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How challenging? Barriers for teachers in institutional implementation of blended learning

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ABSTRACT

Blended learning has been popular in higher education over the past decade, aiming to provide students with enhanced learning experiences by integrating digital technology with face-to-face (F2F) learning. However, due to several barriers confronted by teachers, the uptake of blended learning has been highly variable. This variability can yield significant inconsistencies in learner experiences and can result in learner inequity. This case study aims to explore some of the common barriers encountered by university teachers as they attempt to implement institutional blended learning in the Maldives. The participants were 24 teachers who were involved in blended learning adoption in 2019. Data were collected through semi-structured interviews and were analysed by employing thematic analysis. In addition, university policy documents related to blended learning were collected and analysed. Results suggest that in the implementation of blended learning, teachers may encounter several barriers that include (a) teacher resistance, (b) teacher low self-efficacy, (c) increased teacher workload, (d) university policy issues, and (e) lack of readiness. The implications of these barriers to institutional implementation of blended learning and teacher support are discussed.

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Blended learning; institutional adoption; barriers for adoption; diffusion of innovations; higher education

Introduction

Blended learning has been a popular mode of course delivery in higher education for decades (Antwi-Boampong, 2020), and appears to have been even more valued amid the COVID-19 pandemic (Ali, 2022; Li & Wang, 2022). The pedagogic approach has been perceived as a method that provides students with increased access to learning (Ali, 2019; Wang & Huang, 2018), increased flexibility (Hamdi & Abu Qudais, 2018; Herman et al., 2019) and enhanced learner performance (Olelewe & Agomuo, 2016; Thai et al., 2020). By purposefully integrating face-to-face (F2F) learning with online interactions, often the aim of blended learning is to provide students with personalised and enhanced learning experiences (Al Zumor et al., 2013; McKenzie et al., 2013).

Blended learning has been embraced by individual teachers in various learning contexts (e.g. Olelewe & Agomuo, 2016; Posey & Pintz, 2017; Xu et al., 2020). However, due to

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various challenges such as teacher low self-efficacy (Reid, 2017), and lack of proper teacher support mechanisms (Porter & Graham, 2016), the application of blended learning by teachers has been highly variable (Rasheed et al., 2020). These variations are problematic because the variances in teaching practices can yield inconsistencies in learner experiences and can result in inequity among learners (S.-H. Liu, 2011). Therefore, it is important to explore aspects that can inhibit teacher adoption and implementation. Understanding the inhibitors of blended learning adoption can allow universities to provide better support for teachers and, in return, can increase teacher uptake of technology enhanced learning methods such as blended learning. It can also help universities to harness blended delivery practices across disciplines to provide students with consistent and equitable learning experiences. The aim of the current study was to investigate the barriers encountered by university teachers in the Maldives regarding the adoption and implementation of blended learning.

Background

Blended learning

Blended learning is, at its simplest form, a pedagogic approach that integrates technology-mediated instruction with F2F learning (Antwi-Boampong, 2020; Dziuban et al., 2018). The aim of the integration is to provide students with the affordances of digital technology and the advantages of F2F instruction. Several studies have shown that among other affordances, blended learning can enhance learner engagement and academic performance (e.g. Jesus et al., 2017; Xu et al., 2020).

Blended learning is no longer a new mode of course delivery. A plethora of research has been conducted to understand various aspects of this pedagogic approach (e.g. Gao et al., 2020; Owston et al., 2013). Most of the attention in relation to adoption, however, has been given at subject levels (Anthony Jnr et al., 2020; Porter et al., 2014), leaving institutional matters on the fringe, despite more institutional initiatives having been undertaken since the outbreak of COVID-19. Specifically research efforts to understand the issues around differences in teacher uptake of blended learning at institutional level are limited (Anthony Jnr et al., 2020). This may have significant implications for the adoption of blended learning amongst teachers and can ultimately result in inconsistent and inequitable learning experiences for students. Therefore, it is important to explore the factors that affect teacher adoption of blended learning, specifically at the institutional level.

