

EFFECTIVENESS AND CHALLENGES OF ONLINE TRAINING IN TEACHER COMPETENCY DEVELOPMENT: A SYSTEMATIC STUDY IN BILINGUAL EDUCATION

Nindya Liftia Sani, Agus Wedi, Yerry Soepriyanto

Teknologi Pendidikan, Universitas Negeri Malang, Malang, Indonesia
nindya.liftia.2301218@students.um.ac.id

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Abstrak

Penelitian ini bertujuan untuk menganalisis elemen kunci dalam desain pelatihan online yang efektif dalam mendukung pengembangan profesional guru, khususnya dalam konteks pendidikan bilingual. Ruang lingkup kajian mencakup efektivitas pelatihan online dalam meningkatkan kompetensi guru, tantangan implementasinya, serta solusi yang dapat diadopsi. Metode yang digunakan adalah tinjauan literatur sistematis terhadap dua puluh lima penelitian terkini yang dipublikasikan dalam jurnal internasional dan nasional dalam rentang waktu tahun lima tahun terakhir. Hasil kajian menunjukkan bahwa pelatihan online yang dirancang dengan elemen interaktif, berbasis praktik langsung, dan responsif terhadap kebutuhan lokal dapat secara signifikan meningkatkan kompetensi pedagogis dan teknologi guru. Pelatihan ini juga mampu mengatasi hambatan geografis dan logistik yang sering dihadapi dalam pelatihan tradisional. Namun, tantangan utama seperti keterbatasan infrastruktur teknologi dan rendahnya literasi digital masih menjadi kendala utama dalam implementasinya. Kesimpulan dari penelitian ini menegaskan bahwa pelatihan online dapat menjadi solusi yang efektif jika elemen desainnya sesuai dengan kebutuhan lokal dan karakteristik peserta. Implikasi penelitian ini memberikan kontribusi penting bagi pengembang program pelatihan guru dan pembuat kebijakan untuk merancang strategi pelatihan yang lebih inovatif dan inklusif.

Kata Kunci: pelatihan online; pembelajaran bilingual; pengembangan profesional guru; pendidikan guru

Abstract

This study aims to analyze the key elements in the design of effective online training to support teachers' professional development, particularly in the context of bilingual education. The scope of the study includes the effectiveness of online training in improving teacher competencies, implementation challenges and possible solutions. The method used was a Systematic Literature Review (SLR) of twenty five recent studies published in international and national journals in the last five years. The results show that online training designed with interactive, hands-on elements and responsive to local needs can significantly improve teacher pedagogical and technological competencies. It can also overcome geographical and logistical barriers often encountered in traditional training. However, key challenges such as limited technological infrastructure and low digital literacy are still major obstacles to its implementation. The conclusion of this study confirms that online training can be an effective solution if the design elements are appropriate to the local needs and characteristics of the participants. The implications of this study provide an important contribution for teacher training program developers and policy makers to design more innovative and inclusive training strategies.

Keywords: online training; bilingual learning; teacher professional development; teacher education

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INTRODUCTION

In the era of globalization and the development of information technology, online training has become an innovative solution for improving teacher competency, especially amidst the demand for technology-based education. The COVID-19 pandemic has also been a catalyst for accelerating the adoption of online training in various countries. Teachers face the challenge of adapting to technology-based learning, which requires mastery of digital tools and effective teaching strategies (Dhawan, 2020). In this context, online training has the potential to become a relevant medium for teacher professional development, including in the field of bilingual education.

Over the past decade, teachers have faced significant changes in education policy and societal trends that require them to innovate and adapt their practices (OECD, 2019). To effectively navigate these changes, teachers need training and support. It is generally agreed that continuous professional development throughout a teacher's career is crucial to address these changes.

Online training has emerged as a potential solution to overcome geographical and logistical barriers to teacher professional development (Garrison, 2016). Previous research has shown that online training can significantly improve teacher competency if designed with interactive elements and involving hands-on practice (Richards & Rodgers, 2014). Online training can also significantly impact teacher competency. For example, research by Prilop highlighted that structured pedagogical design in online training can increase participant engagement and motivation (Prilop et al., 2021). However, the existing literature is limited in identifying specific design elements that are effective in bilingual education contexts.

