# Activities and barriers in online professional development: a systematic literature review

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**Abstract.** Despite the increased use of technology to facilitate English teachers' professional development, there is a lack of comprehensive review of the employed activities and barriers. The current study aims to comprehensively look into the landscape of online professional development activities and the encountered barriers. Employing a systematic literature review approach, activity types and barriers of online professional development were identified. Through rigorous methodology, including database searches and inclusion criteria, 18 studies conducted in diverse global contexts were reviewed. The findings reveal four categorized professional development activities: structured learning, mentoring, informal learning, knowledge sharing, and social interaction. Barriers encompass attitudinal, physical, and structural factors such as negative attitudes, internet connectivity issues, and collaboration difficulties. The study concludes that effective communication, tailored solutions, and stakeholder collaboration are essential for overcoming the barriers of online professional development. The findings imply the crucial roles of stakeholders in enhancing online professional development for teachers. Future research should address the interplay of the barriers, their impacts, and innovative strategies. **Keywords** *:* professional development, online, systematic literature review

## 1. Introduction

In recent decades, technology has revolutionized the way education and professional development are conductted. As technology continues to evolve, educators and professionals worldwide are increasingly adopting technology-based approach to enhance their skills, knowledge, and competencies. These advancements offer a wide range of online activities and opportunities for professional development, but they also present numerous barriers [1]. Understanding the types of activities available and the barriers encountered in online professional development is vital to harnessing the full potential of technology for effective lifelong learning and continuous improvement.

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Despite the growing popularity of online professional development, there remains a lack of comprehensive understanding of the different types of activities available within these programs. Many educators and professionals are uncertain about which technological tools and platforms are best suited for their needs, and there is a need for empirical evidence to inform decision-making in this area. Certain activities may be more suitable for addressing specific learning needs or challenges. Recognizing these activities allows for the inclusion of targeted support where it is most needed. Moreover, the barriers inherent in implementing and engaging with online professional development have not been thoroughly explored. Identifying and addressing these barriers is crucial for optimizing the effectiveness and sustainability of technology-driven professional development initiatives. Knowing the barriers can also help organizations avoid investing resources in activities that may be hindered by these obstacles. This cost-effective approach ensures that resources are spent wisely on activities that have a higher likelihood of success.

Several studies have explored the adoption and impact of technological tools in education and professional development, providing valuable findings about the advantages and barriers of incorporating technology into these contexts. Some researchers have investigated specific technological tools and platforms [2]–[5], highlighting their potential to facilitate personalized and self-directed learning. Others have examined the role of online communities and networks in fostering collaboration and knowledge sharing among educators and professionals [6]–[9]. Despite these individual contributions, a systematic review is necessary to synthesize the existing literature comprehensively, identify gaps, and draw robust conclusions about the types of activities and barriers in technology-mediated professional development.

According to self-determination theory [10], [11], individuals have an innate tendency to seek out activities that are inherently satisfying and enjoyable. In the context of technology-mediated professional development, understanding and promoting intrinsic motivation is essential for creating learning experiences that truly engage educators and professionals. This theory also highlights the significance of autonomy in driving intrinsic motivation and sustained engagement. By understanding the importance of autonomy, this research aligns with self-determination theory, as both emphasize the need to empower educators and professionals to take ownership of their learning journey. Understanding the significance of autonomy can contribute to the design of professional development initiatives that cater to individual preferences and learning styles. Besides, it underscores the role of competence in building individuals' confidence and perseverance in their pursuits. In line with that, this study delves into the types of activities that promote competence-building within the context of technology-mediated professional development. Empowering educators and professionals through technology-mediated professional development is in line with self-determination theory principles of fostering lifelong learning, thus contributing to their overall motivation and engagement in professional development. The use of technological tools to facilitate professional development has long been advocated [12], [13]. With the use of technological-tools, professional development activities can be offered online and in flexible formats, allowing participants to engage in self-paced learning or synchronous/asynchronous sessions that fit their schedules. This accessibility enables educators and professionals to participate regardless of their geographical location [14], [15]. Technology-mediated professional development can be tailored to fulfil the particular needs and interests of teachers and professionals. Personalized learning paths, adaptive content, and targeted resources can be provided to address their unique learning objectives and career goals. Technologymediated professional development promotes a culture of lifelong learning [13], [16], encouraging educators and

professionals to continuously update their skills, stay current with emerging trends, and adapt to evolving educational practices and technologies.

