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Beyond Learning by Videoconference: Findings From a Capacity-Building Study of Kosovan Teachers in the Post-Covid-19 Era

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During the Covid-19 pandemic, teachers were exposed to technology-enhanced learning as an emergency measure, yet despite decades of advancement in educational technology, the online learning experiences lacked deliberate design. Recent research highlights a gap concerning the design elements of online professional development and teachers' needs for professional development in online education. Through this Design-Based Research, we therefore sought to offer an intervention in the form of a professional development programme built on the specific needs of teachers. In the present study, we report on the findings from this two-cycle, five-phase online professional development, taken by 90 practising high school teachers across Kosova. The study sheds light on teachers' experiences and attitudes, as well as their readiness to take hands-on approaches to integrate, when available, complex technologies while leveraging the power of instructional design concepts in the post-Covid-19 era. The evidence indicates that, in order to develop effective teaching capacity in this environment, online professional development programmes must go beyond simple off-the-shelf technology (i.e., videoconferencing) applications. Similarly, our data shows that the inclusion of prior needs assessment in online and blended teacher development instruction positively impacts the development of teachers' attitudes towards online education. The present paper provides specific recommendations for any innovative education system leader, teacher or scholar hoping to leverage new online learning knowledge to strengthen teacher practice.

Keywords: online education, professional development programmes, teachers' needs, instructional design, innovation

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Iti dlje od učenja prek videokonference: ugotovitve študije o krepitvi zmožnosti kosovskih učiteljev v obdobju po epidemiji covid-19

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Med pandemijo covid-19 so bili učitelji izpostavljeni s tehnologijo podkrepjenemu učenju, kar je bila posledica ukrepov v izrednih razmerah, vendar kljub desetletjem napredka na področju izobraževalne tehnologije spletne učne izkušnje niso bile premišljeno načrtovane. Najnovejše raziskave opozarjajo na vrzel med elementi načrtovanja spletnega strokovnega izpopolnjevanja in potrebami učiteljev po strokovnem izpopolnjevanju v spletnem izobraževanju. S to raziskavo, ki temelji na načrtovanju, smo zato skušali ponuditi intervencijo v obliki programa strokovnega izpopolnjevanja, ki bi temeljil na specifičnih potrebah učiteljev. V tej študiji poročamo o ugotovitvah tega dvostopenjskega petfaznega spletnega strokovnega izpopolnjevanja, ki se ga je udeležilo 90 aktivnih srednješolskih učiteljev na Kosovu. Študija osvetljuje izkušnje in stališča učiteljev ter njihovo pripravljenost na praktične pristope za vključevanje kompleksnih tehnologij, kadar so na voljo, ob hkratnem izkoriščanju moči konceptov načrtovanja pouka v obdobju po epidemiji covid-19. Dokazi kažejo, da morajo programi spletnega strokovnega izpopolnjevanja za razvijanje učinkovitih učnih zmožnosti v tem okolju presegati preproste, že pripravljene tehnološke (npr. videokonferenčne) aplikacije. Podobno naši podatki kažejo, da vključitev predhodne ocene potreb v spletno in kombinirano izobraževanje učiteljev pozitivno vpliva na razvoj odnosa učiteljev do spletnega izobraževanja. Ta članek vsebuje konkretna priporočila za vse inovativne vodje izobraževalnih sistemov, učitelje ali znanstvenike, ki upajo, da bodo lahko uporabili novo znanje o spletnem izobraževanju za krepitev učiteljske prakse.

Ključne besede: spletno izobraževanje, programi strokovnega izpopolnjevanja, potrebe učiteljev, načrtovanje pouka, inovacija

Introduction

With the recognition of the importance of technology-mediated learning in schools, instructional design has gained considerable attention (West, 2023). The Covid-19 pandemic brought about radical shifts in education, for which nearly all educational workers, especially frontline K-12 teachers, were ill-prepared (Carrillo & Flores, 2020; Kaden, 2020; Kuhfeld et al., 2022; Scull et al., 2020), thus further emphasising the need for teacher professional development (PD) in online learning practices (Hodges et al., 2021). The aim of teacher professional development programmes is to improve teacher practice and beliefs (Guskey, 2002); however, it is widely acknowledged that changing teacher beliefs and attitudes is challenging. Along with gaining new skills, teachers need to ‘unlearn’ virtually unconscious ideas, presumptions and ideals about the nature of teaching, learning and schooling in order to implement transformative shifts in education (Dede, 2014, p. 21).

Many online course design teams adopt traditional frameworks, such as Moore’s Interaction Framework (Bernard et al., 2009; Karataş et al., 2017) as well as the Universal Design for Learning Framework (Rao et al., 2015), in attempts to create purposeful and well-designed online learning experiences together with effective PD. While many teachers had embraced traditional frameworks before the arrival of Covid-19, during the pandemic, most teachers failed to shape intentional online learning experiences from systematic support for PD due to the emergency. The rapid response to the pandemic resulted in emergency remote teaching, which can diminish the quality of course design and delivery compared to an intentional, well-designed online course. The latter can take months to prepare when done properly, whereas in emergency situations, the need to ‘just get it online’ contradicts some of the more advanced methods used to design online learning normally dedicated to developing quality programmes (Hodges et al., 2021).