Online training for teachers, particularly in the context of bilingual education, requires a design that is not only technically effective but also supports the development of competencies relevant to field needs. One approach proven effective in developing learning media is the project-based learning model based on design thinking methods (Aprianto et al., 2023). This approach overcomes various challenges in the learning process, such as difficulties in generating ideas, developing, and completing projects, through systematic stages that foster empathy, creativity, and reflection. This is relevant to this research, which emphasizes the importance of interactive, hands-on, and contextual elements in online training. By adopting the principles of the design thinking approach, online training can be more effective in equipping teachers with the skills to design innovative, collaborative, and multilingual learner-oriented learning.

Other research also indicates that the integration of learning technologies, such as multimedia tutorials based on the Audio-Lingual Method (ALM), makes a significant contribution to improving language skills (Ningsih et al., 2021). The ALM approach, which emphasizes repetition, imitation, and accurate pronunciation, is highly relevant for supporting teacher competency in communicative bilingual teaching. This study concluded that participants found it easier and more engaging to pronounce English using multimedia tutorials than using textbooks.

Although various studies have addressed the effectiveness of online training, studies examining technology-based training design elements in the context of bilingual education are relatively limited. As a field requiring a multidisciplinary approach, bilingual training requires designs that are not only technically effective but also relevant to local needs and participant characteristics (Gonzalez et al., 2006). Therefore, this study aims to fill this gap in the literature by highlighting how online training design can support the professional development of bilingual teachers.

The scientific novelty of this article lies in its focus on key elements of online training design for bilingual teachers, which have rarely been comprehensively discussed in previous literature.

Furthermore, this study also highlights how online training can overcome obstacles such as limited infrastructure and lack of social interaction through a blended learning approach and interactive technology.

The transformation of teacher competency in the context of bilingual education depends not only on training content but also on the sustainability of the mentoring and coaching provided. Significant changes in teacher skills and attitudes occur through a long and consistent process, especially when supported by school management (Darwisy et al., 2024). In this context, systematically designed online training accompanied by ongoing mentoring can be an effective strategy to support teacher professional growth.

The main question addressed in this research is "How can online training design elements support teacher professional development in the context of bilingual education?" The research hypothesis is that effectively designed online training will improve teacher competency in bilingual education while addressing various challenges in online training implementation.

This literature review aims to fill this gap by conducting a systematic analysis of research related to online training for teachers in the context of bilingual education. This review is important because it provides insight into best practices and challenges, thus providing a basis for designing more effective training.

The main objectives of this article are to analyze key elements in online training design, evaluate the effectiveness of online training on bilingual teacher competency, and identify challenges and solutions in online training implementation. The findings of this study are expected to provide practical guidance for teacher training program developers and policy makers in the field of education.

METHOD

This research is a systematic literature review (SLR) that begins with an organized and comprehensive literature review through scientific journal databases as academic references. Next, the research is conducted by grouping inclusion and exclusion criteria as part of the selected articles. Table 1. Inclusion and Exclusion Criteria maps the scope of the articles in detail.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Related to the topics of online teacher training, bilingual education, and teacher professional development	Not related to the topic of online teacher training, bilingual education, and teacher professional development
Articles published between 2020 and 2024	Articles published outside of 2020 to 2024
Ranking of top 100 databases from a maximum of 200 articles	Out of the top 100 databases ranking
Written work in the form of a scientific journal	Not a written work in the form of a scientific journal

This research was conducted in 2024, focusing on online teacher training in bilingual learning contexts. Articles were searched through the Publish or Perish database using the keywords online teacher training, bilingual education, and teacher professional development. Selected articles had to meet specific inclusion criteria to ensure the quality and relevance of the information related to the keywords online teacher training, bilingual education, and teacher professional development. Furthermore, articles had to have been published within the last five years, or between 2020 and 2024. This was to ensure that the data and analysis presented were up-to-date and relevant to current educational trends and practices. This publication time criterion was important to accommodate the latest developments in online teacher training, bilingual education, and teacher

professional development, as well as to encompass perspectives and findings from current research. Articles had to be sourced from the top 100 databases to ensure that the information presented had undergone a rigorous review process and met the highest academic standards. The written work should be formatted as a scientific journal, which not only ensures the accuracy and credibility of the information presented but also facilitates the systematic and structured presentation of data and analysis. Through the process and efforts to meet these inclusion criteria, 25 scientific articles met the scope. These 25 scientific articles will be a valuable resource for researchers, educators, and practitioners who wish to delve deeper into online teacher training, bilingual education, and teacher professional development. In the process of evaluating and interpreting the research data, the authors applied qualitative analysis techniques as shown in Figure 1. Miles and Huberman Diagram (Miles & Huberman, 1994).

