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# Practice-based teacher education: a literature mapping over the past five years

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**ABSTRACT**

How to train future teachers to face the complexity of teaching? The practice-based teacher education approach is recent; the research associated with this approach provides information that may be of value for future research and empirical studies in this area. The objective of this article is to analyze the evidence published in the 2015-2019 period regarding practice-based teacher education, to identify publications on the subject that can contribute to other studies or experiences. As a method, a systematic mapping of the literature was used. The findings show that it is a relevant field in practice-based teacher education studies; those who investigate in this area are mostly from English-speaking countries; the context of the studies is in initial teacher education and the main topics addressed are experiences of implementation of practice-based programs, core practices, and high leverage practices. This review provides a framework for identifying challenges and contexts of less influence, such as the evaluation of learning in this approach, as well as establishing a database of studies in practice-based teacher education to support future research.

**CCS CONCEPTS**

Social and professional topics → User characteristics → Cultural characteristics.

**KEYWORDS**

Practice-based, teacher education, pre-service teacher, core practices, high-leverage practices, systematic mapping.

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**1 Introduction**

If today we enter the classrooms of a school anywhere in the world, we will undoubtedly perceive that the teacher in charge of the class performs several actions and carries out complex interactions to help students learn. Teachers must know their students and their characteristics; they must manage the curriculum they teach and master the contents, they must also know general didactics, and the specific didactics of the content they are teaching [1]. Although having this knowledge could translate into a good lesson plan, it would not necessarily make students learn. The teacher must also teach, that is, must perform the actions associated with the act of teaching.

The act of teaching is extremely complex; it is an intense work without breaks that requires multiple actions that are deployed many times simultaneously and in front of a large group of children or young people. It involves helping students without doing the work for them; being amazed about students' ideas even though, for teachers, they are already familiar; interacting fairly with all pre-service teachers, even if they do not like it. These skills and habits are not straightforward [2] and those who train as teachers need to learn them. Since teaching and learning are increasingly important to schools, practice-based opportunities can allow pre-service teachers to "see" the complexity of teaching and challenge assumptions about teaching and learning, which are fundamental [3]. Therefore, it is necessary to identify those practices that good teachers make when teaching, analyze their representations, perform exercises in simulated spaces that reduce the risks (of making mistakes in front of real students) and favor the delivery of timely and quality feedback.

Teacher education programs should be adjusted recognizing the importance of practice. Practice must be at the center of teacher preparation, thus increasing the demands on initial teacher education programs, since pre-service teachers require not only to learn to think like a teacher, but also, to act like one of them [4]. In the last decade, the new approach based on practice has been installed in teacher education. This approach integrates learning from practice as something relevant and is in contrast to previous methods that have trained teachers with specialized theoretical knowledge about teaching and learning but have not done much to prepare them for its implementation [5]. This does not mean that the cognitive and theoretical aspects of training must be eliminated, but rather, the presence of both elements must be balanced and their integration must be intentional.

In this regard, this training seeks to bring a close connection between theory and practice, since the latter is not only offered in clinical or fieldwork but is taught explicitly in the courses of teacher education program. In these courses, the students must know the proper content of the discipline and the ways to represent it so that it can be learned [6]. Therefore, both elements are present, and not only the theory. A good part of the magic of teaching and teacher training is how teachers integrate theory and practice in a way that allows them to become experts in making and adopting decisions to meet the different needs of the children they attend [7]. To address the practical elements that have been mostly absent in these teacher training, some practices to be learned by those who are being trained as teachers have been recognized and defined, so that the teaching of their future students offers better learning opportunities for them.

In this way, in the courses for those who are [8] being trained as teachers, the teaching of basic or core practices is integrated. The hallmark of a practice-based approach is the focus on core practices [9], also called high-leverage practices [10]. These practices consist of putting into action the knowledge, beliefs, and dispositions, through strategies, routines, and movements that can be broken down and learned by teachers. Among their features are that they occur with high frequency in teaching, novices can implement them in the classroom through different instructional approaches, core practices can be mastered by beginners, which allows them to learn more about students and teaching, preserve the integrity and complexity of teaching; they are also research-based and have the potential to improve student achievement [11]. These core practices, which apply to a wide range of subjects and contexts, become part of the contents of the training program.

