

A Scoping Review of Teacher Training During COVID-19 Pandemic

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Abstract

In comparison with other sectors, the education sector was most visibly impacted by the negative effects of the COVID-19 pandemic, necessitating the adoption of effective strategies by teachers and teacher educators in order to minimize the negative effects of school closure on student learning within in a short period of time. This paper attempts to review the literature on the training of in-service and pre-service teachers during the COVID-19 pandemic in order to help guide relevant researchers in conducting more in-depth academic research, and to remind educational institutions and individuals of the need to take the most recent social issues into account when designing teacher training programs.

Keywords: COVID-19 pandemic, teaching training, teacher education, scoping review

1. Introduction and Background

The widespread COVID-19 virus has harmed global average production, and every aspect of human daily life has been affected as a result of its rapid spread (König et al., 2020; Lennox et al., 2021; Valeeva & Kalimullin, 2021), and according to official figures, no other emergency in history has had a greater global impact (Çınar et al., 2021). The COVID-19 pandemic has caused chaos, uncertainty, confusion, and terror in practically every sector of society (Wong et al., 2021), and particularly in the field of education. In order to lessen the pandemic's detrimental impact, most governments worldwide issued national movement restriction orders, and all educational institutions were required to temporarily close.

According to estimates from the United Nations Educational, Scientific, and Cultural Organization (UNESCO), more than one billion learners (91.3 percent) in the 195 countries around the world have been forced to interrupt their face-to-face learning due to school closures (Fotheringham et al., 2021; Kamal et al., 2020; Sundarasan et al., 2020). Such a preventive measure has undoubtedly had a significant impact on the education sector (MacIntyre et al., 2020), and accordingly, this is the sector most significantly impacted by the COVID-19 pandemic, being second only to the health sector (Hebebcı et al., 2020). As a result, nearly all educational workers, particularly front-line K-12 teachers, were not adequately prepared for the unexpected challenges they encountered in the initial period of the COVID-19 pandemic (Carrillo & Flores, 2020; Kaden, 2020; Kuhfeld et al., 2020; Scull et al., 2020).

Nonetheless, regular teaching and learning were still required as a means to minimize the negative consequences of the ongoing pandemic, and to help prevent gaps in students' learning, and in this context, therefore, "emergency online homeschooling" (Bozkurt & Sharma, 2020; MacIntyre et al., 2020; Richmond et al., 2020) has emerged as a new method and de facto approach to teaching (Zhao & Watterston, 2021). In order to adapt to the new teaching norm, teachers have been forced to urgently acquire updated teaching methods and communication strategies related to online teaching, in order to provide effective homeschooling.

With the emergence of the COVID-19 pandemic, related research has also emerged (An et al., 2021), and the issues of the COVID-19 pandemic and its consequences have received considerable critical attention. Over the past two years, academic publications with COVID-19 as a keyword have occupied the majority of the various academic fields (Boyko et al., 2021; DeMatthews et al., 2020), and relevant research is likely to continue. Therefore, the primary goal of this review is to sift through the existing related academic literature, and summarize the main findings on pre and in-service teacher training during the COVID-19 pandemic in order to respond to this new research trend.

The first and most significant reason for conducting the current study is that the results of this scoping literature

review may provide the foundation for future related research, and stimulate teacher training institutions to develop new teacher training procedures, particularly to train teachers to help them cope with potential future unexpected social and public crisis events. Based on these reasons, it is necessary to review the relevant literature in order to gain a clearer understanding of what researchers have accomplished in terms of teacher training in the context of the COVID-19 pandemic, and what further relevant research may be conducted in future.

More specifically, based on the research purpose, the current review was guided by the following research objective: to conclude which aspects of teacher training are being studied in the context of the COVID-19 pandemic. In order to complete the research objective, a scoping selection and review of relevant academic publications from three databases (Web of Science, Science Direct, and Scopus) were carried out. All of the selected academic literature was reviewed and analyzed, and a summary of the main findings, in addition to the corresponding researchers and their assertions, are provided in the findings section.

2. Methodology and Methods

The aim of this study was to conduct a scoping review of the literature on teacher training in the context of the COVID-19 pandemic published from January 2020 to the end of 2021. This time period was selected because the pandemic had forced teachers to transition from face-to-face teaching to emergency online homeschooling in almost all countries in 2020, but this situation had dramatically improved in 2021 (OECD, 2021). To achieve the research goal, a scoping review strategy, consisting of five steps, as defined by Arksey and O'Malley (2005), was employed to select and review all relevant articles. The tasks completed by the researchers within each stage are described in Figure 1.

