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Dursun, H.; Claes, E.; Agirdag, O.

**DOI**

[10.1080/2005615X.2021.2006118](https://doi.org/10.1080/2005615X.2021.2006118)

**Publication date**

2021

**Document Version**

Final published version

**Published in**

Multicultural Education Review

**License**

Article 25fa Dutch Copyright Act

[Link to publication](#)

**Citation for published version (APA):**

Dursun, H., Claes, E., & Agirdag, O. (2021). Diversity pedagogical content knowledge: a new conceptual framework and assessment across different teacher education programmes. *Multicultural Education Review*, 13(4), 303-322. <https://doi.org/10.1080/2005615X.2021.2006118>

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RESEARCH ARTICLE



## Diversity pedagogical content knowledge: a new conceptual framework and assessment across different teacher education programmes

Hakan Dursun <sup>a</sup>, Ellen Claes <sup>b</sup> and Orhan Agirdag <sup>a,c</sup>

<sup>a</sup>Laboratory for Education and Society, Ku Leuven, Leuven, Belgium; <sup>b</sup>Centre for Political Research, Ku Leuven, Leuven, Belgium; <sup>c</sup>Department of Educational Sciences, University of Amsterdam, Amsterdam, The Netherlands

### ABSTRACT

Previous work on multicultural teaching competence has mainly focused on teachers' beliefs and attitudes towards ethnocultural diversity. Little attention has been paid to examine the nature of teachers' ethnocultural diversity knowledge. Drawing upon Shulman's model of pedagogical content knowledge, this study presents a novel theoretical framework and a performance-based assessment for examining teachers' ethnocultural diversity knowledge. We collected data from 819 preservice teachers across six teacher education programmes in Belgium, Flanders. Our findings indicate that student teachers in Flanders have limited and low levels of cultural diversity knowledge and there is a significant variation between the mean scores of teacher education programmes. We conclude by arguing that teacher education institutions should make meaningful reforms to develop student teachers' knowledge base regarding ethnocultural diversity.

### ARTICLE HISTORY

Received 15 March 2021  
Revised 21 June 2021  
Accepted 27 July 2021

### KEYWORDS

Teacher education;  
ethnocultural diversity;  
multicultural education;  
teacher knowledge

As classrooms are becoming increasingly diverse in many European countries (Benediktsson & Ragnarsdottir, 2020; Forghani-Arani & Cerna, 2019; Keppens et al., 2019) and others, such as the United States (Acquah & Commins, 2017; Cochran-Smith et al., 2016; Darling-Hammond et al., 2017; Sleeter, 2016), Canada (Kowaluk, 2016; Raza, 2020), Australia (Ollerhead, 2019; Pareja & Lopéz, 2018), and China (Liu et al., 2020; Zhang & Cao, 2017), a pressing need has arisen to adequately prepare student teachers for culturally and linguistically diverse classrooms (Nieto & Bode, 2018; Banks, 2017; Gay, 2018; Forghani-Arani & Cerna, 2019). Within these classrooms, to effectively address issues of equity and social justice, teachers need to develop a broad range of knowledge, including deep knowledge of content, broader understanding of the multiple dimensions of cultures, cultural differences, stereotyping mechanisms as well as knowledge of students' social, cultural, and linguistic contexts and their pedagogical needs (Nieto & Bode, 2018; Gay, 2018). Developing this knowledge base is critical for teachers as it has

a significant impact on their daily teaching, planning, evaluation, and their expectations for students' academic and personal development. (Moloney & Saltmarsh, 2016; Pareja & López, 2018).

In analysing teachers' ethnocultural diversity knowledge, the literature in the field raises two primary issues. First, there is no theoretical framework for understanding the complex nature of teachers' ethnocultural diversity knowledge that is conceptually grounded. Without a tailored conceptualization of teacher knowledge about ethnocultural diversity, we cannot fully understand what teachers need to know about ethnic, cultural, racial, and/or linguistic diversity and we cannot examine whether teacher education programs make progress in transforming this knowledge base. Second, the majority of available measures are self-report evaluations that focus primarily on general cultural knowledge (see Ang et al., 2007; Spanierman et al., 2011; Van Dyne et al., 2012). Although these are adaptable and easy-to-use instruments, they have been critiqued for focusing on multicultural self-efficacy (Leung et al., 2014; Schwarzenhal et al., 2019), not on knowledge. According to studies utilizing these self-report instruments most preservice teachers view themselves as being knowledgeable about multicultural education and teaching minority students (see Iwai, 2013; Kumbong & Piang, 2020; Perkins, 2012; Yeager, 2019). Thus, a direct and objective assessment that specifically depicts teachers' general, pedagogical, and content-related cultural diversity knowledge is also urgently needed.

In this study, we address this gap by suggesting a new theoretical framework and a performance-based assessment for understanding teachers' cultural diversity knowledge. Surely, teacher knowledge is just one element of teacher preparation, and teacher beliefs, values, and, experiences are also very important. However, we will primarily focus on the knowledge dimension as it has been neglected in the teacher knowledge paradigm and multicultural teacher education research.

The two questions guiding this study are: (1) to what extent do pre-service teachers in Flanders develop the knowledge base for and about ethnocultural diversity? And (2) is there a significant difference across teacher education programmes in terms of student teachers' knowledge of diversity? To address these questions, in the following sections, we will first introduce the diversity pedagogical and content knowledge (DivePACK) framework, and next, we will report and discuss the findings of the data collected from six different teacher education programmes in Belgium (Flanders).

