutung von Lerngelegenheiten für den Erwerb von DaZ-Kompetenz. In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.), *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 201–220). Waxmann.
- Federal Office of Statistics (Statistisches Bundesamt/StBA). (2022). *Migration and integration. Bevölkerung in Privathaushalten nach Migrationshintergrund*.
- Fischer, N., & Ehmke, T. (2019). Empirische Erfassung eines "messy constructs": Überzeugungen angehender Lehrkräfte zu sprachlich-kultureller Heterogenität in Schule und Unterricht. *Zeitschrift für Erziehungswissenschaft*, 22(2), 411–433. <https://doi.org/10.1007/s11618-018-0859-2>
- Fischer, N., & Ehmke, T. (2020). *Theoretische Abbildung und empirische Erfassung der Überzeugungen angehender Lehrkräfte zu sprachlich-kultureller Heterogenität in Schule und Unterricht - Fragebogenerhebung*. Datenerhebung 2015. Frankfurt am Main: Forschungsdatenzentrum Bildung am DIPF, Skalensammlung: Version 1.0. <https://doi.org/10.7477/395:246:1>
- Fischer, N., & Lahmann, C. (2020). Pre-service teachers' beliefs about multilingualism in school: An evaluation of a course concept for introducing linguistically responsive teaching. *Language Awareness*, 29(2), 114–133. <https://doi.org/10.1080/09658416.2020.1737706>
- Fischer, N., Hammer, S., & Ehmke, T. (2018). Überzeugungen zu Sprache im Fachunterricht: Erhebungsinstrument und Skaldokumentation. In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.), *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 149–184). Waxmann.
- Fives, H., & Buehl, M. M. (2012). Spring cleaning for the "messy" construct of teachers' beliefs: What are they? Which have been examined? What can they tell us. ? In K. R. Harris, S. Graham, T. Urdan, S. Graham, J. M. Royer, & M. Zeidner (Eds.), *APA educational psychology handbook, vol 2: Individual differences and cultural and contextual factors* (pp. 471–499). American Psychological Association.
- Gogolin, I. (2008). *Der monolinguale Habitus der multilingualen Schule* (2nd ed.). Münster a.o.: Waxmann.
- Guler, N. (2020). Preparing to teach English language learners: Effect of online courses in changing mainstream teachers' perceptions of English language learners. *Innovation in Language Learning and Teaching*, 14(1), 83–96. <https://doi.org/10.1080/17501229.2018.1494736>
- Hachfeld, A., Hahn, A., Schroeder, S., Anders, Y., & Kunter, M. (2015). Should teachers be colorblind? In *How multicultural and egalitarian beliefs differentially relate to aspects of teachers' professional competence for teaching in diverse classrooms* (vol. 48, pp. 44–55). Teaching and Teacher Education. <http://dx.doi.org/10.1016/j.tate.2015.02.001>
- Hammer, S., Fischer, N., & Koch-Priewe, B. (2016). Überzeugungen von Lehramtsstudierenden zu Mehrsprachigkeit in der Schule. *Die Deutsche Schule. Zeitschrift für Erziehungswissenschaft, Bildungspolitik und pädagogische Praxis. Beiheft*, (13), 147–171.
- Hammer, S., Viesca, K. M., Ehmke, T., & Heinz, B. E. (2018). Teachers' beliefs concerning teaching multilingual learners: A cross-cultural comparison between the US and Germany. *Research in Teacher Education*, 8(2), 6–10.
- Haukås, Å. (2016). Teachers' beliefs about multilingualism and a multilingual pedagogical approach. *International Journal of Multilingualism*, 13(1), 1–18. <https://doi.org/10.1080/14790718.2015.1041960>
- Heppt, B., Henschel, S., & Haag, N. (2016). Everyday and academic language comprehension: Investigating their relationships with school success and challenges for language minority learners. *Learning and Individual Differences*, 47, 244–251. <https://doi.org/10.1016/j.lindif.2016.01.004>