Factors affecting technology adoption

This section outlines some of the common factors that affect teacher adoption of general technology, not necessarily blended learning. These include teacher resistance, teacher low self-efficacy, increased workload, policy issues, and lack of readiness. Whilst these factors can be generic aspects in relation to technology adoption, it is reasonable to relate them to blended learning to understand the common barriers that teachers may encounter in institutional blended learning adoption. As stated in the introduction, blended learning is a pedagogic method that involves online and technology-integrated teaching and learning (Dziuban et al., 2018).

Resistance is one of the key factors that can hinder the adoption of technology in general (Reid, 2014; Watty et al., 2016), and is a common barrier preventing teachers from integrating technology in their teaching. For example, Howard (2013) examined teachers' affective and analytical risk perceptions to understand their resistance to integrating technology in the classroom. This study showed that, overall, teacher beliefs and attitudes such as negative perceptions and resistance can negatively influence their decisions regarding integrating technology in the classroom. In a more recent study, Watty et al. (2016) explored Australian accounting academics' resistance to new technologies in higher education. The authors reported that teachers showed resistance to using technology for a variety of reasons including lack of interest and institutional resources, additional workload, and preference for traditional teaching methods. These studies suggest that resistance can play a major role in the decision-making of teachers in relation to using online and blended learning methods.

Teacher low self-efficacy can also affect teacher decisions in relation to the integration of technology in teaching and learning (Buchanan et al., 2013; Joo et al., 2018). Self-efficacy is an individual's personal judgement of their ability to succeed in a prescribed task in a certain context (Hameed & Arachchilage, 2021). Self-efficacy has been identified as a significant element that explains teachers' instructional practices in general (Lemon & Garvis, 2016; Prifti, 2020; Zainab et al., 2017), and has also been recognised as a powerful factor that affects teachers' behavioural intentions towards technology adoption. For instance, in the U.S., Kwon et al. (2019) investigated how teacher self-efficacy concerning the use of mobile computing devices explained their use by teachers in the classroom. Results of this study showed that self-efficacy was a vital predictor of levels of teacher integration of mobile technology in their teaching practice. This suggests that teachers may not try mobile technology in the classroom if they do not believe that they have the capabilities to use it. Similar results have been reported in other contexts, including online and blended learning environments (e.g. Cheng et al., 2021; Joo et al., 2018; Reid, 2017; Zee & Koomen, 2016). This indicates that teacher adoption is unlikely to occur unless teachers have confidence in their ability to achieve desired outcomes through a pedagogic method and can mitigate potential negative consequences of their actions.

Another aspect that can inhibit adoption of technology is teachers' academic workload (Gregory & Lodge, 2015). In technology integrated teaching methods such as blended learning, teachers often need to allocate more time to developing learning resources (Ocak, 2011). In addition, many teachers, specifically those who are accustomed to traditional teaching methods, may need to enhance their technological knowledge and skills in order to use new technology effectively in the classroom (Gregory & Lodge, 2015). This may force teachers to spend more of their time on teaching related activities, such as preparing teaching materials and learning how to use technology, compared to the time they would have spent if they only used traditional F2F teaching. This can put an enormous amount of pressure on teachers and, consequently, can induce a negative attitude among teachers towards the use of technology in general, specifically blended learning. Several studies have shown that teacher workload is an important factor that can impact the uptake of online and blended learning methods (e.g. Napier et al., 2011; Watty et al., 2016).

Teachers' technology adoption can also be affected by various institutional factors (Scherer et al., 2021). One important aspect is institutional policies, particularly those related to resources and professional development. Porter and

Graham (2016) argue that effective adoption and implementation of blended learning in universities require relevant policies and strategies. These policies and strategies are crucial as they enable universities to provide teachers with the necessary infrastructure and support, including pedagogical and technological assistance. Professional development plays a significant role in delivering such support, and insufficient professional development opportunities for teachers can significantly inhibit their uptake of technology-enhanced learning, such as blended learning (Philipsen et al., 2019). In addition, institutional policies can help universities to maintain consistency across academic disciplines in relation to the implementation of technology in teaching (Porter & Graham, 2016). Similar findings were reported in a systematic review that included 131 articles about academics' adoption of learning technology. In this study, Q. Liu et al. (2020) found that institutional policies can affect teacher adoption of technology enhanced learning such as online and blended learning, and policies that are in line with the local context can facilitate the adoption process better.

