

Maldivian Teachers' Experiences in Digitalising Their Remote Teaching during the COVID-19 Pandemic

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How to cite this paper: Adam, A. S., Moosa, D., Reesha, A., & Mohamed, A. (2024). Maldivian Teachers' Experiences in Digitalising Their Remote Teaching during the COVID-19 Pandemic. *Creative Education*, 15, 880-899.

<https://doi.org/10.4236/ce.2024.155054>

Received: April 15, 2024

Accepted: May 28, 2024

Published: May 31, 2024

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Abstract

The sudden shift to remote teaching during the COVID-19 pandemic has forced teachers to integrate Digital Technology (DT) more extensively in teaching. This research sought to collect teachers' experience of digitalising their teaching during the pandemic. The research adopted an explanatory sequential mixed-method approach, generating quantitative data, followed by qualitative data. Primarily, using a survey, quantitative data were collected from 659 teachers across selected Maldivian schools. Next, using purposive sampling, a total of three focus group interviews were conducted, giving teachers the opportunity to discuss the emerging findings to clarify and validate the understanding sought. The result of the survey suggests that overall, teachers reported greater use of DTs and gained more confidence in their use of DTs during the pandemic. Teachers reveal specific purposes of using DTs aligned with a range of different pedagogical strategies suitable for remote teaching. The main challenges identified by teachers include unreliable internet and connection issues, while also revealing the need for support to facilitate smooth use of DTs in teaching. There is better recognition of teachers' readiness to incorporate DTs into pedagogy with the high level of confidence and realisation of the potential DTs have in teaching/learning.

Keywords

Remote Teaching, Teacher Experiences, Digital Technologies, COVID-19 Pandemic

1. Introduction

The Maldives is one of the smallest countries in the world both in population and land area. It is geographically located in the Indian Ocean and is composed of 1190 islands, grouped into 26 administrative atolls (Adam, 2015). The current population of the Maldives is 549,704 unevenly distributed across the 196 islands. The formal education system of the Maldives is divided into six stages. The Foundation Stage (FS) includes Lower Kindergarten (LKG) and Upper Kindergarten (UKG), and the other five Key Stages range from Grade 1 to Grade 12 (K-12). Students remain in the school system from age 4 to 18, as shown in **Figure 1**. The unique geographic characteristics of the Maldives led to several challenges in the use of Digital Technology (DT) in teaching. These include limited capacity of fixed broadband and telephone infrastructure. However, the education system of the Maldives recognises the integration of DT in education as an essential element. Using technology and the media is one of the key competencies which is clearly outlined in the National Curriculum of the Maldives.

The teachers in the Maldives have been practising traditional face-to-face teaching methods as their dominant pedagogical approach across the educational system. Even though DT integration is promoted in face-to-face teaching at schools, to what extent teachers have been incorporating DTs in their teaching is still unclear. A few studies (Adam, 2015, Kinaanath, 2013) related to DT integration conducted in the context of the Maldives report that many educators find integrating DT in teaching to be challenging due to various reasons such as dominance of deep-rooted traditional pedagogy, limited ICT knowledge, unfamiliarity with the new tools, internet speed, lack of capacity in maintaining and updating the available devices and systems at school. However, with the emergence of COVID-19, teachers in the Maldives and the world over have been forced to bring radical changes to the way they teach. The COVID-19 pandemic has left teachers with an option to which many teachers were not accustomed. These sudden and forced changes to teaching have added to teachers' stress and concerns brought on by the pandemic. The research conducted is timely as it sheds light on how teachers are implementing the new curriculum and use of

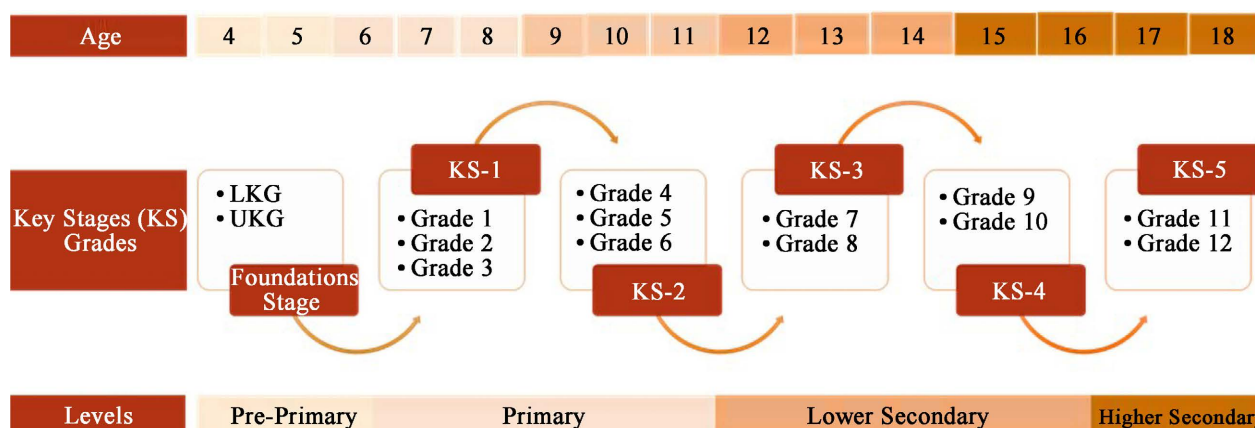


Figure 1. Structure of the school education system, Maldives.

DTs that have been formulated in response to the pandemic. Years after the pandemic, there is still very limited research or data reporting how remote teaching was conducted by the teachers in the Maldives. Therefore, understanding how teachers coped with and adjusted to the sudden and forced extensive use of DTs and their experiences during the COVID-19 crisis is important to ensure that Maldivian teachers are better prepared and equipped with the knowledge and skills required to teach remotely using DTs in similar situations in the future.