## **A Framework for teachers' ethnocultural diversity knowledge**

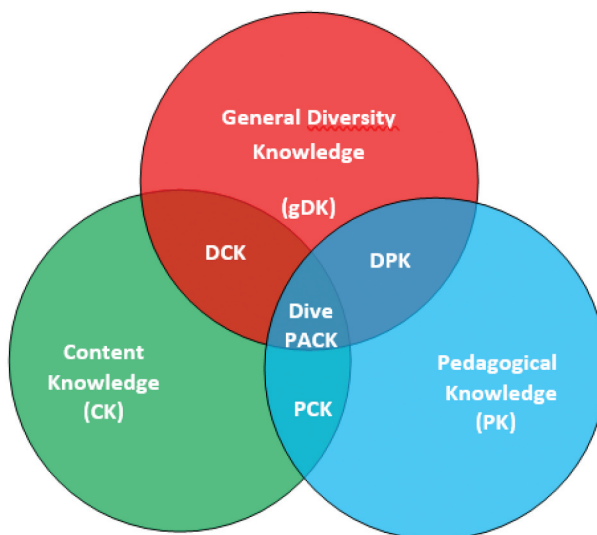
Developing a theoretical grounding for teachers' diversity knowledge is a complex and challenging task because it goes beyond merely identifying the concept of teacher knowledge and multicultural education through existing approaches. In this particular study, we argue that a conceptually based theoretical framework for teacher's cultural diversity knowledge can combine these two research areas and contribute to the existing literature in both fields.

In this study, we use the term knowledge in the sense that it is used in the sociology of knowledge to describe how an individual explains or interprets reality. According to Merriam-Webster's online dictionary, 'knowledge' as a noun is defined as 'the fact or condition of knowing something with familiarity gained through experience or association. The sum of what is known: the body of truth, information, and principles acquired by

humankind' (Knowledge, 2020). Although many complex and dynamic aspects govern knowledge generation, postmodern theorists argue that knowledge is socially constructed, under the influence of personal, cultural, and social elements (Foucault, 1972; Habermas, 1971).

Traditionally, teacher knowledge has been defined as content knowledge (CK) and pedagogical knowledge (PK) in isolation from each other (Ball & McDiarmid, 1990; Shulman, 1986). The study of the structure and content of teacher knowledge began with Shulman (1986, 1987) who made a breakthrough by introducing the notion of pedagogical content knowledge (PCK). Specifically, PCK represents 'the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction' (Shulman, 1987, p. 44). This is the type of knowledge, according to Shulman, that is fundamental to teachers' knowledge of teaching. Many educational researchers turned their attention to the notion of PCK since it represents a unique form of knowledge available only to the profession of teachers.

We argue that, however, in a multicultural and multilingual society teacher knowledge cannot be reduced to CK, PK, or PCK, even though it is related to them. Building on Shulman's model, In Figure 1, we have mapped the central elements of our conception of teachers' ethnocultural diversity knowledge. We first distinguish a separate general diversity knowledge (gDK) dimension that refers to teachers' general knowledge about ethnic, linguistic, religious, racial, and migration-related differences in society. Then, we emphasize the diversity content knowledge (DCK) component, which can be theorized as the intersection between gDK and Shulman's content knowledge. DCK is always subject-matter-specific. The intersection of gDK with pedagogical knowledge (PK) is diversity pedagogical knowledge (DPK). This includes knowledge of pedagogical strategies and approaches for educating students from a variety of cultures, languages, and ethnicities in the classroom.



**Figure 1.** Diversity Pedagogical Content Knowledge (DivePACK).

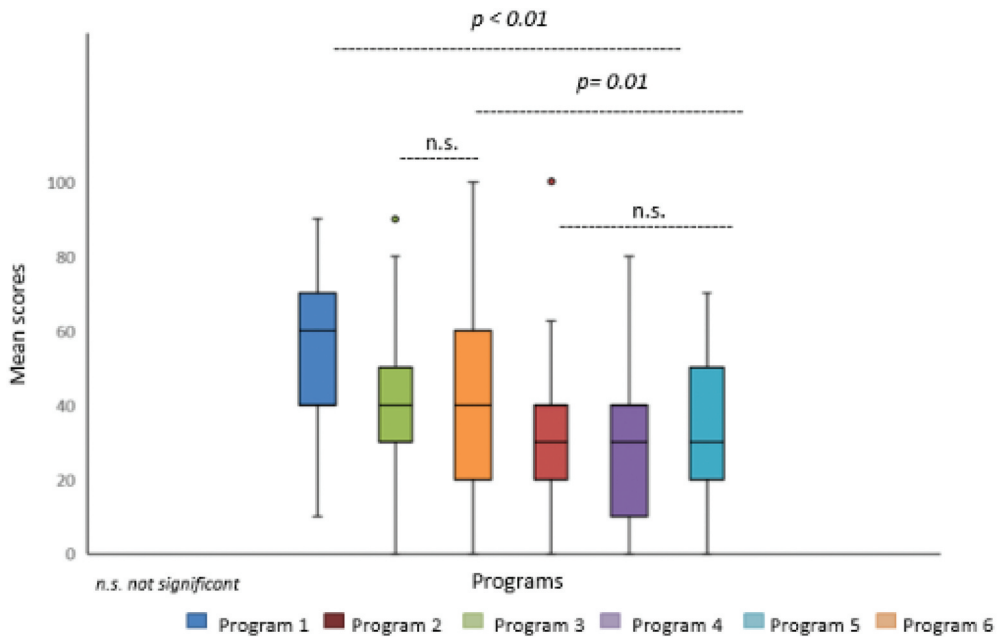


Figure 2. A Boxplot of Mean Scores on the gDK Scale.

