


# Evaluating the effectiveness and implementation of an online professional development program for health professional educators: The case of Jimma University

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## Abstract

The usage of virtual platforms for reforming teachers' continuous professional development (CPD) is becoming more and more necessary in contemporary higher education (HE) settings. For a comprehensive understanding of the implications of this strategy for CPD, research studies from various contexts are required. This study evaluated the effectiveness and implementation of a pilot online professional development (PD) package called the 'higher diploma program (HDP)' for health professional educators (HPEs) in the Ethiopian HE context. We used mixed methods in a Hybrid II design. Additionally, a comprehensive e-learning quality framework guided the overall research and integration of the qualitative and quantitative data. The qualitative component includes a key-informant interview (KII) with facilitators, a program coordinator, and a single focus group discussion with HPEs. Additionally, the quantitative component includes a cross-sectional survey of the (HPEs') responses to a self-report questionnaire. The findings show that this pilot project was feasible and well accepted by the HPEs, facilitators, and coordinators of the project. These participants also perceived several implementation challenges as weaknesses of the pilot project. Mitigating the prevailing challenges requires sustained and collaborative efforts by universities, the education and health sector, and other partner institutions. Our interpretations imply that customizing online PD in HE is, ultimately, a local phenomenon that results from individual motivation and interest, institutional capacity, and contextual factors like access to technology, the quality of online PD resources, and program management.

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## Introduction

Traditional face-to-face professional development (PD) activities, for example, training workshops, are essential elements of a systematic PD program for health professional educators (HPEs) (Stark et al., 2021). However, such PD activities require HPEs' physical presence for a specific period. This does have limitations, primarily due to many barriers to

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attendance (Wasserman & Migdal, 2019). One of the most mentioned barriers is time pressure resulting from multiple roles and duties of HPEs (Elliott, 2017).

Online PD for HPEs is an emerging technology-based approach for capacity building (Stark et al., 2021). It has become essential to meet the changing needs of health care providers (Jeyakumar et al., 2023) and to mitigate the implementation challenges of traditional face-to-face PD (Rienties et al., 2013). Scholars asserted that promoting the effectiveness of online PD is possible if standards that address the unique circumstances of the online learning environment are met (Rienties et al., 2013). Additionally, the use of developmental structures designed to support progressive PD over time is important (Fallis et al., 2022).

HPEs need high-quality PD to help their students meet quality academic standards and to meet the goal of ensuring high-quality teacher (Feldacker et al., 2017). While there is a wealth of information in the literature about what is required to provide quality PD for HPEs, the use of new technologies to provide HPEs with access to PD is rarely addressed (Walker et al., 2019). In addition, the literature on PD for HPEs documents anecdotal records and few empirically based research evidence, often-describing PD programs or lessons learned.

Over the past ten years, there has been ample documentation of the exponential expansion in the usage of technology and the availability of software applications (apps) for PD among HE teachers. The literature on technology integration in HE indicates that rather than focusing on how technologies can be utilized for PD, there is a growing emphasis on how technologies are employed for teaching and learning purposes (Feldacker et al., 2017; Zelelew et al., 2022).

The online PD has been an increasingly important component of PD for health professionals for a long time. Due to the widespread usage of mobile devices in clinical settings, online PD is a great option for busy health professionals who want to be both teachers and learners (Nguyen et al., 2023). Online PD enables health professionals to access courses at their convenience, regardless of their geographic location. To achieve these potential benefits, a comprehensive strategy should be used in the design, development, implementation, and evaluation of online PD programs for health professionals (Scott et al., 2017).

### **Statement of the Problem**

PD is crucial for health professional educators because it ensures they stay updated with current trends, advancements, and best practices in their field. However, there is a lack of theoretically grounded research on online PD for health professionals (Bergeron et al., 2017). According to systematic reviews of studies conducted in resource-rich settings, internet-based learning for health professionals has been demonstrated to be at least as effective as traditional non-internet-based instruction in improving skills, knowledge, behavior, and patient care when compared to no intervention (DeCorby-Watson et al., 2018). However, little is known regarding the applicability or impact of online PD in environments with restricted resources (Feldacker et al., 2017). This study looked into the efficacy and implementation of an online PD for health professionals at an Ethiopian university. The study

is significant because it will help universities provide context and need based PD for health professionals to make changes and give administrators useful guidance about the functions of online PD in Ethiopia and around the world, as well as the pertinent methodologies in comprehensive studies.

There is also a dearth of studies focusing on the effectiveness and implementation of online PD for HPEs (Kitema et al., 2023). What is more, administrators remain uninformed about which online PD program will help support HPEs' change and the relevant methodologies in comprehensive studies. In addition, administrators lack sufficient strategies for where to direct their support. Therefore, the purpose of this study is to evaluate the effectiveness and implementation of the online component of a pilot PD project for teachers of health sciences at Jimma University.

