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The Effectiveness of Online Teaching and Learning Delivery for Practicing Teachers in a Continuous Professional Development Programme

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ARTICLE INFO	ABSTRACT
	Introduction: Following the COVID-19 pandemic in the world and its negative impact on the continuous delivery of professional development programmes which require practising teachers to be physically present on campus for in-service training, online teaching and learning became the most convenient mode of delivery to meet the national requirements for the development of effective leaders in primary schools. **Objectives**: This study reflects different lenses of experiences encountered by practicing teachers who are developed through online teaching and learning delivery in a teacher training institution in Mauritius. **Methods**: A mixed case study research method was used to collect data about the perceptions of primary school teachers who were called by the Ministry of Education for online professional development in school leadership and management. A semi-structured survey questionnaire was administered to 113 teachers, and two focus group interviews with 5 teachers in each group were conducted. An interpretive inductive research method was used for the qualitative data collected, and the quantitative data was analysed using simple statistical descriptive methods about the effectiveness of online teaching and learning. **Results**: It was found that individual online assignment motivates teachers for digital engagement; socio-constructivism is the most preferred principle of their learning through student-led online pedagogy; online MCQs were an alternative assessment to the traditional assignment; and self-directed learning was enhanced through the regular posting of OERs by the online tutors. However, the greatest challenge to online teaching and learning delivery is the lengthy muteness of students, which results in online disturbance and delivery disruptions **Conclusions**: Online teacher professional development is context-bound, and the internal and external factors within the virtual learning environment and beyond should be considered as the higher education institution must address them to foster the professional development of primary school teachers. **Keywords:** Online teaching and learning, online delivery, professional development, practicing primary school teachers

INTRODUCTION

Continuous professional development (CPD) consists of numerous activities for staff development that are designed to meet the professional development needs of individual teachers (Mwila *et al.*, 2022). Teaching and school management are dynamic functions in modern schools, as the demands from society towards the teachers and school leaders are challenging. Hertz *et al.* (2022) asserted that teachers experience changes in societal trends and education policies and practices, as well as cultural shifts in pedagogical discourse and philosophies that require them to continually adapt and innovate in their daily practices. This state of affairs has been observed over the last ten years (OECD, 2019). Evidence from the Teaching and Learning International Survey showed that many teachers have difficulties in accessing and benefiting from continuous professional development (OECD, 2014; OECD, 2019). Furthermore, Khechane et al. (2020) and Evans and Acosta (2021) reported that teacher education and training need

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to be improved and made accessible to teachers who are under-qualified, unqualified, with a lack of teaching and learning materials, and inappropriate assessment systems in Africa. So, the World Bank (2020) advocates for continuous professional development programmes for teachers to address these issues related to teaching and school management. The main purpose of CPD is to improve teachers' professional and instructional practices (Tyagi & Misra, 2021). This falls within the UNESCO Sustainable Development Goal 4, which seeks "*to ensure inclusive and equitable education and promote lifelong learning opportunities to all*" (National Curriculum Framework, 2015, p. 14).

Though Mwila et al. (2022) found that many countries in the SADC region did not have continuous development programmes, and those that had them had professional boards or councils to monitor the programmes, Mauritius has a policy for the professional development of teachers. Teachers follow pre-service teacher training before joining schools for teaching, and practising teachers are also provided with a continuous development programme. Historically, CPD has been conducted through conventional training programmes that are award-bearing and standards-based and provided face-to-face on campus. However, with the COVID-19 pandemic that disrupted the provision of CPD on campus, the provision shifted to online professional development for teachers. Universities had to ensure continuity in the training of teachers by having recourse to digitally supported remote learning or online learning (Li & Lalani, 2020). Online professional development is defined as formal professional learning that is structured and offered online in an attempt to bring changes to teacher knowledge, practices, and behaviour (Bragg et al, 2021). CPD in Mauritius is not an exception, particularly with the rapid current growth of the online learning environment. However, with the rapid and compulsory shift to online CPD for teachers, the effectiveness of the new mode of delivery for teachers' professional development and learning is questioned. Bragg et al. (2021) questioned its effectiveness in terms of the online practices of facilitating professional development and the design and delivery of CPD programmes online to improve the content and pedagogical knowledge of teachers.