Therefore, one of the challenges for those who work in practice-based teacher education is to identify the core practices on which to focus [12], reorienting the courses and looking for ways to support the transfer of conceptual understandings about teaching in daily life in the classroom, both critical aspects to improve teacher education [13]. It is expected that from a practice-based program, pre-service teachers not only have the necessary knowledge but also, can support the learning of their students from putting this knowledge into action through strategies and

concrete routines. In a changing context, with a policy framework where educational providers are continuously attracted, conversations about competencies and high-leverage practices by the novice professional should continue [14]. If a defined set of these specific practices could be articulated and taught during the preparation and induction of teachers, the broader educational community of teachers could collectively refine such practices, as well as the tools and other resources that support their appropriation by beginners, in various learning contexts to teach [15]. Therefore, by identifying more opportunities to develop and extend this work, teachers can be better prepared in practical experience, which, in turn, will be more likely to support meaningful student learning [16]. In this way, practice-based training could go beyond the scope of preparation of pre-service teachers, and reach the schools and in-service teachers.

The objective of this study was to analyze the recently published scientific evidence on the topic practice-based teacher education, focusing on the research that has been carried out in this area and analyzing its content in terms of the areas and topics addressed. For this, a systematic mapping of articles published from January 2015 to March 2019 was carried out, following each of the steps established for the process. With the results obtained and the analysis of these, it was possible to have an overview of the state of the art concerning the practice-based teacher education in the world to identify gaps and possible topics for future research.

## 2 Research Method

For this work, a systematic mapping study of the literature has been chosen. This type of study consists of a broad review of primary studies in a specific topic area that aims to identify what evidence is available on the topic [17]. It allows identifying the available literature before performing Systematic Literature Reviews (SLRs) using the same search and data extraction methods as standard SLRs but focusing on tabulating primary studies in specific categories [18]. Starting with a systematic mapping and then continuing with a systematic review of the literature offers better results [19]. In this study, a systematic mapping was chosen, since the main concern was to structure an area of research as a preliminary step to an SLRs.

The systematicity of this method is achieved through rigorous compliance with different steps or successive stages that have been previously established. According to the ideas of Kitchenham and Charters [17], three major phases were established for the review process: planning the review, conducting the review and reporting the review. Having phases and procedures ensures systematicity, which is one of the most powerful signs of excellent academic work [20]. In addition, for each of these stages, the researchers explicitly state the decisions they make. In this way, the results obtained make possible the review by other researchers, contributing to the objectivity of the process. The steps were established for each phase, based on the ideas described in previous mapping studies [21, 22]. Figure 1 presents the phases of the study, the steps associated with each one and the purposes of each of these stages.

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Phase	Steps	Purpose
Planning	Review of previous work	Detect need for a Review
	Specifying the Research question	Direct the work
	Definition Inclusion and Exclusion criteria	
Conducting	Choice of databases as sources of information	Apply inclusion and exclusion criteria
	Definition of the key words and camps for the search	
	Save data and review	
	Data extraction	
	Reading the articles: overview, methodology, results.	Data Analysis
	Identify classification scheme	
Reporting	Writing the report	Response to specific questions and Discussion of the results
	Formating the report	Review consistence
	Report evaluation	

**Figure 1: The Systematic Mapping Process (based in Kitchenham and Charters [17])**

## 2.1 Planning

The first phase described in this systematic literature mapping study is the planning of the study. The topic to investigate "practice-based teacher education" is of recent data and no systematic mappings or SLRs were found on it. For this reason, the need to map the topic was identified, to have an overview and the questions that led to the study were formulated (Table 1). Four inclusion criteria were established and presented in Table 2. It was decided to review the studies published from 2015 onwards in order to have the most recent scientific production. In addition, studies published in high-impact journals were chosen due to the quality of the studies.