In line with this purpose, the present study is organized under the following research questions: (1) Are the objectives of the online PD program being met as applied at the Institute of Health, Jimma University, Ethiopia? (2) What impact does the online PD has as applied at the Institute of Health, Jimma University, Ethiopia? (3) How do the research participants perceive and experience their involvement in the online PD activities and social interactions at the Institute of Health, Jimma University, Ethiopia? (4) What challenges exist with implementing the online PD at the Institute of Health, Jimma University, Ethiopia?

### **The Study Context**

This pilot PD program called the 'online HDP' is one of the desired solutions for making the PD program appropriate and meaningful for HPEs. However, this has brought pressure on educational managers and PD providers to adopt agile solutions that simultaneously address relevance and quality. Such a solution needs to ensure that PD programs that are customized for virtual platforms consider several issues across multiple dimensions, such as institutional, technological, pedagogical, evaluation, student and teacher support, and instructional design (Qian et al., 2018). Adopting digital technology in HE has been in a continual effort with collaboration from different stakeholders; however, the application of online PD in Ethiopian universities is in its infancy.

This online PD for HPEs was an internal initiative of a mini project by committed staff and collaborative efforts launched in the Health Institute at Jimma University (JU), Ethiopia. In the process of piloting the program, other institutions also had taken part, including the central HDP office of JU, the Ministry of Science and Higher Education (MoSHE) and Feed the Future Ethiopia's Growth through Nutrition Activity implemented by international partner organizations Jhpiego and Save the Children International (prime) with funding from USAID. Although the concept for the program's launching was developed several years earlier, the pilot program—which included 22 volunteer HPEs—was introduced in 2020.

Compared to the program offered at teacher education colleges, this pilot PD project is innovative in two ways. 1) customization of HDP from the teacher Education College to a setting in the Institute of Health, including integration of practical and effective teaching

skills E-contents tailored to the health professions; and 2) changing the mode of delivery from face-to-face into online platforms.

The facilitators and program coordinators internally evaluated this online PD while the program was underway. Following the completion of three modules, except the module on action research, an external evaluation was initiated by the Ministry of Science and Higher Education (MoSHE) to evaluate the E-content, process, and overall management of the program.

### **Theoretical Framework**

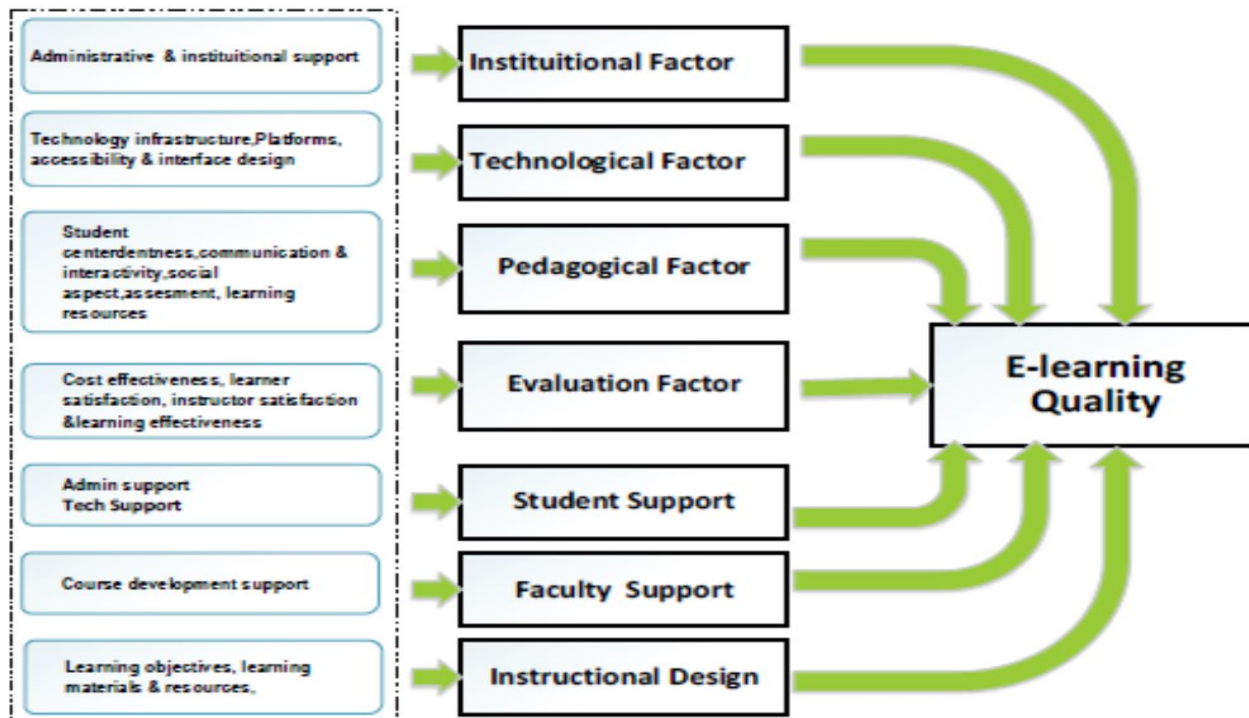
In this study, the authors used adult learning theory and constructivism as theoretical frameworks. Malcolm Knowles (1984) first coined adult learning theory (also known as andragogy). Knowles (1984) proclaimed five assumptions of adult learning: the self-directed and autonomous behavior of adult learners and the ability to bring life experiences to learning situations; self-readiness to learn something that addresses social roles; their keen interest in seeking immediate application of learned materials; and motivation to learn often triggered by intrinsic rather than extrinsic factors.