- Kaiser, G., & König, J. (2019). Competence measurement in (mathematics) teacher education and beyond. *Higher Education Policy*, 32(4), 597–615. <https://doi.org/10.1057/s41307-019-00139-z>
- Lemmrich, S., & Ehmke, T. (2024). Performance-oriented measurement of teachers' competence in linguistically responsive teaching, relevant learning opportunities and beliefs. *Cogent Education*, 11(1), 2352267. <https://doi.org/10.1080/2331186X.2024.2352267>
- Llompart, J., & Birello, M. (2020). Migrant and non-migrant origin pre-service teachers' beliefs about multilingualism and teaching in multilingual classrooms: Convergences and divergences. *Sustainable Multilingualism*, 17(1), 102–123. <https://doi.org/10.2478/sm-2020-0015>
- Lorenz, E., Krulatz, A., & Torgersen, E. N. (2021). Embracing linguistic and cultural diversity in multilingual EAL classrooms: The impact of professional development on teacher beliefs and practice. *Teaching and Teacher Education*, 105, 103428. <https://doi.org/10.1016/j.tate.2021.103428>
- Lucas, T., & Villegas, A. M. (2013). Preparing linguistically responsive teachers: Laying the foundation in pre-service teacher education. *Theory into Practice*, 52(2), 98–109. <https://doi.org/10.1080/00405841.2013.770327>
- Maak, D., Ricart Brede, J., & Born, S. (2015). Einstellungen von Lehramtsstudierenden zu Mehrsprachigkeit erheben. Bericht über die Anlage eines Forschungsprojektes. In H. Rösch & J. Webersik (Eds.), *Deutsch als Zweitsprache – Erwerb und Didaktik* (pp. 263–282). Klett.
- Martí Arandiz, O., & Portolés Falomir, L. (2021). The effect of individual factors on L3 teachers' beliefs about multilingual education. *Language, Culture, and Curriculum*, 35(4), 1–18. <https://doi.org/10.1080/07908318.2021.1999463>
- Mizumoto, A. (2023). Calculating the relative importance of multiple regression predictor variables using dominance analysis and random forests. *Language Learning*, 73(1), 161–196. <https://doi.org/10.1111/lang.12518>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (Eighth Edition). Muthén & Muthén.
- Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, 19(4), 317–328. <https://doi.org/10.1080/0022027870190403>
- Otwinowska, A. (2014). Does multilingualism influence plurilingual awareness of Polish teachers of English? *International Journal of Multilingualism*, 11(1), 97–119. <https://doi.org/10.1080/14790718.2013.820730>
- Paetsch, J., & Heppt, B. (2021). Teaching German as a second language: Implications for teacher education in Germany. In J. Chin-Kin Lee & T. Ehmke (Eds.), *Quality in teacher education and professional development* (pp. 253–267). Routledge.
- Paetsch, J., Heppt, B., & Meyer, J. (2023). Pre-service teachers' beliefs about linguistic and cultural diversity in schools: The role of opportunities to learn during university teacher training. *Frontiers in Education*, 8, 1236415. <https://doi.org/10.3389/feduc.2023.1236415>
- Pajares, M. F. (1992). Beliefs and educational research. Cleaning up a messy construct. *Review of Educational Research*, 62(3), 307–332. <https://doi.org/10.2307/1170741>
- Pappamihel, E. (2007). Helping Preservice Content-Area Teachers Relate to English Language Learners: An Investigation of Attitudes and Beliefs. *TESL Canada Journal*, 24(2), 42–60. <https://doi.org/10.18806/tesl.v24i2.138>
- Paulsrud, B., Juvonen, P., & Schalley, A. C. (2023). Attitudes and beliefs on multilingualism in education: Voices from Sweden. *International Journal of Multilingualism*, 20(1), 68–85. <https://doi.org/10.1080/14790718.2022.2153851>
- Pulinx, R., Van Avermaet, P., & Agirdag, O. (2017). Silencing linguistic diversity: The extent, the determinants and consequences of the monolingual beliefs of Flemish teachers. *International Journal of Bilingual Education and Bilingualism*, 20(5), 542–556. <https://doi.org/10.1080/13670050.2015.1102860>
- Reeves, J. (2009). A sociocultural perspective on ESOL teachers' linguistic knowledge for teaching. *Linguistics and Education*, 20(2), 109–125. <https://doi.org/10.1016/j.linged.2008.11.001>
- Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. P. Sikula, T. J. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (pp. 102–119). MacMillan.
- Riebling, L. (2013). *Sprachbildung im naturwissenschaftlichen Unterricht. Eine Studie im Kontext migrationsbedingter sprachlicher Heterogenität*. Waxmann.