This research report aims to conduct a systematic review of the literature on online professional development, focusing on the types of activities employed and the barriers faced by educators and professionals. Therefore, the research questions are: (1) What types of activities are employed in online professional development activities? (2) What are the barriers of conducting online professional development activities? By integrating the findings from various studies, this research offers a holistic view of the current landscape of online professional development and offers evidence-based insights for educators, policymakers, and stakeholders.

The value of this research is in its offering to bridging the disparity between theoretical knowledge and practical application in online professional development. By systematically reviewing the existing literature, this study identifies innovative and effective technological tools, platforms, and activities that have been successful in promoting continuous learning and enhancing professional competencies. Additionally, the comprehensive analysis of barriers will enable the development of strategies to address these issues and optimize the implementation of technology-mediated professional development initiatives. Furthermore, this research report offers an up-to-date perspective on the topic, accounting for recent developments and emerging trends in technology and education. As technology is constantly evolving, staying current with the latest innovations is critical for designing sustainable and future-proof professional development programs. The findings of this research offers a invaluable resource for teachers, policymakers, and researchers seeking to leverage the potential of technology for effective and impactful professional development practices in the ever-changing landscape of education and training.

## 2 Method

The research team conducted a comprehensive and exhaustive search across multiple online databases, including Taylor and Francis, Google Scholar, and ERIC to identify studies investigating the types of activity in Technology-mediated professional development and the barriers. Those databases were selected because they are prominent in providing a vast array of peer-reviewed journals and scholarly articles. This systematic review employed a rigorous methodology called PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) [17]. This method includes comprehensive literature searches, strict inclusion and exclusion criteria, and a systematic data extraction process. This approach was employed because it has been an established method in systematic review and had been adopted in many systematic literature studies [18]–[22]. Figure 1 provides an overview of the various stages including identification, screening and eligibility evaluation, and inclusion. Additionally, this review incorporates a precise set of inclusion and exclusion standards to guarantee the selection of pertinent and high-quality studies for analysis.