In this study, adult learning theory helps to examine HPEs' perceptions of an online PD experience based on the premise that teachers are adult learners with specific and unique learning needs (Ostashewski et al., 2011). Using this framework as a lens, the authors examined the extent to which the evaluated online PD project could influence PD outcomes and the implementation challenges (Thompson & Deis, 2004).

Scholars recommend constructivism as a core explanation for HE teachers' PD (Pitsoe & Maila, 2012). Constructivist principles such as social interaction, time, reflection, and ongoing support are helpful to effectively execute teachers' PD (Eun, 2008). Social constructivism highlights the contextual relevance of social interactions to enhance pedagogical practices (Amineh & Asl, 2015). According to this theory, human development is socially situated, and knowledge is constructed through interaction with others (Akar & Yildirim, 2009). These theoretical frameworks helped the authors define the study's scope, select relevant variables to measure, and place the research within the body of knowledge and understanding of PD for HE teachers.

### **Study Framework**

In this study, the authors used an e-learning quality framework as suggested by Masoumi and Lindström (2012), primarily because the framework captures the essential components anticipated to be measured in the study. This framework shares many of the elements of the framework suggested for the integration of e-learning in HEIs (Han et al., 2019), particularly in the context of developing countries (King & Boyatt, 2015; Kituyi & Tsubira, 2013). Figure 1 presents the model summary of the study framework.

**Figure 1***E-Learning Quality Evaluation Framework*

Source. Masoumi and Lindström (2012, p. 29)

As shown in Figure 1, the quality of E-learning establishes across seven interrelated dimensions, including institutional factors, technological factors, pedagogical factors, evaluation factors, student support, faculty support, and instructional design. This framework and its various components propose that quality E-learning is multidimensional (Littenberg-Tobias & Reich, 2020). With the help of this framework, the authors systematically organized the generated data (see Table 2). According to this framework, the quality of online PD originates not only from its module E-content and the competence of the facilitators but also from the institutional, instructional, and social environment (Muñoz Carril et al., 2013; Ossiannilsson & Landgren, 2012). Hence, attention should be given not only to online PD but also to the interaction between individuals and their multiple environments (Hays et al., 2020).

## Methods

### Design

In this evaluation study, a mixed methods design was used in a Hybrid II design to evaluate the pilot online PD's effectiveness and implementation simultaneously (Curran et al., 2012). Unlike other Hybrid designs, Hybrid II design gives equal priority to an evaluation of program effectiveness and implementation (Cully et al., 2012; Kozica et al., 2016; Rogers et al., 2013). This design's components include a single case study (Stake, 2005), collecting

qualitative data from three study participants: PD candidates, facilitators, and program coordinators, and a cross-sectional survey (quantitative) of eighteen HPEs at the Institute of Health, Jimma University. The quantitative and qualitative data were collected side-by-side, and in the end, creating an integrated report (Scholz & Tietje, 2002). The integration occurs through merging of the quantitative and qualitative data sets when the two sets of data are used to provide answers to the same question and embedding to provide answers to related questions (Palinkas et al., 2019).

## **Participants**

The total number of participants in the pilot online PD was twenty-two, and the survey participants accounted for 82%. Additionally, the participants of the qualitative component included two facilitators, a program coordinator, and a single focus group discussion with four HPEs. While the program coordinator and facilitators selected purposively, the HPEs were selected using maximum variation sampling based on major fields and gender.

## **Data Collection Instruments**

### ***Survey Questionnaire***

The authors used a questionnaire for the collection of quantitative data from the HPEs. The substantive E-contents of the questionnaire included seven aspects of online PD guided by the conceptual framework of the current study. Additionally, it involved open-ended items regarding the challenges of program implementation and recommendations for a better future.

### ***Key Informant Interview (KII) Guide***

The authors scheduled an interview for a purposefully selected key informant. In the interview, the E-contents include questions to elicit information about the strengths and weaknesses of program implementation. Moreover, insights, gaps, and challenges in training delivery (program & modules) are part of the E-contents. In addition, the effectiveness and relevance of online PD in developing the skills, capacity, and competitiveness of teachers were included.

### ***FGD Guide***

The authors arranged FGDs with the HPE participants. The points of discussion used in the FGD reflect the issues presented in the KII with little modifications to fit with the FGD format.