In a study conducted among New Zealand university students in the online learning environment, Brown (2023) found an absence of student connectedness as they do not show a sense of belonging due to the absence of social presence. Online connectedness is pivotal since it promotes student engagement, which is positively related to student learning, and it also has a positive influence on student success and well-being (MacLeod et al., 2019). Kauka (2009) asserted that in the context of the online delivery of professional development of teachers, the cognitive presence and the teaching presence take place with the Community of Inquiry Framework, but the social presence is not there. There is no effective connectedness for the promotion of productive communication (Lim, 2011). However, Tseng and Kuo (2014) maintained that when CPD is done online, through an online community of practice, teachers' social participation increases, with shared professional roles and functions.

Besides, online delivery of professional development programmes promotes effective online learning. In an online study carried out by Darius et al., (2021) in South Indian universities, it was found that digital collaboration with peers, online quizzes with multiple choice questions, animations, video lectures delivered by the lecturers, the availability of student version software, and a conducive learning environment at home are methods in making online delivery effective. Davis et al. (2019) postulated that the effectiveness of a programme delivery depends largely on using the appropriate tools to boost student engagement and adapting the programme content to the varying learning styles of students in the online delivery. Darius et al. (2021) added that online tutorial classes are more effective since students have live access to PowerPoint, they may listen to the lectures at a sound level of their choice, and there is no need to spend time walking or traveling to the physical campus.

In addition, a systematic literature review of the successful design and delivery of online professional development for teachers indicated that the effectiveness of teachers' online professional development programmes depends on design elements that include learner support, learner engagement, practical learning activities, flexibility, learning styles, the relevance of skills and knowledge, reflection and individual differences in students (Bragg et al., 2021). Furthermore, in a study conducted among teachers in regional and remote Australian schools, Main and Slater (2022) found that student support from the schools was the main factor promoting the effectiveness of online professional development programmes. They also found that accessibility of the technology to the teachers is essential when using online resources. Also, Kraft et al. (2018) identified concerns with scalability in terms of diminishing returns to student achievement, the greater the number of teachers who are following the programme online.

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A few studies on the online delivery of teacher professional development programmes examined the pedagogical models. Edinger (2017) examined the impact of Kirkpatrick and Kirkpatrick's PACKaGE model of online teacher professional development and found that gifted education teachers were satisfied with its effectiveness, quality, and adequacy. The Model created a positive pedagogical change in teachers' practice, attitude, collaboration, content knowledge, and goal effectiveness (the five components of the Model). Hertz et al. (2020) explored the pedagogical model of online teacher professional development programmes of the European Commission's Teacher Academy and found that redesigning the programmes by using MOOCs helps in supporting teacher training, and MOOCs are more scalable than on-campus CPD delivery as they engage teachers in a meaningful manner.

Online teacher professional development is faced with many challenges such as time management, interpersonal relationships, misinterpreting expectations, providing and getting feedback, and setting expectations (Davis et al., 2021), yet it facilitates teacher training more effectively depending on the instructional design, the social innovation (Catalano, 2014) and the efficacy of the teacher-coach interactions (Glover et al., 2019; Matsumura et al., 2019; Joshi et al., 2020). The effectiveness of online delivery of CPD programmes is highly dependent on the socio-constructivist theory of learning and the existence of an online Community of Inquiry for meaningful and authentic learning among the teachers.

OBJECTIVES

In the Mauritian teacher training context, teachers, in general, and primary school teachers, in particular, having a minimum of fifteen years of teaching experience are recruited by the Ministry of Education to follow an in-service professional development programme to develop them into effective heads of school or Deputy Headmasters of primary schools. Hibberd (2016) highlighted the struggles of having a teacher education system that serves the local needs of teachers and school heads. From this perspective, Allybokus (2014) found the importance of the professional development of teachers in the country from the following lens: the ignorance of teaching standards, inadequate teacher preparation, inability of teachers to build learners' expectations, absence of initial professional development for novice teachers, inability or unwillingness of Heads of department to provide support to their juniors, and the absence of continuing professional development for certified teachers. It is therefore of paramount importance to determine how effective the new mode of delivery of professional development programmes is, with the shift to online teaching and learning. The objectives of this study are:

(a) To examine the effectiveness of the online delivery of a particular teacher professional development programme in terms of teaching approaches, teaching media, and assessments, and

(b) To determine the barriers to effective online teaching and learning in the delivery of a teacher professional development programme.