The COVID-19 pandemic had a significant impact on education systems worldwide. Some researchers argue that the education of young children fell back to a level where a quick recovery would have been difficult (Orhan & Beyhan, 2020). Some questioned whether confining children's education to home was the best option and expressed concerns about how learning was managed through remote teaching. A more important question, however, is whether the sudden shift to remote teaching warranted the quality of education targeted in the curriculum. The sudden and forced migration to remote teaching was not a move most teachers anticipated. Nevertheless, they bravely faced the challenges of managing teaching and learning for almost two years since the onset of the pandemic in 2019. During this time, they accumulated numerous experiences; of battling challenges, dealing with unexpected concerns and consequences regarding student learning and teaching. Four years after remote teaching due to COVID-19, there is still extremely limited research or data reporting how remote teaching was carried out by the teachers in the Maldives. Understanding how teachers coped with or adjusted to the sudden and forced extensive use of DTs is vital to ensure better preparedness of teachers in the future. The present study sheds light on how teachers implemented remote teaching pedagogy using DTs. This paper aims to outline useful insights, practices, and experiences of teachers regarding use of DTs and remote teaching during the pandemic. It specifically addresses the following research questions:

What are the teachers' experiences of remote teaching during the COVID-19 pandemic?

What are the teachers' experiences of using DTs for remote teaching?

What devices/applications did the teachers use to teach remotely?

What are the approaches used by the teachers and for what purpose did they use these during remote teaching?

What strategies did teachers use to overcome the challenges faced during remote teaching?

2. Literature Review

The literature section outlines three important areas related to remote teaching. The first part contextualizes remote teaching with the school context. The second part discusses technological and pedagogical aspects of remote teaching. Finally, the third part examines the literature related to challenges and limita-

tions involved in remote teaching.

2.1. Remote Teaching within the School Context

Remote teaching is often discussed in relation to higher education contexts. However, during the COVID-19 pandemic, several researchers examined the use of DTs in remote teaching in the school context (Klobucista & Maizland, 2020; Marshall, Shannon, & Love, 2020). It is presumed that any type of device or application used in remote teaching could be relevant to school context. In general, how the use of digital technologies is implemented or the purpose of using them would be linked with student engagement and interaction regardless of the level of learners.

Waters, Barbour, and Menchaca (2014) state that there are varied terminologies used for describing online or remote teaching in school contexts, such as online learning for elementary and secondary students, virtual school (supplementary programmes), and cyber school (publicly funded, full-time online schools). Some of these aspects could be home-schooling needs, specific disability needs, or any other social or geographic distance need. In these contexts, several arrangements must be made, and resources must be available for teachers to be able to teach and for students to access lessons. Some researchers argued that there was a mismatch between what the students preferred to use and what the teachers/lecturers used for remote teaching (Buzzard et al., 2011). Beckman, Apps, Bennett, and Lockyer (2018) reported that it would be unreasonable to think that all young learners will be well-connected, digitally savvy, or digital natives. These ideas clearly outline the importance of considering children's age, their capacity, style of learning or other family related factors when choosing and deciding specific DTs for teaching. This raises some concerns over whether the tools chosen by the teachers for remote teaching would have any impact on how students engage in the learning contexts. It is important to consider these questions, especially in the pandemic situation where teachers have no option but to utilise available technology to communicate with and educate students (Orhan & Beyhan, 2020, Hodges et al. 2020). There are questions regarding how far Maldivian teachers may have considered these aspects when carrying out the forced remote teaching.

Some may even argue that using a specific technology might not be a major concern at the point of the pandemic as there was a force or a need that was required for the time of teaching due to the pandemic (Hodges et al., 2020). In such a situation, teaching was considered as an emergency remote teaching practice implemented by teachers at the time of having no other option (Albó et al., 2020). This could mean that the use of specific technologies for teaching remotely was rather a replacement of the regular classroom teaching at schools to ensure continuation of children's education. Williamson, Eynon, and Potter (2020) assert that the emergency remote teaching practice is a distinctive approach to pedagogy, which has emerged as a global norm during the pandemic time. They further claimed that "distance education, remote teaching, and online

instruction are not new approaches to pedagogy or curriculum design, but they have taken on renewed salience” (Williamson et al., 2020: p. 108). This idea could also suggest whether the teaching or the use of digital technology perhaps be implemented as in a normal classroom or would that look different.

During the pandemic, the only option left for teachers to carry out teaching was using video conferencing or other means of video resources to manage children’s learning. Video Conferencing (VC) is an educational technology that can replace many obstacles such as school closure at any given difficult time, or barriers of the physical classroom setting for learning. The face appearance, gestures, body language, voice with video are important elements that VC could offer for a learning setting (Bennett et al., 1998) with higher levels of social presence. Although VC has been used in educational settings for over 20 years (Anderson, 2008), it was seen as a new dimension of school learning until the COVID-19 pandemic. Anderson (2008) argues that VC is discussed as a means for “increased access, equal or better education outcomes, and increases in positive attitudes towards technology use by participants” (p. 111). He found that it is one modality in a multifaceted and networked learning context, and it offers high levels of immediacy and social presence. Some researchers discuss the use of VC as an important means for rural virtual schooling (Barbour, 2007), which appeared to have the same effect of school closures during the pandemic. The physical barrier of not having the opportunity for students to attend schools with a teacher is the same as the situation in rural virtual schooling. Barbour (2007) discusses that the children were unable to attend school with the teachers in the physical classroom, which was replaced with the VC learning environments. The literature mentioned outlines the aspects related to specific tools or appropriateness of different tools for different circumstances. It would raise the question of whether any such aspects were pertinent for Maldivian teachers in the context of this research.