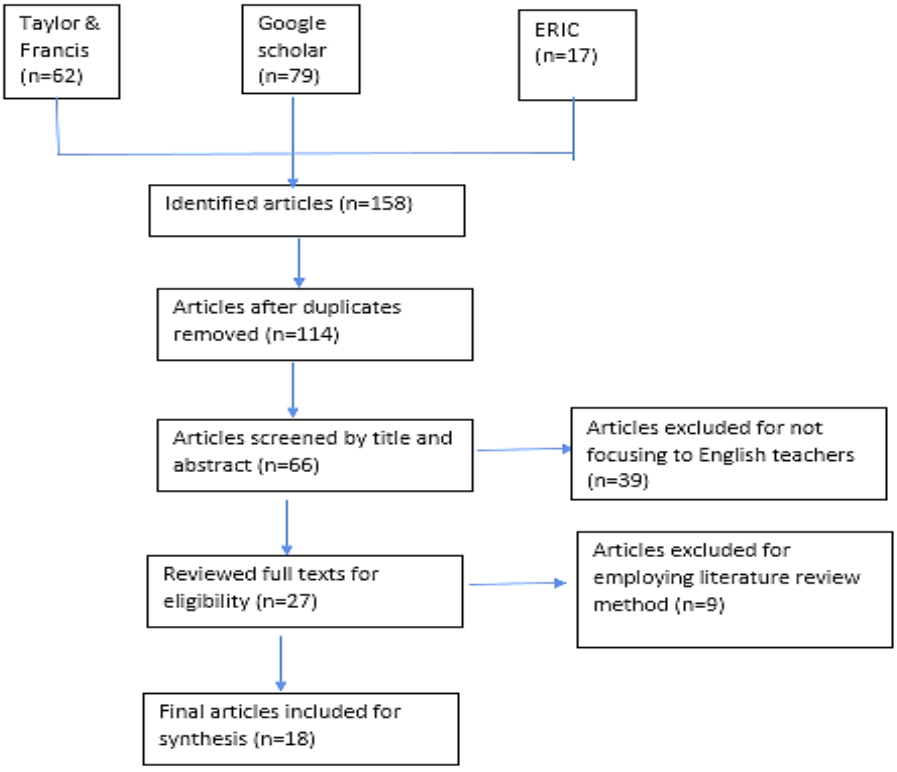


**Figure 1.** The systematic review procedure

To guarantee the most up-to-date information, the literature search focused on recent publications. Only articles from 2019 to 2023 were included in the search, ensuring that the research primarily revolved around the use of technology for teachers' professional development. By limiting the search to articles papers released during this period, the analysis
aimed to maintain currency and relevance in its findings. The search parameters comprised terms such as 'online,' 'technology,' 'ICT,' 'virtual', and 'English teachers,' combined with 'professional development,' or 'community.' To ensure the reliability and relevance of the gathered literature, the focus was limited to English-language, peer-reviewed journals. The subjects were focused on English language teachers' professional development. Certain articles were excluded from the review process because they did centre on English language teachers' professional development and employed literature review methods. Before reviewing the full-text articles, the titles and abstracts retrieved during the search underwent preliminary evaluation for relevance and alignment with the aim of the study.

## 3 Results and discussion

### 3.1. The reviewed studies

Initially, 158 articles containing the key terms were identified from three major journal databases: Taylor and Francis, Google Scholar, and ERIC. Duplicates were removed, leaving 114 articles to be screened for eligibility. 66 articles were then included for abstracts and tittles screening. Abstracts and titles contain essential information about the research, including the topic, research design, and key outcomes. This can ensure the relevance of a study to the research questions. Studies that are clearly irrelevant can be excluded at this stage, ensuring that only pertinent articles are considered further.39 articles were excluded because they were not associated with English language teachers' professional development. Evaluation was conducted to ensure the eligibility of the articles, resulting in 9 articles to be left out due to their employment of literature review method.

This systematic review involved the examination of 18 articles that collectively shed light on the landscape of online professional development. The examined articles were published from 2019 to 2023 : 5 articles (2019), 3 articles (2020), 7 articles (2021), 2 articles (2022), and 1 article (2023). These studies were conducted in a diverse array of countries, representing a global perspective on the subject matter. The geographical distribution of the reviewed studies underscores the international relevance and applicability of online professional development, with insights drawn from various regions and educational contexts. The countries of the reviewed studies are displayed in Table 1 below.

**Table 1.** Countries of the studies

| **Country** | **Number of the reviewed studies** |
|---|---|
| Turkey | 4 |
| Indonesia | 4 |
| Saudi Arabia | 3 |
| The U.S | 1 |
| Jordan | 1 |
| Algeria | 1 |
| Nepal | 1 |
| Malaysia | 1 |
| Vietnam | 1 |
| Cyprus | 1 |

As seen in Table 1, Turkey and Indonesia are the two top countries that conducted studies on the employment of online technology for professional development. It might indicate that in those countries, the concept of lifelong learning through the employment of technology is gaining prominence. This resonates with heutagogy concept [23] where technology plays a crucial role to accommodate self-directedness in distance learning. Concerning the educational contexts, the studies were undertaken in three categorized settings: tertiary, school, and mixed levels as displayed in Figure 2.