METHODS

An explanatory sequential research design was used in this study. It emphasises the quantitative and qualitative phases subsequently (Creswell, 2011). The purpose of the qualitative phase is to explain the most pertinent findings from the quantitative phase. Analysis of the interview transcripts helped explain the survey results (Caesar, 2024). This approach enables the researcher to build a 'detailed view of the meaning of the phenomenon for individuals' (Creswell, 2009). Besides, it is a pragmatic approach to knowledge that attempts to view the phenomenon of online delivery of professional development programmes from all viewpoints (Johnson et al., 2007).

A questionnaire aims to identify the effectiveness of various elements of online delivery. Questions 1 to 3 capture the bibliographical information about the respondents. Questions 4 to 10 capture the online learning styles of teachers doing the professional development programme. Questions 11 to 18 capture the effectiveness of the online teaching and learning medium. Question 19 captures the effectiveness of online teaching and learning, and Question 20 captures the barriers to effective online teaching and learning. The survey was conducted with a cohort of 150 primary school teachers in the online CPD programme. All the teachers had at least 18 years of teaching experience, and 113 of them responded to the online survey through WhatsApp. After the online survey, a semi-structured focus group discussion was conducted with two groups of 8 teachers in the cohort. The FGD was conducted after the analysis of the quantitative data from the survey. Each face-to-face interview lasted for a maximum of thirty minutes. The convenience purposive sampling technique was used for both data collection instruments. The researcher used accessibility and convenience to determine which participants made up the research sample (Saunders, Lewis, & Thornhill, 2012).

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The data collection and analysis of this study involved seven phases. The researcher set up the ontological and epistemological position, established an approach to inquiry, collected data, analysed quantitative data, recollected the data, analysed the qualitative information gathered, and integrated and reported the findings (Toyon, 2021). Interpretivism was used in online teacher professional development is experienced by the teachers from their perspectives and their interactions with the programme; there is no one objective reality but different realities or different teachers (Bhaskar, 2009) in the cohort. The quantitative data was analysed using the Google form and Excel sheet, whereas the interviews were analysed using the Reflective Thematic Analysis. Reflexive thematic analysis is an easily accessible and theoretically flexible interpretative approach to qualitative data analysis that facilitates the identification and analysis of patterns or themes in a given data set (Braun and Clarke, 2012).

The data collection was conducted by strictly abiding by the principles of the Data Protection Act 2017 (Mauritius) and the principles of ethics guidelines of the British Educational Research Association (2018) in terms of privacy and data security, integrity, independence, informed consent, respect for participant autonomy, avoiding harm/minimising risk and full disclosure. All measures were taken to ensure the validity and reliability of the survey and the trustworthiness and transferability of the findings from the interviews.

RESULTS

10% of the respondents in the survey were male teachers, and 90 % were female teachers. 41.6 % of them had a high level of ICT skills, 53.1 % had an average level, and 5.3 % had a very high level of ICT skills. They were all at least holders of a Teacher's Diploma in primary education. The profile of the participants is given in Table 1 below.

Table 1: Profile of Participants in the Focus Group Discussions

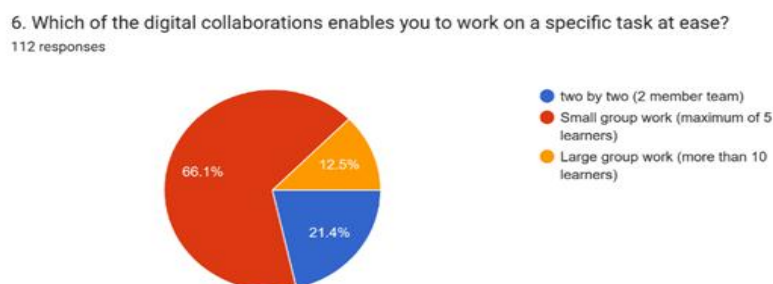| PARTICIPANT	FGD 1	FGD2	AGE	GENDER	QUALIFICATIONS	NUMBER OF YEARS OF TEACHING EXPERIENCE
A	√		35	Female	Diploma	10
B	√		28	Female	Diploma	10
C	√		40	Male	Degree	15
D	√		29	Female	Degree	11
E	√		35	Male	Diploma	13
A		√	42	Female	Master degree	20
B		√	33	Male	Master degree	11
C		√	30	Male	Degree	10
D		√	29	Female	Diploma	11
E		√	34	Female	Diploma	15

4.1 Online learning styles

The survey investigated the online learning styles of the teachers, and it was found that 67.9% of teachers personally engaged in writing their assignments, 39.3% engaged in formal group discussion in the online class, and 25% engaged in online oral presentations. These methods were the most preferred ones for them to personally engage and learn digitally (Fig. 1). However, it is also obvious that they also engaged in informal group discussion and project-based learning, and brainstorming in the online class.