2.2. Technological and Pedagogical Practice

The majority of countries, including Nepal, have traditional educational systems that relied on classroom instruction (Gautam & Gautam, 2020). However, the majority of schools, colleges, and universities switched to offering their classes online or digitally due to the limitations placed on these types of operations. Such patterns were observed not just in theoretical disciplines but also in practical subjects that required virtual platforms for on-site practice. In a short period of time, educational institutions underwent a shift in pedagogical approach, quickly redeveloping courses to make them fit for virtual platforms. This sparked a fresh wave of reform in the process of teaching and learning in practically every nation on the planet (Hamal & Aryal, 2021).

Pedagogy can be defined in various forms and dimensions. Some understandings conceptualized by early scholars about pedagogy are important to note in order to make sense of what happens in the pedagogical contexts when technology is integrated. The conceptualisation of pedagogical content knowledge (Gud-

mundsdottir & Shulman, 1987) is a complex process, which can be more complex when integrating DT into a previously established traditional practice (Adam, 2015). Pritchard (2007) points out that teachers' everyday teaching habits of using DTs were evident with a limited student-centred focus in their teaching. This idea closely indicates that teachers who might have adopted several tools during the pandemic time might have just used them to replace what they have been doing in face-to-face teaching.

Seeking to learn a new pedagogical practice and experimenting with a range of devices, tools, means and strategies to make learning meaningful for the students can be overwhelming, particularly at a time of difficult circumstances such as pandemic. Teachers identified several pedagogical and technological considerations such as transferring their previously established practice of physical classroom teaching to online modes, preparing multiple forms of online materials for students, thinking about a range of forms that student learning can be designed and maximise the learning opportunities for students (Azhari & Fajri, 2021). Orhan and Byhan (2020) argue that teachers tend to adopt the traditional teaching methods when using VC for their remote teaching, which appears to be less successful for children than in a formal classroom setting. They further elaborated some aspects involved in lack of communication and interaction as the main elements that affected the learning mode. These ideas are likely to be useful for understanding ways in which Maldivian teachers might have implemented remote teaching through video conferencing or any other form they have adopted in delivering teaching.

Forming a specific pedagogical practice is a continuing journey. Nind et al. (2016) explain the three dimensions of the pedagogical journey. The understanding of pedagogical practice is defined as a journey, a continual learning process, rather than an outcome or end-targeted oriented practice, which can end with a specific aim. Nind et al. (2016) argue that pedagogy can be understood as a "specified", enacted, or experienced process (Figure 2). The first dimension relates to the set curriculum, policies, best practices expected, and logic of practice established in a given context. This means that when thinking about an academic who practices teaching whether online or face-to-face, the main elements of pedagogy that are underpinned pre-defined or set expectations in an organizational context. The second dimension is involved in the way the pedagogical knowledge is translated into the context. This includes the teaching competencies, nature of students, the context of practice, the nature of modules taught, and many other aspects related to resources, devices, tools, or other means that are part of the pedagogical context. The third dimension is linked with how the person him/herself is translating the practices and the conceptualisation of what pedagogy means to one's own practice. This includes its own interpretation of what it means to teach, what it means to bring changes to teaching, what it means reflecting on how teaching is done. These ideas are linked to what people exactly do in practicing teaching. The main thinking behind the three dimensions is outlined in Figure 2.

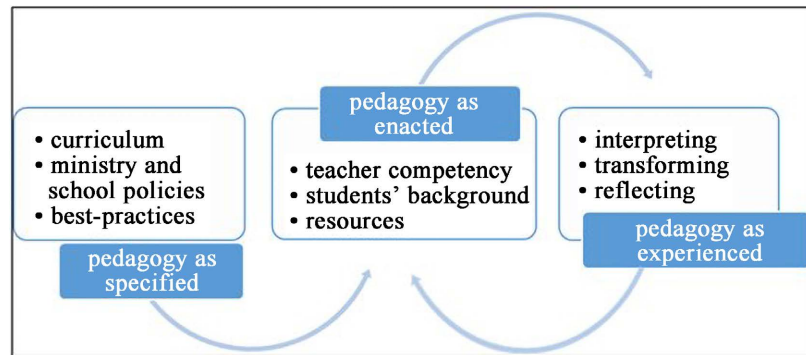


Figure 2. The three pedagogical dimensions of teaching.

Apart from the pedagogical aspect, the extensive use of the internet in teaching and learning spaces whether online or face-to-face (F2F) modes were some widely discussed areas over decades. Some of these discussions were related to the pedagogy and the change it requires to the way it is practiced when digital technology is integrated into the teaching and learning contexts or spaces (Sargent & Casey, 2021). Scott, Chovanec, and Young (1994) claimed that pedagogical practice is very likely to be linked to an individual's personal philosophy. They discussed that teachers who believed teaching as delivering knowledge were influenced by their own philosophies of teaching, which in turn may influence the way DTs were integrated into their teaching. These researchers raise important questions regarding how a teacher's pedagogical practice could change with deliberate thinking. Presuming that teachers who adopted DTs in their teaching may have sought to understand what benefits could be gained through the used tools that can also enable them to discover new ways of teaching. Some researchers have indicated that teachers often bring little change to the way that they taught with the integration of DTs in teaching (Adams, 2012; Bang & Luft, 2013). These researchers strongly critique the way teaching was done by teachers regardless of their use of DTs in teaching. They further asserted that the use of DTs was merely a replacement of traditional practice. This could lead to a question, how far the Maldivian teachers who might have adopted a range of DTs in remote teaching, brought any deliberate change to the way the teaching was practiced with the integration of DTs. What is more captivating in this scenario is, as these studies have been conducted in technology-rich contexts, it would be critical to look at what might be the case in the context of the Maldives where the access to DTs is limited, which could also lead to many other issues or challenges that may be involved in remote teaching contexts.