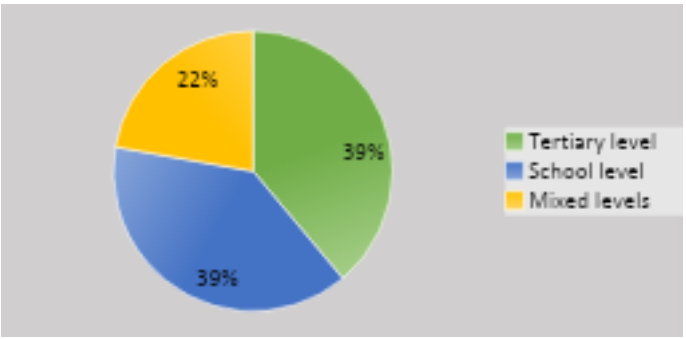


Figure 2. Educational contexts of the studies

The data show that the employment of online technological tools to accommodate professional development activities in tertiary and school levels are equally important. This could mean that teachers teaching in those two settings have demonstrated awareness and needs of employing technology to support their professional learning as found in [24]. The rampant use of online technological tools for teachers' professional development could have been marked since the outbreak of the COVID-19 pandemic as highlighted in an earlier study [25]. The pandemic necessitated a swift shift to online and remote teaching and learning, prompting educators at all levels to adapt rapidly to new digital tools and platforms. This adjustment likely accelerated the recognition of the value of technology in supporting continuous professional growth, which is reflected in the data. This trend accentuates the enduring and transformative impact of the pandemic on educational practices, emphasizing the urgency for continuous integration of technological tools in professional development across educational sectors. The platforms used to facilitate the professional development activities were categorized into social networking sites, video conferencing facilities, learning management systems, and others. Each category includes specific platforms. The types of platforms are presented in the following table:

**Table 2.** The used platforms

| Social networking sites | Video conferencing facilities | Learning management systems | Others |
|---|---|---|---|
| Facebook, Instagram, YouTube, and WhatsApp | Zoom, Skype, and MS Team | Moodle, Blackboard, Google Classroom, and G Suite for Education | Google +, email, website, and radio broadcast |

As seen in Table 2, the professional development activities were conducted by employing various platforms. The categorization of platforms used for professional development activities highlights the flexibility and adaptability of these programs to accommodate both synchronous and asynchronous learning activities. Certain platforms like Zoom, Skype, and MS Teams are ideal for synchronous activities, where participants engage in real-time events like live webinars and virtual meetings. These tools enable immediate interaction and collaboration, regardless of participants' locations, fostering dynamic learning experiences. The use of platforms to accommodate immediate interaction in virtual learning environments accord with previous studies [6], [26]. On the other hand, learning management systems (LMS) such as Moodle, Blackboard, Google Classroom, and G Suite for Education are primarily designed for asynchronous activities. This means participants

can engage with course materials and activities at their own pace and schedule. LMS platforms provide a structured environment for content organization, resource distribution, and assessments, allowing participants to access content, complete assignments, and interact with course elements independently, making them suitable for self-paced learning. Synchronous and asynchronous modes in distance learning have been urged in earlier studies [9], [27], [28].

### 3.2. The activities

The reviewed studies revealed various online professional development activities. To report these findings, they are categorized into themes and sub-themes. There are four themes: structured learning, mentoring and coaching, informal learning, knowledge sharing and collaboration, and social interaction and support. The summarized themes and sub-themes of the professional development activities are shown in Table 3.

**Table 3**. Themes and sub-themes of the activities

| **Themes** | **Sub-themes** |
|---|---|
| Structured learning | Online courses [1], [3], [12], [29] |
| Mentoring and coaching | Peer teaching observation [30]; Virtual mentoring and coaching [31] |
| Informal learning | Informal conversations, watching tutorials, developing presentation slides, media, handouts [24]; webinars [28], [32], [33]; keeping up with trend and information in ELT through social media [13], [34] |
| Knowledge sharing and collaboration | Discussions [6], [15], [35], [36]; Collaborating, sharing experiences and resources [35], [37] |
| Social interaction and support | Socializing and problem sharing [13] |

Knowledge sharing and collaboration is the most frequent theme that occurs during the review of activities. Under this theme, some activities are grouped: discussions [6], [15], [35], [36], collaborating, sharing experiences and resources [35], [37]. The employment of knowledge sharing and collaboration could be due to the benefits that they offer. Engaging in discussions allows participants to explore topics in greater depth. Different perspectives and insights can result in a more thorough comprehension of the subject matter. Collaboration and knowledge sharing bring individuals who have diverse backgrounds, skills, and experiences. This variety of viewpoints can inspire creative thinking and solutions that would be challenging without input from various sources. Collaboration not only offers concrete and quantifiable advantages in terms of outcomes, which could be crucial for maintaining and propelling our field and individual initiatives forward, but also holds the potential for nuanced and understated benefits in the shape of a well-founded and potentially enduring community of practitioners [38].