## **Integrating the Results of Quantitative and Qualitative Data**

The authors combined the results of the qualitative and quantitative data based on the study model and the categorization and advice informed in the methods section. This helped the authors to see whether the two databases—quantitative and qualitative—unify and generate consistent conclusions or diverge and produce contradictory findings. Thus, the

research model serves as a foundation for the selection of items on the various instruments. This is evident from Table 1, which categorizes the different items.

**Table 1**

*The seven Quality Domains of the Items in the Various Study Tools used in this Study.*

Category	Institutional	Technological	Pedagogical	Evaluation	Student Support	Faculty Support	Instructional Design
Quality domain	Admin and Institutional support	Infrastructures, Platforms, Accessibility, Interface design	S-centred communication, interactivity, Social aspect, Assessment, Learning resources	Cost effectiveness, learner satisfaction, Instructors' satisfaction, Learning effectiveness	Admin support Tech support	Course development support	Learning Objectives Learning Materials and Resources
Specific item	Interview, FGD	1, 2, 3, 4	5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,	18, 19, 20	Interview, FGD	Interview, FGD	21, 22, 23, 24

*Note:* The number represents the questionnaire item.

The seven domains that the items employed in this study in the different study instruments are displayed in Table 1. Elements from the FGD and interview were categorized as institutional, student, and faculty support; elements from the survey questionnaire fell into categories: technical, pedagogical, evaluative, and instructional design aspects. Additionally, the qualitative interview and FGD were used to supplement the survey responses in the other factors where the quantitative dimensions were used.

## Data Analysis

Using SPSS software, the authors analyzed the quantitative data. Given the small sample of participants, the authors used descriptive statistics for the quantitative analysis (Field, 2009). The participants' responses to the open-ended items in the survey questionnaire and data from the interview and FGD were independently coded line-by-line, and all codes systematically organized and guided by the study framework. The authors categorized in line with the teachers, facilitators, and program coordinators.

In the end, the authors integrated the summary findings of the qualitative and quantitative data to explore whether the two databases (quantitative and qualitative) united or deviated. The authors categorized the question items for the different tools.

Research outputs have been published previously in the Journal of Medical Science Educator regarding the development and validation of the online professional development process (Gedamu et al., 2022). This pilot study is entirely different from the one published earlier in terms of its focus, the data sources, and methods of analysis, as it specifically examines online PD for HPEs using a Hybrid II design and collecting both quantitative and qualitative data sets and descriptive statistics of the quantitative data.

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## Results

### Overview

The online PD for HPEs is a blended model in terms of its program delivery and operations. We introduced this online PD at the Institute of Health. Hence, the pilot program consists of online learning and study, together with face-to-face sessions for reflection and experience sharing.

### HPEs' Responses to the Survey Items in a Questionnaire

In this study, the authors used a questionnaire consisting of 24 objective questions to elicit HPEs' responses across the technological, pedagogical, evaluation, and instructional design domains. As shown in Table 1, the E-quality domains offer a structured set of four factors: technological, pedagogical, evaluation, and instructional as tools for measuring the practical quality of online PD. The questionnaire items used in this study largely comprise items from the pedagogical factors category. In contrast, the items under the evaluation factors category included relatively fewer items.

The study found that most HPEs agreed on the quality of online PD, focusing on higher-order thinking, critical reasoning, interaction with other course participants, and occasional technical problems. They also agreed on 16 of 24 items justifying the quality of online PD, including communication tools, opportunities for higher-order thinking, time and effort required for learning organization, and the availability of communication facilities like email, chat, and discussion forums. Table 2 shows that 8 HPEs doubted the ease of problem-solving, 6 were unsure of the course policy's clarity, 8 were unsure of the online course structure's methods for assessing E-content mastery, and 7 were unsure of the quality of materials and resources for PD modules.



**Table 2***Summary of the HPE's Responses to each Quality Measure*

E-Quality Domain	Specific Items	Response		
		Agree	Unsure	Disagree
Technological Factors	1. The course is easy to navigate/ platform is user friendly.	12	3	3
	2. The course architecture permits the online teacher to add E-content, activities, and assessments to extend learning opportunities.	12	4	2
	3. The online course encounters technical problems occasionally such as software errors, slow internet connections, etc.	17	0	1
	4. It was easy to fix problems when technical problems occur during online PD and alternative learning strategies were in place too.	6	3	8
	5. The course engages learners in active learning activities that address a variety of learning styles and preferences.	12	3	3
	6. The course provides opportunities for learners to engage in higher order thinking, critical reasoning and thinking in increasingly complex ways.	16	1	1
	7. The course design provides opportunities for trainer-trainee and trainee-to-trainee interactions and timely and frequent feedback about progress.	12	4	2
	8. Information literacy and communication skills are incorporated and taught as an integral part of the course (promotes trainee-to-trainee interactions as part of lesson activities; utilizes communication forums such as threaded discussion forums, chats, etc. and information literacy is addressed).	13	2	3
Pedagogical Factors	9. The course structure includes adequate and appropriate methods and procedures to assess learner's mastery of E-content.	9	4	4
	10. Group and individual assignments or assessment (if any) answers and explanations are included in the course as required.	12	3	3
	11. The online course provides ways to access trainers easily and quickly.	12	4	2