2.3. Challenges and Limitations Related to Remote Teaching Contexts

A plethora of studies have been conducted about the benefits and challenges involved in online or remote teaching and learning (Bouhnik & Carmi, 2012; Hegarty, 2015; Makarova & Makarova, 2018; Kung Keat & Ng, 2016). Yet, it is seen that most of these studies discuss the learning context related to higher educa-

tion and online learning. It would raise how online learning or remote teaching could be different from the way learning is designed for school students. The learning process, how it is designed, how students experience the learning moment, the nature of learning, the type of content, and many other aspects may be involved in the context of school student learning. Hence the ways that teachers have implemented online/remote teaching and learning could vary. The use of digital technologies, particularly the use of different tools for specific purposes could vary.

Some researchers would argue that multiple obstacles can be identified as part of the learning situations even in a normal scenario. [Rehn, Maor, and McConney \(2017\)](#) report that insufficient time, feelings of isolation, scheduling and logistics, unreliable technology and limited personal connection are inevitable obstacles. A few years back, a model named Inquiry-Based Learning and E-mentoring (IBLE), which appeared as a successful learning model that had enhanced students' learning, most significantly on their affective development, including increased motivation, broadened understanding, and augmented career awareness ([Barbour, 2007](#)). What might be challenging in the context of this research is the application of such a model when it comes to changing the pedagogy in the context of remote teaching. This research thus focuses on exploring any such understanding that could explain how factors related to both teachers and learners could be understood when it comes to integration of DTs in remote teaching.

3. Research Methodology

Previous research about digital technology often concentrated on using quantitative methodology rather than mixed methods. This research adopts a mixed-method research paradigm using an explanatory sequential approach advised by [Creswell and Clark \(2017\)](#). The research seeks to investigate teachers' experiences of using digital technologies in their remote teaching during the COVID-19 pandemic. It focused on explaining the aspects related to teachers' use of digital technologies through quantitative approach at the outset and confirming and clarifying with qualitative data in more detail at the end. The research thus commenced with a larger sample, following up with a qualitative method with a smaller number of participant teachers to clarify with an in-depth understanding of how their experience of remote teaching took place. Further, [Creswell and Clark \(2018\)](#) assert that when researchers have little knowledge about a phenomenon, starting with quantitative or baseline understanding would enrich and help to confirm the understanding of the phenomenon with more qualitative details such as using focus group discussions (FDG). In this research, teachers are given opportunities to share their actual experiences, insights, and dilemmas, in the FGDs.

Research Process

This section details the sampling process, data collection, data analysis as well as

ethical considerations that are taken into consideration during the research process. The sampling process was carried out separately in two phases as detailed below.

Quantitative: The population of the research was selected from Key Stage 1 to Key Stage 3 across selected schools in the Maldives. The total population of teachers in these three Key Stages was estimated as 3000. This is a 4.08% margin of error sample $n = 659$, (Raosoft, 98% confidence level). The online survey questionnaire prepared on Google Forms link was sent to all principals requesting to circulate the questionnaire to all teachers who were teaching in the three Key Stages (1-3). The questionnaire was administered in two circles to reach the highest response possible.

Qualitative: Purposive sampling procedure was followed, inviting teachers who have shown their interest in participating in the focus group discussion. The teachers from different schools were individually approached and requested to share their thoughts regarding their remote teaching experiences. The only criteria to be closely maintained was to check whether they have had remote teaching experience in Key Stage 1 - 3 during the COVID-19 pandemic.

The research has gained ethical approval prior to its data collection process. The data collection process was divided into two phases, a brief description for each phase is given.

Primarily, the data collection started with a survey questionnaire sent to all teachers who teach in Key Stage 1 - 3, the number of responses received in two circles was 659 teachers across selected schools in the Maldives.

Next, a total of three focus group interviews (with 6 - 10 participants/group) were conducted, giving teachers the opportunity to discuss the emerging findings of the survey to clarify, add details, and validate the understanding sought. The data were analysed using quantitative (statistical analysis) and qualitative strategies (thematic analysis) for seeking validation and confirmation of the understanding sought. The thematic analysis was conducted in three phases. Initially, all focus group discussions were recorded, and transcribed by listening to the audio. At first, all transcripts were open coded, identifying the emerging ideas that were contextualised with COVID-19 experiences of teachers. Later, those open-coded ideas were categorised into wider themes that represented the main focus of this paper. Finally, the categories were cross-checked and refined within and across many views that were shared by teachers about different aspects.

4. Findings

The findings are presented in two sections. The first section reports the quantitative and the second reveals qualitative findings.

4.1. Quantitative Findings

Figure 3 shows that 61.2% of teachers completed Google Certified Educator Level

1 training while 9.8% of teachers completed Google Certified Educator Level 2 training.

When the Ministry of Education provided the upskilling programme to facilitate remote learning during the COVID-19 pandemic. However, 28.7% of teachers did not obtain Google Certification on any level. Additionally, very few teachers are trained to be trainers to support other teachers.

Similarly, about 67% of the teachers received technical support to ease their remote teaching whereas 32.9% of the teachers mentioned that they did not receive it as shown in **Figure 4**.

During the pandemic, 84% of teachers revealed that necessary facilities and devices were available, although 16% of the teachers had the issue of unavailability of resources as depicted in **Figure 5**.

Further, **Figure 6** reveals that the majority (58.8%) of the teachers normally carried out remote learning from their home, while 39.7% of the teachers carried out the classes from school. Additionally, about 1.5% of the teachers used both home and school to conduct remote teaching during the pandemic.

