Journal of Education and e-Learning Research
Vol. 10, No. 4, 702-710, 2023
ISSN(E) 2410-9991 / ISSN(P) 2518-0169
DOI: 10.20448/jeelr.v10i4.5092

Realigning online teacher training modules to COVID-19: An evaluation of the online training module among pre-service and in-service teachers in Pakistan

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Abstract

This paper aims to have a critical evaluation of an online training module among pre-service and in-service teachers in Pakistan. The aim of this study was to provide a thorough examination of the various aspects that contribute to both satisfaction and dissatisfaction with the training module. This evaluation is critical in the process of facilitating the accommodation of the synchronous and asynchronous online models that have established a permanent mark in education years after the COVID-19 pandemic lockdowns. A total of thirty educators who registered for the online training module were selected as participants for the study, in which open-ended online questionnaires were employed as the primary method of data collection. This research employed Braun and Clarke's technique, which involves a six-step theme analysis process. The results revealed the mixed feelings of satisfaction and dissatisfaction with adopting training modules. The motivation behind satisfaction stemmed from several factors, including the pertinence of content structure, adaptability, proficient utilization of media, and a determined attitude. Conversely, dissatisfaction was driven by the inadequacy of the content in addressing issues they thought were pertinent for teachers in the 21st century. The study underlined the crucial role of content design in online instruction, highlighting the need for robust planning to create accessible, engaging, and flexible modules compatible with standard devices like smartphones. The study proposes the ongoing adjustment of online modules to cater to the requirements of learners in the 21st century. This is because online modules have great potential for establishing a permanent position in the training of pre-service and in-service teachers.

Keywords: In-service teachers, Online training, Pakistan, Pre-service teachers, Professional development, Qualitative analysis.

Citation | Mohebi, L., AlMohsen, F., & Alshamsi, A. (2023). Realigning online teacher training modules to COVID-19: An evaluation of the online training module among pre-service and in-service teachers in Pakistan. *Journal of Education and E-Learning Research, 10*(4), 702–710. 10.20448/jeelr.v10i4.5092
History:
Received: 11 May 2023
Revised: 22 September 2023
Accepted: 6 October 2023
Published: 25 October 2023

Publisher: Asian Online Journal Publishing Group

Funding: This research is supported by Zayed University, United Arab Emirates (Grant number: R20121).
Institutional Review Board Statement: The Ethical Committee of the Zayed university, United Arab Emirates has granted approval for this study on 27 December 2022 (Ref. No. ZU20_158_F).
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Contents

Contribution of this paper to the literature
This paper measures the satisfaction of pre-service and in-service teachers with an online training module. The uniqueness of this paper is that it uses YouTube videos as the training module. This will help policymakers develop training modules using available materials online.

1. Introduction

The onset of the COVID-19 pandemic necessitated the temporary cessation of in-person educational activities in numerous nations, leading to the adoption of remote learning as an alternative mode of instruction. Pakistan is among the nations that expeditiously transitioned to online training programmes in response to the lockdown measures imposed as a result of the COVID-19 pandemic. The teacher training programs in Pakistan had to adapt to the changing circumstances to mitigate potential challenges to their milieu, such as time constraints and family obligations. Teacher training is perceived as inadequate when it does not provide the teacher with the knowledge and skills to adjust and align with the needs and challenges of society in general and the demands of 21st-century teachers. The world of Information and Communication Technologies (ICT) is any combination of hardware, software, media, and delivery systems like LAN, Internet, digital cameras, camcorders, videos, CD-ROMs, DVDs, digital libraries, scanners, transparencies, power point presentations, overhead projectors, email, video and audio conferencing, virtual reality, simulation software, and tools like Hyper-studio and Microsoft office, etc. In addition, ICT, includes technologies like Social Networking, Digital Gaming, and Simulations, (Mohebi, 2018), has made a permanent mark in numerous fields of human existence and has now extended its impact to the education sector. The COVID-19 pandemic forced and hastened the adoption of ICT in teacher training through online training (Hartshorne, Baumgartner, Kaplan-Rakowski, Mouza, & Ferdig, 2020; Lockee, 2021). Educators worldwide have embraced the integration of Information and Communication Technology (ICT) in teaching and learning in order to remain pertinent and effectively address anticipated needs. It is imperative that the instructor possess the necessary skills to design, develop, teach, and assess courses in the online environment (He, Xu, & Kruck, 2014; Molise & Dube, 2020). Such an effective process requires meticulous care in assessing and evaluating the developed online modules. The assessment of this process holds significance, as it offers the expedited implementation of online instruction in response to the COVID-19 pandemic. (Hartshorne et al., 2020). The idea that online teaching and planned learning occur in different places requires proper care in the design processes (Moore & Kearsley, 2012). An in-depth evaluation of the available courses is significant in this regard. This study sought to have an in-depth evaluation of an online course in teacher education. The educators undergoing training are provided with a platform to express their opinions and actively participate in the enhancement of online educational programmes. An in-depth evaluation of the design process is done, which in turn informs the development, implementation, and improvement of the online teaching training modules.