**Table 1: Research Questions**

Question	Type of response sought
RQ1: How many studies are in the WOS and Scopus databases from 2015 to march 2019?	Number of articles in Scopus
	Number of articles in WoS
	Number of duplicated articles
	Number of theoretical-conceptual articles
	Number of empirical scientific articles
RQ2: Which are the most cited articles?	Most cited articles
	Most cited authors
RQ3: What is the geographical distribution of the first authors?	Countries where the authors are from
RQ4: What are the journals with more publications on this line of research?	Journals Q1, Q2, Q3 or Q4
RQ5: In what contexts of practices based teacher education are these studies developed?	Educational, social, cultural, others.
RQ6: What are the main topics addressed in this line of research?	Categories on emerging topics

**Table 2: Inclusion and exclusion criteria**

Inclusion criteria	Exclusion criteria
Scientific articles	Not scientific articles
Articles published from 2015 to March 2019	Articles not published from 2015 to March 2019
Studies on practice-based teacher education	Studies that do not study practice-based teacher education
Articles published in high-impact journals	Articles that have not been published in high-impact journals

## 2.2 Conducting

In the second phase established in this systematic literature mapping study, articles will be searched in databases that ensure access to a high-impact journal such as Scopus and WoS. To establish more specific search terms, several articles related to teacher training and practice were previously read to identify commonly used concepts. In this way, the search for studies was carried out, establishing as terms "practice-based", "teacher education", "practices". The search was refined limiting categories or thematic areas and language (Spanish and English). In addition, the previously established inclusion criteria were applied regarding the type of studies and the time range of the studies (from 2015 to March 2019). Below is the search chain in both databases.

### WoS

ALL FIELDS:("practice-based") AND ALL FIELDS:("teacher education") AND ALL FIELDS: (practices) Refined by: DOCUMENT TYPES: (ARTICLE) AND WEB OF SCIENCE CATEGORIES: (EDUCATION EDUCATIONAL RESEARCH) AND LANGUAGES: (ENGLISH OR SPANISH) Timespan: 2015-2019. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.

### Scopus

ALL ("practice-based teacher education" ) AND ALL ( practices ) AND ALL ( "teacher education" ) AND DOCTYPE ( ar ) AND PUBYEAR > 2014 AND ( LIMIT-TO ( PUBSTAGE, "final" ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) AND ( LIMIT-TO ( SUBJAREA , "SOCI" ) OR LIMIT-TO ( SUBJAREA , "ARTS" ) AND ( LIMIT-TO ( LANGUAGE , "English" ) OR LIMIT-TO ( LANGUAGE , "Spanish" ) AND ( LIMIT-TO ( SRCTYPE , "j" )

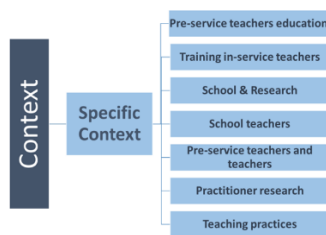
Once the search results were obtained in each database, they were saved in a reference manager application. In this application, duplicate items were detected, and the WoS database was chosen for those cases. Next, an Excel sheet was created in which the needed information to answer the research questions was categorized. Metadata included author, title, year, database, number of citations, type of study, journal quality index, topic, objective, findings, among others. The summary, title, and keywords were reviewed to detect articles that did not meet the inclusion criteria or that presented any of the established exclusion criteria. This was how we identified studies that did not match the inclusion criteria, such as reviews and duplicated works that had not been detected by the reference management application. Finally, we selected only those studies of high-impact journals (Q1, Q2, Q3, and Q4). Figure 2 presents the process.

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	Filter 1	Filter 2	Filter 3	Filter 4	Filter 5
	Search in databases	Duplicity criterion	Reviews not detected by the database	Duplicity criterion not detected by reference manager	Indexation criterion in journals Q1, Q2, Q3, Q4
Scopus	144	123	118	110	96
Wos	84	84	84	84	79
Excluded	None	21	5	8	19
<b>Total</b>	<b>228</b>	<b>207</b>	<b>202</b>	<b>194</b>	<b>175</b>

**Figure 2: Synthesis of the Application of inclusion and exclusion criteria**

The selected papers were analyzed to answer the research questions. Given that all the studies corresponded to the educational context, a classification was developed to specify the context. (Figure 3).