- Schroedler, T. (2021). What is multilingualism? Towards an inclusive understanding. In M. Wernicke, S. Hammer, A. Hansen, & T. Schroedler (Eds.), *Preparing teachers to work with multilingual learners* (pp. 17–37). Multilingual Matters.
- Schroedler, T., & Fischer, N. (2020). The role of beliefs in teacher professionalisation for multilingual classroom settings. *European Journal of Applied Linguistics*, 8(1), 49–72. <https://doi.org/10.1515/eujal-2019-0040>
- Schroedler, T., & Grommes, P. (2019). Learning about language: Preparing pre-service subject teachers for multilingual classroom realities. *Language Learning in Higher Education*, 9(1), 223–240. <https://doi.org/10.1515/cercles-2019-0014>
- Schroedler, T., Rosner-Blumenthal, H., & Böning, C. (2023). A mixed-methods approach to analysing interdependencies and predictors of pre-service teachers' beliefs about multilingualism. *International Journal of Multilingualism*, 20(1), 11–30. <https://doi.org/10.1080/14790718.2022.2125975>
- Tandon, M., Viesca, K. M., Hueston, C., & Milbourn, T. (2017). Perceptions of linguistically responsive teaching in teacher candidates/novice teachers. *Bilingual Research Journal*, 40(2), 154–168. <https://doi.org/10.1080/15235882.2017.1304464>
- Townsend, D., Filippini, A., Collins, P., & Biancarosa, G. (2012). Evidence for the importance of academic word knowledge for the academic achievement of diverse middle school students. *The Elementary School Journal*, 112(3), 497–518. <https://doi.org/10.1086/663301>
- Vikøy, A., & Haukås, Å. (2021). Norwegian L1 teachers' beliefs about a multilingual approach in increasingly diverse classrooms. *International Journal of Multilingualism*, 20(3), 912–931. <https://doi.org/10.1080/14790718.2021.1961779>
- Xu, Y. S., & Krulatz, A. (2023). “Multilingualism is a resource, not a difficulty”: Exploring Norwegian teachers' beliefs and reported practices in multilingual settings. *Teaching and Teacher Education*, 136, 104332. <https://doi.org/10.1016/j.tate.2023.104332>
- Young, A. S. (2014). Unpacking teachers' language ideologies: Attitudes, beliefs, and practiced language policies in schools in Alsace, France. *Language Awareness*, 23(1–2), 157–171. <https://doi.org/10.1080/09658416.2013.863902>

Appendix A. Survey Questionnaire (scale and item collection)

Section 1. Pre-service teachers' beliefs about multilingualism (Fischer & Ehmke, 2020).

Skala: Epistemologische Überzeugungen: Sprachgebrauch zu Hause

Einleitender Text

Stellen Sie sich folgenden Fall vor: Nadja ist in Deutschland geboren. Ihre Eltern sind in Russland geboren, aufgewachsen und dann nach Deutschland ausgewandert. Sie sprechen mit Nadja zu Hause hauptsächlich russisch, manchmal mischen sich das Deutsche und das Russische auch. Inwieweit stimmen Sie den folgenden Aussagen zu?

Items der Skala

Es ist gut, wenn zu Hause in der Familiensprache gesprochen wird.

Wenn zu Hause kein Deutsch gesprochen wird, behindert das den Erwerb der deutschen Sprache. (umgepolt)

Es ist besser, wenn die Eltern mit den Kindern auf Deutsch und nicht in der Familiensprache sprechen. (umgepolt)

Nadjas Eltern sollten aufpassen, dass das Russische das Deutsche nicht verdrängt. (umgepolt)

Die russische Sprache sollte zu Hause gefördert werden.

Antwortkategorie

Wert	Bedeutung
0	stimme überhaupt nicht zu
1	stimme eher nicht zu
2	stimme eher zu
3	stimme voll zu

Skala: Überzeugungen der Lehrkraft: Zuständigkeit für Sprachförderung im Fachunterricht

Einleitender Text

Sie lesen online den folgenden "Hilferuf" einer Lehrkraft in einem Lehrerforum: "Kinder, die kein Deutsch sprechen, im Unterricht einbinden!" von: HerrMüller, erstellt: 28.02.2014/15:25:21 "Hallo liebe Mitstreiter! Ich bin Lehrer an einer Hauptschule und habe gerade eine neue Klasse (5) bekommen. Es gibt drei Kinder, die die deutsche Sprache überhaupt nicht beherrschen. Ein Kind kommt aus der Türkei und kann noch nicht einmal unser ABC. Was tun???..." Inwieweit stimmen Sie den folgenden Antworten anderer Forenmitglieder auf den Beitrag zu?