4.2. Teachers' Experiences of Using DTs for Specific Purposes

Table 1 shows mean, standard deviation and respective ranking for items

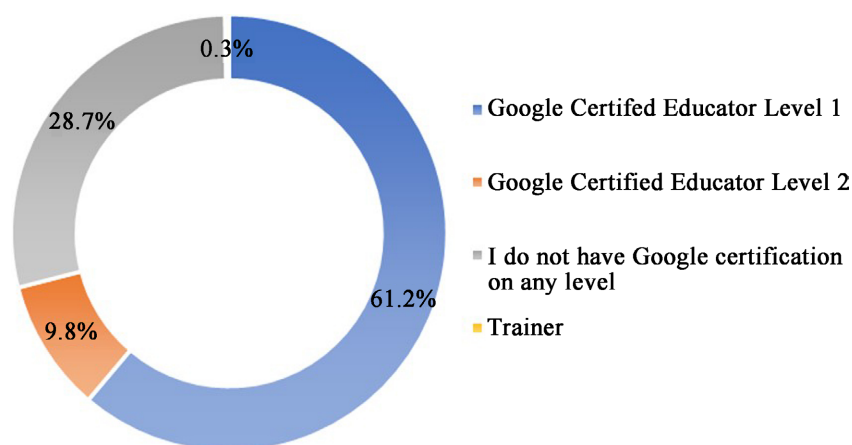


Figure 3. Percentage of teachers with Google Certified Educator Level 1 and Level 2 training.

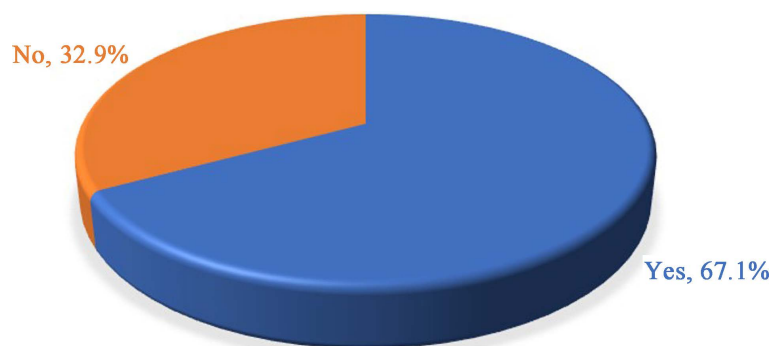


Figure 4. Percentage of teachers with and without technical support.

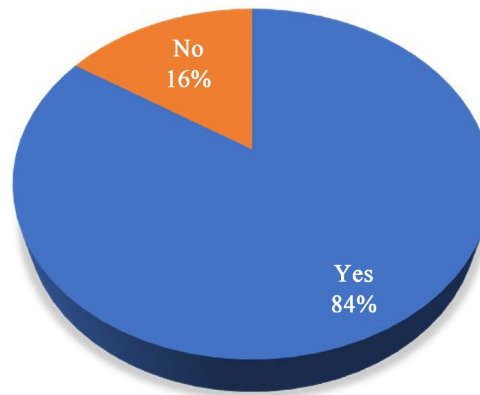


Figure 5. Percentage of teachers with and without resources.

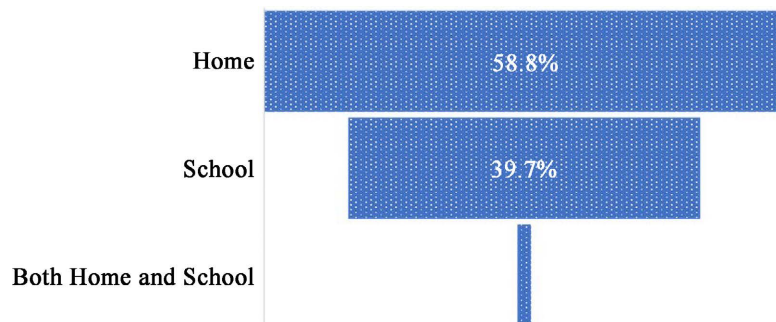


Figure 6. Environment/location used to carry out remote learning.

Table 1. Experiences of using digital technologies for remote teaching.

Code	Item	Mean	SD	Rank
DT1	I use a range of digital technologies to design remote learning	3.53	1.12	7
DT2	I use different techniques and strategies for designing	3.67	1.17	4
DT3	I have become very familiar with the use of digital technologies for teaching	3.67	1.19	4
DT4	I find it difficult to achieve learning outcomes when using digital technologies	3.36	1.22	8
DT5	I have realised the importance of using digital technologies for my teaching more than before	3.88	1.23	1
DT6	I find the use of digital technology makes my teaching more relevant for today's generation	3.83	1.25	2
DT7	I am confident in designing learning online	3.67	1.20	4
DT8	I am confident in designing online learning activities	3.69	1.21	3
DT9	I feel my students are more motivated when digital technologies are used for their learning	3.66	1.24	5
DT10	I use a range of assessment for learning activities in remote teaching	3.55	1.10	6
DT11	I observe that my students often become more interactive when online learning is designed	3.36	1.22	8

representing teachers' experience of using digital technologies for remote learning. The mean value of all items shows a moderate level of experience of using digital technology when they carried out remote teaching with a mean score range of 3.36 to 3.88. Despite having a moderate level across the items, the highest-ranked two items; "I have realised the importance of using digital technologies for my teaching more than before" ($M = 3.88$, $SD = 1.23$), and "I find the use of digital technology makes my teaching more relevant for today's generation" ($M = 3.83$, $SD = 1.25$) indicate the positive attitude of teachers towards the use of digital technology in remote learning due to this experience.