Martin et al. (2019) identified the fact that consistent course organisation is also crucial for a well-designed online learning experience. They found that highly effective programmes were designed by systematically aligning learning outcomes with course content and organising the material into modules or weekly segments. In addition, this approach to programme design considers learners’ needs, creates opportunities for online interaction, integrates a variety of assessments, and uses systemic grading of activities and assignments. For an online course to be effective, Martin and Bolliger (2018) identified four types of critical support: design personnel, administrative support, pedagogical support and technical support. While online instructors look for various engagement

strategies to implement in their online courses, instructional designers assist in designing and developing online courses from inception to assessment (Reigeluth, 1999). Many system administrators first and foremost search for ways to increase engagement in online courses institution-wide, while many contemporary online course instructors are only content domain experts without a deep knowledge of online teaching theories and instructional design principles (Merrill, 2002). On the other hand, educational experts in course development teams can lack domain-specific knowledge, so they depend on subject matter experts in design work. This gap between content expertise and course design expertise prevents the effective application of teaching methods in online courses. Hence, identifying a grounded instructional framework that facilitates collaboration between domain experts and educational technology experts is crucial for building successful online courses. The success of online courses is also factored in by perceived usefulness, expectancy and engagement on the part of participants (Eickelmann & Vennemann, 2017), factors that also describe and shape attitudes towards online courses.

To date, many frameworks have been developed to support the design of online learning. For example, Czerkowski and Lyman (2016) offer a design framework for e-learning engagement with four essential components: learning needs, learning objectives, learning environments and summative assessment. Conole (2014) offers the 7Cs of the Learning Design Framework, developed in collaboration with the Open University and the University of Leicester, to meet the needs of modern learners with access to a wide range of media and digital learning tools. Gao and Ji (2019) have created an online course design framework based on Merrill's fundamentals, or the First Principles of Instruction (Merrill, 2002). These models and frameworks offer possible solutions for designing effective online learning experiences beyond emergency application contexts like the pandemic.

Both globally and specifically in Kosova, several digital pedagogy professional training programmes appeared in 2020, witnessing high participation in the first months due to the urgent demand for professional development (PD) and the demand for teaching staff to offer distance and online courses in the summer and autumn of that year (Fuch & Phillips, 2022). The development of digital competencies for educators, school staff and students, as well as the establishment of institutional mechanisms to coordinate the digital transition and the use of technology in education, is among the main areas prioritised in the Kosovo Strategic Plan (KESP) 2022–2026. According to the Framework for Teacher Professional Development (MESTI, 2017), teachers need to incorporate technology into their lessons to enhance both instruction and learning. Although the percentage

of schools with teachers who possess the necessary technical and pedagogical skills to integrate digital devices in instruction increased from 2018 to 2022, it is still lower than in OECD countries (OECD, 2018, 2022). Unfortunately, there is limited academic literature on the digital skills of Kosovan teachers and the available information is restricted to grey literature.

In terms of motivating teachers to engage in online education, a major challenge in the field of digital-based education is overemphasising the role of technology in learning without complementary, nuanced design thinking to consider the integration of pedagogy and teaching strategy foundations that leverage technology with instructional design. We know that new learning technologies provide new teaching and learning opportunities that can anchor new approaches to teaching and learning, and that technological innovation can precede pedagogical creativity (West, 2023); however, Kowch (2021) argues that simply adopting technology is not enough for actual teaching and learning process transformation. What is required is a combination of experimental, evidence-informed and risk-taking efforts by teams working in adaptive organisations with design thinking. The latter highlights the importance of understanding education ecosystems as complex and interconnected systems where learning environments are carefully designed for online learners and teachers alike.

Aim of the Research

During the Covid-19 pandemic, many European teachers were introduced to and even mandated to use technology-enhanced learning as an emergency measure. This came with various implementation challenges. In Slovenia, for example, teachers lacked clear guidelines for distance learning (Urankar & Jamšek, 2022), while in Kosova, teachers identified a lack of opportunities for online professional development (OPD) as one of the main challenges for implementing effective (or quality) online teaching and instruction (Morina et al., 2021). In response to this issue, researchers from the Kosova Center for Digital Education (KCDE) developed an OPD programme for high school teachers by focusing on the teachers' needs as part of the design process. The purpose of the present study is to understand the importance of needs assessment in the design of teacher OPD programmes and to investigate teachers' experiences and attitudes with this PD as well as their readiness to take hands-on approaches to integrate, when available, complex technologies.

Research Questions

- How do teachers' needs inform the design and content of OPD programmes and determine the training goals?
- How do teachers' experiences with an OPD programme (i.e., Teaching Online at the Right Level) shape their attitudes and readiness to leverage the power of instructional design for their students in the post-Covid-19 period?