The DivePACK framework seeks to illustrate how general cultural knowledge, subject-matter knowledge, and general pedagogical knowledge must be combined to form a specific type of knowledge. It is generalizable to individual teachers working in culturally and linguistically diverse settings and intended to guide policymakers, curriculum designers, and teacher educators. Therefore, it is important to emphasize the core definitions and principles of the framework's following components.

### General diversity knowledge

General diversity knowledge (gDK) is a construct that has been widely used in the literature and is considered to be a specific knowledge that makes one a good teacher in culturally diverse classrooms (Keengwe, 2010; Gay, 2018). Our conception of gDK includes two components: (1) knowledge of one's own culture, its values and concepts, and (2) knowledge of individual cultures, as well as the similarities and differences between them. Similar to Banks' (1993) notion of transformative academic knowledge, gDK challenges the facts, concepts, and paradigms about one's own and other cultures that teachers derive from personal experiences, popular media, or traditional Western-centric academic knowledge. It is not only about acquiring knowledge of other cultures, but rather accepting that cultures are diverse and dynamic, that different cultures exist within a society, and that cultures are powerful dimensions of personal identity. Of course, the specific cultural content that originates from cultural identities may shape the characteristics of gDK. For instance, in the US the knowledge about ethnic and racial diversity might be more important, while in Europe cultural diversity is perceived as religious and linguistic diversity.

Multicultural teaching requires a deep cultural knowledge that moves beyond a static and simplified understanding of culture (Hollins, 2015). Teachers need to master traditional sociocultural concepts in their society and be able to critically reflect on these concepts. For instance, teachers with a high level of gDK will also have a broad knowledge about racism and discrimination in society and power-privilege relationships. They would be able to identify the different languages spoken in the communities and will recognize the sources and negative effects of bias, prejudice, and stereotyping. Thus, gDK is not specifically linked to teaching or education, but it focuses more on ethnic, cultural, and linguistic diversity in society. It is logical to assume that teachers with a high level of gDK will function better in culturally and linguistically diverse schools because they will be more able to understand the cultures, values, and living conditions of their ethnoculturally diverse pupils.

### *Diversity content knowledge*

Diversity content knowledge (DCK) can be theorized as the intersection between gDK and Shulman's content knowledge. It is related to teachers' knowledge of the specific subject they are to teach. However, in multicultural classrooms, knowing a subject well enough to teach requires more than knowing its facts and concepts. It entails recognizing the complex relationship between power and knowledge (Foucault, 1980), which is embedded in official curricula and implicitly produces a global racial discourse (Leonardo, 2002); a White European identity (Goldberg, 2006), and/or an ideology of White European supremacy (Gillborn, 2005) through educational practices (see also Fylkesnes, 2018). Therefore, our notion of DCK represents a broader, deeper, and critical understanding of subject matter and its connections to other content areas, pedagogical principles, and students' ethnic and cultural backgrounds.

Scholars argue that some subjects within a curriculum are more directly embedded in social and cultural contexts (Cochran-Smith, 2004; Milner & Hoy, 2003), such as history, arts, music, languages, geography, and literacy. In recent years, however, a substantial amount of research has documented how STEM (science, technology, engineering, and mathematics) education subtly promotes White European supremacy (see Haynes & Patton, 2019; Hall et al., 2017; Singer et al., 2020; Killpack & Melon, 2016; Vakil & Ayers, 2018). With that in mind, we will examine how DCK functions on both levels.

The dominant mode of instruction in history classes, for instance, tends to reflect the ethnocentric characteristics of national narratives which are always constructed around superior terms and see other cultures, ethnicities, and languages as inferior and odd (Virta, 2009). Students should, however, learn how to critically analyse and evaluate multiple perspectives on historical issues, events, and/or ideas. For example, a teacher with a low level of DCK will refer to the voyages of Columbus as 'the discovery of the Americas', while a teacher with a high level of DCK in history knows that 'discovery' may not be the correct term to refer to an already existing native American civilization. Similarly, for geography, teachers should know that the typical representation of the world on a map (i.e. the Mercator-projection) is intensely flawed. It is not only Eurocentric, but many parts of the world appear much smaller than they are, especially Africa. Traditional literacy, arts, and

music curricula also overlook students' diverse cultural resources and promote Eurocentric notions of artistic expression while emphasizing middle-class values (see Bond, 2017; Boon, 2014; Fitzpatrick, 2012; Shaw, 2012).

The ideology of white European supremacy also works through in STEM education. Throughout human history, scientific means of knowing have been prevalent in many civilizations and individuals, groups, and communities from many cultures have contributed to science and engineering advancements (see Haynes & Patton, 2019; Singer et al., 2020). Science education in many countries, however, fail to represent this diversity (Speed et al., 2019) as it has primarily focused on the work of white European men, narrowing the perception of who performs science, why they do it, and how they do it (Rodriguez & Bell, 2018). This White supremacy and patriarchy can prevent diverse students from thriving and persisting in STEM fields (Killpack & Melon, 2016; Vakil & Ayers, 2018). Teachers must recognize specific contributions to scientific and technical enterprises that are important to the topic, practices, and knowledge they will teach. This deeper and critical understanding of content in STEM education can promote scientific literacy and more equal learning opportunities in STEM disciplines for all students.