The 3rd and 4th ranked items inform that teachers became confident designing online learning and competent in using digital technology in remote teaching with a mean score range of 3.67 to 3.69. Two items are at the lowest rank with a mean score of 3.36 ($SD = 1.22$).

The lowest-ranked items are "I observe that my students often become more interactive when online learning is designed", and "I find it difficult to achieve learning outcomes when using digital technologies". Overall, these findings indicate that a positive attitude towards the use of digital technology among teachers, their competencies for use of digital technologies in remote teaching and confidence in using these technologies to design online learning have been developed. However, they had difficulty making lessons interactive and achieving the learning outcomes with the use of digital technology.

One-way ANOVA was employed to examine if there is a significant difference in teachers' use of digital technology in remote teaching based on the duration that teachers used digital technology for teaching. The duration was classified into four categories; 1) More than 5 years, 2) Around 1 to 4 years, 3) Less than 1 year and 4) Have not been used at all.

The results in **Table 2** indicate that there is a significant difference in teachers' use of digital technology in remote teaching among the four duration groups: $F(3, 619) = 3.564$, $p = 0.014$. Despite the significant result, the difference in mean scores between the groups is small as indicated by the effect size ($\eta^2 = 0.02$). Following this, a post-hoc procedure using the Tukey HSD test was conducted to find out where exactly the difference lies. The investigation revealed that the difference lies between the "have not used at all" group and the other two groups:

Table 2. The difference in use of digital technology in remote teaching.

Duration	N	Mean	SD	SE	95% CI for mean		F	df	sig	η^2
					Lower	Upper				
More than 5 years	252	40.599	10.992	0.692	39.235	41.963	3.564	3619	0.014	0.02
Around 1 to 4 years	348	39.728	9.184	0.492	38.760	40.697				
Less than 1 year	6	36.542	11.703	4.778	24.260	48.823				
Have not used it at all	17	32.794	7.954	1.929	28.705	36.884				
Total	623	39.861	10.012	0.401	39.073	40.649				

more than 5 years and around 1 to 4 years. This finding shows differences in teachers who did not use digital technologies at all and teachers who used it for more than one year including more than 5 years' group.

Figure 7 shows that teachers generally used Google Docs, Google Classrooms, Google Slides and Google forms most frequently. Other applications (Google Maps, Google Keeps and Google Jamboards) were used less frequently.

Figure 8 confirms that teachers used devices mostly to motivate students, to provide learning activities and to make simple presentations with texts, pictures, and videos. Devices are also used to teach complex concepts and make students learn independently. These findings were complemented with the qualitative data.

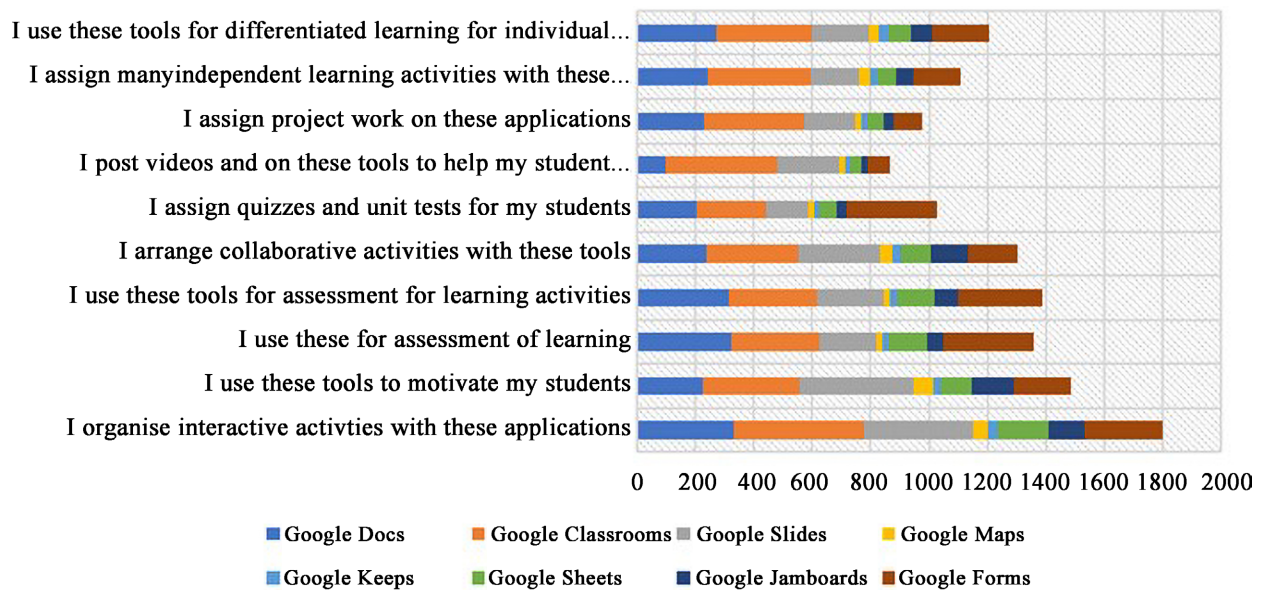


Figure 7. Use of google applications in remote teaching.