Method

Design-Based Research (DBR) seeks to develop solutions to practical problems through intervention (Herrington et al., 2007; McKenney & Reeves, 2018). In the present study, researchers applied a DBR approach, seeking to improve Kosovan teachers' experiences with online teaching through adequate professional development. Bannann (2003) found that problem identification and definition are common for most research approaches but are particularly important in DBR. Furthermore, in DBR, an intervention is applied in a naturalistic setting with multiple iterations and continuous outcomes analysis (Forman & McPhail, 1993). Herrington et al. (2007) argue that a single implementation is insufficient to determine the success of the intervention, suggesting two or even more cycles; after the first cycle, changes should be made to the intervention to address the problem better. Anderson and Shattuck (2012) affirm that "[DBR] interventions are rarely if ever designed and implemented perfectly; thus, there is always room for improvements in the design and subsequent evaluation" (p. 17). Similarly, Crossman (2014) states that, with multiple iterations, the DBR study is recurrent and long term.

Intervention remains at the core of DBR, and in our study, we sought to design, develop and implement a PD programme on online teaching for Kosovan teachers. We adapted Ge and Huang's (2019) framework for online course design based on the first principles of instruction. This framework recognises that online course instructors are often subject matter experts with deep knowledge and skills in their respective fields; however, they may have a limited understanding of teaching methods and theories. Conversely, educational teams working towards online course development often include pedagogical or educational technology experts who may lack domain-specific knowledge. This gap in design and content knowledge hinders the effective application of valuable teaching methods and theories in online courses. Ge and Huang's (2019) framework therefore facilitates collaboration between domain experts

and educational technology specialists, divided into four stages: the teaching planning stage, the teaching design stage, the course implementation stage and the course improvement stage (p. 33). In addition, our adapted framework also includes a testing phase, where the team sought to improve the programme before implementing it with a larger group of participants.

Participants

The present study included public high school teachers employed in urban and rural areas of Kosova who participated in a five-week OPD held in 2022. A total of 603 high school teachers applied to attend the OPD, 92 (or 15.25%) of whom were selected to participate in the training. Purposeful sampling was employed to investigate the experiences of the teachers recruited to attend the OPD. The study included 61 public high school teachers who attended the OPD and agreed to participate in the study. Of the 61 participating teachers, 31 were part of the first cycle and 30 were part of the second cycle. Table 1 provides a more detailed overview of the participants' demographics for the Training Programme 1 (TP1) and Training Programme 2 (TP2) cycles.

Table 1

Participant demographics throughout the Design-Based Research process: The present study

	Cycle 1 participants (TP1)			Cycle 2 participants (TP2)		
	<i>n</i>	%	Mean	<i>n</i>	%	Mean
Gender	31	100		30	100	
Female	23	75		22	73	
Male	8	25		7	27	
Age			40			41
Total years of experience			8			8
Online teaching experience			2			2
Subjects						
Social Sciences & Humanities	12	39		15	49	
Hard Sciences & ICT	14	45		11	38	
Vocational Education	5	16		4	13	

Instruments

Three main instruments were used to collect the data throughout the study: (1) a teacher needs assessment survey, (2) a feedback survey for TP1, and (3) an end-of-PD semi-structured focus group for TP2.

Our initial instrument, the needs assessment survey, helped set the foundation of the programme design, as it was mainly utilised to determine programme objectives. The needs assessment survey consisted of four key sections to the online survey: teachers' experiences with e-learning, use of available platforms, online teaching methods and techniques, and needs for professional development. The needs assessment was designed using a questionnaire, including different question types, such as dichotomous, open-ended, multiple choice and rating scale questions.

The second instrument developed by the team was a feedback survey with different question types, which participants were invited to complete anonymously by the end of TP1. The participants' opinions on the timeliness, overall quality and satisfaction, mode of instruction, learning management system, and utility/effectiveness of each online module and item of course material were solicited.

The last instrument, an end-of-PD focus group semi-structured interview, included open-ended questions to provide thicker descriptions of any shifts in teachers' experiences and attitudes after the OPD experience. These questions were adapted from the capstone project of a teachers' development programme offered by the Taylor Institute for Teaching and Learning (2022). The focus group events, which lasted for about an hour, were facilitated by the programme director and the instructional designer in online settings. Focus group interviews were audio-recorded, transcribed in the original language (Albanian), translated into English and coded thematically for data analysis using NVIVO.

Research design

Through the programme Teaching Online at the Right Level, we sought to address Kosovan teachers' needs for PD in digital teaching and learning, as well as to improve their experiences and attitudes towards the topic. We adapted Ge and Huang's (2019) framework for PD design based on the first principles of instruction. Four people were directly involved in the programme development process: the director of programme development, two instructional designers and the LMS technical administrator. Once the programme had been developed, the team opened a call for applications. Our study participation call invited public high school teachers to apply for an OPD experience by expressing their motivation to join the programme, their alignment with the KCDE's vision for e-learning, and their technical and leadership capacities. A total of 603 high school teachers applied to attend the training. The distribution of PD hours can be seen in Table 2, which provides a detailed overview of the programme content and format.