On the hand, social interaction and support becomes the least favored professional development activity, as it was only found in one study [13]. Despite the benefit of social interaction and support that contributes to professional development as found in previous studies [7], [39], there are potential problems that this activity might bring. Engaging in social interactions, whether online or in person, can be time-consuming. Excessive socializing might interfere with productivity, work, or other important tasks. Miscommunications and misunderstandings can arise during social interactions [40], leading to conflicts and strained relationships. Differences in opinions, values, or cultural

backgrounds can contribute to such issues. These findings yield practical, theoretical, and methodological findings as follows.

The practical contribution of these findings is the categorization of professional development activities into themes, offering practical guidance for developing teacher development programs that are effective. Recognizing the prevalence of knowledge sharing and collaboration activities allows program developers to prioritize these, fostering deeper discussions and diverse perspectives. It also highlights the importance of balancing social interaction with other activities to harness its benefits while managing potential drawbacks. Meanwhile, theoretical contributions include enriching our understanding of teacher development by categorizing activities into themes. It emphasizes the significance of knowledge sharing and collaboration in generating innovative ideas and fostering a sense of community among practitioners. Methodological contributions involve reviewing and summarizing existing literature, providing a structured analysis of professional development activities, and referencing previous studies to support the findings. This approach enhances the clarity and organization of the presented information, serving as a valuable resource for upcoming studies in the realm of teaching.

### 3.3. The barriers to online professional development

The enactment of online professional development activities is not without barriers. In fact, there are various barriers that can be categorized into three themes: attitudinal, physical, and structural [41]. Among the three types of barriers, structural barriers are the most prevalent. On the other hand, attitudinal barriers are the most infrequent. The barriers are categorized into themes and sub-themes as presented in Table 4.

**Table 4**. Barriers to online professional development

| **Themes** | **Sub-themes** |
|---|---|
| Attitudinal | Negative attitude of participants [32]<br>Trust issues on the usefulness of webinars [28]<br>Lack of motivation of students and teachers [35]<br>Addiction/uncontrolled use of smartphones [13] |
| Physical | Internet connection issues [6], [24], [35], [42]<br>Lack of technical support [42]<br>Limited technology use training and workshop availability [35]<br>Technology infrastructure limitations [35]<br>Paid websites with inappropriate materials [35]<br>Limited facilities and infrastructure [24] |
| Structural | Teachers' different skills and experience in using technology devices [33]<br>Difficulties in collaboration [29]<br>Lack of interaction with peers and instructors [42]<br>Low frequency of interaction [3]<br>Paperwork and time constraints [30]<br>Difficulty in asking questions regarding videos or tutorials [24]<br>Colleagues' limited knowledge [24]<br>Difficulty of choosing the right material among many others [35]<br>Unfamiliarity with how webinars work [28] |

#### *3.3.1. Attitudinal barriers*

Attitudinal barriers encompass one's attitudes and self-perceptions regarding themselves as learners [43]. As shown in Table 2, four studies report attitudinal barriers [13], [28], [32], [35] that consist of participants' negative attitudes towards professional development programs, trust issues on the usefulness of webinars, lack of motivation, and uncontrolled use of smartphone. The reviewed studies indicate participants' negative attitudes toward online professional development programs. Participants might develop a negative attitude towards online professional development due to various factors such as inadequate engagement, technical difficulties, lack of personal interaction, unclear objectives, limited support, or perceived ineffectiveness of the online format in addressing their learning needs. These factors can contribute to a sense of frustration, disconnection, and ultimately a negative perception of the learning experience. This finding seems to agree with the finding in a previous study [44], which shows that the change from on-site learning interaction to online mode has led to learners' negative attitude rather than the positive one.

The unavoidable consequence of online professional development is the uncontrolled use of smartphone [13] which turned out to be negative impact on learning. Using smartphones for professional development often involves accessing educational content, courses, and resources online as found in [35]. However, if the smartphone is used uncontrollably, the quality of learning might suffer. This is as found in a previous study [45]. Reading lengthy articles, watching educational videos, or participating in online courses can become challenging when constant notifications and distractions disrupt the learning process. Moreover, uncontrolled smartphone use blurs the boundaries between work and personal life. If the smartphone is constantly used for both work-related tasks and leisure activities, it becomes difficult to detach from work during personal time. This can lead to burnout and reduced overall satisfaction with both professional development efforts and personal life.