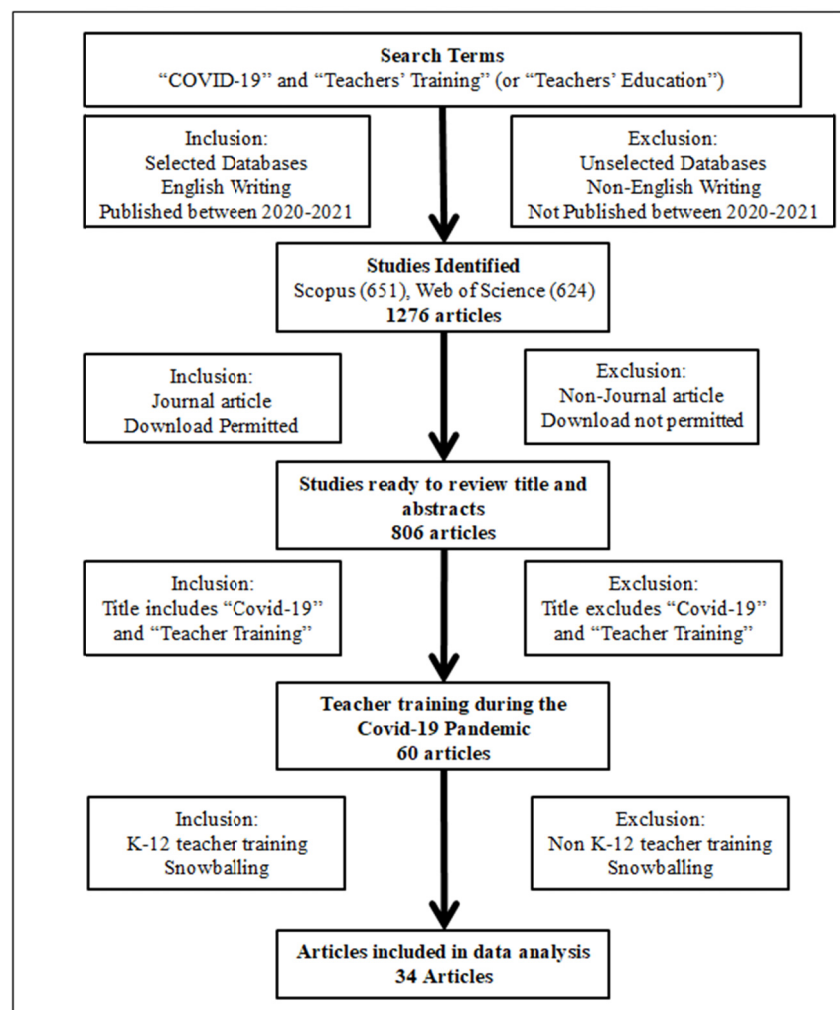


Figure 1. The stages of the Scoping Review (Cited from (Arksey & O'Malley, 2005))

2.1 Identifying Relevant Literature

The selection of relevant publications began with the identification and screening process, as indicated in Figure 1. Keywords for the literature search were selected based on the research purpose, and these included COVID-19 and teacher training. Under the direction of the corresponding author, the search was undertaken using three databases: Science Direct, SCOPUS, and Web of Science. Following a superficial collection, inclusive and exclusive criteria for filtering articles were devised with the goal of narrowing and maintaining the objective of answering the research questions. The process began by narrowing the search to papers published between January 2020 and December 2021 that were written in English. In order to assure the trustworthiness of this review, a peer-reviewed strategy (Merriam, 2009) was employed.

2.2 Screening of Literature

The screening process was conducted manually. First, non-journal articles and studies without authors were excluded. Next, studies related to teacher training for in-service or pre-service K-12 teachers were included for further responses after reading the titles and abstracts for further exclusion. Examples of excluded studies included studies focusing on higher education, students in teacher training, professional development for kindergarten teachers and curriculum. However, if articles were felt to be relevant to answering the research questions, they were still included in the final list of review articles, even if they did not meet the researchers' screening criteria.