Table 2

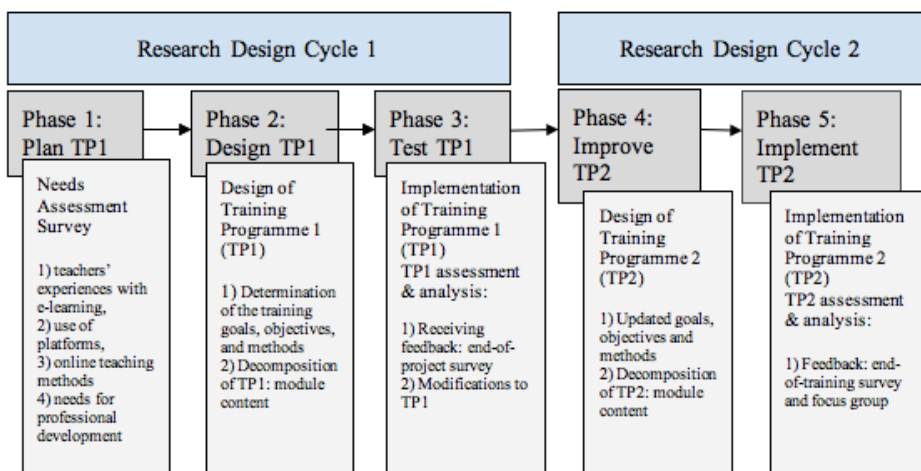
TP2 Programme content, session types, and distribution of hours by modules and sessions

Module	Session	Event Mode	Hours
Module 1: Introduction to Online Teaching	Online Learning Platforms	Synchronous	2
	Theory and Concepts of Online Teaching	Asynchronous	1.5
	Creating the Course Shell	Synchronous	2
Module 2: Online Teaching Methods	Online Teaching Methods	Asynchronous	1.5
	Synchronous and Asynchronous Teaching	Synchronous	2
	Drafting an Online Lesson Plan	Asynchronous	1.5
Module 3: Audio-Visual Materials	Visual Materials in Online Learning	Asynchronous	1.5
	Interactive Materials for Synchronous Sessions	Synchronous	2
	Interactive Materials for Asynchronous Sessions	Synchronous	2
Module 4: Online Assessment	Introduction to Online Student Assessment	Asynchronous	1.5
	Online Assessment Tools	Synchronous	2
	Online Assessment Rubrics	Asynchronous	1.5
Module 5: Learning Management System	Integration of Other Platforms in Moodle	Synchronous	2
	Designing a Complete Instructional Unit	Asynchronous	1.5
	Presentation of a Virtual Instructional Unit	Synchronous	2

Our adaptation of Ge and Huang's (2019) framework, that is, the two-cycle and five-phase PD Teaching Online at the Right Level, is shown in Figure 1.

Figure 1

Design-Based Research Process: The Present Study



The first and second cycles of our study consisted of five phases: planning, designing, testing, improving and implementing.

Phase one of the process, planning, aimed to understand the experiences of Kosovan teachers with online teaching, as well as their needs for PD. A needs assessment survey was distributed to teachers through partner organisations, KCDE email distribution lists and social media. A total of 235 teachers completed the survey, the majority of whom (96.6%) had engaged in some form of online teaching throughout the pandemic.

Phase two, programme design, was built from data gathered in the first phase, aiming to address the identified PD needs and provide teachers with the necessary skills and knowledge for effective online teaching. This included defining the learning modules and their content, resources and activities. To ensure the effectiveness of the OPD, the team tested it with a cohort of teacher participants in Phase 3.

Phase three, testing, included the implementation of TP1 with the first cohort of teachers. This cohort underwent the entire programme and their progress was closely monitored to identify areas for improvement and to assess the programme's overall impact on teachers' acquired skills. For a complete picture of the programme's impact, the teacher participants were required to complete a feedback survey for TP1 and provide their evaluation of the programme.

Phase four, improving, sought to improve the designed programme. This phase was dependent on the data that emerged from phase three. After analysing the teacher survey responses, phase four also involved refining and enhancing the PD design, addressing any shortcomings or concerns raised by the teachers, and incorporating the suggestions and recommendations to make it more effective.

Phase five, implementing, consisted of the refined programme (TP2), which was offered to more cohorts and was therefore implemented with additional groups of teacher participants. However, phase five was also monitored for learner outcome evaluation, which included an end-of-PD focus group with the teacher participants. Out of the 30 participants in TP2, 7 attended the focus group interviews. The purpose of the focus group was to gain a deeper understanding of the programme's impact on teachers' attitudes and perceptions regarding online education, as well as to assess the overall effectiveness of our programme development.