As implied above, the content knowledge in multicultural classrooms should bridge the gap between the mainstream school knowledge and students' diverse cultural resources. Rather than transmitting mainstream academic knowledge, it should value students' cultures and reflect their lives and interests to construct a meaningful knowledge base (Banks, 2016). However, DCK alone is insufficient, and higher DCK levels are not necessarily associated with better learning outcomes. In order to provide equitable learning opportunities for all students, teachers also need to know how to deliver instruction in multicultural classrooms

### *Diversity pedagogical knowledge*

The general pedagogical knowledge of teachers has been termed and described in various ways. According to Shulman (1987), it is limited to cross-curricular classroom management and organization methods: 'those broad principles and strategies of classroom management and organization that appear to transcend subject matter' (p. 8). In some models of general pedagogical knowledge, psychological characteristics such as knowledge of various cognitive and motivational learning processes and knowledge of individual student characteristics are included (see König et al., 2011; Voss et al., 2011). Although students' background characteristics, learning styles, motivation are integral components of diversity, how do other elements of culture, such as ethnicity, language, social status, and gender identity affect teaching and learning. Diversity pedagogical knowledge (DPK) that we propose links pedagogical practices with students' ethnocultural characteristics. It includes the knowledge of a wide range of teaching styles and strategies to establish a trusting classroom environment and holding high expectations for all students. Teachers with a high level of DPK, for example, are familiar with strategies to deal with racism and stereotyping, can use cooperative learning techniques to enhance the academic achievement of students of colour, and are aware that low expectations may harm minoritized students' academic performances.

Creating an ethnoculturally responsive classroom environment goes beyond simply controlling misbehaviour and administering discipline in the classroom (Gay, 2018). It entails inspiring all students, establishing positive relationships, and facilitating culturally and ethnically inclusive interactions. To do so, teachers need to develop a broad knowledge of pedagogical methods and intervention strategies which can be studied throughout initial teacher training. They need to build an understanding that the underlying reasons for misbehaviour are located in cultural conflicts, misunderstandings, and inconsistencies between the behavioural norms of schools and culturally diverse students (Gay, 2018). As noted in Monroe and Obidah (2004) student behaviours are more positive when they experience strong feelings of self-belonging and support.

The gDK, DPK, and DCK are the three critical components of the Diversity Pedagogical Content Knowledge (DivePACK). DivePACK is a dynamic form of knowledge and the basis of good teaching in a culturally diverse classroom. It requires teachers to master various bodies of knowledge and it aims to build constructive pedagogical methods and strategies to teach content by utilizing the critical theories of race, ethnicity, culture, and society. In other words, teachers who have high levels of diversity pedagogical and content knowledge (DivePACK) will also have a deeper knowledge about diversity in general (gDK), a broad knowledge of pedagogical strategies and methods (DPK), and a high subject matter knowledge that is adapted to a diverse society (DCK). In particular, DivePACK emerges from the complex relations and interactions between a specific knowledge of one's own and others' cultural heritages, a unique form of content knowledge, and a deeper understanding of pedagogical strategies that are connected to ethnic and cultural diversity.

## The study

Dealing with cultural and linguistic diversity is a challenge for many teachers around the world (Acquah & Commins, 2017; Darling-Hammond et al., 2017; Forghani-Arani et al., 2019), including those in Flanders (Agirdag et al., 2016; Keppens et al., 2019; Strobbe et al., 2017). In order to better understand diverse students' educational needs, teachers should learn about existing cultural concepts, students' diverse cultural backgrounds, and how to deliver instruction that is culturally and linguistically responsive. Since initial teacher education is the first crucial stage in a teacher's professional career, it is important to ascertain to what extent future teachers acquire ethnocultural diversity knowledge. Thus, drawing on the DivePACK framework, the main objective of this study is to examine preservice teachers' general, pedagogical, and content-related knowledge about ethnic, cultural, and linguistic diversity. Moreover, we want to see if there is a significant difference in student teachers' knowledge of diversity across teacher education programmes in Flanders (Belgium). To address the key research objectives, this study employs a quantitative research design. The data sources, instruments, and data analysis procedures are discussed in this section.

## Participants

The region of Flanders is the Dutch-speaking northern part of Belgium. Since the 1960s Belgium has become a permanent country of settlement for many different types of migration from Southern Europe, Northern African countries, and Turkey. As of 2020,



minority residents in Flanders include 170 nationalities and the largest groups are speaking French, English, Berber, Turkish, Arabic, Spanish, Italian, and Polish (Eurydice, 2019). Recent data show that 30% of the preschoolers in Flanders speak a language other than Dutch at home. In cities like Antwerp that is 57% and in Gent 40% (Agirdag, 2020). In Flanders, initial teacher training is provided by three different institutions: (1) university-based, master-level training programs for teaching in upper secondary classrooms; (2) a three-year (bachelor-level) training program in Higher Education Colleges, and (3) Centers for Adult Education (Centra voor Volwassenenonderwijs) that are flexibly organized and primarily offering teaching degrees for vocational and technical secondary education (Simons & Kelchtermans, 2008).

The study population consisted of preservice teachers from six teacher education programmes in Belgium, Flanders. Data were collected during the 2018–2019 academic year. The participants for this study were 819 preservice teachers who are in different stages of their teacher training to become primary, secondary, and higher education teachers. We invited teacher candidates from five bachelor's (Higher Education Colleges) and one university-based master-level teacher education programme to fill a computer-based questionnaire. Of the total sample ( $n = 819$ ), 531 (65 %) were female, with 783 (95 %) identifying themselves as Western European (see Table 1).