2.3 Determining the Final Literature

Ultimately, a total of 34 studies focused on the training of K-12 in-service and pre-service teachers during the COVID-19 pandemic were identified, and these were included in the literature review phase. After full-text reading, these studies were categorized into three main groups: I who responded, II why they responded, III what they responded to. Following the selection of the final articles, a descriptive analysis approach was used to review all of the articles in order to determine their main contents. The corresponding author's main task during the scoping literature review was to check the documents and provide feedback on journal article selection, research methodology and research findings. This paper has thus far concentrated on why this research was conducted and how it was conducted; the findings of this study are discussed in the subsequent section.

3. Analysis and Findings

This section describes the findings of the scoping literature review, and it is divided into two parts: an outline of the reviewed literature, and the themes that emerged to address the research objective. Although a comprehensive review of the targeted literature is required for a descriptive analysis (Carrillo & Flores, 2020), due to the word limitations of this paper, this section focuses primarily on the research purpose of the literature, rather than on the research methodology employed in the study.

3.1 An Outline of the Reviewed Literature

It should be noted that there were no restrictions on the nature of articles in this study, which means that both review articles and empirical research articles were chosen contingent on their being relevant to the research purpose. As presented in the Table 1, a total of 34 articles were discovered to meet the inclusion criteria for further review.

Table 1. A scoping review consisting of 34 studies

No.	First author	Purpose
1	König, J.	How early career teachers adapted to online teaching during COVID-19 school closures.
2	Gegenfurtner, A.	Evaluating the reactions of training participants toward webinars.
3	Mohamad Nasri, N.	Offering a snapshot into how teacher educators, coped with the unprecedented situation.
4	Khlaif, Z. N.	How teachers in middle school responded to school closure to fight the spread of COVID-19 pandemic.
5	Ramploud, A.	Mathematics teachers' personal and professional responsiveness to changing circumstances.
6	Chaaban, Y.	Investigating teachers' professional agency in response to changing educational contexts caused by the COVID-19 pandemic in four participating countries.
7	Assunção Flores, M.	Focusing on the national, institutional and pedagogical responses as a result of the closure of schools in March 2020 in Portugal.
8	Van Nuland, S.	Providing an overview of how the Canadian province of Ontario responded to the pandemic, as well as the effects of those responses on teacher education in the province.
9	Valeeva, R.	Providing a critical insight into teacher education in Russia during the COVID-19 pandemic.

10	Moyo, N.	Investigating the policy and quality assurance debates in teacher education that have erupted at one school of education in Zimbabwe as a result of the sudden closure of schools and universities due to the COVID-19 pandemic.
11	Scull, J.	How the Australian education sector responded to the COVID-19 pandemic.
12	Leacock, C. J.	Describing the actions taken by the Eastern Caribbean Joint Board of Teacher Education to assist teachers in adjusting to this new learning environment.
13	la Velle, L.	Examining the impact and implications of the crisis caused by the COVID-19 lockdown of schools and universities on initial teacher education (ITE) from the perspectives of four university providers in England.
14	Nissim, Y.	Dealing with agility in the implementation of distance learning during the COVID-19 pandemic as it occurred at Ohalo College of Education with the outbreak of the epidemic in Israel in March 2020.
15	Ladendorf, K.	Examining the link between instructors' self-efficacy, as measured by TPACK, and their reported success and satisfaction with delivering online learning during COVID-19 pandemic.
16	Kidd, W.	Focusing on the challenges this posed for teacher educators.
17	Juárez-Díaz, C.	Describing 26 English language teaching faculty members' and 32 pre-service English as a foreign language teachers' emergency remote teaching experiences and emotions.
18	Padilla Rodríguez, B. C.	Focusing on the experiences of 75 rural teachers in Mexico.
19	Rodríguez-Muñiz, L. J.	Analyzing 244 secondary mathematics teachers' perception of their readiness to ERT during the COVID-19 pandemic.
20	Pozo-Rico, T.	Presenting an empirical learning package to assist teachers in dealing with stress, minimizing burnout, enhancing their ICT competency, and teaching the ideas of emotional intelligence in the classroom.
21	Clausen, J. M.	How professional development is preparing teachers to improve communication between the school, teachers, students and families during COVID-19.
22	Ellis, V.	Examining whether the changes imposed on organizations and individuals as a result of the global COVID-19 epidemic qualify as innovation.
23	Francom, G. M.	Determining technology resources and strategies K-12 teachers have used in this transition
24	Jain, S.	Under the three-gap framework: access, usage, and pedagogical skills gap, exploring the perspectives of affected teachers.
25	EŞİCİ, H.	Within the phenomenological pattern of qualitative research methods, investigate teachers' career needs and psychosocial experiences during the COVID-19 pandemic.
26	Henriques, S.	Understanding how the transition from face-to-face to digital education in Portuguese primary and secondary education was accomplished, particularly in terms of teacher training and the difficulties encountered during the emergency remote education period.
27	Valeeva, R.	Analyzing some examples regarding teacher training during the pandemic implemented at Russian universities.
28	Centeio, E.	Investigating physical education teachers' perceptions of implementing online physical education during the COVID-19 pandemic, as well as to investigate their needs in terms of support for future teaching experiences.
29	An, Y.	Looked into K-12 teachers' feelings, experiences, and perspectives on online instruction during COVID-19 pandemic.
30	Donitsa-Schmidt, S.	The goal of this research is to concentrate on the emphasis and examples used by Israel's largest teacher education during the COVID-19 sessions.
31	Kaden, U.	Examining the COVID-19 school closure-related changes to the professional life of a secondary school teacher in rural Alaska.
32	Quezada, R. L.	Describing how one California liberal arts college and its graduate teacher education program prepared its faculty for this significant transition to a new educational setting and teaching methods in response to COVID-19 pandemic.
33	Marshall, D. T.	How did teachers deal with the abrupt change brought about by COVID-19 pandemic, both personally and professionally?
34	Liao, Y. C.	Investigating which critical components teachers should include in their online instruction to support elementary students' online learning.