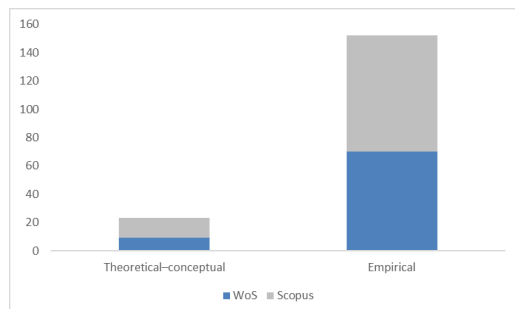
**Figure 3: Classification context**

### 3 Results

In this section, we report the results obtained by answering each of the research questions established for this study.

#### RQ1: How many studies are there in the WoS and Scopus databases from 2015 to March 2019?

In this study, 96 articles were found in the Scopus database, of which 14 are theoretical or conceptual studies, and 82 are empirical studies. In the WoS database, 79 articles were found: 9 are theoretical or conceptual studies, and 70 are empirical studies (Figure 4). The database is available at [https://drive.google.com/file/d/1bevGUevK53S\\_BkawSA9L7sYyIrY1c5-P/view?usp=sharing](https://drive.google.com/file/d/1bevGUevK53S_BkawSA9L7sYyIrY1c5-P/view?usp=sharing)



**Figure 4: Type of studies Scopus and WoS**

#### RQ2: Which are the most cited articles?

The most cited articles give an account of the interest that the content of these and their reference may have generated to support new research. Table 3 shows the most cited authors, the quartile (Q) of the journal in which they were published, and the total number of citations and Table 4 shows the most cited articles and the number of citations of each.

**Table 3: The most cited authors**

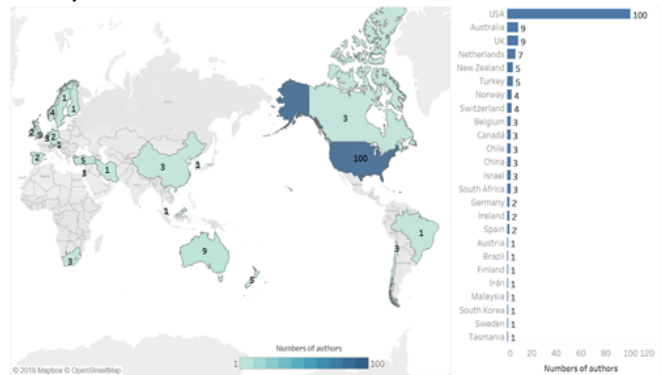
Authors	Quartile	Total Citations
Kubanyiova, M.; Feryok, A.	Q1	44
Zeichner, K.; Peña-Sandoval, C.	Q3	40
Bryk, A. S.	Q1	34
Kennedy, M.	Q1	24
Zeichner, K.; Bowman, M.; Guillen, L.; Napolitan, K.	Q1	21
Leko, M. M.; Brownell, M. T.; Sindelar, P. T.; Kiely, M. T.	Q1	20
Meuwissen, K. W.; Choppin, J. M.	Q2	16
Kazemi, E.; Ghousseini, H.; Cunard, A. & Turrou, A. C.	Q1	15
Anthony, G.; Hunter, J.; Hunter, R.	Q1	11
Brown, C. P.; Weber, N. B.	Q1	10
Gotwals, A. W.; Birmingham, D.	Q2	10
Peeray, M. M.; Troyan, F. J.	Q1	9