Institutional readiness can also have an impact on teachers' adoption of online and blended learning (Webster & Gardner, 2019). Institutional readiness encompasses multiple aspects such as establishing sufficient infrastructure and teacher support mechanisms, which are vital for the adoption and diffusion of technology-enhanced learning like blended learning (Brown, 2016; Porter & Graham, 2016). Lack of institutional readiness can prevent universities from providing teachers with adequate support mechanisms and, consequently, can induce low rates of adoption at the individual teacher level. For example, a small-scale study by Antwi-Boampong (2020) reported that university readiness, amongst several other factors, can positively motivate teachers to adopt technology-integrated teaching such as blended learning. Several other studies have also identified the importance of university readiness in the adoption of technology enhanced learning such as blended learning (e.g. Webster & Gardner, 2019; Wong et al., 2014). This suggests that institutional readiness is a vital element to be considered in institutional adoption and implementation of online and blended learning.

Despite the prevalence of forms of technology-integrated teaching such as online and blended learning, adoption at the institutional level may not be straightforward, and the adoption process can be hindered by multiple factors such as teacher perceptions and beliefs, teacher self-efficacy, teacher workload and institutional resources (Brown, 2016; Scherer et al., 2021). Therefore, it is paramount to understand the common problems that teachers encounter in relation to the adoption of technology enhanced learning, specifically blended learning, to better support teachers, so they can provide students with consistent learning experiences. This study aims to investigate the barriers encountered by teachers in the adoption and implementation of blended learning at a university. The study is guided by two research questions; (a) what are the teacher perceptions of using blended learning? and (b) what barriers are encountered by university teachers in the institutional adoption of blended learning? The following sections present methods, results and discussion, limitations, and conclusions. The current study is a portion of a larger PhD project, and the ethics approval for conducting this study was obtained from the Human Research Ethics Committee of the Maldives National University, and the University of Wollongong (#2019/129).

Methods

Methodological approach

A single case study method was adopted for this study. The case study method is appropriate to conduct analysis of issues that are embedded within natural contexts, that require rich and in-depth analysis to understand the phenomena, and when the research questions are descriptive (Yin, 2009, 2012). Previous studies have used the case study approach in various blended learning contexts to understand detailed information about the phenomena being investigated (e.g. Lai et al., 2016; Truitt & Ku, 2018).

The context

The current study is a portion of a larger PhD project which was conducted at the Maldives National University (MNU), a public university in the Maldives. The university has an annual student body of approximately 9000, and offers courses in education, science and engineering, health sciences and nursing, business, tourism studies, maritime studies, law and Islamic studies, and liberal arts. Most of these faculties offer dual-mode courses (i.e. regular F2F and blended learning), and the courses range from certificate level to doctoral studies.

The Maldives is an archipelago comprising approximately 1200 islands, of which 189 are inhabited and widely scattered. Due to financial and logistical reasons, most of the higher educational institutions are in Malé, the capital city, although some regional facilities are being established by various education providers. Therefore, accessing higher education can be very difficult for people who live on the remote islands. To address this need, blended learning was formally adopted by MNU in 2019, even though the pedagogic approach had been used by some teachers at the university since 2010. In the scope of this study, blended learning refers to a mix of F2F and online instruction, where the amount of F2F learning time was approximately halved. The reduction of F2F learning time was achieved through the implementation of structured weekly online learning activities using Moodle, the university's learning management system. The official adoption of this teaching method necessitated several changes in the university's policies and organisational structure. These included formulating some guidelines for conducting blended learning courses and establishing a new unit called the Centre for Educational Technology and Excellence (CETE) to provide teachers with technical and pedagogical support. With this official adoption, blended learning has become the mode of instruction to be used for flexible course delivery across the university.