The COVID-19 pandemic has had far-reaching consequences for various aspects of life, particularly education. As face-to-face interactions were abruptly halted, traditional classroom-based instruction shifted to remote online learning (Wang et al., 2020). This rapid transition has presented opportunities and challenges for educators and learners alike, including pre-service and in-service teachers (Hodges, Moore, Lockee, Trust, & Bond, 2020). While online learning has the potential to offer flexible and convenient learning opportunities, concerns have been raised about its impact on the quality of education and the overall satisfaction of learners (Ali, 2020). The sudden shift to remote learning has emphasized the importance of practical online training modules, as they play a crucial role in the professional development of teachers (Garrison & Kanuka, 2004). Online training modules allow these teachers to enhance their pedagogical skills, adapt to new teaching methods, and integrate technology into their instructional practice (Nicolle & Lou, 2008). However, the effectiveness of these modules largely depends on the satisfaction and engagement of the participants, which can be influenced by various factors (Kebritchi, Lipschuetz, & Santiague, 2017).

The literature on online learning has identified several factors that contribute to satisfaction, including the quality of the course content, interaction with instructors and peers, feedback and support, and the usability of the learning platform (Sun, Tsai, Finger, Chen, & Yeh, 2008). Conversely, dissatisfaction with online learning often stems from technical issues, a lack of engagement, limited access to resources, and feelings of isolation (Bolliger & Martin, 2018). Although numerous studies have explored satisfaction and dissatisfaction factors in online learning, limited research focuses on pre-service and in-service teachers' experiences during the COVID-19 pandemic (Trust & Whalen, 2020). It is critical to comprehend the happiness and dissatisfactory variables among pre-service and in-service teachers when they engage with online training modules, given the unprecedented nature of the epidemic and the rapid move to remote learning. This research aims to fill this gap in the literature by exploring the experiences of these teachers during the COVID-19 pandemic, focusing on their satisfaction and dissatisfaction with online training modules. This understanding will provide valuable insights for educational institutions and policymakers, enabling them to make informed decisions and tailor their online training programs for better support of teachers' professional development in the post-pandemic era.

This increased uptake of online modules requires a critical analysis of existing training modules to realign those modules that are challenges for society and the 21st-century demands in teaching and learning modules. This study acknowledges the existing body of research on the efficacy of online teaching modules and explores the utilization of such modules by Pakistani students amidst the COVID-19 pandemic. However, most of the studies were quantitative. The current study sought to build on that body of literature by qualitatively evaluating an online teaching training module in a Pakistani setting. The objective of this study is to provide teacher trainees with the opportunity to conduct a critical analysis of a training module, with the aim of exploring the various factors that contribute to both satisfaction and dissatisfaction with a specific training regimen. Therefore, the study develops the following research objectives:

1. To identify the satisfaction and dissatisfaction factors of pre-service and in-service teachers in online training modules during Covid-19 pandemic.
2. To explore the recommendations and possible opportunities for effective implementation strategies in online training modules among pre-service and in-service teachers.