**Table 4: The most cited studies**

Article Title	Cited
Language Teacher Cognition in Applied Linguistics Research: Revisiting the Territory, Redrawing the Boundaries, Reclaiming the Relevance	44
Venture philanthropy and teacher education policy in the U.S.: The role of the new schools venture fund	40
2014 AERA Distinguished Lecture: Accelerating How We Learn to Improve	34
Parsing the Practice of Teaching	24
Engaging and Working in Solidarity With Local Communities in Preparing the Teachers of Their Children	21
Envisioning the Future of Special Education Personnel Preparation in a Standards-Based Era	20
Preservice teachers' adaptations to tensions associated with the edTPA during its early implementation in New York and Washington states	16
Getting Inside Rehearsals: Insights From Teacher Educators to Support Work on Complex Practice	15
Prospective teachers development of adaptive expertise	11
Eliciting, Identifying, Interpreting, and Responding to Students' Ideas: Teacher Candidates' Growth in Formative Assessment Practices	10
Struggling to Overcome the State's Prescription for Practice: A Study of a Sample of Early Educators' Professional Development and Action Research Projects in a High-Stakes Teaching Context	10
Making transparent the challenges of developing a practice-based pedagogy of teacher education	9

#### RQ3: What is the geographical distribution of the principal authors?

The geographical distribution of the authors allows us to visualize those countries in which the topic is being researched. Figure 5 presents a map of the geographical distribution of the principal authors and the number of publications associated with each country.



**Figure 5: Geographical distribution of authors**

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#### RQ4: What are the journals with more publications on this line of research?

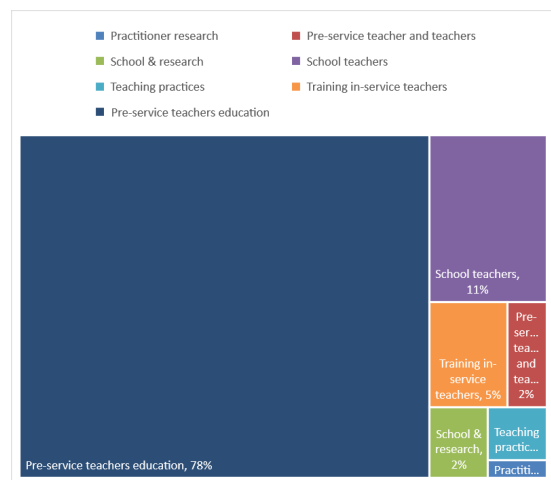
The identification of the journals that have the highest number of articles in the subject allows visualizing those that could have more significant expertise in it and possible interest in the publication of new articles in that subject. Table 5 presents the journals with the most papers, the journal ranking, the number of articles in each journal and the identification of the corresponding articles.

**Table 5: Journal with more articles published**

Journal	Quartile	Number of articles	Article identification number
Teaching and Teacher Education	Q1	13	[33], [94], [85], [64], [53], [101], [58], [61], [106], [43], [109], [54], [110]
Journal of Teacher Education	Q1	12	[40], [52], [49], [46], [24], [10], [60], [88], [108], [55], [91], [16]
Journal of Science Teacher Education	Q1	4	[65], [99], [239], [89]
Asia-Pacific Journal of Teacher Education	Q3	2	[74], [84]
International Journal of Educational Research	Q3	2	[59], [69]
Teachers College Record	Q3	2	[6], [62]
TESOL Journal	Q1	2	[76], [97]
Urban Review	Q1	2	[75], [100]
Vocations and Learning	Q2	2	[92], [93]

#### RQ5: In what contexts of practice-based teacher education are these studies developed?

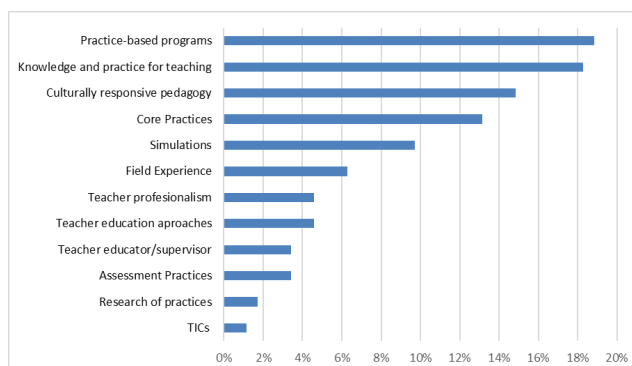
All the studies occur in the educational context, so a classification was used to identify more specific settings. Figure 6 shows the presence of each of the specific contexts in the total.