	12. The learning environment offers e-mail, chat, discussion forum and other communication facilities for interaction with other course participants.	16	2	0
	13. The online course is easy and fast for exchange of information and knowledge with peer learners.	13	5	0
	14. The online course supports cooperative learning and group work with other course participants.	11	4	3
	15. The online course demands more time and effort regarding the organization of learning and time needed for learning	15	1	2
	16. The online communication tools facilitate establishing new contact and interactions with other learners	17	0	1
	17. The course provides opportunities for learners to decide on when and where to take the course.	13	4	1
	18. The course offers opportunities for the learner to decide on the pace of learning and the use of preferred learning strategies.	12	4	2
Evaluation Factors	19. The course offers opportunities to control one's own learning motivation and success.	10	5	3
	20. There is a mechanism for internal evaluation and course is evaluated regularly for effectiveness and findings used as a basis for improvement.	14	3	1
	21. The course E-content, tasks and assignments are of sufficient rigor, depth and breadth and are aligned with the course goal and objectives	11	5	2
Instructional Design Factors	22. Sufficient learning resources and materials to increase trainee success are available for each module of the course.	8	7	3
	23. Academic integrity and netiquette (Internet etiquette) expectations regarding lesson activities, discussions, e-mail communications and plagiarism are clearly stated. (The course includes guidelines for students on the use of copyrighted materials, appropriate use of networked resources and academic honesty).	6	6	6
	24. The online course is accompanied with face-to-face sessions (when possible) to improve interpersonal communication and personal relations with other participants.	13	1	4

The results from Table 2 indicate that slightly less than half of the HPEs had concerns about the pace of learning and the use of preferred learning strategies. A similar proportion of them had concerns about the availability of cooperative learning and group work with other course participants, the rigorousness, depth, and breadth of the E- course contents, tasks, and assignments, and their alignment with the course goal and objectives.

### **Results of Open-ended Items (Questionnaire), Focus Group, Discussions and Interviews**

In this study, the HPEs' responses to the open-ended items in the questionnaire, HPEs discussion points in the FGD, and the program coordinator and facilitator interviews were analyzed depending on the emerging themes. The study participants' perspectives regarding the nature and use of online PD for health science instructors comprise three primary categories: (a) online PD characteristics, (b) perceptions of online PD, and (c) experiences of online PD. Additionally, within each of these primary categories, subcategories were developed that further delineated each category. Table 2 presents the definitions of the general codes and descriptions of the specific codes.

**Table 3**

#### *Definitions of General Codes and Descriptions of Specific Codes*

General Code	Specific Code	Specific Code Description
Characteristics: Key features of the online PD program's effectiveness across a range of dimensions.	E-content	Effectiveness of the online PD module components, electronic or digital contents in meeting the stated objectives.
	E-pedagogy	Effectiveness of the pedagogical strategies designed to meet end-users (health science instructors) requirements.
	E-assessment	Effectiveness of the assessment methods used to meet end-users (health science instructors) requirements.
	Technology	The effectiveness of the devices used to deliver or facilitate online PD over network-based electronic devices or using a computer network such as the internet.
Perception: An awareness or understanding of the benefits of online PD interpreted in the light of experience.	Personal benefits	The benefits of online PD in terms of flexibility, versatility, and interpersonal relationships.
	Institutional benefits	The perceived potential of online PD to empower instructors and build community among health science instructors and across groups.
	Overall benefits	The perceived potential of online PD to impact pedagogical practices, student outcomes, and healthcare services.

General Code	Specific Code	Specific Code Description
Experience: An event or happening that is lived through direct exposure to online PD. It can be something personal or professional for the individual.	Personal experience	Individual's formal and informal learning experiences.
	Professional experience	The experience that occurred in performing a professional activity in health science-related fields during the online PD implementation period.

The essential online PD characteristics, perceptions and experiences presented in Table 3 include those empirically identified by the participants for the online PD program studied. Here, the analysis of the findings organized into two major themes and nine subcategories are presented.

### Online PD characteristics

#### *E-content*

The HPEs and facilitators perceived the E-content of online PD as authentic, contextually appropriate for the HPEs, and engaging. The FGD participant HPEs appreciated most of the E-content and the way it was tailored to medical and health science disciplines. In their view, the E-content design encourages HPEs' active participation in individual and group learning activities, reflections, and discussion forums. They also noted that examples tailored to medical and health sciences presented clearly, so that it was easy to understand them.

However, the FGD participant HPEs commented that Module 2, i.e., "Managing Teaching, Learning and Assessment Methods in HPE" was vast and needs shortening. Also, they reported that some contents lacked references while they needed to have one. Other suggestions include reducing the number of learning activities in the modules so that participants will not be overwhelmed with a series of activities.