Regarding the main content of the reviewed literature, the first finding to emerge was that a large number of the papers reviewed investigated how teacher training institutions, relevant departments, and individuals have responded to the challenges of the COVID-19 pandemic on teacher training and their professional development requirements. Although these studies investigated a variety of organizational and individual responses to the challenges posed by the COVID-19 pandemic, they failed to provide additional evidence on whether these

responses effectively met teachers' demands during the specific time period, indicating a lack of research.

Another topic that received significant attention was what teacher training should encompass in order to assist teachers in overcoming the challenges presented by the COVID-19 pandemic. In this regard, researchers proposed that more updated teaching skills related to online teaching ought to be provided, and that it was necessary to improve the techniques employed for the various training contents. The third finding was that there appeared to be an urgent need to conduct training to meet teachers' targeted professional development requirements within the specified time frame; however, few articles have been published on this topic. The following sections provide detailed descriptions of each of the findings.

3.2 Teacher Training During the COVID-19 Pandemic

There is a consensus understanding that teachers and their instruction are some of the most critical factors which may influence student learning outcomes (Dille & Røkenes, 2021). Therefore, training activities related to teacher professional development have a direct impact on the success of online learning for students from preschool to K-12 (Çınar et al., 2021). Francom et al. (2021) point out that in times of uncertainty, timely training support for teachers becomes even more important, because it may not only assist in the smooth operation of their teaching practices, but may also help to maintain their mental health, and reduce feelings of burnout. Based on the above researcher's statements, Pozo-Rico et al. (2020) propose that further practical and applied research into teacher training is still required in order to improve teachers' instructional effectiveness and sense of occupational belonging, particularly in light of the severe COVID-19 problem. By reviewing the final selection of academic publications, three themes emerged from the primary content of the articles reviewed in this study, and detailed explanations of each theme are provided in the following sections.

3.2.1 Respondents

The first finding that emerged from the majority of articles was that organizations or individuals involved in teacher training events had responded to the negative effects that the COVID-19 pandemic had on teacher training. Based on the challenges of teacher training during the COVID-19 pandemic, König et al. (2020) and Gegenfurtner et al. (2020) present strategies for teachers to overcome challenges caused by the pandemic, based on a summary of what helps them respond appropriately. In this regard, Mohamad Nasri et al. (2020) based on interview responses, describe how Malaysian teacher educators and student teachers reacted to the unprecedented situation; Khlaif et al. (2021) explore how middle school teachers selected from three developing countries responded to school closures in order to decrease the negative influence of COVID-19. In a similar vein, Ramploud et al. (2021) explore mathematics teachers' personal and professional responses to the changing environment created by COVID-19. Chaaban et al. (2021) employed a discipline-centered sociocultural approach to investigate teachers' professional agency in the context of COVID-19-related disruptions to education in four Middle Eastern and North African countries (Lebanon, Qatar, Kuwait, and Morocco).