The data derived from the instruments of the study were both quantitative and qualitative. Quantitative data was derived mainly from the teacher needs assessment surveys and the feedback surveys for TP1, while qualitative data was derived from the end-of-PD semi-structured focus group for TP2. All of the closed-ended survey responses were analysed descriptively, focusing on percentages, mean values and frequencies. Focus group responses, on the other hand,

were analysed using an inductive approach to qualitative analysis proposed by Braun and Clarke (2008). More specifically, all of the responses were transcribed, read through reflectively, noting any immediate insights related to the topic, and then coded using an open-coding technique. The last stage of the qualitative analysis involved grouping the most salient codes into themes related to the second research question. The themes encompassed two main aspects: teachers' OPD experiences and their attitudes towards them. The validity of these findings was determined by the elements described by Lincoln and Guba (1985): a) credibility, b) transferability, c) dependability, and d) confirmability throughout the study implementation. Thus, we used prolonged engagement in the field, cross-member checking and data triangulation for credibility. As qualitative data in this study overruled quantitative data, we sought transferability rather than generalisability. The findings are discussed in detail in the Results and Discussion sections.

Results

In order to provide a comprehensive understanding of the results, this section has been divided into subheadings corresponding to the key objectives of the research. Firstly, we present the baseline data on teachers' needs and how they informed the OPD design, including the objectives, content and format. Subsequently, we discuss the teachers' experiences with the OPD, further examining how these experiences shape attitudes and readiness to leverage the power of instructional design.

Teachers' Needs as a Means of OPD Programme Design

The OPD programme Teaching Online at the Right Level was developed by the KCDE team to enhance teachers' capacity to use educational technology during regular or supplementary teaching processes. The initial phase of the project involved designing, distributing and analysing the results of teachers' needs assessments. However, the participating teachers were also assessed continuously through the programme evaluation survey offered to participants at the end of each training cycle.

OPD Objectives

The needs assessment survey responses informed the determination of training goals, objectives and the fundamental design of our OPD. For instance, among the topics that survey participants selected as 'most important' for them to be more effective in online teaching were: online teaching methods (57.4%)

and platforms for online classes and digital content (29.8%). In one matrix question, teachers were asked about various needs for PD in online education, and their responses revealed additional vital areas, such as digital content development. Specifically, the respondents claimed that the digital content development area is highly important (22.97%), important (20.85%) and somewhat important (27.65%). From these results, five main training objectives were identified based on the needs assessment:

- (a) to establish a foundational knowledge of online education,
- (b) to build skills in utilising e-learning tools for creating engaging and interactive digital content through appropriate online teaching and learning methods,
- (c) to generate audio-visual content and activities that contribute to building an online presence,
- (d) to create different forms for online student assessment, and
- (e) to apply the acquired skills to design and facilitate an engaging experience in a learning management system (LMS).

OPD Content

The team used these objectives to design and develop the foundation of the programme content or learning goals by identifying five main modules and developing suitable content. Specifically, the five modules of our OPD were: *Introduction to Online Learning, Online Teaching Methods, Creating Audio-Visual Methods, Online Assessment, and Using Moodle as an LMS*. While we decided to include three sessions per module, the content of the online training sessions was not fully pre-planned, thus enabling the trainers to cater to the specific needs of the selected participants. More specifically, the KCDE programme development team separated the modules into three named sessions, but the TP1 trainers had the autonomy to decide which activities to do with the selected participants based on their level and needs.

Although the modules were created based on the initial needs assessment, at the end of TP1, through the feedback survey, we asked teachers about the relevance of the modules. The feedback survey results indicated that all of the predesigned modules were highly relevant to teachers' needs, thus ensuring content validity. Specifically, Modules 1, 2 and 3 were considered highly relevant by 92% of the TP1 teacher participants; similarly, Modules 4 and 5 were considered highly relevant by 96% of the TP1 respondents. Feedback surveys for TP1 also helped create detailed sessions for TP2; for example, sessions such as creating the course shells, online assessment tools and online assessment rubrics were highlighted by the majority (76%) of the teacher respondents.

OPD Format

The needs assessment and feedback surveys for TP1 also helped determine other elements of the PD programme, such as the mode of delivery (i.e., online vs. in person, as well as synchronous vs. asynchronous) and the number and length of sessions (i.e., three sessions per module and 1.5 two-hour sessions), especially for TP2. For instance, 96.6% (227 out of 235) of the needs assessment respondents claimed that they had tried teaching an online class before, whereas only 3.4% (8 out of 235) reported having yet to experience online teaching. However, when asked about how prepared they feel to deliver online classes, while most of the respondents (44.4%) felt prepared, only 15.8% felt very prepared; the rest felt somewhat prepared (33.8%), a little prepared (5.1%) and not at all prepared (0.9%). Thus, although most of the teachers had experienced online teaching themselves, a significant number still did not feel fully confident in delivering online classes. The KCDE programme development team therefore decided to offer the PD programme online to enable teachers to experience the online format of training from a learners' perspective.