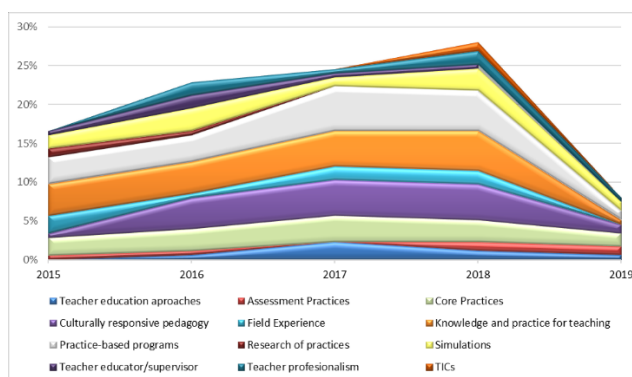
**Figure 6: Specific context**

#### RQ6: What are the main topics addressed in this line of research?

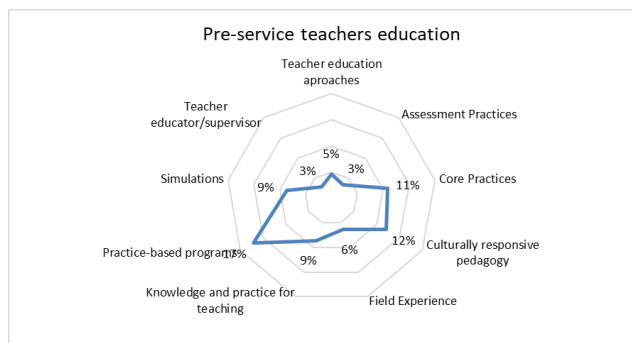
The main topics addressed by the studies were also identified (Figure 7). Also, to have a greater depth in the understanding of the topics addressed, a relationship was established between the main topics of all the studies and their distribution according to the year of publication (Figure 8). Finally, the pre-service teacher education-specific context was considered, which has the highest percentage of studies and topics associated with it (Figure 9).



**Figure 7: Most recurrent topics**



**Figure 8: All topics and year of publication**



**Figure 9: Topics on the specific context of pre-service teacher education**

## 4 Discussion

The practice-based teacher education is a subject of high interest for researchers, who provide empirical evidence in the field. Figure 4 shows that a high percentage of the studies (87%) are empirical studies. Since teaching and learning are increasingly important to schools, practice-based opportunities can allow pre-service teachers to "see" the complexity of teaching and challenge assumptions about teaching and learning, which are fundamental [3]. As Jenset and team [16] point out, by identifying more opportunities to develop and extend this work, teachers can be better prepared in practical experience, which, in turn, will be

more likely to support students' meaningful learning. The concern for the education of new generations and, therefore, the training of teachers who will be in charge of this task, is a problem that is far from being solved. For many years, teacher training has been based on theoretical discussions without counting, most of the times, with empirical support, so the results of this study in terms of the amount and type of research that has been carried out, are an encouraging sign because they could lead to enriching the work that takes place in the field.

We can also recognize that teacher education is an area of research that is consolidated and specialized and practice-based teacher education is a relevant topic in this area of study. The information in Table 5 allows us to appreciate that the journals with the most publications on this subject are those whose names refer to teacher training and also, the first three, have the highest impact index. Also, among the topics of the most cited studies (Table 4), we recognize core practices as one of the most discussed topics. This reaffirms that the hallmark of practice-based teacher education is the focus on core practices [9]. Therefore, it is a subject of high interest among researchers in the area of teacher education, which is current and with many opportunities to continue developing.