Additionally, the interviewed coordinator and facilitators recognized the E-content weaknesses. They suggested careful selection of the relevant activities and removing some irrelevant pieces, and merging some related pieces together to decrease the number of times participants could be engage in learning activities.

In the views of some HPEs who participated in filling out the questionnaires, the E-content revision appears critical. Very similar assignments, discussion forums, and activities were apparent in the pilot online PD. As one participant said, "there are almost very similar assignments and discussion forums. So better to make it shorter and to the point" (Survey Participant 16). Additionally, it was commented that enough reading materials should be available, and the E-contents should be available in a flexible format so that HPEs attending the online PD would have options for easy access to the E-contents.

The interviewed facilitators reported that the HPEs who participated in the pilot online PD liked the new content added to the online PD program, especially those integrated from the effective teaching skills manual developed and used by Jhpiego for faculty

pedagogic skills training. Facilitators also suggested that adding more audio and videos would help to reduce some learning activities. Universities might need to make efforts in the knowledge of multimedia creation and instructional design.

### ***E-pedagogy***

This included the program delivery and structure. Interviewed facilitators reported that the e-pedagogy applied in the pilot online PD implementation was very interactive and engaging and that the HPEs who participated in the online PD appreciated it. However, maintaining the same pace for all HPEs attending the online PD was another E-pedagogy challenge. As one interviewed facilitator said, some HPEs are fast and some lag, and some catch up by doing several activities at a time, so it was a challenge for facilitators to follow up all participants and bring them up to the same level.

Another drawback mentioned was that some discussion forums continue for extended periods without an end, which created fatigue and feelings of boredom among many trainees. It was suggested that facilitators should be aware of this and need to assign trainees or manage this themselves to summarize the key points of the discussion and end the forum in an appropriate period. Thus, the transition from traditional face-to-face PD to online formats necessitates pedagogical adaptation, necessitating a redesign of instructional approaches to accommodate the online environment's advantages and limitations.

### ***E-assessment***

Features in this study context included online discussions, critical readings, submission of assignments, and reflections. Most of the HPEs involved in the study reported the relevance of the E-assessment activities used in online PD. As the foremost role player in the online PD program, facilitators can provide reliable feedback on the quality and effectiveness of their PD experience, both directly and indirectly.

### ***Technology***

In terms of technology, almost all HPEs mentioned failure to access the server and the LMS system due to poor internet connectivity. This forced them to dominantly use email for their communications, and this email communication demanded much engagement and commitment. They also reported minimal ICT support and that there were continual interruptions due to electric power outages and poor internet access.

The program coordinator and facilitators reported that the free Moodle platform was not reliable, and it needs different features and packages for improved use. According to one of the facilitators, commercially available digital platforms are important for their advanced features and functions. Thus, an all-encompassing strategy incorporating infrastructure, support systems, and pedagogical techniques is required to successfully integrate online PD in a university setting.

## **Online PD Perceptions and Experience**

### ***Participants' Perception***

The different participants, including HPEs, facilitators, and program coordinators, liked the online PD. Most of the participants who liked the program described it as being interesting and engaging. However, most HPEs believed that punctuality, close supervision and follow-ups, regular attendance, and facilitators' minimal support need improvement, as these factors negatively affect online PD success. Additionally, the participants of this study believed that online PD has the potential to improve teachers' professional knowledge and skills and transform teachers' effectiveness in classrooms and throughout their careers. These results imply that increasing online PD success requires increasing punctuality, close supervision, regular attendance, and facilitator support.

### ***Personal Experience***

This included all interpersonal experiences study participants encountered in relation to the online PD program studied. All HPEs had interacted at one time or another with the program coordinator, or their peers, or either of the facilitators. Interactions might have been brief, but HPEs developed various perspectives over the project implementation period.

Most of the HPEs described their facilitators as interactive, respectful, and caring suitable for the learning and convenience of the online PD program. As one interviewed facilitator noted, the interaction would have been better had it been the case that a pool of facilitators was assigned. Hence, they can share the work burden and enhance interaction with HPEs. Additionally, most participants pointed out that they were able to provide their opinions and suggestions in discussion forums within a given period and were able to see points forwarded from their peers after some time since their opinions were saved and retrieved.

Almost all HPEs encountered internet connectivity issues several times during the online PD, forcing them to use other means of communication, such as email for group or individual work submissions, notifications, or similar messaging from the facilitators. The success of online PD was significantly hampered by these issues.

### ***Professional Experience***

All the HPEs involved in filling out the questionnaires gave some positive remarks about online PD based on their positive experiences at one time or another. Most of them expressed their interest and positive thoughts about the online PD they had experienced with this pilot project. For example, one of the HPEs (Survey Participant 8) wrote the following:

I have found this online course very interesting and fast paced. For people who have busy schedules, online course delivery provides an excellent opportunity to work with their own time and pace. People can attend the course from anywhere.