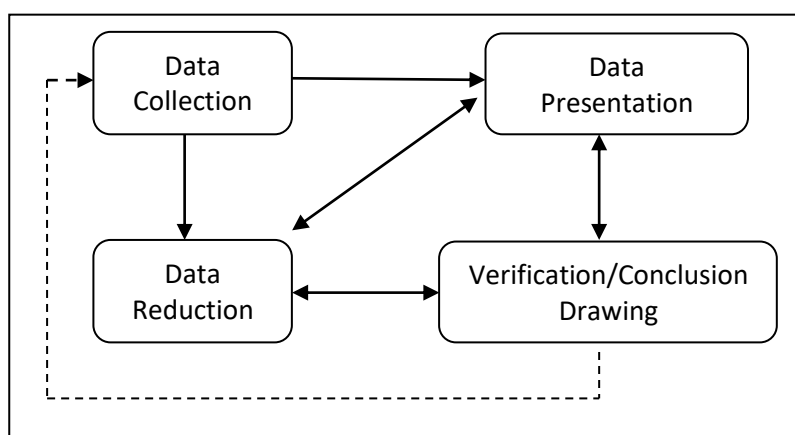


Figure 1. Qualitative Analysis Model Flow

This qualitative method offers a comprehensive framework for processing, analyzing, and interpreting data with clarity and depth. Through this approach, the research process can understand the perspectives and experiences of research subjects, as well as the social and cultural contexts that shape and influence those experiences. This analytical approach emphasizes in-depth exploration and rich interpretation of qualitative phenomena. This includes text and narrative analysis, identification of themes and patterns, and in-depth contextual and social understanding. By exploring layers of meaning, the research process can achieve a holistic and multidimensional understanding of the phenomena under study.

The framework in this research is rigorous, implementing a series of analytical procedures illustrated by Miles and Huberman. The entire analysis process is based on authentic and reliable data collection, as well as objective and reflective interpretation. By applying this method, the authors strive to produce findings that are not only valid and reliable, but also significant in theoretical and practical contexts.

The data analysis process involves three main steps: data reduction, data presentation, and conclusion drawing. During data reduction, information from relevant articles is classified based on themes such as training design elements, challenges, and achieved results. Irrelevant data was eliminated to focus on the research objectives. In presenting the data, the results of the reduction were arranged in tables and diagrams for ease of interpretation. Miles and Huberman emphasized that data visualization helps identify patterns and relationships between variables. In drawing conclusions, the presented data were analyzed to find key conclusions regarding the effectiveness of teacher training design in a bilingual learning context. This process ensured that the data used were relevant and had high validity to answer the research questions.

RESULT

This study presents an in-depth analysis of the design and effectiveness of online training in supporting the development of bilingual teaching skills in teachers. Data from various previous studies were collected, evaluated, and analyzed to identify key findings, challenges, and opportunities. Of the 25 articles reviewed, the most frequently used research method was qualitative (40%), followed by mixed methods (24%), case studies (24%), and experiments (12%). The results of the analysis of the 25 scientific articles were categorized into three areas: key elements in online training design, the effectiveness of online training on improving teacher competency, and challenges in implementing online training.

This review of key elements in online training design explores various aspects of online training, from curriculum design to implementation methods. Some key elements that have been identified are approaches that focus on teacher needs including the flipped classroom method (Dooly & Sadler, 2020) and project-based assignments (Nami, 2022), effective pedagogical designs such as the Teacher Academy Initiative (Hertz et al., 2022) and the use of telecollaboration (Üzüm et al., 2020) which show the importance of structures that support collaborative and interactive learning, technology integration such as Computer-Assisted Language Learning/CALL (Nami, 2022) and Corpus-Based Pedagogy (Ma et al., 2022) to improve teachers' ability to use technology in teaching, contextualization and local needs where training programs must be tailored to the local context such as in bilingual programs (Durán-Martínez et al., 2022, (Almazova et al., 2020)) and EFL teacher training (Arifani et al., 2023), and psychological support where training takes into account the needs of teachers. The basic psychological well-being of teachers (Arifani et al., 2023).