Fig. 1: Personal engagement in digital learning

5. Which of the methods engage you personally to learn digitally?
112 responses

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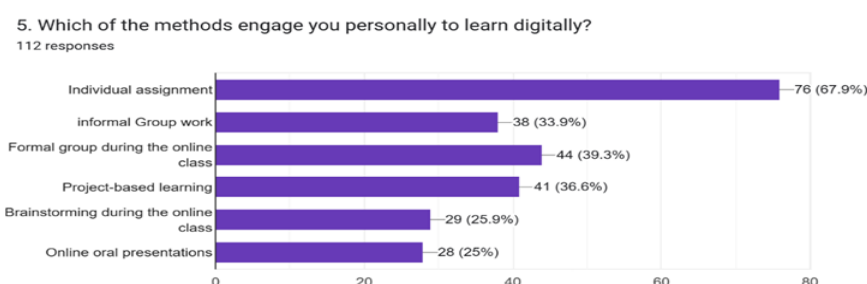
Moreover, digital collaboration is a fundamental aspect of online teaching and learning. In this study, it was found that 66.1% of teachers preferred to work in a small group of a maximum of 5 teachers, 21.4 % preferred to work in pairs, and 12.5% preferred to work in a group of more than 10 teachers. This is shown in Fig. 2 below:

Figure 2: Most effective digital collaborations

6. Which of the digital collaborations enables you to work on a specific task at ease?
112 responses

- two by two (2 member team)
- Small group work (maximum of 5 learners)
- Large group work (more than 10 learners)

Teachers following the online professional development programme found small groups of a maximum of five teachers more conducive to digital collaboration. A small online discussion group allows for better and more effective discussion. From this perspective, Teacher D of FGD2 elaborated: *'In a small group, I feel free and at ease to share my ideas, which would be considered by the others; it is easier for a few people to organise an online meeting at the same time.'* On the other hand, Teacher C of FGD1 pointed out the disadvantages of having a large online discussion group: *'It is difficult to manage due to divergent views and the difficulty of reaching a consensus and co-construct knowledge. Some people may hesitate to voice out due to the storming phase, which may not calm down.'*

Furthermore, since the respondents were certified in their profession, they were asked which theories of online learning motivated them to learn more effectively. 62.8 % of them were more interested in learning in collaboration with their peers in online learning through interactions (Socio-constructivism), 35.4% preferred direct online teaching by the lecturer (Cognitivism), and only 1.8% preferred online learning through behaviourism. Teachers are more motivated when online teaching is based on the underlying principles of socio-constructivism. This is shown in Figure 3 below:

Figure 3: Theories of learning that motivate online learning

7. Which of the online learning theories motivate you to learn?
112 responses

- Socio-constructivism (Collaboration in group through interactions)
- Cognitivism (direct teaching by the lecturer)
- Behaviourism (teaching with praise and punishment)

The survey also examined the types of online pedagogical approaches that motivate teachers to learn. It was found that 83.9% of the respondents were motivated to learn online when the lecturer gave them the possibility to voice out their views, perspectives, their opinions, and their professional experience, and when they could choose what and how to learn. They preferred student-led approaches. However, 16.1% of respondents were motivated to learn online when the lecturer used the talk and chalk method, whereby they were not solicited to share their professional experience.

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Figure 4: Most effective online pedagogical approaches
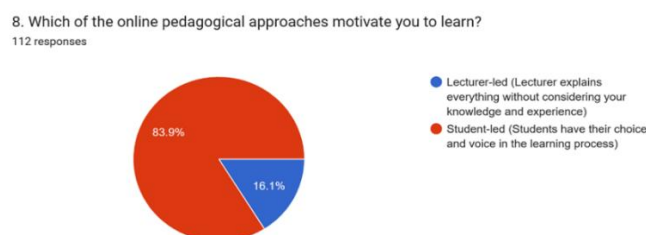
PowerPoint presentations were the best digital approaches to motivating teachers to learn online. 61.6% of respondents were most motivated when PowerPoint presentations were used in the online delivery of the professional development programme. Online lectures (43.8%) and animations (42%) were also found to be very motivating for them. This is shown in Figure 5.