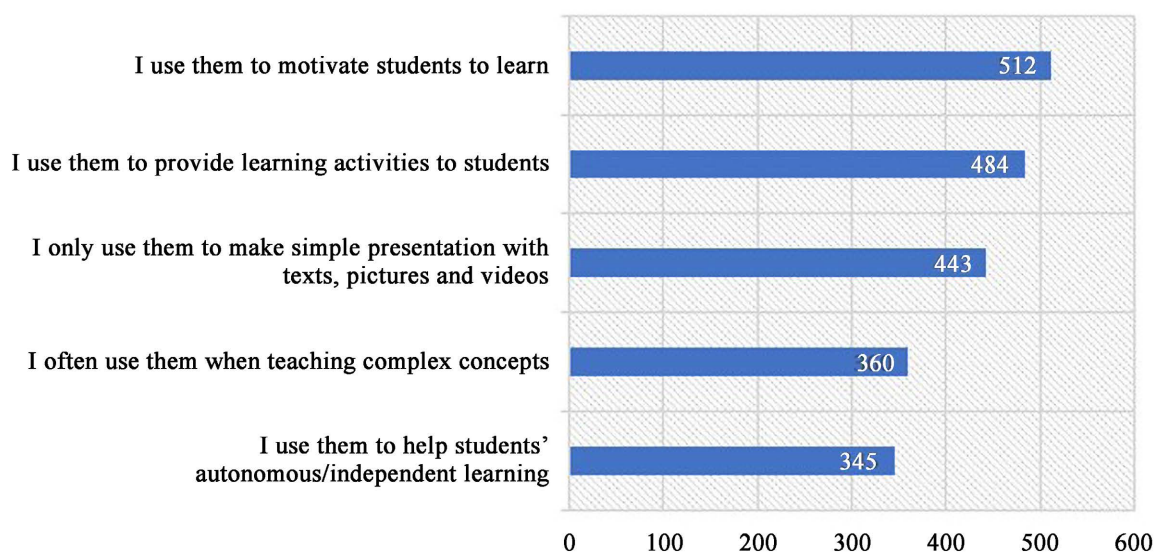


Figure 8. Ways of using devices/applications in own teaching.

4.3. Qualitative Findings

4.3.1. Opportunities for Timely Professional Learning

Experimenting with technology

Teachers talked about the timely professional learning that they received to manage remote teaching during the pandemic. The pandemic presented teachers with the opportunity to experiment with various technologies. According to the teachers, while they used technology to some extent, it was confined to the basic or superficial level like PowerPoint slides and Excel sheets. Having to suddenly switch to remote mode was the key reason they were forced to experiment with technology and in the process, they have become more comfortable with integrating technology in their teaching as one teacher recalled:

“I believe that teaching during this pandemic was an opportunity to use technologies... What I mean is, even though we struggle, I would like to say that I am sure that I, for sure ...gotten a lot of achievements. What I mean is when this all first started, we got some training, from Google Certificate level 1.”

“I learned to use a lot of Google applications from the teaching. I have noticed that in Jamboards, we were able to give works to the students very interactively, and I'd like to state that Google Slides was also very helpful. Like in doing the group work.”

Realisation of own potential

Teachers described their experience of teaching during the pandemic to have pushed them to a level of learning that was beyond their imagination. The teachers were surprised to know that they were able to use technology to the extent they had without much training. This opened to them the possibility of learning through doing. The teachers were extremely pleased with their achievement and confidence they had gained teaching remotely during the pandemic:

I didn't even imagine that I will come to ... this level in online teaching... many people started talking about me on social media. I created a community Viber group to teach students in Maldives, I had 1700 students. Viber group was created because I didn't know any other tools at that time. Viber was commonly used by students and parents... that group was very successful. But it wasn't very effective due to large no. of students. I started searching for effective tools.

“I started getting the habit of using and experimenting a range of different tools such as ... Jamboards, Quizizz, Mentimeter, Kahoot, helpful. Like in doing the group work, when each group must do a specific task, students have created very creative works and had uploaded.”

4.3.2. Inevitable Dilemmas and Challenges

Teachers talked about a range of different difficulties and dilemmas that they had to deal with due to remote teaching. A lot of these were inevitable and they had to tackle it somehow to avoid discontinuation of teaching. One of the most

concerning issues shared by teachers were that of the cost of the internet and poor connection:

“Many teachers complained about the internet issue and its cost... I have never seen any teacher who did not talk about it. There was no option left except going with what we have... So, Viber was more commonly used among us.”

A common concern expressed by the teachers was that during remote teaching, student engagement and interaction was very limited. However, many teachers tried to engage them, teachers still struggled to motivate students to communicate and interact which for the teachers was extremely difficult and frustrating:

“Students were not motivated. Some students took it as an option and didn’t attend online classes. Some students even told that it was better in face to face.”

“Some students didn’t talk in the online classes. Only 2 or 3 students talk in the class don’t know whether students understand or not. we get students to work through Google class or through Viber in a class.”

One of the dilemmas teachers identified was how the pandemic was widening the gap between high achievers and low achievers. As they were teaching online, teachers were not able to see students and while the high achievers could keep up with the pace of lesson, the low achievers struggled as teachers were unable to provide the individual attention they needed:

“We started online teaching without any training. It was very difficult [at the start]. There were students who needed special attention, ...Because of this they don’t understand. In physical teaching we take them to extra classes. In remote classes the low achievers became even lower.”

“In remote classes the low achievers became even lower. That’s definitely a challenge.”

“It also depends on how we conduct the lesson it was difficult to cater to low achievers.”

4.3.3. Challenges Owing to Nature of Subject

According to the teachers, some subjects were very difficult to teach online as it required use of specific tools. For instance, teachers found it difficult to use symbols and in teaching our local language “Dhivehi”, the issue was that students were unfamiliar with the keyboard:

“Teaching math was a big challenge, as I will need to type all symbols online. When teaching face-to-face it was not difficult at all as I could write them so easily... When teaching online, I had to look for those... That was more complex when students had to do the work online.”

“We use symbols to type. And when we make presentations in advance and show the students the PowerPoint Presentation, we must show it step by step and it’s very difficult for us to explain it. As I did a degree in mathe-

atics back in 2010 and had helped us focus on typing the symbols, I was able to handle it a bit unlike many others.”