These findings provide practical contributions related to the importance for designing effective digital professional development programs. They identify key attitudinal barriers like negative attitudes, trust issues in webinars, lack of motivation, and smartphone distractions. Educators and trainers can use this knowledge to create more engaging, technically supported, and clearly defined online courses. It also highlights the need for strategies to promote digital mindfulness and reduce distractions during online learning. Furthermore, recognizing the impact of trust-building elements, such as credible webinar facilitation and evidence-based research, can help program designers establish a sense of reliability and effectiveness in online learning environments, ultimately contributing to more successful digital professional development programs.

### *3.3.2. Physical barriers*

Four studies reveal physical barriers that inhibit online professional development [6], [24], [35], [42]. Physical barriers encompass elements within an individual's current life circumstances that impede their engagement in ongoing education [43]. All the four studies that report physical barriers mention a common issue which is Internet connection Internet in Indonesia, Turkey, and Vietnam. This finding, especially in Indonesian context, is consistent with that in earlier studies [46]–[48], which show that internet connection stability still contributes to the hindrance in distance learning. Poor Internet connectivity can hinder participation and the ability to acquire new skills and knowledge. Connectivity issues can exacerbate the digital divide, where individuals or communities with limited access to reliable internet services are further marginalized in accessing professional development opportunities. Furthermore, constant problems dealing with connectivity problems can lead to a negative experience. This had been shown in some studies [26], [46] which revealed that poor internet connection could affect learners negatively. This can

decrease their learning motivation [46]. Thus, the efficiency of online professional development is worth questioning. The fact that Internet connection is still an issue in this digital age implies the need to resolve digital divide between modern and developing countries, so that the global society has even access to technological information and communication, especially regarding professional development.

Among the studies that address physical barriers in online professional development, one study [35] reports four kinds of physical barriers: Internet connection issues, the lack of available ICT training and workshop, technology infrastructure limitations, and paid websites with less proper materials. It is ironic that despite participants' extensive use of Internet to support their learning, there are some problems that inhibit their process of acquiring knowledge. This finding accords with an earlier study [49] which addressed issues in the use of Internet despite its extensive use. The emergence of physical barriers shows a lack of preparation and anticipation to problems that inhibit online professional development.

### *3.3.3. Structural barriers*

Eight studies indicate the existence of structural barriers [3], [29], [30], [24], [33], [28], [35],[42]. Structural barriers are practices, procedures, and policies that restrict opportunities to engage in online learning [43]. One study reports two structural barriers: difficulty when asking questions related to videos or tutorials and colleagues' limited knowledge [24]. Surprisingly, no studies report the same structural barriers. It might indicate that different contexts face different kinds of structural barriers. Different educational settings and regions may have unique structural challenges when it comes to Technology-mediated professional development. The specific infrastructure, policies, and practices can vary significantly, leading to distinct barriers in different contexts.

Difficulty in collaborating, low interaction frequency, and lack of engagement with peers and instructors can lead to a sense of isolation [50]–[52], hindering the fulfillment of the need for connection and belonging. Paperwork and time constraints can prevent teachers from participating in interactions and discussions, limiting their sense of community and relatedness [53]. Facing difficulty in asking questions or encountering colleagues with limited knowledge can hinder the sharing of experiences and insights. This lack of open communication and knowledge exchange can isolate teachers from the collective wisdom of the professional community. It reduces the chances for mutual support and relatedness, as individuals may not feel comfortable or confident enough to seek assistance or share their perspectives. Struggling to choose suitable materials and unfamiliarity with certain platforms can lead to frustration and disengagement [54], [55]. Overall, these barriers can prevent teachers from fully participating in professional development activities, potentially isolating them from opportunities for learning and connection. Overcoming these barriers is important for fostering relatedness, as it enables teachers to engage with their peers and instructors in a meaningful way.