Although the teachers needed some instructions throughout the OPD, which could be ensured through synchronous sessions, the results of the TP1 surveys suggested that they also needed the flexibility and personalised learning experience that asynchronous sessions provide. When asked about the preferred mode of instruction, 53% of the participants claimed that they preferred synchronous sessions, while the other 47% preferred either asynchronous or a combination of the two. For example, one teacher stated, "The synchronous sessions for teachers assigned to the afternoon shift were inconvenient, and the programme's inflexibility did not help". Therefore, while all 15 sessions were synchronous in TP1, the programme development team decided to include asynchronous sessions in TP2 as well. Specifically, the team sought a balance between synchronous and asynchronous sessions and therefore divided them into eight synchronous and seven asynchronous sessions for TP2. Assessing various levels of digital competence during TP1, the team noted that the participants reported an average confidence level of 3.5 out of 5 when asked about their comfort using the Learning Management System (LMS) Moodle, indicating moderate digital competence. Additionally, when questioned about the allocated time for practical work during synchronous sessions, 25% expressed that they did not have enough time to finish the tasks. In response, the team opted for synchronous sessions lasting two hours each, while asynchronous sessions were assigned slightly less time, at 1.5 hours (anytime during the day). This adjustment accommodated participants with lower digital proficiency by providing them additional time to complete tasks during synchronous sessions.

As a result of these adjustments, the entire TP2 included 27 hours of training. Specifically, as a synchronous OPD session lasted for 120 minutes, the total duration of synchronous sessions was 16 hours, while an asynchronous session lasted approximately 90 minutes, making a total of 11 hours. Besides the 27 hours of training, the programme also included the preparation of four assignments, which required approximately 8 hours of engagement, as well as optional participation in a two-hour focus group discussion after completing the training. In total, our OPD required 35 hours of engagement for the participating teachers.

OPD Experience and Attitudes Towards Online Education

The final themes that emerged from the focus group analysis captured the teachers' e-learning experience and attitudes towards e-learning post-TP2. These themes encompassed various aspects, such as motivation for joining an OPD experience, perceptions of the online mode of delivery and methods used, and assessment of the support provided throughout the learning process (Table 3). Additionally, aspects such as e-learning usefulness, content design and ease of use (Table 4) collectively contributed to understanding the attitude towards e-learning.

Teachers' OPD Experience

The teachers' experience with TP2 allowed them to share perceptions on online modes of delivery, autonomous learning and the support needed in such settings. Their comments on the ability to attain results, the availability of multiple tools and learning experiences also shaped themes related to their experiences during the focus group analysis.

Table 3

Teachers' OPD Experience

Theme	Code	Frequency
Motivation to Attend TP2	Lack of competence and training in utilising online platforms	6
	Challenges faced from autonomous learning	6
	Opportunity to attain credit hours for licensing	1
Delivery Mode	Positive perceptions of the online mode of delivery	5
	Neutral perceptions of the online mode of delivery	1
	Negative perceptions of the online mode of delivery	1
Method and Support	Partial autonomous learning/learner-centred	5
	Lack of autonomous learning/tutor-centred	1
	Lack of sufficient time to cover all content	2
Learning Outcomes/Results	Ability to attain better results	6
	Added value to learning outcomes	6
	Diminished value to learning outcomes	1

Motivation to Attend TP2. The teachers' motivation to attend TP2 mainly concerned factors such as lack of previous training and underutilisation of e-learning, the challenges faced in autonomous learning during the Covid-19 pandemic, and the opportunity to attain credits towards their licensing.

The teachers mentioned that their "shortcomings in digital competence became evident during the Covid-19 pandemic". Therefore, they believed that by gaining more knowledge about e-learning, they could integrate technology into their teaching. Despite some previous experience with online teaching, most of them (6) believed that they "have not explored the right tools or methods", which motivated them to seek out and engage in further learning.

It was found that the teachers discussed the challenges they faced when resorting to self-taught teaching and learning during the pandemic. Although they recognised the benefits of an online presence, they were reluctant to embrace online teaching due to the sudden shift caused by the pandemic. Most of the teachers (6) in the focus groups initially admit that, "their experience with online training was limited and not in the same format they encountered during the pandemic". The Covid-19 pandemic made it evident that digital skills were necessary, and teachers realised the need to learn about the right tools and approaches for online teaching.

One teacher admitted they "initially started the training reluctantly, but the motivation to attain credits for licensing motivated them to participate in TP2". This implies that some teachers saw the training as a way to fulfil their licensing requirements for their teaching careers.

Perceptions of the Delivery Mode of TP2. Most of the teachers (5) expressed a positive perception of the online mode of delivery of TP2. The teachers believed that TP2 positively impacted their work as well as that of their colleagues, "making learning more attractive for students". They appreciated the practicality of the online format, especially in terms of "timesaving compared to physically attending meetings". Additionally, the use of the Moodle platform and other online tools transformed their beliefs, proving that "online learning could be effectively developed, even when combined with traditional teaching methods".