Participants

The participants of this study were 24 university teachers who were involved in blended teaching in the second semester of 2019. The teachers were from eight different faculties, namely science and engineering, nursing, education, law and Islamic studies, arts, health sciences, hospitality and tourism studies, and business. In addition, teachers from the CETE were included as they have a significant role in blended learning implementation across the university. Participants included teachers from all the faculties that offered blended courses at the time of data

collection. Of the teachers, 41.1% were male and 58.9% were female. At the time of data collection, most of the teachers (65%) had less than two years of blended teaching experience.

Data collection and analysis

For participant recruitment, a purposeful sampling method (Creswell, 2014) was used. A blended teaching staff list was obtained from all the faculties, and they were subsequently contacted through email by the researcher. Those who were interested in participating in the study were then contacted via phone to arrange times for one-to-one interviews.

For data collection, semi-structured interviews were administered, and a total of 24 interviews were conducted for the teachers. Each interview lasted for about 50–60 minutes. In each interview, participants were asked several open-ended questions about their blended teaching practices and were given opportunities to elaborate on their answers and provide specific examples of their experiences. Interview questions were related to the research questions, and teachers were asked to explain activities that they undertook in the preparation and delivery of blended subjects, and the difficulties they encountered in teaching blended subjects. All the interviews were conducted during lecturers' normal office hours at the university and were audio recorded for transcription purposes. In addition, various university documents such as blended learning policy guidelines, strategic plans and annual reports of the university were collected and analysed.

For the purpose of data analysis, thematic and content analysis (Vaismoradi et al., 2013) were conducted for interviews and documents, respectively. For thematic analysis, the interviews were transcribed verbatim and initial ideas were noted down to familiarise the author with the data. The interview transcripts were then carefully read, and the initial codes were generated in NVivo. Following the identification of the initial codes, several sub-codes were collated into potential themes, and these were then refined and named. This yielded the six main themes reported in this study. Table 1 shows the emerged themes, frequency, and some examples of the interview excerpts.

For content analysis, the documents were read, and the texts relevant to the main themes were highlighted and categorised. As the final step, the identified texts were linked to their respective themes in the NVivo coding scheme.

Table 1. Main themes, frequency, and examples of representative excerpts.

Main theme	Frequency	Representative interview excerpts
Overall teacher perceptions	6	"Blended learning is . . . very useful . . . . Our islands are very dispersed . . . students (who) live in the island(s) cannot come to daily classes. . ."
Teacher resistance	5	"I feel fresh school leavers doing their undergraduate studies (in blended mode) wouldn't be good, and I don't think the learning quality would be good."
Teacher low self-efficacy	6	"I actually don't know what I don't know . . . . it's really difficult to say that I need support from a specific area."
Increase teacher load	6	"I think, overall, I spend more time for teaching of alternative mode (blended) subjects."
Policy issues	7	"Another issue is, as a university, lacking a strategy or policy for blended teaching."
Lack of readiness	6	"One difficulty is we don't have readily available simulations and videos to use for online teaching."

Member checking and data triangulation were achieved in order to maintain the trustworthiness of the findings (Creswell, 2014). For member checking, a summary of the finding was sent to the interview participants to verify the accuracy of the findings. Participants agreed about the key findings and no amendments were proposed. For triangulation, data sources triangulation (Carter et al., 2014) was achieved by obtaining evidence from multiple interview sources and documents.

Results and discussion

The following section presents the results and discussion. This section starts with the teacher perceptions about blended learning which addresses RQ1, followed by the barriers encountered by the teachers which answers RQ2. In each of these sections, fictional names are used to refer to teachers to increase the readability of teacher descriptions of their teaching practices and experiences.

Teacher perceptions

Results revealed that teachers were generally happy about the use of digital technology and blended learning. Generally, teachers felt that blended learning was a useful method for the nation because it allowed many students who lived on the remote islands to carry on university studies. Almost all the teachers explained how blended learning helped them to reach the learners, which was nearly impossible for them without blended learning. Fareed was one such teacher who taught both regular F2F and blended courses.