### *Instruments*

We used a performance-based assessment to explore teacher candidates' general and pedagogical knowledge regarding ethnocultural diversity. The majority of the existing scales in the field consist of attitude surveys and self-reporting methods. Self-reporting data is often met with scepticism in empirical research as it tends to be limited and biased (Cohen & Swerdlik, 2010; Krumpal, 2013). On the contrary, performance-based tests are more practical to measure knowledge and can be scored reliably.

Since there exists no tailored instrument to measure ethnocultural diversity knowledge, the scales for gDK, DPK, and DCK were constructed specifically for this study. Items were developed from the scholarly literature and empirical studies in the field of multicultural teacher education, culturally responsive pedagogy, and teacher knowledge research. The majority of the items were multiple-choice questions (MCQ) and a few items had a free response, short answer possibility. Although MCQ has its limitations, it can be used for a great variety of educational purposes and they are the most useful format to compare performances and scores accurately and objectively. Scholars argue that MCQ is not only good for measuring lower-level objectives such as knowledge of facts, terms, methods, and principles but also for higher-level objectives such as comprehension, application, and analysis (Brown & Abdulnabi, 2017; Butler, 2018).

In total, more than 120 items were developed (in Dutch) and these items were critically reviewed by university professors and teacher educators. As a result, 20 items were selected for each scale. Following two pilot studies ( $n = 185$  and  $n = 82$ ), we used an item response theory (IRT) analysis to evaluate the items and kept only the ones that had a discrimination value higher than 0.30 and a  $p$ -value between 0.20 and 0.80.

The updated gDK scale contains 10 items and designed to measure participants' basic, factual and conceptual knowledge of ethnic, linguistic, and religious diversity. Of those, eight items were MCQ and two items were free-response questions. Regarding the

**Table 1.** Demographic Characteristics of Preservice Teachers.

Baseline characteristics	N	%
Gender		
Female	531	64.8
Male	284	34.7
Ethnicity		
Western European	783	95.6
Others	36	4.4
Programme type		
Primary education	420	51.3
Secondary education	372	45.5
Higher education	27	3.3
Training phase		
1st year	302	36.9
2nd year	274	30.2
3rd year	270	33.0

knowledge about religious diversity, participants responded to three items. Teacher candidates' knowledge about ethnic and cultural diversity was measured by two short-answer, free-response questions. (see [Table 3](#)).

Preservice teachers' pedagogical knowledge about multiculturalism and multilingualism was explored by several cases and scenarios (10 items). These cases and scenarios include several statements referring to questions about culturally relevant classroom interaction, the ability to create a culturally responsive classroom environment, culturally sensitive teaching strategies, and student expectations. Some items are related to linguistic diversity and two items in the scale emphasize the teacher's understanding of culturally relevant interaction (see [Table 4](#)).

Finally, 10 items were developed to measure the diversity content knowledge of history education students ( $n = 27$ ). Within the limited scope of this study, we could not address all possible subject matters. Therefore, this dimension of the survey is designed to assess future history teachers' intercultural historical competencies. This includes having a critical understanding of one's own culture, its values, facts, and historical relationships between individuals of various cultures. Therefore, questions on this scale primarily focus on the migration history of Europe, knowledge of other cultures, and the history of European colonization in Africa (see [Table 5](#)).

For all scales, low scores reflect a low level of general and pedagogical diversity knowledge while high scores indicate a higher knowledge level. Likewise, mid-range scores can show a general knowledge of some diversity issues or uncertainty for others. We rescaled the scores from 0 to 100 to ease the interpretation. [Table 2](#) provides a summary of descriptive statistics on each scale.

### **Data analysis**

The data analyses were carried out with the statistical software, IBM SPSS Statistics (Version 23). A series of analyses were performed to calculate the scores on the scales. First, a descriptive analysis is conducted to capture preservice teachers' personal and socio-cultural backgrounds. To determine on which scale teacher candidates show

**Table 2.** Descriptive statistics: Frequencies (N), Range (Minimum and Maximum), Means or %, and Standard Deviations.

	N	Min	Max	M	SD
General diversity knowledge	781	0	100	38.16	0.19
Diversity pedagogical knowledge	755	0	100	36.95	0.19
Diversity content knowledge	27	0	100	52.2	0.22

**Table 3.** Mean Scores on Items (General Diversity Knowledge).

Items	Description	% correct
1	Question about the Muslim population in Belgium	18.3
2	Question about non-Belgian residents	19.4
3	Case about linguistic diversity in Belgium	11
4	Question about ethnic groups in Belgium	41.7
5	Religious sects within Islam	60.6
6	Item related to the most spoken languages in the world	66.7
7	Question about Arabic numerals	60.7
8	Major religions of the world	50.6
9	Question about asylum seekers in Belgium	14
10	Conceptual knowledge about integration vs assimilation	38.6

**Table 4.** Mean Scores on Items (Diversity Pedagogical Knowledge).

Items	Description	% correct
1	The need for multiculturalism in a non-diverse school.	41.5
2	Question about stigmatization and cultural affirmation.	37.6
3	Item related to multilingualism and linguistic diversity.	29.5
4	Case about ethnic minority students' school belonging.	52.6
5	Teacher expectations about religiously diverse students.	24.5
6	Case about colour-blind ideology.	18.1
7	Teacher's knowledge of multiple identities.	43.2
8	Understanding ethnic inequalities in education.	49.3
9	Monoculturalism and colour-blind ideology.	40.4
10	Monolingualism and linguistic diversity.	32.9

**Table 5.** Mean Scores on Items (Diversity Content Knowledge).

Items	Description	% correct
1	The role of international organizations in peacekeeping	29.6
2	The history of migration in Belgium	51.9
3	The historical developments of Islamic civilization	85.2
4	Historical facts about the Roman Empire	51.9
5	An item about 'neo-colonialism'	81.5
6	Question about European colonization	55.6
7	Knowledge about China's history	25.9
8	European colonization in Morocco	40.7
9	Historical knowledge about Muslim inhabitants in Europe	59.3
10	The history of Belgian colonization	40.7

a higher or lower score, the frequencies on items and mean scores were calculated. For a multiple-choice question with four options, there is always a 25 % chance for guessing which introduces a level of distortion into the results. However, we did not apply a correction for the guessing formula since it poses a disadvantage to respondents who avoid guessing. Finally, we used a one-way ANOVA to see if there were any significant differences in mean scores between programmes.