2. Literature Review

2.1. COVID-19 Pandemic and Online Training

Against the backdrop of the COVID-19-induced lockdowns, Pakistan had to adapt the online training for teacher training. The difficulties arising from the pandemic necessitated the innovative development of online modules, subsequently leading to the rapid enrollment of numerous students in training for online educational programmes. (Hartshorne et al., 2020). The internet is considered the most amenable to alleviating challenges related to learning in the backdrop of COVID-19 restrictions. Platforms such as Whatsapp and Zoom were quickly adopted in online education (Rehman, Zhang, & Iqbal, 2021). Using the current online teaching module as a measure, Pakistan is one of the countries from which several students and teachers signed up for the online training module even after the pandemic. Teachers in Pakistan should have been generous with online classes (Rehman et al., 2021). Thus, the pandemic left a lasting effect on lesson design and delivery (Lockee, 2021). The pre-service and in-service online training modules for bachelor's degree qualifications proved popular in Pakistan. Teacher training in Pakistan is categorized into pre-service and in-service. The teachers graduate with a bachelor's degree upon completion. The COVID-19 outbreak set in motion disruptions that have left a permanent mark on teaching and learning. The disruptions induced by the COVID-19 lockdowns and social distancing required that education, just like other sectors, had to adapt and quickly adjust to some other mode so that the goals could be accomplished in continuation. Among other developing nations, Pakistan was ill-prepared to adopt online education because many students had no cellular phones, computers, or internet access (Rehman et al., 2021). Online classes had severe challenges from the onset, affecting higher education delivery. One positive aspect in response to the challenges was the recognition of the situation as an opportunity to implement policy changes with the goal of revitalizing and enhancing the education system.

2.2. Challenges in Adopting Online Training Modules

The COVID-19 pandemic has drastically impacted global education, forcing institutions to transition from traditional to online learning (Crawford et al., 2020). This sudden shift has presented numerous challenges for educators, including pre-service and in-service teachers, who are required to adapt to new teaching methods and technologies (Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2020). Online training modules have become essential tools for enhancing the pedagogical skills of these teachers and preparing them according to the demands of remote learning (Dhawan, 2020). However, adopting and implementing online training modules have been challenging. A growing body of literature has explored educators' challenges during online learning, including technical difficulties, a lack of training and support, and concerns over student engagement (Bozkurt et al., 2020). Additionally, the rapid nature of this transition has exacerbated existing issues and highlighted the need for effective online training modules tailored to the needs of pre-service and in-service teachers (Toquero, 2020). Notwithstanding the significance of comprehending these challenges, there remains a need to investigate the research pertaining to the encounters of pre-service and in-service teachers with online training modules amid the COVID-19 pandemic. Table 1 also highlights the critical challenges during Covid-19 pandemic.

Table 1. Challenges of adopting online training modules during Covid-19.

No.	Challenge	Source(s)
1	Technical difficulties	Anderson (2020) and Bozkurt et al. (2020)
2	Lack of training and support	Rapanta et al. (2020) and Toquero (2020)
3	Student engagement and motivation	Dhawan (2020) and Bozkurt et al. (2020)
4	Time management and workload	Baticulon et al. (2021) and Dhawan (2020)
5	Access to resources and digital divide	Crawford et al. (2020) and Bozkurt et al. (2020)
6	Online assessment and evaluation	Baticulon et al. (2021) and Toquero (2020)
7	Communication and collaboration barriers	Rapanta et al. (2020) and Anderson (2020)
8	Privacy and security concerns	Baticulon et al. (2021) and Dhawan (2020)