The analysis shows that online training effectively contributes to improving teachers' bilingual teaching competencies. Online training has been shown to improve teachers' professional competencies in bilingual learning (Gacs et al., 2020), (Collins et al., 2023), (Krulatz et al., 2024), and CLIL/Content and Language Integrated Learning (Banegas, 2020). Teachers demonstrate improvements in pedagogical knowledge and teaching strategies through well-structured online training (Tang et al., 2020, Li & Peters, 2020). Blended learning approaches (P, 2024) and flipped classrooms (Dooly & Sadler, 2020) increase teacher engagement and motivation in the learning process. Bilingual teacher training has a positive effect on multilingual practice, with teachers who participated in bilingual training reporting improvements in managing multilingual classrooms (Scherzinger, 2023; Acosta et al., 2021).

The analysis also identified several challenges, including access to and technological infrastructure, which are major barriers, particularly in certain regions (Saiyad et al., 2020; Hakim, 2020), teacher and facilitator preparedness (Sadeghi & Richards, 2021; Bragg et al., 2021), training often not implemented according to initial plans, thus reducing program effectiveness (Tang et al., 2020), limited social interaction among participants, considered crucial for building pedagogical skills (O'Dowd & Dooly, 2022), and inadequate contextualization when training is not relevant to local needs, resulting in a lack of knowledge transfer to classroom practice (Durán-Martínez et al., 2022).

To increase the effectiveness of online training, programs must be designed with teachers' needs in mind, strategically integrate technology, and consider local contexts. Blended learning approaches can be a solution to overcome limitations in social interaction, while investments in technological infrastructure and facilitator training can enhance teacher preparedness. With the right design, online training has significant potential to improve teacher competency and student learning outcomes.

DISCUSSION

This discussion presents a synthesis of a series of previous studies that focus on key elements in online training design, the effectiveness of online training on improving teacher competency, and the challenges of implementing online training, particularly in the context of bilingual education.

As presented in the results, online training effectively contributes to improving teachers' bilingual teaching competencies. Several studies have shown that online learning and training are equally effective or even superior to face-to-face approaches. A qualitative study by Gacs, Goertler, and Spasova (2020) found that online language learning is as effective as face-to-face learning, offering advantages such as flexibility, personalized materials, and wider audience reach. Rico, Corbí, Izquierdo, and Castejón (2020) demonstrated the positive impact of training on competencies through an experimental study. Teachers who participated in the training program showed significant differences compared to the control group in terms of their ability to cope with stress and fatigue, ICT competency, and the introduction of Emotional Intelligence (EI) in the classroom. Tang, Tong, Irby, Lara-Alecio, and Guerrero (2020) found that Virtual Professional Development (VPD) significantly impacted bilingual teachers' implementation; teachers in the treatment group outperformed the control group in student engagement, graded questioning, implementation of ESL strategies, and providing feedback. Li and Peters (2020) demonstrated significant improvements in second language (L2) knowledge and teacher strategies for working with English Language Learners (ELL) after participating in an innovative professional development program. O'Dowd and Dooly (2022) found that participating in a virtual exchange (VE) provided valuable experiences for ongoing professional development, methodological innovation, and the development of professional partnerships.

Several challenges have been identified, focusing on technological access and infrastructure, but few solutions have been proposed by previous research. Despite its effectiveness, the transition and implementation of online training face various challenges that need to be addressed. Infrastructure and Readiness Challenges: Saiyad, Virk, Mahajan, and Singh (2020) highlighted challenges such as inadequate infrastructure, unreliable internet, and inadequate faculty preparedness. Solutions include institutional support, training, and aligning teaching activities with learning objectives. Psychological Factors and Teacher Self-Efficacy: Arifani, Mindari, Hidayat, and Wicaksono (2021) found that teachers lacked confidence in helping students perform better in online coursework, despite the fact that online learning strategies boosted student self-efficacy. This suggests that students' psychological problems are a differentiating factor. Lack of Practical Benefits and Institutional Support: Sadeghia and Richards (2021) found that teachers are less likely to engage in professional development activities if they offer few practical benefits, are poorly managed, lack motivation, and lack institutional support.