## Findings

The purpose of this study was to explore Flemish preservice teachers' general diversity knowledge, diversity pedagogical knowledge, and diversity content (subject-matter) knowledge about ethnocultural diversity. The results of the scales are presented in the following order: the data from the scales is initially displayed, with mean scores for each item. After that, we compare the mean scores of teacher education programmes to see whether there are any variations between them.

### *General diversity knowledge*

This scale has a general mean score of 38.16 (SD = 19.03) showing a significantly low level of general diversity knowledge. Considering the guessing effect in a multiple-choice test with four options, 25% correct scores could mean no knowledge. Table 2 displays the correct response percentages on each item. The highest mean scores are found on item 6 (66.7 %) and item 7 (60.7 %) while the lowest mean scores are on item 3 (11%) and item 9 (14%). The low scores on questions 2, 4, and 9 suggest that respondents in Belgium may have a variety of prejudices about ethnocultural diversity and migration. In comparison with ethnic diversity, respondents seem to score relatively higher on items regarding religious diversity (items 5 and 8). However, these scores (60.6 % and 50.6 %) hardly represent moderate levels of knowledge. Further, the low mean score on item 10 (38.6%) indicates that the majority of preservice teachers cannot identify cultural assimilation. Overall, these mean scores reveal that most preservice teachers in this study have limited knowledge of ethnic, religious, and linguistic diversity.

### *Diversity pedagogical knowledge*

This scale measures whether preservice teachers' pedagogical knowledge is up to date regarding the ethnocultural diversity represented in schools and classrooms. The general mean score of 36.95 % (SD = 19.76) in this scale shows that preservice teachers in this study have a low level of diversity pedagogical knowledge.

The lowest scores on this scale are on item 6 (18.1 %) and item 5 (24.5 %). In item 6, the majority of the preservice teachers failed to recognize that a teacher's decisions might be influenced by the colour or origin of the students. Item 5 aimed to evaluate whether preservice teachers hold a certain level of stereotyping towards Muslim students and their parents. The majority of future teachers think that a male teacher can teach better to Muslim boys or some Muslim student fathers do not shake hands with female teachers because they believe women can be unchaste. As seen in item 3, according to most preservice teachers, using another language in the school is a problematic situation, even in the playground or in the hall. Likewise, preservice teachers think that if students are allowed to speak their mother tongue in the school they will have less motivation to learn Dutch and some students will be excluded (item 10). Regarding student performance on item 8 (49.3 %), most teacher candidates consider that the low performance of ethnic minority students is a result of their capacities and that instructional methods or pedagogical strategies are less decisive than students' efforts.

### *Diversity content knowledge*

The last dimension of the survey explores preservice teachers' basic knowledge of the history of their own culture and relations between other cultures, especially concerning historical inequalities. This scale contains 10 items aiming to measure history education students' intercultural historical knowledge and reaches the highest mean score of the entire instrument (Mean = 52.22 %; SD = 22.92). The results demonstrate, however, moderate levels of subject-specific knowledge about the impact of past and present experiences with members of other cultures.

First, low mean scores on items 2 and 4 show that student teachers lack sufficient knowledge about the history of migration in Belgium and historical facts about the Roman Empire. Second, future history teachers in this study have partial and fragmented knowledge about European colonization in Morocco and Congo (items 6, 8, and 10). Overall, these results suggest that teacher candidates lack knowledge of their own culture as well as the history of relationships between other cultures, particularly in terms of historical inequalities.

### *Differences and similarities across teacher education programmes*

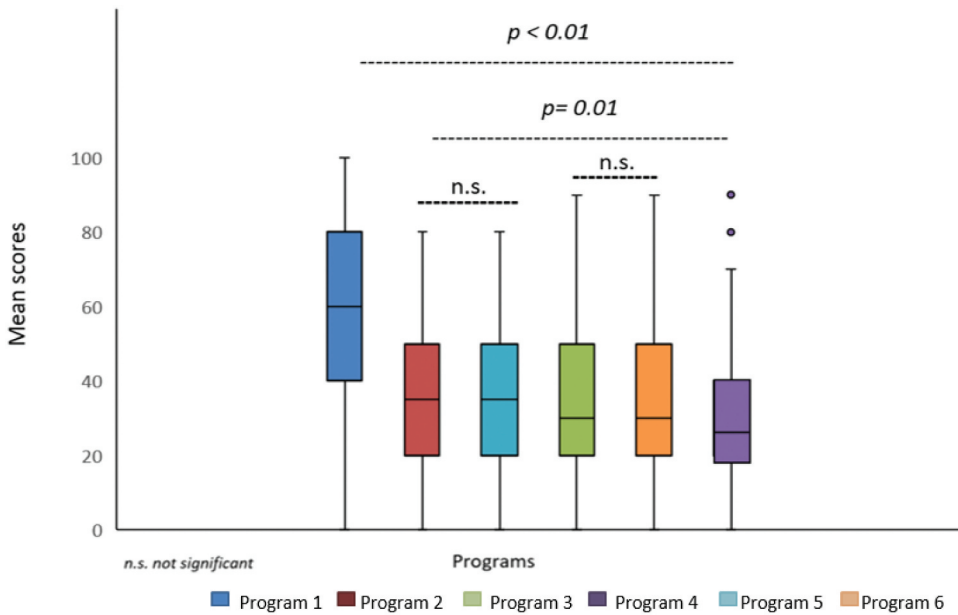
Teachers' knowledge about ethnocultural diversity was examined in six different teacher education programs in Belgium (Flanders). We wanted to see if different teacher education programs prepared teachers differently and if any programs scored significantly higher or lower than the others.