Some HPEs expressed that online PD improved their pedagogical practices by helping them use student-centered methods in their actual teaching. Almost all HPEs said that they would recommend the online PD program over face-to-face with their colleagues and friends. Almost all HPEs reported that they received proper orientation at the beginning of the course,

and so the course went almost smoothly with close guidance and follow-up from the facilitators. However, they noted the presence of several challenging situations in the overall coordination and management of the program. For example, they mentioned the negative perception of university management towards online PD, which resulted in lack of management follow-up and support.

Most of the study participants commented that the university management should be more committed and should own the program. In addition, they suggested that participants and facilitators of the online PD program should receive all kinds of incentives like the face-to-face PD, so participants and facilitators will be motivated to do better in the course.

The program coordinator and facilitators strongly argued that the MoSHE should endorse the program and officially announce the launch of the online PD program for health educators in universities prepared for the online program once the pilot test is completed and revisions made based on the findings of the internal and external evaluations. It also needs to develop working guidelines specifying ownership issues – which unit or department should coordinate and manage it, the benefit/incentive packages, etc. Other suggestions included institutional ownership, program management, and sustainability of the online PD program. One HPE suggested the following for the management of the online PD program.

The HDP course needs structure within colleges/faculties. It also needs to be contextualized according to current university development to handle graduate programs and research. The [online PD] should have a clear mandated personnel/structure (Survey Participant 4).

Some other HPEs even recommended such online PD programs to continue in their future PDs by incorporating additional new online technologies (for example, zoom technologies). Despite these positive insights and experiences, the HPEs also highlighted areas that need improvement for a better future of online PD. Still others recommended this online PD program for all teachers, particularly for new teachers at the beginning of their recruitment (before a new teacher starts teaching students in the institute of health). The other area that needs improvement, as suggested by the HPEs, includes emplacing management structure and institutional commitment.

## Discussion

This article reports on a study that examines online PD for HPEs, using a Hybrid II design and involving multiple stakeholder groups as study participants to understand its effectiveness and implementation at the same time. We used an overarching online learning conceptual framework and hybrid type II design in the context of online PD at the Institute of Health, to provide evidence that online PD can be effective and successfully implemented under some circumstances. These circumstances have been translated to several lessons learned that cover design issues, facilitation of interaction, and assessment and evaluation issues.

Both extrinsic and intrinsic motivational factors influence instructors' choice of online PD over traditional face-to-face PD. According to Alzahrani (2021), factors such as personal

interest, practical enhancement, and social contact motivated the participants' preference for online PD over the traditional face-to-face modality. Additionally, other factors, including independent learning, personalized learning, computer self-efficacy, social perception, external expectations, and improvement of skills, influenced instructors' motivation to choose online rather than face-to-face PD (Ibrahim & Nat, 2019). Similarly, the current study participants reported a mix of intrinsic and extrinsic factors influencing their decision to choose online PD over the face-to-face modality based. This was proved from both the quantitative and qualitative evidence collected for this study.

Kirkpatrick's four levels of training evaluation, also known as the Kirkpatrick model, is a crucial tool for evaluating the effectiveness of training inside an organization (Kirkpatrick & Kirkpatrick, 2016). This model, which has four stages—behavior, learning, results, and reaction—is among the finest for assessing training (Campbell et al., 2019). From that perspective, our pilot study focused on evaluating outcomes in terms of the teacher participants' acquired knowledge, skills, attitude, confidence, and commitment that the training program offered (quantitative results), as well as the program coordinator's and facilitators' perspectives on the relevance of the pilot online PD and its usefulness (qualitative results). Only the first and second levels of the Kirkpatrick model were examined in this pilot evaluation. Nevertheless, this was insufficient as it left out crucial evidence on the third and fourth levels (Kitema et al., 2023). Future studies should consider how participants' behaviors change after completing online PD and apply the knowledge they gained to their actual teaching responsibilities (Kennedy et al., 2014).

In a PD setting, the digital course materials provide both facilitators and program participants with greater interactivity and social collaboration both from within and between groups (Scott et al., 2017). In the current study context, the facilitators and HPEs viewed the E-content as relevant because of its flexibility of time, place, and pace of learning. As the evidence in this study as well as others shows, online PD can offer massive opportunities for capturing, storing, disseminating, and communicating a wide variety of information for PD purposes (Nguyen et al., 2023).

Additionally, issues of usability and usefulness are central concerns (Spector, 2015) to ensure program effectiveness, and the online PD implemented in the current study context is put forward as one solution to address these issues. Additionally, the online PD was implemented as planned to address the stated objectives by the program designers. This was evident from both the quantitative and qualitative findings of this study.

In the context of online HDP, participants' (facilitators and teachers) satisfactions can be enhanced by the facilitators' online presence, follow-up, and ability to troubleshoot teacher participants learning problems (Johnson et al., 2008; Moreira et al., 2017). However, this was found problematic, particularly in this study context, as the teacher participants encountered additional problems in the administrative and technological aspects. For example, most of the teacher survey participants, as well as FGD and interview participants affirmed that they had several obstacles during the pilot online HDP.