Items der Skala

„Unterrichtest du Deutsch in der Klasse? Wenn nicht, würde ich die Deutschlehrkraft auf die Problematik aufmerksam machen, da sie dafür zuständig ist, DaZ-Kinder sprachlich zu fördern.“ (umgepolt)

„Vielleicht solltest du dich nach dem Unterricht oder in einer Freistunde mal mit dem Kind zusammensetzen und herausfinden, wo genau es Probleme gibt. Dann kannst du überlegen, welche Maßnahmen du einleiten könntest, um zu helfen.“

„Ich würde die Aufgabe abgeben und mich bemühen, Förderunterricht zu organisieren.“ (umgepolt)

„Egal welches Fach du unterrichtest – du musst das Kind in deinem Unterricht sprachlich fördern.“

Wie sehr stimmen Sie den folgenden Aussagen zu?

Für Sprachförderung ist ausschließlich Förderunterricht da. (umgepolt)

Sprachförderung ist keine Aufgabe des Fachunterrichts. (umgepolt)

Fachunterricht kann keine Sprachförderung leisten. (umgepolt)

Jeder Fachunterricht muss sprachsensibel geplant werden.

Im Fachunterricht können sprachliche Fehler zwar berichtet, aber es kann nicht systematisch an ihnen gearbeitet werden. (umgepolt)

Antwortkategorie

Wert	Bedeutung
0	stimme überhaupt nicht zu
1	stimme eher nicht zu
2	stimme eher zu
3	stimme voll zu

Skala: Überzeugungen zum Unterrichten: Mehrsprachigkeit im Unterricht

Einleitender Text

Stellen Sie sich folgende Situation vor: Im Mathematikunterricht wird gerade der Zahlenraum bis 100 erlernt. Cem meldet sich und sagt: „Auf Türkisch heißt 1 bir und 21 yirmi bir!“ Inwieweit stimmen Sie den folgenden Aussagen zu?

Items der Skala

DaZ-Lernende sollten im Fachunterricht die Möglichkeit haben, sich von Zeit zu Zeit in ihrer Muttersprache auszutauschen.

Wenn Kinder im Unterricht auch andere Sprachen als Deutsch sprechen, dann leidet das Klassenklima darunter. (umgepolt)

Im Unterricht sollten mehrsprachige Schülerinnen und Schüler ausschließlich Deutsch sprechen, da sie ein Sprachwechsel irritieren könnte. (umgepolt)

Im Fachunterricht sollten die Schülerinnen und Schüler von Zeit zu Zeit Lerninhalte in ihren Herkunftssprachen besprechen dürfen.

In der Schule sollte nur die deutsche Sprache erlaubt sein, damit mehrsprachige Kinder leichter Deutsch lernen. (umgepolt)

Wenn DaZ-Lernende im Unterricht ihre Herkunftssprachen sprechen dürfen, verliert die Lehrkraft die Kontrolle. (umgepolt)

Im Unterricht sollten DaZ-Lernende auch Lernmaterialien (z.B. Bücher) in ihren Herkunftssprachen nutzen dürfen.

Antwortkategorie

Wert	Bedeutung
0	stimme überhaupt nicht zu
1	stimme eher nicht zu
2	stimme eher zu
3	stimme voll zu

Section 2. LRT-relevant OTL (Ehmke & Lemmrich, 2018).

Skala: Thematische DaZ-relevante Lerngelegenheiten

Einleitender Text

Inwiefern wurden bisher folgende Bereiche in Ihrer Lehramtsausbildung thematisiert? Kreuzen Sie bitte in jeder Zeile ein Kästchen an

Items der Skala

(Teil-)Gebiete der Linguistik (z.B.: Syntax, Semantik, Morphologie)
Grammatik des Deutschen
Unterschiede zwischen mündlich und schriftlich geprägter Sprache
Sprachliche Anforderungen verschiedener Darstellungsformen
Erwerb von Bildungssprache
Phänomene des Zweitspracherwerbs
Erwerbsequenzen sprachlicher Entwicklung
Unterschiede zwischen Fremd- und Zweitspracherwerb
Migration und Mehrsprachigkeit
Sprachliche Vielfalt in der Schule
Umgang mit Heterogenität
Sprache und Identität
Sprachstandsdiagnostik
Sprachförderung
Unterstützung des sprachlichen Lernprozesses durch Scaffolding
Sprachsysteme von Zuwanderungssprachen (z.B. Türkisch, Russisch)

Antwortkategorie

Wert	Bedeutung
0	gar nicht
1	in einer Sitzung
2	in mehreren Sitzungen
3	in einer ganzen Lehrveranstaltung
4	in mehreren Lehrveranstaltungen