As shown in [Table 6](#), Program1 scored higher on both scales (gDK = 59.09 %, DPK = 56.66 %). This is probably because Program1 is the only university-based MA program in this study. Program 4 had significantly lower mean scores (gDK = 28.96 %, DPK = 31.53 %) than the other programs. There are less variability and a narrower range between the mean scores of the other programs. A one-way ANOVA was conducted to compare the mean scores on gDK and a significant difference was found ( $F(5,775) = 19.30, p = .000$ ) between programs.

Post hoc comparisons using the Tukey HSD test indicated that the mean scores of programs 2, 4, and 5 were not statistically different from each other. On the contrary, the mean scores of programs 3 and 6 are significantly different from other programs. Taken together, these results suggest that there are significant differences between programs for the preparation of future teachers for ethnocultural diversity.

**Table 6.** Mean Scores of Teacher Education Programs.

Programs	General Diversity Knowledge		Diversity Pedagogical Knowledge	
	Mean	SD	Mean	SD
Program 1 (MA)	59.09	19.80	56.66	25.57
Program 2 (BA)	33.92	16.08	37.09	18.90
Program 3 (BA)	44.08	16.73	36.31	20.24
Program 4 (BA)	28.96	17.52	31.53	17.22
Program 5 (BA)	35.09	15.46	37.73	18.55
Program 6 (BA)	40.99	21.11	36.95	19.78



**Figure 3.** Diversity Pedagogical Content Knowledge (DivePACK).

Similarly, a one-way ANOVA has been conducted for DPK between programs. An analysis of variance showed that there is a significant difference between group mean scores ( $F(5,749) = 7.43, p = .000$ ) on the diversity pedagogical knowledge scale.

A post hoc comparison using the Tukey HSD test showed that (Figure 3), the mean score of the university-based MA program (Program1) is significantly higher than the other programs. The differences between Program2 (37.09%) and 5 (37.73%), and Program3 (36.31%) and 6 (36.95%) are not statistically significant. However, there is a statistically significant difference between Program4 (31.53%) and other programs. The compared mean scores and analysis of variance indicate that preservice teachers from different teacher education programs have reached significantly different mean scores on the DPK scale.

## Discussion

In this study, by extending Shulman's (1986) model of pedagogical content knowledge, we attempted to build a theoretical framework of teachers' knowledge base in a culturally diverse society. DivePACK framework identified three key elements for teachers' ethno-cultural diversity knowledge: general diversity knowledge (gDK), diversity pedagogical knowledge (DPK), and diversity content knowledge (DCK). We also created performance-based test items to measure prospective teachers' gDK, DPK, and DCK. The findings indicate that preservice teachers in this study have low levels of general, pedagogical, and subject-matter-related cultural diversity knowledge. These results contrast with previous self-reported assessments, which revealed high levels of cultural knowledge (Perkins, 2012; Iwai, 2013; Kumbong & Piang, 2020; Yeager, 2019; Collins, 2009).

Scholars identify and distinguish three domains of teacher knowledge: subject-matter knowledge, general pedagogical knowledge, and pedagogical content knowledge (Shulman, 1986). In times of globalization and migration, the concept of what teachers need to know can no longer be limited to these three domains. Scholars often argue the role of cultural diversity knowledge in the debate about how to better prepare teachers for ethnoculturally diverse classrooms. (Banks, 2016; Gay, 2018; Zeichner et al., 2015). However, most of these arguments are evaluative rather than founded on comparative empirical inquiry. This study is one of the first to provide empirical evidence for teachers' ethnocultural diversity knowledge.

In contrast to other self-report assessments that reveal high levels of cultural diversity knowledge (see Perkins, 2012; Iwai, 2013; Kumbong & Piang, 2020; Yeager, 2019; Collins, 2009), our test results suggest that preservice students in this study have limited and low levels of general, pedagogical, and subject-matter related knowledge of ethnic and cultural diversity. These results confirm the claims that many teachers enter their teacher training programs and teaching profession with preconceived notions and fragmental knowledge about cultural diversity (Nieto & Bode, 2018; Gay, 2018).

We also wanted to see if any programs scored significantly higher or lower than the others and we found that some programs train teachers much better than the others. The data suggests that many teachers fail to broaden their general, pedagogical, and content-knowledge of ethnocultural diversity during their initial teacher training. This disparity in teacher education programs shows that the curriculum and teaching training practices should be re-evaluated and improved.

Additionally, we have found that preservice teachers in our study scored slightly higher on items related to religious diversity. In a previous study Agirdag et al. (2016) argued that, when it comes to multiculturalism and multicultural education, West-European teachers tend to focus more on religion and religious diversity, rather than ethnic and linguistic diversity. Empirical studies indicate that West-European multiculturalism ignores linguistic pluralism (Agirdag, 2010; Blommaert et al., 2006; Jaspers, 2008). In this study, the low mean scores on items related to ethnic and linguistic diversity are in line with the above-mentioned argument. The majority of preservice teachers in this study have limited knowledge about linguistic diversity. For instance, they are not able to recognize the significant benefits of bilingualism and they view home language use at school as a problematic situation.