Perhaps due to the uniqueness of the current COVID-19 pandemic, few studies seem to have explored the ways in which teachers respond to distance learning during emergency situations (Francom et al., 2021); rather, the vast majority of studies have presented the range of measures undertaken by institutions involved in teacher education, and there are a several noteworthy examples of this. Flores and Gago (2020) employed interviews in order to explore the national, institutional and pedagogical responses to the educational challenges caused by COVID-19 in Portugal; Van Nuland et al. (2020) provide an overview of the measures taken by the Canadian province of Ontario to support teacher education events, in order to decrease the harmful influence of the COVID-19 outbreak; Valeeva and Kalimullin (2021) establish the Russian government's responsive educational policy issued in response to the challenges of COVID-19, through the application of documentation. Moyo (2020), Scull et al. (2020), Leacock and Warrican (2020) analyzed the response decisions made by one educational institution to assist K-12 teachers in overcoming the pedagogical challenges they faced as a result of the pandemic; la Velle et al. (2020) provide a clear example of how four higher education institutions in England protected and motivated their trainees during the COVID-19 outbreak. Unlike the aforementioned studies, Nissim and Simon (2020) applied mixed research methodology in order to assess the agility of the various responses made by the government of Israel.

3.2.2 Reasons

The necessity and importance of teacher training in assisting teachers in coping with the negative effects of COVID-19 has also been highlighted (Henriques et al., 2021; Pozo-Rico et al., 2020), particularly with regard to training aimed at supporting their online teaching. The reason for this is that prior to the COVID-19 pandemic, online teaching was still regarded as supplementary, rather than as the primary method of teaching in K-12 settings; as a result, K-12 teachers may have conducted their online teaching ineffectively (An et al., 2021; Çınar

et al., 2021; Liao et al., 2021; Zimmer et al., 2021). Within the series of studies reviewed by this paper, Ladendorf et al. (2021) concur and maintain that during the pandemic, teachers require additional training and support in order to apply their content knowledge to online instruction, so as to increase the effectiveness of their online teaching. Based on qualitative data obtained from 14 respondents, Kidd and Murray (2020) also conclude that suitable training may motivate teachers to adopt and apply updated pedagogy to the new online learning environment. Juárez-Díaz and Perales (2021) conclude that teachers with suitable training in online teaching tended to achieve more effective results. Rodríguez-Muñiz et al. (2021) also reveal that teachers require additional training in online teaching. Padilla Rodríguez et al. (2021) also note that, in comparison with instructors in metropolitan or city settings, teachers in rural settings required more timely and appropriate training in order to support them in overcoming challenges presented by the pandemic.

In response to the above assertions, Pozo-Rico et al. (2020) and Clausen et al. (2020) conclude that, in addition to assisting teachers in making their online teaching more effective, targeted training was beneficial during the COVID-19 pandemic, as a means to support teachers in successfully managing stress, preventing burnout and improving their knowledge and mastery of communication technology. Nonetheless, an online survey conducted by Marshall et al. (2020) involving 328 teachers, revealed that few of them had received any meaningful training from their schools or school districts in this regard.

Taking into account the evidence presented in the preceding paragraph, it appears that although it may be difficult for teacher training institutions to adequately train teachers in a short period of time to cope with the negative impacts that the COVID-19 pandemic has had on the education sector, teacher educators need to find ways to meet this challenge, because it is crucial, not only for the teachers themselves, but also for the long-term development of students (especially K-12 students). Failure to appropriately address teacher training during extraordinary events could lead to a decrease in the quality and efficiency of teaching (Rodríguez-Muñiz et al., 2021).

The COVID-19 pandemic may have had a major negative effect on teacher education; however, it may provide an opportunity to re-examine current teacher training systems, and to establish a well-designed and highly adaptive system for teacher training organizations and teachers per se. From the perspective of teacher training organizations, Ellis et al. (2020) and Scull et al. (2020) developed a consensus understanding, and point out that the COVID-19 pandemic has provided an opportunity for teacher training institutions to innovate and adapt their approach in order to meet the new developmental requirements of pre-service and in-service teachers. Lennox et al. (2021) agree and add that the lessons learned from this experience could also prove to be a helpful reminder for future planning within the education sector. From the perspective of teachers per se, Rodríguez-Muñiz et al. (2021) propose that the period when the COVID-19 pandemic first emerged was the ideal time to prompt teachers to pursue training in information and communication technology, through both on and off campus training activities. Francom et al. (2021) mention that the current pandemic period has provided teachers with a valuable opportunity to assess, rethink, and increase their preparedness for future unexpected emergency scenarios.