Despite the positive aspects, one teacher also had some negative perceptions of the online mode of delivery. This perception was more relevant to the advantages of in-person training. Specifically, the teacher felt that "in-person training offered opportunities for direct communication with other participants, something that online training lacks". Challenges were also noted with completing tasks online, indicating that the virtual setting presented

difficulties. While both of the teachers concerned appreciated the training for “inspiring new ideas that they could integrate into their in-person classes”, the lack of physical presence was considered a drawback, limiting certain interactions and communications.

One teacher had a neutral perception of the training being conducted online, recognising that the purpose of the training itself was to take place in a virtual environment. Furthermore, they believed that “similar results could have been achieved even if the training had been held in person”, indicating a neutral stance on the effectiveness of the delivery mode in achieving learning outcomes.

TP2 Method and Support. The teachers’ perceptions of the methods and support during the online training can be summarised into two main points: autonomy and time sufficiency. Five of the seven teachers who participated in the focus groups appreciated the support provided by the trainers and tutors, both in real time and via email, while allowing partial autonomous learning. Specifically, during synchronous sessions, “the breakout rooms were beneficial for partially autonomous hands-on practice with platforms”. On the other hand, two of the teachers felt that the training was too fast paced and wanted more time to “explore specific platforms autonomously rather than relying solely on demonstrations”.

TP2 Learning Outcomes and Results. The teachers’ perceptions of learning management platforms like Moodle are that these platforms could be effectively used to develop online learning content, complementing traditional teaching methods. According to the teachers’ reflections, the training positively affected their work by “adding value to their teaching practice”. The teachers expressed confidence in organising online classes, including assignments, and in using interactive tools such as H5P and Mentimeter. They saw the potential of online learning by offering multiple opportunities for students to choose their preferred learning methods. Overall, the training improved the teachers’ ability to attain better results through effective online lesson planning, quizzes and interactive videos.

The teachers expressed increased confidence in achieving better results through online learning, acknowledging that “e-learning could make their work easier and more attractive for students compared to traditional methods”. The training empowered them to create engaging lessons with their students. The participants highlighted the potential of online learning to deliver successful lessons and improve class results.

One teacher, while acknowledging the benefits of e-learning for theory-based subjects, also expressed a limitation for arts profile teachers who engage in practical activities such as playing instruments. They perceived e-learning as less suitable for entirely replacing physical practice in their field.

Teachers' Shape of Attitude

The teachers' perceptions of the content's intuitive nature for navigation, use and completion, as well as their control over the pace of work, were among the main factors influencing the attitude themes. The presence or absence of differentiated learning and how online/interactive content added or diminished value further contributed to the themes that emerged from the focus group analysis.

Table 4

Teachers' Shape of Attitude

Theme	Code	Frequency
Content Design	Intuitive content to navigate, use and complete	5
	Adequate use of multimedia and interactive learning materials	5
	Limited use of multimedia and interactive learning materials	2
Ease of Use	Easy use and reproduction of the content	5
	Flexible pace of work	5
	Need for a more flexible pace of work	2
E-learning Usefulness	Enriching learning experience	6
	Differentiated learning	6
	Limited differentiated learning	1

Content Design, Ease of Use and Usefulness of TP2. During the training, the teachers found the content “user-friendly and easily reproducible”. They appreciated the intuitive design, which allowed them to navigate through the modules seamlessly. Overall, the training provided them with valuable skills in creating interactive material. As one teacher states, “[...] after attending TP2, I am convinced that each of us can organise online classes, including assignments”. These skills were seen as highly beneficial for engaging students and enhancing the learning experience.

Most of the teachers (5) also valued the flexibility of the training, as it allowed them to learn at their own pace, especially in asynchronous settings. One teacher states that “in particular, asynchronous learning was greatly appreciated, as it allows for self-paced learning, without compromising our work schedule”. This aspect was particularly appreciated, as it enabled them to adjust their learning to suit their schedules as in-service teachers. Incorporating

videos, interactive tasks and different online tools kept the teachers actively involved and motivated throughout the OPD.

While most of the teachers praised the flexible pace of the training, some expressed the need for even more flexibility. They suggested that the “time constraints on certain tasks caused stress and limited their ability to fully explore and apply the concepts learned”. Additionally, two of the teachers noted a limited use of multimedia and interactive learning materials in certain modules. They felt that “adding follow-up tasks to audio-visual content would enhance engagement and encourage them to complete all of the modules thoroughly”.

All of the teachers expressed the opinion that TP2 positively shaped their attitude towards using e-learning in the future. One teacher said, “I was sceptical about whether students can attain knowledge in an online learning environment; however, during TP2, I got to acknowledge that it [e-learning] is a very effective mode”. The training has triggered some of the teachers to create and implement digital education with their students, even while they were participating in our OPD. Aspects such as e-learning content usefulness, content design and ease of use collectively contributed to the positive attitude development towards e-learning in general.

Discussion

In this section, we a) discuss the methodological limitations of the current study that could have affected the interpretation of the results, b) analyse the findings of the study in relation to existing literature, and c) examine the implications of the research findings for OPD theory and practice.