Another finding to discuss is that research in this field is developed mostly by English-speaking authors and, unfortunately, it is very scarce in Ibero-American countries. According to Figure 5, teachers research is produced mainly by authors from the USA (57%), England (5%), Australia (5%) and New Zealand (2%) and in a minimum percentage, by Ibero-American authors from Chile, Spain and Brazil, that together represent 3% of the total of articles reviewed. This may be due, as noted above, to the fact that in recent years, particularly in the USA, in a context of changing political terrain, with a policy framework where educational providers are continuously attracted, conversations about competences and high-leverage practices for professional beginners should continue [14]. Undoubtedly, the fact that the practice-based approach is recent and has started in the USA contributes to this difference. However, the problem of teacher education and the need to enable teachers for the multiple challenges of teaching is transversal, so it is also necessary to contribute with research from Ibero-American contexts.

Also, as might be expected, practice-based teacher education is a subject that is developed in the educational field and, by distinguishing specific contexts, pre-service teacher education stands out as the highest percentage of studies. However, also several other specific contexts appear, such as the implementation of practices by teachers in schools and in-service teacher training. In this regard, Figure 6 shows that the context of pre-service teacher education is the main specific context in which research is carried out (78%), but other contexts are school teachers and training in-service teachers. This finding confirms the idea that if a defined set of specific high-leverage practices could be articulated and taught during the preparation and induction of teachers, the broader educational community of teachers could collectively refine these practices [15] and extend their incorporation. Undoubtedly, given the challenges for effective

teaching, practice-based teacher education will focus on those who are training to become one of them but should also permeate to those teachers who already practice the profession and who lead the teaching of millions of children and young people all over the world.

Most of the topics investigated in the last four years are related to the distinctive features of the practice-based approach. According to the information in Figure 8, the topics with the most associated studies and that have been present throughout the period of analysis are practice-based programs, knowledge and practices for teaching, culturally responsive pedagogy, core practices, and simulations. This concurs with what the literature points out in that the hallmark of a practice-based approach is the focus on core practices [9] and these are learned by approaching the experience of teaching through simulations or enactment of practices, because those who are being trained to be teachers require not only to learn to think like a teacher, but also, to act like one of them [4]. The empirical evidence contributes mainly to understanding the purpose and components of this model, the different ways that institutions have incorporated them into teacher education, the learning that is reported by those who have been involved in this process and other most specific methodological elements.

When focusing on the context of pre-service teacher education, we must consider the added factors that contribute to the complexity of incorporating an approach of this nature. Among these factors we can mention the teacher educators who work in the university, who have been trained in a traditional method and who have been training generations of teachers under that approach, so they need to learn and unlearn to incorporate new ways of teaching. Also, university education requires grades that account for students' learning and acquiring certifications, therefore, evaluation of learning and in this case, the practice that is incorporated by the teacher in training is a very relevant factor. According to the information in Figure 9, it is worrisome that these are precisely the topics with the lowest percentage of studies: Teacher educator/supervisor and assessment practices. Therefore, these topics can be opportunities to extend the work, to better prepare teachers in the practical experience [16] that is required for the teaching of new generations. In this line, it is possible to advance by providing research and proposals that offer empirical evidence of work with teacher educators and evaluative processes associated with the learning experiences of practices, thus contributing to generate a complete vision and with significant elements.

The objective of this study was to analyze recently published scientific evidence on the subject of practice-based teacher education, focusing on the research that has been carried out in this area and the analysis of its content. This process allowed us to have a global view of the research in this area, regarding the number of studies, most cited authors, the geographical distribution of the principal authors, journals that publish studies on this subject, contexts in which it is studied and common topics. From this analysis, we can see that although we find a significant

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quantity of research in this area and several quality journals publish these studies, there is still a need for more research. As limitations of the study, we can mention that consulting only two databases could have restricted the scientific evidence reviewed. Also, it should be considered that both the classification of specific contexts and the assignment of topics were decisions made by the authors, and it may not have been possible to accurately detail the most specific context or topic of each study. In conclusion, the article presents a synthetic view of the state of the art of research in the practice-based teacher education and invites scientific inquiry into the possibilities that arise in terms of providing scientific evidence on some topics that are underdeveloped, such as teacher educators and the evaluative processes of learning associated with this approach. It would be interesting, therefore, to contribute from experiences in Ibero-American countries with evidence for these lines, especially on the implementation of programs based on practice, core practices, and high-leverage practices.

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