3.2.3 Content

Comparatively, a large volume of published studies have described the essential contents of teacher training during the emergency remote-education period, and the suggested training contents are as follows: teachers' readiness before online teaching (Jain et al., 2021; Leacock & Warrican, 2020), teachers' digital knowledge (EŞİCİ et al., 2021; Henriques et al., 2021; Mohamad Nasri et al., 2020; Valeeva & Kalimullin, 2021; Zimmer & Matthews, 2022) and its effective application (Centeio et al., 2021); teachers' online pedagogies towards improving students' learning autonomy (An et al., 2021; Jain et al., 2021); remote teaching and supervision (Assunção Flores & Gago, 2020; Zimmer & Matthews, 2022); online assessment of student learning outcomes (Henriques et al., 2021; Moyo, 2020); teachers' crisis management skills (Donitsa-Schmidt & Ramot, 2020; EŞİCİ et al., 2021); teachers' preparation for coping with volatile, uncertain, complex, and ambiguous circumstances (Hadar et al., 2020); innovation in instructional design (Kaden, 2020; Mohamad Nasri et al., 2020; Quezada et al., 2020); teachers' social-emotional engagement (Quezada et al., 2020); teachers' ability to communicate with parents and community (Clausen et al., 2020); skills to deliver quality instruction with the appropriate level of rigor (Marshall et al., 2020); hybrid classroom teaching (Ramos-Pla et al., 2021).

4. Discussion and Conclusion

It is critical to provide teacher training to assist teachers in managing epidemics and other unforeseen obstacles to their professional development. This study has focused on teacher training from 2020 to 2021 under the effects of the worldwide COVID-19 pandemic through a scoping review of 34 journal articles. Although this

study does not focus on research methodology, it was discovered that the studies reviewed in this research were conducted using a variety of research methods, and a wide range of sample sources. Despite the fact that the included studies were written in English, it is hoped that this review may serve as a resource for future related research.

Taken as a whole, this study suggests that a personal interview with in- or pre-service teachers is essential for researchers and teacher training institutions in order to obtain a comprehensive picture of teachers' training needs during the COVID-19 pandemic period. The findings also reveal a clear shared understanding of how teachers may be assisted in effectively utilizing technology for teaching and assessment as a critical teacher training effort and the following section highlights the most important findings and summarizes the conclusions.

Firstly, there is still a lack of the information needed to more effectively inform teachers and policymakers on the impact of the pandemic on teachers' professional development (Carter Andrews et al., 2021). In other words, all of the studies reviewed in this research point to the impacts of the unanticipated COVID-19 outbreak on teacher training and professional development; however, it seems that no study has gone so far as to identify the specifics of these impacts. In this study, identifying these impacts is a prerequisite for organizing appropriate teacher training; therefore, it is necessary to analyze relevant policy documents, or to communicate with front-line teachers in order to document the impact of COVID-19 on teachers' training and professional development in as much detail as possible, with both positive and negative aspects presented.

Secondly, limiting personal factors, such as increased workloads and prior lack of technological experience have resulted in anxiety for many K-12 teachers (Chaaban et al., 2021). As a result of this study, it seems that teacher training institutions need to support teachers in adapting their existing body of knowledge to the new norm caused by the COVID-19 pandemic and other unpredictable social changes, rather than continually adding new training elements to their already significant workload, as they may lack the experience needed to absorb this new body of knowledge.

To summarize, for the readers in this study, those involved in teacher training need to fully comprehend the implications of the COVID-19 pandemic for teacher training in order to develop training activities that adequately address teachers' needs. In addition, it is important to note that teachers are highly educated and knowledgeable individuals, and not "empty vessels" that need to be filled with new knowledge (Dille & Røkenes, 2021), so teacher training developers and facilitators need to consider the existing knowledge system of teachers, and assist them in adapting their existing knowledge base to the new norm, so that they may indeed be supported in overcoming the challenges presented to their professional development caused by unpredictable and unanticipated external changes.

5. Limitations and Future Research

The limitations of this research process were primarily the result of methodological decisions. Because the scoping review did not include a quality assessment of the studies reviewed, a future study evaluating the existing relevant literature could yield further valuable information. The findings of this study are of particular interest to those who work in teacher education institutions. More specifically, the reviewed findings provide guidance for them to design and implement curricula that are more responsive to teacher training in extraordinary times, as well as to improve existing curricula based on them.

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