2.3. Teaching in the 21st Century

Education is meant to play a key role in preparing and empowering students for 21st-century challenges. The world is changing rapidly, requiring education to play a key role in empowering learners with the requisite soft skills for the challenges of 21st-century (Jan, 2017). The COVID-19 pandemic is one such challenge that led to the suspension of face-to-face instruction for up to two billion learners, propagating the adoption of online instruction (Freshwater, 2020). The pandemic fast-tracked education technology, facilitating a transition to 21st-century practices. According to Lockee (2021), online instruction driven by COVID-19-related challenges was an opportunity for change and reimagined how education could be delivered. By the nature of their job, teachers are expected to play a critical role in empowering their students with the requisite skills for the 21st century. The teacher of the 21st century is required to develop students of the 21st century (Jan, 2017). In teacher training, this implies that the training modules should be structured to develop mastery among the student teachers. Well-prepared and fully supported instructors make the online course effective (Sun & Chen, 2016). The teacher in training should be exposed to the various ICT gadgets so that he/she can demonstrate mastery. Various gadgets are used in delivering online instruction. The smartphone is critical in this regard. This is regarded as an excellent online instructional tool rather than a distraction (Jan, 2017). This is a powerful tool that, even if the teacher does not use the smartphone for instruction, the students may use it for learning. The teacher needs to be aware of and familiar with how the students receive the instruction.

2.4. Online Course Design

The design process of online modules is very critical, as it is supposed to meet the needs of the teacher and the students. Designing online course content usually follows five phases, according to Keengwe and Kidd (2010). Firstly, the teacher must design content considering the student's needs. Secondly, the content is developed. Thirdly, content implementation. Fourthly, course evaluation, and fifthly, content revision. Of these five stages, the evaluation

phase is critical because it provides the much-needed feedback that informs content development. These phases need due care because the teacher would not be there to address the ensuing challenges. The revision of the course content is a product of the evaluation and feedback from the participants. The findings of a qualitative content analysis conducted on a corpus of online literature, comprising 47 studies published from 2008 onwards, indicate that the efficacy of online instruction is contingent upon the presence of meticulously crafted course content. (Sun & Chen, 2016). This emphasizes the need to take due care in the design of online modules. For teacher training, the content structure addresses the expectations of the teacher and the students. Certain factors are considered in the design of online modules. Lockee (2021) highlights that lengthy instructional sessions are no longer encouraged because they need to be aligned with individuals' psychological learning processes. An excellent online teacher training module is expected to be shorter to allow flexibility among those taking the course.

2.5. Flexibility in Taking Online Modules

One of the major factors that motivated the design and development of online modules was the desire to meet the flexible study schedules of the students (Parsad, Lewis, & Tice, 2008). This should be on the mind of online content designers. The content of online modules should be flexible for students. The student may choose to leave some classes or reschedule them later. Flexibility distinguishes online learning from physical instruction. It is this flexibility that attracts students to sign up for online instructions. Sixty-eight percent (68%) of the students who took online modules at some of the universities in the United States of America (USA) affirmed that they were attracted by the flexible schedule (Parsad et al., 2008). Ensuing innovations and challenges posed by COVID-19 made the adoption of flexible remote learning a possibility (Lockee, 2021). Though these observations were made long before the COVID-19 pandemic and the subsequent lockdowns, flexibility remains an important factor in the uptake of online modules today. Flexibility is not only a factor of time in taking the online module, but students also need the freedom to move through different delivery systems. The coming of the virtual learning option gave students an alternative that would allow hybrid or blended teaching and learning (Lockee, 2021). Thus, a student can take the course virtually or through face-to-face instruction. This alternative was considered after the occurrence of the COVID-19 pandemic and the subsequent implementation of lockdown measures. The provision of alternative instructional modalities, including virtual and face-to-face formats, has effectively mitigated concerns related to educational equity. Some students who experience adverse effects due to external circumstances are presented with the choice between online or in-person instruction as a means to mitigate the disparity. This has opened access to higher education for previously disadvantaged communities.

2.6. Accessibility and Equity Issues

Accessibility is also noted as a factor that drives the uptake of online modules. When students sign up for an online module, they should be able to access the course they are studying without driving to a face-to-face class. The design of online modules should avoid content that may require complicated procedures, unique ICT gadgets, or software. One of the significant challenges that online learning faced had to do with internet connectivity. Some rural communities had limited or no internet access. Lockee (2021) also highlights competing family needs as a significant challenge affecting online instruction. A study in Pakistan reveals that inadequate internet connectivity and a lack of electricity are significant hindrances to the implementation of online education (Rehman et al., 2021). However, it is such a challenge that it became the springboard for the development of innovative solutions to address the internet and accessibility challenges. Synchronous and asynchronous electronic resources, such as Zoom and Google Meet, allowed students in various localities to take online modules (Lockee, 2021). Furthermore, the systems allowed the recording of presentations for more convenience. Again, this opened up opportunities for marginalized communities.