As with DBR, a notable limitation of our study is that a lot of data is gathered, but not a lot of it is reported, so it could be possible to overlook valuable data that might be important for other researchers (Wang & Hannafin, 2005, p. 20). However, utilising DBR as a research design for studying OPD is significant, as it addresses the identified gap in Bragg et al. (2021)'s scoping review, which found that, among OPD studies, “not enough attention is focused on the design elements and activities [...] to support positive outcomes, as well as the theoretical underpinnings informing the program design” (p. 11). Another limitation of the present study is the involvement of the researchers in the design and development of PD. As Barab and Squire (2004) argue, “if a researcher is intimately involved in the conceptualization, design, development, implementation, and re-searching of a pedagogical approach, then ensuring that researchers can make credible and trustworthy assertions is a challenge” (p. 10). Given that this is problematic, in order to overcome the potential bias in

the interpretation of the findings, the study involved a third researcher who was not directly affiliated with the OPD or organisation in any way.

A literature review highlights the fact that consistent course design, organisation and support, taking into account learners' needs, is crucial for a well-designed online learning experience and for online programme design and delivery to be effective (Martin et al., 2019; Martin & Bolliger, 2018). The present DBR study offers insights into how OPD may shape teachers' experiences and attitudes, as well as their readiness to teach with technology. It also confirms that teachers' perspectives were positively influenced by the programme's content design, usability and convenience of use. Previous research shows that the flexibility that OPD affords allows teachers to process information at their own pace, return to online content as needed and collaborate with other teachers through various networks (Wynants & Dennis, 2018). Similarly, our study found that teachers valued the flexibility of the training, especially in asynchronous settings, where they had the freedom to learn at their own pace, for example. It was noted that the programme's integration of multimedia and interactive learning resources, including videos, quizzes and online tools, kept the teachers motivated and interested throughout. Gorozidis and Papaioannour (2014) also confirm that teachers are more likely to apply new knowledge when intrinsically motivated, driven by an inherent engagement in learning rather than external rewards. In addition, engagement increases when the material is "relevant and personally meaningful to the learner" (Chametzky, 2014). Our data confirms the relevance of our OPD to teachers' needs, while our end-of-PD focus group discussions highlight factors for motivation similar to the study from Beach et al. (2022), such as lack of training, convenience and credit attainment.

The participants in Beach et al.'s study preferred certain forms of online PD when given the chance. Popular options included online communities, video libraries of exemplary practice, instructional videos of teacher-student interactions and student videos sharing academic engagement insights. The participants in our study also recommended supplementing audio-visual content with follow-up exercises to increase engagement and guarantee that all of the modules were fully completed. Most of our findings also echo online learning theory and practice, emphasising the use of design principles tailored for learners and learning environments carefully designed to promote inquiry, collaborative thinking and social learning with technology (Garrison, 2015).

As noted above, our study is in line with earlier research (Fuch & Phillips, 2022; Hodges et al., 2021; Kowch, 2021; Martin et al., 2019; Martin & Bolliger, 2018; West, 2023). The pandemic presented an urgent need for online programmes,

while also emphasising a critical need for balancing technology and pedagogy with design principles, along with the importance of support and flexibility to keep teachers positively motivated to teach online when teacher needs are considered in the design.

Conclusions

Due to the Covid-19 pandemic, the Kosova Center for Digital Education launched a design-based professional development programme in response to teachers' demand for online professional development. The present study investigated teachers' experiences, attitudes and readiness regarding e-learning through a two-cycle research-based OPD intervention involving teachers nationwide in five phases: planning, developing, testing, improving and implementing.

The results of the study highlight the fact that going beyond simply offering PD by adopting videoconferencing or any one technology, and by using a multiple-cycle programme design that includes a needs assessment as well as testing, crucial elements emerge for designing a PD programme that improves teacher attitudes towards teaching online. Our needs assessment, in particular, informed the training objectives, course content and format of the OPD. The study also highlights the fact that an online PD developed based on teachers' needs helps shape teachers' experiences, attitudes and readiness regarding teaching with technology.

The results suggest that using a multiple-cycle research design for programme development has practical and methodological implications. From both perspectives, including needs assessment and testing in the phases of programme development is highly significant, as it optimises OPD success. The study also suggests that OPD programmes for teachers should provide space for reflection and practical work, so that teacher participants can think of ways to utilise the acquired knowledge and skills to benefit their students. Our research design could also serve as a model for how, when teachers' needs are met in a PD programme, they can lead to more positive attitudes and a greater readiness for implementing learned strategies in practice.

Despite the significant implications of our work, it is essential to recognise its limits, which call for additional research. A noteworthy limitation is the participants' diverse demographic, which makes it challenging to create a one-size-fits-all OPD programme for teachers. In addition, because attitudes are arbitrary, they can differ significantly between subjects and people, making them difficult to measure. Future studies should therefore concentrate on analysing the

particular needs of teachers in online PD catered to their various subject areas, such as social sciences, hard sciences, language and literacy, and the arts.

Disclosure statement

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