The findings of this study—both quantitative and qualitative—emphasized the value of online PD for health professionals at an Ethiopian public university. The results of the present investigation also show that the pilot PD used at the Institute of Health Sciences, JU,



is confronted with a number of challenges. A large number of Web-based PD programs lack impact demonstration and are vague about the underlying theory (Ebn et al., 2017). Both qualitative and quantitative approaches to data gathering, analysis, and interpretation should be included in a thorough evaluation model (Ramsden et al., 2022).

Overall, all seven components of the study model are included in the quantitative and qualitative findings of this study, either separately or in combination with the quantitative and qualitative data. Furthermore, a positive correlation was noted between the challenges raised by the program directors, facilitators, and FGD participant teachers' qualitative evidence and the quantitative evidence provided by the teacher participants.

## Conclusion and Implications

### Conclusion

This study highlighted the value of commitment, innovation, and evaluation that underpins successful online PD projects. If the HE sector choose to use and support online PD for HPEs, several issues arise concerning management, E-pedagogy, and evaluation. On the surface, the obvious challenges appear to be funding and infrastructure. However, as this study's findings show, other more complex issues need to be addressed to support the smooth implementation of online PD.

Indeed, the online PD enhances HPE's pedagogical knowledge and skills specific to Ethiopian culture. However, it is clear from the study's findings that problems associated with online PD are complex, institutionally situated, and culturally embedded. Our interpretations suggest that customizing or contextualizing online PD in HE is ultimately a local phenomenon that arises because of individual interest and motivation for online PD, institutional capabilities, and cultural factors such as access to technology, quality of online PD resources, and program management.

Moreover, the evidence presented in this study shows that the online PD created a conducive environment for collaboration and networking and more flexible and effective ways of providing PD. Hence, facilitators of online PD for HPEs should set up pertinent activities related to the course module(s) to reinforce and maximize HPEs' learning experience. However, many online materials may cause fatigue and make HPEs unwilling to use all the materials received. Hence, it is important to pay attention to enhance the quality of the materials.

### Implications

This study is the first attempt to examine online PD for HPEs using a Hybrid II design and involving multiple stakeholder groups as study participants to understand its effectiveness and implementation at the same time. Thus, the results may help to inform administrators and leaders regarding key markers of online PD for HPEs to promote a sustainable and scalable change in the quality of online PD. For this, standards for online PD should be developed to help HEIs provide their teachers with higher quality PD and establish a culture that supports online PD implementation.

Our interpretations suggest that the process of contextualizing HDP within the Institute of Health through the online platform is, in the end, a local phenomenon that results from a variety of factors, such as the pedagogical needs and values of teachers, institutional capabilities, and local challenges (Chisholm et al., 2012; Tadesse et al., 2021). This pilot study highlights the significance of a number of factors in the online PD process (Zezelew et al., 2022). At the end of the day, we must recognize that the online HDP designs are not separate entities; rather, they are integrated into the institutional systems throughout the implementation.

The study's quantitative and qualitative results, as well as those of related studies, show that there are more factors at play than just the availability of a technological infrastructure when it comes to online PD for health professionals (Uppal et al., 2018). The multidimensional approach used in this study helps to address most e-learning quality factors, such as instructional design, learner, and teacher support, and institutional, technological, pedagogical, and evaluation components (Masoumi & Lindström, 2012). This comprehensive framework for e-learning quality has significance because it can be used to evaluate the results and procedures of various online PD or learning programs. Furthermore, conducting a comparative analysis of the capacity to sustain and uphold the online HDP is significant.

Moreover, the findings of this study provide evidence about the effectiveness and implementation of online PD for HPEs, and this may help to inform administrators about the strategies needed to support HPEs' PD needs and the relevant methodologies in comprehensive evaluation studies. We strongly believe that the findings in this study serve as relevant resources for online PD scholarship and mixed-methods evaluation of online PD.

### **Limitations**

We recognize that some limitations affected the validity of our findings. The first limitation of this study was that we did not include large samples. Only eighteen participants completed the questionnaires, and four FGD participants were involved in a single FGD. Additionally, the findings' transferability maybe affected by the nature of our participants and study setting. Furthermore, because this was a pilot study on its own and because of the limited sample size, we were unable to confirm the validity and reliability of the data collection tools. However, we believe that these initial data and analysis provide a foundation for future more in-depth examinations of online PD program effectiveness and implementation.

### **Competing Interests**

The authors have no competing interests as defined by BMC or other interests that might be perceived to influence the results and/or discussion reported in this paper.

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## Ethical Approval and Consent to Participate

The protocol for the conduct of the study was approved by the Review Committee of the Institute of Health Science, JU (IHRPGD/868/20 and 9/10/2020). All methods were carried out in accordance with relevant guidelines and regulations. Informed consent was obtained from all subjects involved in the study prior to data collection.

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