2.7. Use of Multimedia in Online Learning

Electronic resources have emerged as a notable innovation in response to the challenges presented by the COVID-19 pandemic. Online learning benefitted a lot from the available online media resources that transformed learning. Virtual field trips, virtual laboratories, videos, and video recordings are media tools introduced in online lessons. Again, this opened opportunities for learners who may need access to a physical laboratory to interact with the laboratory. Online lessons were open for different age groups (Lockee, 2021).

2.8. Assessment in Online Education

Assessment is an essential procedure in teaching and learning. Teaching and learning are considered incomplete without proper assessment. A study in the Middle East on online assessments revealed that remote assessments posed extraordinary challenges that included academic dishonesty, infrastructure, coverage of learning outcomes, and failure of students who submitted late assessments (Guangul, Suhail, Khalit, & Khidhir, 2020). Both formative and summative assessments present challenges that can hinder the accurate evaluation of students' performance. The evaluation of students' academic performance is a multifaceted process that is further complicated by the presence of challenges related to cheating and plagiarism. Students are tempted to cheat and plagiarize other people's work, making it difficult for the teacher to get a correct picture of the student's performance. And some students fail to submit their work for assessment on time, and instructors find it difficult to follow up. The teacher is also expected to be innovative, as ICT is constantly changing.

3. Research Methodology

3.1. Research Method

A qualitative method design was employed in this study to gain an in-depth understanding of the reasons leading to satisfaction or dissatisfaction with the online teacher training module in Pakistan. The goal was to have an in-depth analysis of the reasons behind satisfaction and dissatisfaction.

3.2. Data Collection Procedure

The open-ended questionnaire elicited responses from participants who had signed in for the training module. Two research questions were posed for participants to explain and demonstrate an understanding of the effectiveness of the online training modules by pre-service and in-service teachers. The thematic approach was used in data analysis. Participation in the study was voluntary. Participants were informed that their privacy was going to be respected. Codes were employed to protect the identity of the participants. It should be mentioned that a code of conduct and ethical issues were prioritized when the research was conducted. All participants gave their informed agreement after being given the assurance that they might revoke their participation whenever they saw fit without fear of penalties. Also, all responses were kept anonymous. None of the participants were directly or individually identified in the report, nor was any of their data shared with any third party. As such, the current study maintained confidentiality and privacy. Additionally, because they could respond from the place and at the time of their choice, the participants' safety, security, and comfort were guaranteed.

3.3. Participants

Thirty participants were selected from pre-service and in-service teachers in training. The selection was based on the fact that they signed in for the module and had at least covered three-quarters of the module for the informed analysis. Participants who had completed the course were also included in the sample. Both male and female participants were drawn from diverse areas of specialization, i.e., science, mathematics, English, and early childhood development in Pakistan. Hence, a sample of thirty participants informed this research paper. The emailed consent form had to be filled out voluntarily in order to participate in the study. Codes were used to protect the identity of the participants (e.g., P120). Participants also knew they could withdraw from the study at any stage.

3.4. Instrumentation (Open Ended Questionnaire)

Participants responded to an open-ended questionnaire. They commented on aspects related to their dislike or preference for the online mode.

4. Results

Participants in Pakistan gave an in-depth written evaluation of the online teaching module. This analysis gave the consumers of the online module a voice and a process that contributes to the improvement of online training modules. This feedback is critical to improving and realigning online training modules according to the demands of society and 21st-century teachers. Satisfaction and dissatisfaction were the notable outcomes for the teachers. From the findings, the satisfaction and dissatisfaction factors are identified as follows:

4.1. Satisfaction Factors

1. Flexibility: The ability to balance work and learning with a flexible schedule saves time and allows for more convenience.
2. Multimedia in online lessons: Using various multimedia, such as videos, animations, and toys, enhances teaching and learning experiences, making them more engaging and interactive.
3. Innovative learning methods: The introduction of virtual field trips and laboratory experiments provides more learning opportunities and access to better learning environments.