> Blended learning is . . . very useful . . . . There are many reasons and the first is the geographical features of the country. Our islands are very dispersed . . . students (who) live in the island(s) cannot come to daily classes. (Fareed)

As Fareed mentioned, the islands of the Maldives are separated by sea, and it is nearly impossible for students who live on the islands to attend regular on-campus classes. Most of these students are employed fulltime in the islands and there is no reliable public transport system to travel between the islands. This significantly limits the students' ability to attend everyday F2F teaching lessons held on campus.

Fareed was not the only teacher who highlighted the geographical dispersion of the nation. In fact, nearly all the teachers highlighted how blended learning helped them to reach the geographically dispersed learners. Teachers used phrases such as 'our students are isolated', 'we live in remote islands' and 'our students can't come to regular classes', highlighting a situation which might be rectified to a considerable degree by blended learning. This finding is in line with the previous studies that suggest that blended learning can provide learners with increased access to learning (Dziuban et al., 2018; Wang & Huang, 2018).

The second affordance of blended learning pointed out by the teachers was increased flexibility. Generally, teachers felt that blended learning provided students with control over their time and pace in learning. Afza was a teacher who had more than five years' experience working with students in blended learning courses. She explained how blended learning allowed her students to carry on learning whilst they had multiple responsibilities such as employment and family.

> For learners, (with blended learning) they can study while they work. . . . They can also study while they live in the islands with their family. I think that's the biggest advantage'. (Afza)

As Afza described, in the Maldives, most of the students in blended learning courses were typically employed fulltime in the islands, which made it nearly impossible for them to attend regular classes held on campus. However, with blended learning, they could travel to the campus at the weekend, 3–4 times a semester, and could complete the rest of their learning in the evenings after their regular employment and/or family commitments. This was identified by the teachers as a major affordance of blended learning in this context.

A third affordance of blended learning that teachers highlighted was enhanced learner engagement. Several teachers described how students in blended courses got more engaged in learning. Hajar was one such teacher who reported that she was more satisfied about the learner engagement afforded by blended learning, compared to her previous regular F2F teaching.

> I think my biggest satisfaction about blended learning is the increased learning engagement. It had been always a concern for me not having enough time or (finding) a way to engage with students. But now with this model (blended learning) . . . I feel better. (Hajar)

Like Hajar, many other teachers stressed how the combination of F2F and online interactions of blended learning could increase learner engagement. This is possible, because the online component of blended learning typically includes a range of synchronous and asynchronous learning activities such as discussion forums, wikis, and online quizzes, along with various multimedia learning material such as recorded lectures. Teachers felt that the use of these learning materials and online activities could provide ample opportunities for their students to interact with course content, their peers, and teachers throughout the semester whilst being geographically separated on their remote islands.

Generally, the results suggested that teacher perceptions about blended learning were positive and most of the teachers were willing to use the pedagogic approach in their teaching. Such attitudes can have a positive effect on the implementation of blended learning across this and other universities. Research suggests that teachers' positive beliefs and attitudes often predict the levels of teacher use of technology enhanced learning such as blended learning (e.g. Brown, 2016; Ibrahim & Nat, 2019; Taimalu & Luik, 2019), suggesting that teachers would likely adopt blended learning when it is implemented by the university.

Barriers to adoption

While teachers were mainly positive about blended learning, results suggest that teachers often encounter multiple barriers that can inhibit their use of the learning method. Overall, results indicate that teacher resistance, teacher low self-efficacy, increased teacher workload, institutional policy issues and lack of readiness negatively impacted on teacher use of blended learning. The following sections describe how these barriers were encountered by teachers in blended course delivery.

Teacher resistance

Interview analyses suggest that even though teachers were generally positive about blended learning, some teachers had high resistance to blended learning, predominantly for two reasons. First, teacher participation in institutional adoption of blended learning was minimal and adoption decisions were largely made by the leadership, which resulted in limited understanding of blended learning by teachers, especially in the first few months. Hana, who had nearly 25 years of teaching experience, was an example of this. In her teaching career, Hana had never used many technology tools except for Microsoft Office applications. Therefore, when she was asked to use blended delivery, it was not easy for Hana to accept it, specifically where the F2F instructions were reduced by a half. Therefore, Hana was very sceptical about blended learning and said, 'I use blended learning, because they (the management) are forcing us. I don't think I would use it, otherwise … I'm not sure if it is good. I don't know much'.