Figure 5: Most effective digital approaches
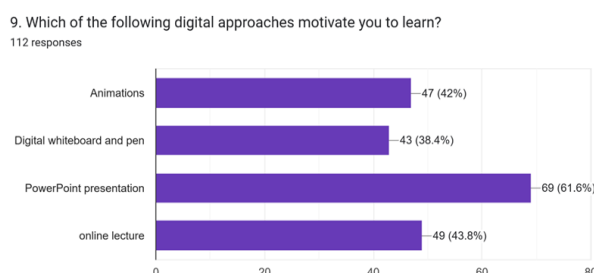
The features of PowerPoint slides are motivating for teachers to learn online. Teacher F of FGD2 asserted: 'Bullet points, the colourful slides, the precise content and the possibility to easily convert them into video or printable PDFs are the factors that encourage me to make sense of the online learning.' Teacher B from FGD1 added: *'I can exploit the bullet points for my interests and to build on them for further knowledge.'*

The online experience of the teachers of the professional development programme is shown in Figure 6. Most respondents (76.8%) found that online CPD allows them to learn at home digitally. Only 1.8% of them found that the situational challenges did not allow them to follow the online professional development programme.

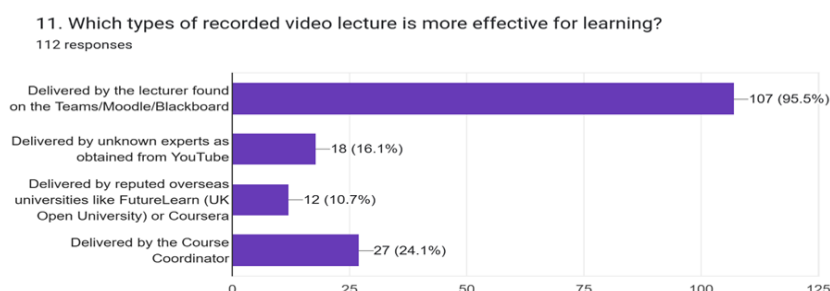Figure 6: The online learning experience of teachers
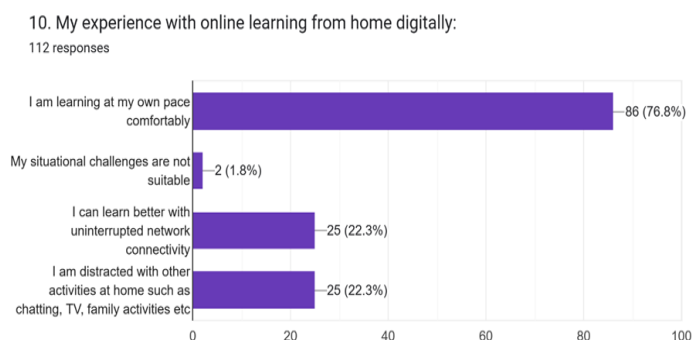
4.2 The effectiveness of the medium used in online teacher professional development

Teachers may obtain the lectures on the content of the professional development programme from the recorded lectures by the lecturer, videos of lectures by unknown experts on YouTube, from FutureLearn or Coursera, and the course coordinator. In this study, it was found that 95.5% of respondents learn more effectively from the video recordings of the lectures and other learning materials posted by their lecturer on Microsoft Teams, Moodle, and Blackboard. The teaching and learning process is more effective since the teachers consider the lecturer as the expert in the field who will assess their professional development in the programme. Teacher E of FGD2 convincingly averted: ' *The video recording by the lecturer is precise and content-oriented while those from external people is vast and is often not contextualised, rather westernised*!'. Teacher B of FGD1 added: *'Knowing that the online class is being recorded allows the teachers to keep their focus more on the lecture, as we do not have to jot down the explanation. So, we learn more effectively by understanding the concept in class. Listening, trying to understand, and writing the explanations at the same time is very often a difficult task for any learner. Learning may not happen effectively*.' The ubiquity of the recordings was also highlighted by the participants. From this perspective, Teacher C of FGD1 posited: '*It is accessible everywhere and anywhere!'*.
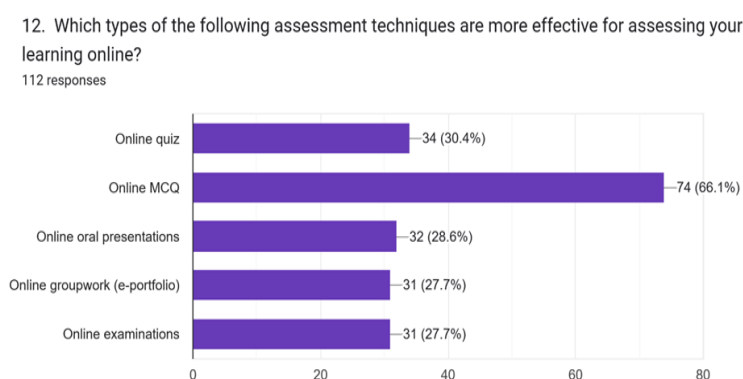
The effectiveness of the recorded video lecture is depicted in Figure 7 below:

Figure 7: Most effective recorded video lecture

11. Which types of recorded video lecture is more effective for learning?
112 responses

- Delivered by the lecturer found on the Teams/Moodle/Blackboard — 107 (95.5%)
- Delivered by unknown experts as obtained from YouTube — 18 (16.1%)
- Delivered by reputed overseas universities like FutureLearn (UK Open University) or Coursera — 12 (10.7%)
- Delivered by the Course Coordinator — 27 (24.1%)

Different types of assessment are used in online teacher professional development programmes, namely quizzes, MCQs, oral presentations, e-portfolio, and written examinations. 66.1% of the respondents preferred to be assessed through online MCQs. They least preferred e-portfolio (27.7%) and online examinations (27.7%). This is depicted in Figure 8 below:

Figure 8: More effective online assessment techniques

12. Which types of the following assessment techniques are more effective for assessing your learning online?
112 responses

- Online quiz — 34 (30.4%)
- Online MCQ — 74 (66.1%)
- Online oral presentations — 32 (28.6%)
- Online groupwork (e-portfolio) — 31 (27.7%)
- Online examinations — 31 (27.7%)

Online multiple-choice questions were the most preferred assessment technique, which is considered more effective. It fitted the specificity of the virtual learning environment, which found it difficult to give online. Teacher C of FGD2

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stated: *'Online MCQs eliminate the lack of online creative writing skills or technological skills that may prevent reliable assessment of the acquired professional development programme, which is more based on professional experience than academic knowledge.*' It also helps in saving time for online delivery, as Teacher A of FGD2 pointed out: '*It can easily be attempted and allows the optimisation of the online teaching and learning process.*'

In addition, the following questions were asked of the teachers following the online professional development programme about the effectiveness of the medium used in online delivery. The results are as follows in Table 2 below. Most of the respondents are using OERs effectively for their professional development. 95.5% of them were using OERs for learning; 98.2% for making sense of new concepts; 93.8% for self-directed learning; 93.8% for online collaborative learning with their classmates; and 98.2% for effective assignment writing.

Table 2: Effectiveness of the OERs used in online delivery

Statements	Responses (n=112)	Percentage
Student software downloaded from the internet is useful for learning	Yes: 84	94.6%
	No: 28	5.4%
Learners' use of OERs is useful for learning.	Yes: 85	95.5 %
	No: 27	4.5%
The lecturer posts OERs for learners to read and make meaning of the new knowledge.	Yes: 87	98.2%
	No:25	1.8%
Learners read and use the OERs for self-directed learning.	Yes: 83	93.8%
	No: 29	6.2%
Learners use OERs for group discussions with classmates.	Yes: 83	93.8%
	No: 29	6.2%
Learners digitally search for OERs to improve their knowledge and write their assignments	Yes: 87	98.2%
	No: 25	1.8%

4.3 Effectiveness of online delivery of the teacher professional development programme

The study provides the factors that contribute more to the effectiveness of online delivery of the programme. It revealed that the sharing of supplementary content like articles, YouTube videos, or hyperlinks on the Learner Management System by the lecturer (73.2%), the use of PowerPoint by the lecturer in the online tutorial class (72.3%), and learners could use chat to give their views during the lesson (72.3%) motivated the teachers to the greatest level. On the other hand, 44.6% of the respondents expressed their views that they cannot express their feelings with emojis during the online class. This is shown in the following figure.