4.2. Dissatisfaction Factors

1. Insufficient training for multimedia usage: Participants expressed a need for more training on effectively using multimedia in their teaching and learning.
2. Limited accommodation for varied intellects: Multimedia content should be designed to cater to learners with different intellectual levels.
3. Lengthy videos: Participants suggest that videos should be more concise so that interest and engagement can be maintained.
4. Font and design issues: Recommendations were made for bolder fonts and more user-friendly design elements in the multimedia content.

By addressing these dissatisfaction factors, online training modules can be improved and optimized for better professional development of pre-service and in-service teachers. Table 2 also summarize the factors in a way that clarifies the findings of the study.

Table 2. Satisfaction and dissatisfaction factors.

Factors	Description	Summary
Satisfaction		
1. Flexibility	Balancing work and learning through a flexible schedule saves time and allow for more convenience.	Convenience and time-saving
2. Multimedia	Using various multimedia (Videos, animations, and toys) enhances teaching and learning experiences, making them more engaging and interactive.	Engaging and interactive learning experiences
3. Innovative methods	Introduction of virtual field trips and laboratory experiments, providing more learning opportunities and access to better learning environments.	Expanded learning opportunities
Dissatisfaction		
1. Insufficient training	Participants expressed a need for more training on how to effectively use multimedia in their teaching and learning.	Need for more multimedia training
2. Limited accommodation	Multimedia content should be designed to cater to learners with different intellectual levels.	Catering to various intellects
3. Lengthy videos	Participants suggested that videos should be shorter and more concise to maintain interest and engagement.	Shorter and more concise videos
4. Font and design	Recommendations were made for bolder fonts and more user-friendly design elements in the multimedia content.	Improved font and design in multimedia content

4.3. Satisfaction Factors

4.3.1. Flexibility

The flexibility of taking the course was one of the major factors that drove satisfaction in Pakistani teacher training. The participants, who were over the age of 25 and were already in the teaching field as mature adults, had to balance work and an online module. This implies that they needed a flexible schedule to balance their responsibilities. Participant P361 viewed this type of learning as "time-saving learning." Male participant P344, an adult 34 years old, referred to the module as a" flexible classroom environment." This implies that the student might have a flexible timetable that would provide him with time for other activities.

4.3.2. The Significance of the Multimedia in Online Lessons

Participants in this study also appreciated the use of multimedia in teaching online classes. Participants were appreciative of the versatility that media use brought about. Participant P352 regarded the videos used in the module as a very "useful method to enhance teaching." Similarly, participant P387 recommended that "more videos should be made. I enjoyed these greatly". The use of video improved the learning environment and student motivation. Videos can be used to undertake innovations like virtual field trips and virtual laboratory activities, giving more and more students access to better learning settings.

Besides video usage, participants also appreciated using animations and toys in content delivery. One student teacher declared, "We learned one new technique: learning with playing is effective because it initiates students' interest" (participant, P381). Thus, learning is made more fun because of the fusion of multimedia. Participants acknowledged the value of multimedia in enhancing the teaching and learning environment, but they also called for further training to ensure that students are able to take advantage of the media. For example, participant P320 recommended the "use of live pieces of training with video examples". Participant P318 advised that it should be user-friendly for all intellectuals". The video and multimedia content should accommodate learners of varied intellects. Participant P352 saw the need for more videos and requested that some videos be in Urdu.

Nonetheless, in terms of video usage, participant P385 advised that "the videos must not be too lengthy. The font should be bold". Similarly, participant P386 said, "The training content is relevant if the length of the videos can be shortened." Thus, at the same time, they appreciated the relevance of the course content. Some participants could have been more impressed by the length of the videos meant to aid the delivery of the content. This goes back to the design stage, in which proper planning considers that while videos contribute to and enhance content delivery, they need to be correct.

4.3.3. Innovative Methods

Incorporating innovative learning methods like virtual field trips and laboratory experiments provides pre-service and in-service teachers with expanded learning opportunities and access to better learning environments. These methods can enhance the online learning experience, making it more immersive and enjoyable. To promote ongoing satisfaction, online training programs need to stay updated with the latest advancements in educational technology and incorporate them into the curriculum. Table 3 also highlights the empirical findings of the satisfaction factors.