These structural barriers contribute empirically and methodologically. The practical contribution of these findings is the identification of various barriers in online learning environments, such as difficulty in asking questions, colleagues' limited knowledge, paperwork, time constraints, and technology-related challenges. Recognizing these barriers is crucial for educators and program designers as it allows them to address these issues to enhance engagement, collaboration, and a sense of community among teachers. Overcoming these structural barriers is essential for fostering a sense of relatedness and ensuring that teachers can fully participate in professional development activities. Methodologically, the multifaceted approach suggested for addressing structural barriers demonstrates a methodological strategy that combines various elements to create a

growth-conducive environment. This approach can serve as a model for addressing complex challenges in Technology-mediated professional development contexts.

### *3.3.4. Solutions to overcome the barriers*

To overcome attitudinal barriers, effective communication about the benefits of online professional development is essential, highlighting how participation enhances teaching skills and contributes to personal growth. Sharing success stories and testimonials from peers [56] who have benefited can reshape perceptions. Building trust involves credible webinars by renowned experts, supported by evidence-based research showcasing their impact. Boosting motivation requires interactive professional development sessions with active learning, tailored content, and recognition through rewards and certificates [12]. Addressing smartphone addiction entails fostering self-awareness, suggesting designated phone-checking times, and highlighting the significance of focused learning.

Overcoming the physical barriers to effective online professional development involves implementing comprehensive solutions. To tackle internet connection issues, it's important to prioritize asynchronous content accessible offline, reducing dependency on real-time connectivity. It's also necessary to establish readily available technical support to assist participants facing challenges during sessions and to mitigate the impact of limited ICT training and workshop availability by offering diverse, accessible online resources for self-paced learning [11], [57]. Overcoming technology infrastructure limitations can be done by adopting platforms optimized for varied devices and connection speeds. The importance of appropriate platforms to facilitate learning had been urged in an earlier study[27]. Ensuring content appropriateness by curating from reputable, free sources, thus avoiding paid websites with inappropriate materials is also important. This is as highlighted in [5], [58]. Lastly, maximizing access by accommodating participants with limited facilities through simplified interfaces and downloadable materials is pivotal. The benefit of promoting downloadable materials is in line with the finding of an earlier work [1]. This holistic approach promotes seamless engagement despite physical barriers.

Addressing the structural barriers of Technology-mediated professional development necessitates a multifaceted approach. It can be started by tailoring training sessions [59] for diverse technological skills. Fostering teamwork through shared projects and user-friendly platforms to overcome collaboration challenges is crucial. This had been urged in a previous study [8]. Establishing regular virtual interactions, forums, and mentorship opportunities to boost engagement is also pivotal. This resonates with the finding in [60] which suggests the importance of maintaining interaction in online learning contexts. Offering flexible scheduling and creating a supportive environment for questions might be necessary. Flexibility and supportive learning environment is crucial in an online learning context and had been suggested in many studies [32], [42], [61]–[63]. Enhancing knowledge-sharing through peer-led workshops and platforms can also be done. To tackle material selection difficulties, curating varied resources and providing guidance is critical. The significance of giving guidance is in line with [13] stating that it can promote positive usefulness. To overcome webinar unfamiliarity, offering pre-session orientations and user-friendly interfaces is helpful. This holistic strategy might create a growth-conducive environment, effectively addressing the identified barriers.

These findings offer valuable practical, theoretical, and methodological contributions to the field of online professional development. On a practical level, the study highlights the importance of effective communication, success stories, and trust-building strategies to overcome attitudinal barriers. It also emphasizes solutions such as prioritizing asynchronous content, providing technical support, and curating accessible resources to address physical barriers effectively. Additionally, the multifaceted approach suggested for

tackling structural barriers, which includes tailored training, teamwork, regular interactions, peer-led knowledge-sharing, guidance, and familiarity, can serve as a comprehensive model for addressing complex challenges in professional development contexts. Theoretical insights underscore the significance of perception reshaping, motivation, and comprehensive solutions in addressing these barriers. Methodologically, the study references previous research to support proposed strategies, providing a strong foundation for their effectiveness. Together, these contributions enhance our understanding of effective strategies for online professional development and offer practical guidance for program designers and educators in this field.

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