Figure 9: The factors that facilitate online delivery of the teacher professional development programme

19. Online teaching-learning takes place effectively because
112 responses
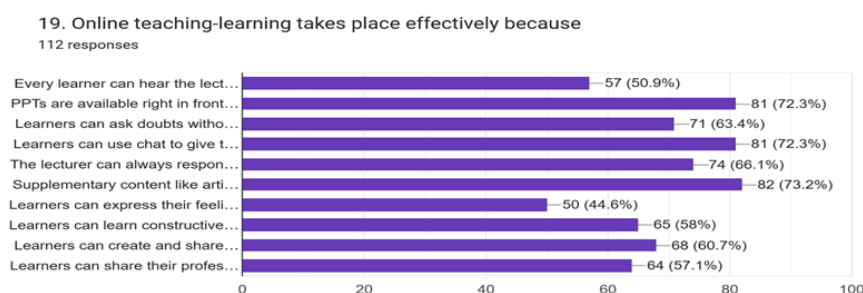
In online classes, the use of articles, YouTube videos, and hyperlinks for further reading is very common. This makes online delivery effective. Teachers highlighted their relevance and importance. Teacher A of FGD1 satisfactorily asserted: *'The lecturer provides us with the hyperlink that is accessible with a click, and we may go to the link and read the article or YouTube videos that supplement our online tutorial classes.'* Teacher C of FGD2 pointed out the usefulness: '*It is very helpful: self-learning takes place from the link provided by the lecturer. It is also an indication of what the lecturer wants the teachers to know and master on the topic. They guide us to relevant further reading.'*

PowerPoint represents the main instructional strategy that is used for effective online delivery. Teacher B of FGD1 emphasised the relevance of PowerPoint: *'The screen with the PPTs and the teaching materials are on my desk, so I can easily access them, compared to the physical class in which I may not hear or see the teacher and the whiteboard with their explanations when I am at the back of the classroom.'* Besides, Teacher D of FGD2 ensured:*' We can even screenshot the PowerPoint slides for future reference and reading.'*

Learners can use Chat to give their views during the lesson. Chat is indeed a powerful tool in online classes. Teachers are used to chatting on other social network sites. So, when they are allowed to use Chat, they are very motivated to engage in the classes. From this perspective, Teacher B of FGD2 positioned: *'I am very happy and enthusiastic about using the Chat during the class.'* The Chat is embedded in the LMS, so teachers spontaneously ask questions or share their feedback and comments in the Chat. There was no hesitation from them to share their personal or professional views on their experience in the education field.

4.4 Barriers to effective teaching and learning

The most common barriers that prevented online delivery from being effective in the teacher professional development programme was unmuted teachers resulting in online disturbance (67.9%), lack of teachers' participation in the class (57.1%), unresponsiveness of teachers to the teaching activities (brainstorming and questioning) (44.6%), the black screen without the teacher's face and name (37.5%), and no class break for teachers in the professional development online class (17.9%). This is depicted in the figure below:

Figure 10: Barriers to effective teaching and learning

20. Which of the following statements are true of online teaching and learning?
112 responses
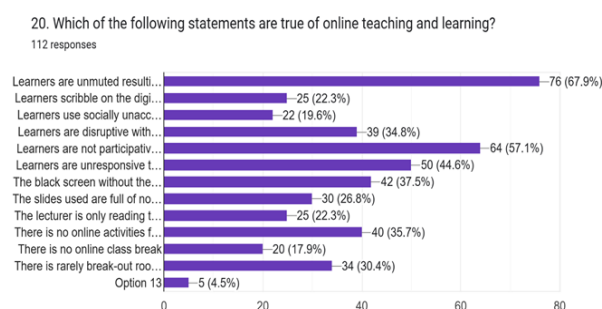
The effectiveness of the online class is hampered by the teachers who do not mute themselves during the class. They often forget about the netiquette of online classes, and one of them is to mute oneself so that the teaching and learning process is effective. However, in this study, it was found that background noise was a hindrance to online teaching and learning. Teacher D in the Focus Group Discussion 1 (FGD1) succinctly pointed out that the lecturer has no control of the class when he asks a question to the whole class: *'We could hear the dog barking when a teacher unmuted himself to share his views and knowledge. It lasted during the whole time the latter was speaking. That is frustrating as I could not listen and understand what was being shared.'* From the same perspective, Teacher C of Focus Group Discussion 2 (FGD2) hammered with anger: *'Following a question from the lecturer, many teachers unmute themselves and try to voice out their answers at the same. It was a cacophony, and it was nonsense. Teachers are grown-up people, so they ought to know they have to take turns to answer, just like they do in the physical class!*
Furthermore, the teachers do not participate in the online class. This prevents the co-construction of knowledge and the class turns out to be teacher-led, though they may feel bored. This is in contradiction to the 83.9% of the teachers in the cohort who mentioned that they preferred student-led approaches to online teaching and learning (Figure 4). Teachers may be physically present in the online class since they need to meet an 80% compulsory attendance in the online class, yet they just log in for attendance purposes only. This is supported by Teacher A of the FGD2: *'Because recording of lectures is compulsory for the lecturer and attendance by teachers is mandatory to 80% attendance, some teachers do not participate or are physically absent in the class.'* A female Teacher C of FGD2 vehemently shared: ' *At the time of the online class, late in the afternoon after our school work, how could we participate? We have to look after our children, cook food in the kitchen, and wash clothes.'* The lack of participation is the result of the inappropriate schedule of the online class.