Table 3. Empirical analysis about satisfaction factors.

Heading	Sub-heading	Findings
Satisfaction factors	Flexibility	Participants valued the flexibility of the online course, as it allowed them to balance their work and other responsibilities. The ability to follow a flexible schedule was seen as a timesaving and convenient aspect of learning. Participants appreciated the flexible classroom environment.
	The significance of multimedia in online lessons	Participants highly appreciated the use of multimedia in online teaching. Videos were viewed as a useful method to enhance teaching and improve the learning environment. The use of multimedia, including animations and toys, made learning more engaging and fun. Participants suggested the inclusion of more videos, live training sessions, and user-friendly multimedia content.
	Innovative methods	Incorporating innovative learning methods, such as virtual field trips and laboratory experiments, enhanced the online learning experience. These methods provided expanded learning opportunities and access to better learning environments. Online training programs should stay updated with educational technology advancements and incorporate them into the curriculum to promote ongoing satisfaction.

4.4. Dissatisfaction Factors

4.4.1. Insufficient Training

Participants expressed a need for effective training in using multimedia in their teaching and learning. Online training modules should address this need by providing comprehensive training resources, including tutorials, webinars, and hands-on practice opportunities, to ensure learners can fully utilize multimedia tools and enhance their teaching practice.

4.4.2. Limited Accommodation

Online training modules should be designed to cater to learners with different intellectual levels, ensuring that multimedia content is accessible and understandable for everyone. This can entail offering various degrees of complexity or adding more resources and support for students who need more help.

4.4.3. Lengthy Videos

Online training modules should feature shorter and more concise videos to maintain interest and engagement. This can be achieved by breaking down complex topics into smaller segments or employing various multimedia elements to make the presentation of information more engaging and digestible.

4.4.4. Font and Design

A good font and design in multimedia content can enhance the overall user experience and make it more visually appealing and user-friendly. Online training modules should incorporate high-quality design elements and typography to ensure the content is easy to read and comprehend. The study also concludes the empirical analysis in Table 4.

Table 4. Empirical analysis about dissatisfaction factors.

Heading	Sub-heading	Findings
Dissatisfaction factors	Insufficient training	Participants expressed a need for effective training in using multimedia in teaching and learning. Comprehensive training resources, tutorials, webinars, and hands-on practice opportunities should be provided in online training modules to address this need. Enhancing multimedia utilization can help improve participants' teaching practice.
	Limited accommodation	Online training modules should cater to learners with different intellectual levels. Multimedia content should be accessible and understandable for everyone. Additional resources and support should be provided for learners requiring more assistance. Different levels of complexity can be offered to accommodate learners' diverse needs.
	Lengthy videos	Participants expressed dissatisfaction with lengthy videos in online training modules. Shorter and more concise videos can help maintain interest and engagement. Breaking down complex topics into smaller segments or employing various multimedia elements can enhance information delivery. Digestible content leads to better engagement.
	Font and design	A good font and design in multimedia content can enhance the user experience. High-quality design elements and typography should be incorporated in online training modules. Ensuring that content is easy to read and comprehend improves user-friendliness. Visual appeal contributes to a more positive learning experience.

As well, Table 5 distinguishes the empirical analysis about satisfaction and dissatisfaction factors.

Table 5. Comparison of satisfaction and dissatisfaction factors.

Satisfaction factors	Dissatisfaction factors
• Flexibility	• Insufficient training
• Allows balancing work and education	• Need for more training on multimedia use
• Provides a flexible schedule	• Limited accommodation for different learners
• The significance of multimedia	• Lengthy videos
• Use of videos, animations, and toys	• Videos should be shorter and concise
• Enhances teaching and learning	• Font and design
• Innovations like virtual field trips	• Improved font and design in multimedia
• Laboratory experiments	• Content

5. Discussion

The study accepts that the designing, development, implementation, and uptake of virtual learning were hurried processes in the face of the COVID-19 pandemic(Hartshorne et al., 2020). However, this was a critical springboard that also hastened the process of aligning education with the demands of the 21st century. Online modules were available, which improved accessibility and equity in higher education training. Communities previously disadvantaged due to geopolitical factors now have access to higher education instructions. The accessibility and opening of education opportunities generally contributed to the development of a more positive attitude towards virtual instruction.