“Teaching Dhivehi (local language) was a big challenge as students were not very familiar with the keyboard. And when they had to do the work online and lot of them complained. But later they became much familiar with typing Dhivehi.”

Both quantitative and qualitative findings underscore the diverse array of tools teachers explored for their instructional purposes, albeit initially prompted by unforeseen circumstances. The integration of digital technologies emerged as a necessity during the pandemic, prompting educators to recognize their potential in managing student learning. Both quantitative and qualitative findings highlighted significant challenges, including limited training, infrastructure, and the complexities of facilitating learning in diverse home settings. Nevertheless, teachers persevered, leveraging digital tools, and employing various strategies to support student learning effectively. Despite the unavoidable hurdles presented by the pandemic, educators discovered their inherent capabilities and adapted their teaching methodologies to incorporate digital technologies seamlessly. Notably, the adoption of specific digital platforms such as Google Classroom, Google Docs, and Google Slides primarily stemmed from the exigencies of the COVID-19 pandemic, reflecting the realistic response to the prevailing context.

5. Discussion

The education systems worldwide were forced to experience a unique educational circumstance due to the COVID-19 pandemic and brought to light the potential of digital technologies in teaching and learning. This study intended to find out teachers’ experiences in remote teaching and the use of digital technologies. It also looked at the applications used by teachers, the challenges they faced and how these were addressed.

The teachers’ experiences in having to digitize their teaching without much warning or preparation were varied and diverse. Many teachers highlighted that they have become more confident in using digital technologies and they now understand that this way of teaching and learning is more relevant and familiar to the young generation. On the other hand, teachers found it difficult to engage students in learning and had difficulties in ensuring that outcomes were achieved. In general, teachers’ experiences of remote teaching have been both a learning experience and a test of their abilities as well as their attitudes towards DTs.

Although the curriculum in the Maldives clearly stated integration of ICT/DT in teaching and learning, the present study has revealed that this was not the practice until the pandemic. Many teachers have completed Google Certification 1 & 2 with the initiative by The Ministry of Education (MoE). However, there are still teachers who have not completed any level of Google Certification. Lack of training was highlighted as a major barrier in teachers’ use of digital technol-

ogies effectively and efficiently in their teaching and learning (Winter, Costello, O'Brien & Hickey, 2021). According to Hollebrands (2020), teachers must understand how and when to use which technology and how it can make teaching and learning more effective. The results also showed that DT integration in teaching and learning were minimal prior to the pandemic. Only basic applications (e.g., Excel, PowerPoint) were used by teachers prior to the pandemic. As the subsequent lockdown forced teachers to shift to remote teaching, teachers struggled initially, and they acknowledged the number of challenges experienced like the internet issues, which is raised in almost every study about online teaching. According to Moore, Vitale, and Stawinoga (2018), many students are disadvantaged due to inequitable access to devices and low-quality internet. The internet in the Maldives is one of the most expensive in the South Asia region and the cost of the internet has been a challenge for both teachers and students.

Despite the challenges, many teachers believe that the pandemic presented them with an opportunity to learn, explore and experiment as evident from the experiences shared by teachers in the focus group interviews. The quantitative results also revealed the extent to which teachers had experimented with various applications during the pandemic. With the support from the school management and the technical teams, the teachers said they have developed a positive attitude towards the use of digital technologies in teaching and learning and can understand the potential it has in motivating students and making them more independent learners. The above literature suggests that support is crucial as teachers try to adapt to new approaches to teaching and learning and modes of delivery for which they are not trained.

One of the interesting findings from the interview was how the pandemic widened the gap between the low achievers and the high achievers. Teachers pointed out that the low achievers were even more disadvantaged as it was difficult to provide them with the individual attention they needed. This literature often discusses how the digital divide contributes to “opportunity, achievement and equity gaps in education” (Moore, Vitale, & Stawinoga, 2018: p. 4). The digital divide is frequently discussed in connection with access to electronic devices and internet connections, which was confirmed in the case of this research which revealed how low performing students are disadvantaged even more.

6. Conclusion and Recommendations

This study indicates that training and Google Certification for teachers facilitated a smooth transition to remote teaching during the pandemic. The crisis prompted teachers to recognise the potential of technology, leading them to explore various applications and devices beyond their prior use of Microsoft applications. Despite the challenges of managing student learning remotely, teachers adeptly utilised a range of tools deemed suitable for their students' needs. Both qualitative and quantitative data emphasised teachers' realisation of the benefits of integrating digital technologies into teaching practices in Maldivian

schools. The research has dual implications: it boosts teacher motivation to experiment with new applications and seek further learning to enhance digital integration, while also providing practical strategies for addressing challenges related to technology use in schools. Teachers expressed that their experimentation with new ideas solidified their belief in the inevitability of digital technology integration. Overall, teachers' experiences have been positive, fostering greater confidence in using technology for teaching and acknowledging its potential to enrich the teaching and learning process throughout the school system.

The research underscores the critical need for teachers to acquire adequate skills and competencies in utilising digital technologies for effective teaching. Limited pre-COVID exposure to digital tools suggests gaps in both pre-service training and ongoing professional development. It's crucial to ensure teachers receive comprehensive training in digital technology through professional development programmes. Despite digital technology being a key competency in the curriculum, its effective integration into teaching remains questioned, with students often lacking awareness of its educational value. Bridging the gap between student familiarity with technology and teachers' proficiency is essential to enhance learning in the digital age. While teachers are showing increased acceptance and confidence in technology after their experience during the pandemic time, evaluating their practices and understanding the positive impact on student learning is crucial for Maldivian schools. Further research on intentional changes to teaching practices in Maldivian schools amidst global digital transformation is necessary.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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