Besides, the online class for the professional development of teachers lasted for three hours on Microsoft Teams. With no breaks in the class, the teachers found it difficult to learn effectively. Teacher E of FGD1 unhesitatingly stated: '*I cannot sit straight in front of the screen for three hours as I switch off at some point and my concentration level decreases. Also, I suffer from eye stress due to the screen's blue light and brightness.*'

DISCUSSION

In this study, it was found that the learning styles that primary school teachers adopt in their online professional development programme are based on socio-constructivism. Social constructivism is a collaborative learning approach emphasising student involvement, student engagement, and discussion, and exchange of knowledge (Saleem et al., 2021). They write assignments, are involved in online small group discussions, generate their knowledge to deepen their understanding of the professional development programme on the Learning Management System, use the lecture PowerPoint slides, online lectures, and animations for self-directed learning, and are involved digitally at their own pace and place to interact with the content of the programme. These findings reflect the two prerequisites for professional development: teachers' willingness to participate and engage cognitively as well as emotionally (Albers et al., 2015; Xie et al., 2017; Dille & Rokenes, 2021). They construct their knowledge through the exchange of their professional experience, and they are all connected in an inclusive and equitable learning community (Rannikmae et al., 2020). This generates a Community of Inquiry that promotes communication and mental abilities, including critical thinking, reflection, and evaluating opposing viewpoints (Jegede, 2010).

Numerous online media are used to facilitate online teaching and learning. This study highlighted that in the online teacher professional development programme, online delivery is more effective when teachers use the recorded lectures by the lecturers who post them on the platform, and the most effective assessment technique is online MCQs. Previous studies support this finding. Darius et al. (2021) found that university students in South India used mostly recorded video lectures delivered by the faculty to learn more effectively. The current study revealed the numerous contributions of recorded video lectures by the lecturer in professional development. The findings are supported by Cavanlit et al. (2023), who maintained that students use different strategies like pausing, filtering, and scanning, and scrolling and rewatching the part or full recorded lectures. Furthermore, using recorded lectures in teaching higher education in an online learning context may impact subject area understanding, time management, and interaction among the teachers, between the teachers and the lecturer, and between the individual teacher and the recorded video in the absence of peers and the lecturer, by combining the benefits of accessibility, adaptability, and self-paced learning with the demands student engagement (Al-Qudah, 2023).

This study also reported that the factors contributing to the online delivery of teacher professional development are the sharing of supplementary content and the use of the Chat option. However, this finding supports previous studies that pointed out the importance of supporting online delivery with real-time teacher-lecturer communication and interactions (Ong & Quek., 2023). Abuhassna et al. (2020) suggested that lecturers should support students to overcome the challenges of online learning and enhance students' online learning experiences. However, using the Chat option is significant in the Mauritian online teacher professional development context. This shows that Mauritian teachers have an urgent need to exchange their views, professional experience, and feelings in the online class with their peers and/or lecturers in the live class.

The barriers to effective online delivery are mostly internal to the teachers who are following the programme. For reasons beyond the control of the lecturer, they choose not to benefit optimally from the online class. They make online disturbances, are reluctant to participate, and do not respond to teaching activities. In this specific online context, teachers are more influenced by attitudinal and environmental barriers than technological ones. This is consistent with Sumalinog (2022), who found that the teachers' low level of motivation to participate actively in the online class and their noisy surroundings or distractive

online learning environment act as potential barriers to effective teaching and learning, and hence make online delivery ineffective (Bao, 2020).

It is therefore of utmost importance to consider the findings of this study in its context. Online teacher professional development is context-bound, and the internal and external factors within the virtual learning environment and beyond should be considered as the higher education institution must address them to foster the professional development of primary school teachers.

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