Accessibility was also improved because of the content design. Participants could easily access the training modules because it was compatible with the basic smartphone. The smartphone went through a transformation and became an excellent tool of instruction rather than distraction (Jan, 2017). Student participants found satisfaction with the module because it did not require expensive gadgets or software access. The participants were more satisfied since the content format, which incorporated videos, was simpler and easier for them to access.

The study reveals the significance of content design in online instruction. The designing stage is critical because online teaching and learning are done separately. The teacher teaches in one place while the learning takes place elsewhere (Moore & Kearsley, 2012). Therefore, this requires the teacher to put in lots of planning when designing online courses. What differentiates online courses from face-to-face instruction is that in face-to-face instruction, the teacher has several avenues for feedback during the instruction. The feedback could be factored into the process of further instruction. The flexible nature of the online modules also drove the uptake of the online modules in Pakistan. This observation aligns with previous research conducted in the United States, wherein it was discovered that 68% of college students expressed interest in online modules due to the convenience of flexible scheduling. (Parsad et al., 2008). Most of the participants in this study were adults who usually have extra responsibilities for family and work. The adults often take the online module to develop themselves professionally and need a flexible schedule to balance work and education. This made the online mode of instruction more attractive, which in turn drove satisfaction.

5.1. Practical Implications and Recommendations

The COVID-19 pandemic has highlighted the need for practical online training modules for pre-service and in-service teachers in Pakistan. Based on the satisfaction and dissatisfaction factors identified, the following practical implications and recommendations are made to support Pakistani teachers during crisis like COVID-19:

1. Enhance flexibility in online training modules: Educational institutions should prioritize flexibility in their online training modules, allowing teachers to learn at their own pace and manage their personal and professional responsibilities more effectively. Offering self-paced courses, asynchronous learning opportunities, and extended deadlines for assignments and assessments can help achieve this.
2. Provide comprehensive multimedia training: Educational institutions should offer comprehensive training resources to ensure effective teaching practice. These resources may include step-by-step tutorials, webinars, hands-on practice opportunities, and access to technical support teams.
3. Develop user-friendly and accessible multimedia content: Online training modules should be designed to accommodate learners of varied intellects by incorporating user-friendly and accessible multimedia content. This can be achieved by using precise language, providing multiple representations of concepts, offering additional resources, and ensuring compatibility with technologies.
4. Optimize video content: To maintain interest and engagement, educational institutions should optimize their content by keeping it concise, visually appealing, and easy to follow. This can be achieved by breaking down complex topics into smaller segments, using engaging visuals, and employing various multimedia elements to present information in an accessible manner.
5. Encourage innovative learning methods: Educational institutions should explore and incorporate innovative learning methods, such as virtual field trips and laboratory experiments, to provide more engaging and immersive learning experiences for pre-service and in-service teachers.
6. Establish support networks: Institutions should establish support networks for pre-service and in-service teachers during crisis like COVID-19. This could include mentorship programs, online discussion forums, and regular check-ins with instructors or peers to provide emotional and professional support.
7. Improve Internet access and infrastructure: To ensure that all pre-service and in-service teachers can access online training modules, the government and educational institutions should work together to improve Internet access and infrastructure, particularly in rural and unprivileged areas.
8. Develop emergency preparedness plans: Educational institutions should develop and regularly update them to ensure that pre-service and in-service teachers can continue professional development during these crises. These plans may include guidelines for transitioning to online learning, strategies for maintaining communication with students and colleagues, and resources for supporting teachers' well-being and mental health.

By implementing these practical implications and recommendations, Pakistani pre-service and in-service teachers can be better prepared for such crisis like COVID-19, while ensuring their continued effort to develop their professional skills for providing high-quality education to their students.

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