The findings from previous analyses contribute to the improvement of bilingual teachers' teaching competencies identified through online training. These findings contribute to other findings that fill the knowledge gap regarding the development of bilingual teachers' teaching competencies. Several studies specifically address teacher competency development in the context of bilingual or multilingual education. Competency Needs for Improvement: Scherzinger and Brahm (2023) highlighted that areas for improvement in bilingual teacher training in Europe include teachers' language proficiency, methodological skills, knowledge of material design and assessment, and collaboration skills. Innovative Training Models and Strategies: Almazova, Eremin, Kats, and Rubtsova (2020) developed an integrative multifunctional model to support bilingual learning that allows for a balanced combination of teaching techniques. Collins, Sánchez, and España (2023) reported a transformation in prospective bilingual teachers in viewing their

own language practices as legitimate and relevant to how they structure student learning. Banegas (2020) found that professional development courses supporting the implementation of CLIL (Content and Language Integrated Learning) impacted teachers' identities as independent and critical content developers and practitioners. Innovative Pedagogical Design: Dooly and Sadler (2020) presented a symbiotic FIT (Flipped, In-class, and Telecollaboration) pedagogical design, helping student teachers bridge the gap between theory and practice. Individual Influences: Krulatz, Christison, Lorenz, and Sevinç (2024) found that individual differences (such as language, family background, education, and teaching experience) mediate the impact of teacher professional development on multilingual teachers' cognition and practice. The Importance of an Integrated Curriculum: Martínez, Llavador, and Abad (2022) concluded that only integrated personal and administrative efforts will bridge the gap between the global education agenda and classroom performance in bilingual programs. In 2022, Nina Raud and Olga Orekhova used qualitative research methods to examine the content of teacher education curricula provided by universities located in Europe's multilingual border regions: Austria, Germany, Estonia, Italy, Slovakia, and Slovenia. The aim was to identify the main components of primary teacher education curricula for multilingual schools and compare them with EU guidelines for teacher training for multilingual schools.

Key elements for designing successful online training were identified, complementing several previous research findings. Several studies have identified elements essential for successful online training design and implementation. Design for Success: Bragg, Walsh, and Heyeres (2021) demonstrated that certain design elements can accommodate individual differences in learning styles, foster engagement, provide learner support, and further foster the acquisition/development of Pedagogical Content Knowledge (PCK). Collaborative Approach: Hertz et al. (2022) highlighted an effective collaborative approach to online continuing professional development. Project-Based Learning (PBL): Nami (2022) found that PBL in online courses contributed to improving teachers' technological knowledge, as well as their awareness of the capabilities, constraints, and evaluation of various Computer-Assisted Language Learning (CALL) tools. The Importance of Corpus Literacy: Ma, Tang, and Lin (2021) highlighted the development of "corpus literacy" (CL) for TESOL teachers, which includes an understanding of corpora, data analysis techniques, and drawing conclusions. Focus on Strategic Skills: Hakim (2020) highlighted the productive use of technology-based online EFL classes, with a focus on strategic skills-based learning and building strong virtual relationships. Comprehensive Model: Raud and Orekhova (2022) examined the key components of primary teacher education curricula for multilingual schools in Europe. Robert O'Dowd and Melinda Dooly, using qualitative research methods in 2022, found that participation in VE projects provided teachers with valuable experiences in continuous professional development and methodological innovation. Specifically, VE is seen as opening up opportunities for teachers to develop new professional partnerships, collaborative academic initiatives, develop their own online collaboration skills, and introduce more innovative approaches to their current teaching practices. This provides teachers with contextual experiences during the online teaching and learning process.

CONCLUSION

The results of this study indicate that effectively designed online training can support teacher professional development in bilingual contexts. By utilizing interactive technology, a collaborative approach, and contextualized design, this training was able to overcome several obstacles that previously hindered teacher competency development. These findings have important implications for training program developers, who need to consider design elements that are appropriate to local needs. However, there are key challenges in implementing online training that must be addressed,

including inadequate infrastructure, inadequate faculty preparedness, lack of institutional support, and psychological issues related to teacher self-confidence..

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