Our findings also provide several global implications for teacher education programs and teacher educators. First, in general, education institutions and teacher educators fail to recognize the added value of students' linguistic, cultural, and religious diversity, resulting in an emphasis on assimilation and acculturation, rather than integration as a two-way process (Siarova & Tudjman, 2018). In many teacher education programs issues related to ethnic and cultural diversity are eliminated or marginalized in favour of content-based knowledge and pedagogy (Kerr et al., 2011). Surely, these teacher education practices are extremely valuable and potentially transformative. However, the extent to which they can expand and transform preservice teachers' knowledge in new ways may be limited.

Second, there is an overall lack of strong and sustained commitment to defining the teacher competencies for cultural diversity in teacher education curricula. Multicultural teaching competence is defined as a set of knowledge, beliefs, and abilities that a teacher

must develop in order to effectively work with and respond to the needs of ethnoculturally diverse students (Gay, 2018; Acquah & Commins, 2017). It is widely acknowledged that the majority of future teachers have limited knowledge and experiences about diversity (Ladson-Billings, 2009; Lucas & Villegas, 2013). Teacher candidates can only gain the essential knowledge base through teacher education practices such as coursework and field experiences. Fostering cultural knowledge, beliefs, and attitudes, however, can be challenging for teacher educators and requires deliberate, focused, and committed efforts and strategies (Acquah & Commins, 2017). Critical reflection, writing autobiographies, structured field experiences paired with post-experience reflection, preparing individual action plans for implementing multicultural education, case study analysis, and discussions around themes of diversity are among the strategies described in the Q48 literature as promoting such conditions and atmosphere for learning (Gay, 2018; Acquah & Commins, 2017; Ukpokodu, 2011; Lastrapes & Negishi, 2012).

Third, the acquisition of a knowledge base concerning cultural and linguistic diversity is the first step in becoming culturally competent teachers. Cultural knowledge not only allows student teachers to reflect on their existing attitudes and beliefs about cultural differences but also enables them to implement culturally responsive curricula and instructional methods. This knowledge can be derived from the literature on multicultural teacher education and culturally responsive pedagogy which covers a wide range of topics linked to cultural diversity and education, culture and identity, educational equity, social justice, and so on (Banks, 2017; Gay, 2018; Nieto & Bode, 2018; Lucas & Villegas, 2013; Acquah & Commins, 2017). Teacher educators can incorporate this literature into teacher education curricula to help preservice teachers to develop this knowledge base.

Classrooms today demand committed teachers equipped with a profound knowledge base of students' ethnic and cultural identities. Research shows that teachers' classroom practices and their student expectations are often influenced by their general knowledge and understanding of cultures and diversity (Pareja & López 2018; Yang & Montgomery 2011). To put it another way, teachers' knowledge about students' ethnic and cultural values, languages, and social norms are key factors of their academic achievement and personal development. If teacher education programs and teacher educators are to prepare future teachers who can work effectively with students from diverse backgrounds, they must recognize the need to expand preservice teachers' knowledge base regarding ethnocultural diversity.

## Conclusion

This study examined preservice teachers' knowledge about cultural diversity. It also looked at the differences and similarities between different teacher education programs. Results demonstrate that preservice teachers in this study have low levels of general, pedagogical, and content-related knowledge of cultural diversity. Moreover, there are statistically significant differences between programs, with university-based MA program teacher candidates scoring significantly higher than the others.

Despite the promising findings, this study contains some limitations. First, data for diversity content knowledge (DCK) were obtained from one teacher education program and limited to history education. Because of this limited sample, our results concerning DCK are inconclusive and might not be generalizable. Second, the statistically measurable



differences across programs suggest that other important factors that were not included in this study might be related to preservice teachers' knowledge base. We do not know, however, what makes these differences and why some programs scored significantly higher or lower than others. Future research on the potential effects of curriculum design, fieldwork, and/or previous multicultural experiences may enable us to better understand the characteristics of successful teacher education programs.

## Disclosure Statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by the Onderzoeksraad, KU Leuven [AVL-19-00190].

## Notes on contributors

**Hakan Dursun** is a doctoral student in Educational Sciences at KU Leuven. His research interests include teacher education, multicultural and multilingual education, equity, and social justice in teaching and teacher education.

**Ellen Claes** is an associate professor at the Centre for Political Science Research and the director of the Academic Teacher Training Programme Social Sciences and Philosophy at KU Leuven. Her current research focuses on classroom climate and its potential to reduce ethnic prejudice and increase social and political trust. In addition, she is looking at the effects of various styles of teaching on political knowledge, political interest, political participation and political trust.

**Orhan Agirdag (Ağirdağ)** is an associate professor of educational sciences at KU Leuven and the University of Amsterdam and a member of the Young Academy of Belgium. Formerly, he was a Fulbright Fellow at UCLA. His research lab focuses on teacher education, early childhood education, multilingualism and educational technology. [www.orhanagirdag.com](http://www.orhanagirdag.com)

## ORCID

Hakan Dursun  <http://orcid.org/0000-0002-1937-9757>

Ellen Claes  <http://orcid.org/0000-0002-1726-9837>

Orhan Agirdag  <http://orcid.org/0000-0002-5508-1501>

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