Hana was not the only one who was resistant to blended learning. Many other teachers also had similar attitudes and shared similar views by using words and phrases such as, 'forcing', 'enforcing', and 'we were told to use', indicating that the reason why teachers started using blended learning was the university's direct instructions rather than voluntary decisions by teachers. It also indicates that if teachers had the choice, they would likely revert to their previous practice which is traditional F2F teaching.

The second reason for teacher resistance was related to teacher pedagogical beliefs. Many teachers reported that blended learning was not good enough for undergraduate courses as they felt that undergraduate students needed more in-person and direct teacher contact, supervised learning and guidance to achieve the expected learning outcomes. Aban was one teacher who held this view and stressed that blended learning was not suitable for those who made the transition directly from high schools to the university. He believed that, at this level, blended learning could negatively impact on the quality of student learning, which was the main reason why he had an attitude of opposition towards blended learning.

> I feel fresh school leavers doing their undergraduate studies (in blended mode) wouldn't be good, and I don't think the learning quality would be good. (Aban)

Using a blended method for undergraduate students was a significant matter for many teachers. The main reason could be that most of the students in blended courses were undergraduates and many teachers were concerned about how blended learning might hinder the quality of learning of these students. Some teachers like Aban, therefore, believed that the negative impact of blended learning for the university would be 'significant'.

Teachers' negative beliefs about the value of using blended learning was a major reason for the resistance held by teachers towards blended learning. The literature suggests that the extent to which a technology or a pedagogic method is perceived as useful and superior to the available alternatives in achieving teachers' educational goals can have a significant influence on their adoption (e.g. Armstrong, 2019; Cheng et al., 2021; Q. Liu et al., 2020). This suggests that teachers' negative views about the effectiveness of blended learning would increase teacher resistance, which ultimately could have a negative impact on their adoption decisions. Overall, teacher resistance hindered teacher use of blended learning.

Teacher low self-efficacy

Teachers were asked how confident they were about teaching in the blended mode. Results indicate that teachers had somewhat mixed views about their ability and self-confidence when teaching subjects in blended mode. Even though some teachers like Inaya felt that they were 'fairly confident' generally, teachers had low self-efficacy of blended teaching. Many teachers, specifically those who were new to blended learning, and those who did not have strong digital literacy skills, felt that they did not have adequate knowledge or the skills needed for blended teaching. Athia was one such teacher who had no issues with F2F classes but struggled with the online component of blended learning. She reported that even though she did not think Moodle was too difficult to learn, she did not know 'most of the (Moodle in-built) tools and the use of them'. Hajar was another example who had just six months of blended teaching experience at the time of data collection. Hajar said, 'I actually don't know what I don't know … so it's really difficult to say that I need support from a specific area'.

When teachers were asked about their ability to teach blended subjects, in most cases, they related their technology self-efficacy to Moodle, the university's learning management system. As teachers reported, this could be because generally they had no issues with F2F teaching and their concerns were about the online component of blended learning that occurred via Moodle. Therefore, they might have felt that their skills gap was with Moodle only, not necessarily with their generic teaching skills.

Overall results suggest that teachers had relatively low self-efficacy in relation to blended teaching. This can be problematic when blended learning is implemented across a university. The literature suggests that low self-efficacy often negatively impacts on user uptake of technology. For example, in a meta-analysis that included 59 articles, Hameed and Arachchilage (2021) confirmed that self-efficacy had a significant effect on users' adoption decisions, suggesting that those with higher self-efficacy would typically be more receptive to adoption. Many other studies reported similar findings, indicating that teachers may not try teaching methods such as online and blended learning that involves technology integration if they do not believe that they have the capabilities to use the technology effectively (e.g. Cheng et al., 2021; Joo et al., 2018; Reid, 2017; Zee & Koomen, 2016). According to Bandura (2001), the likelihood of people wanting to perform certain tasks and activities depends on their beliefs about whether or not they can succeed in those tasks. It is, therefore, reasonable to conclude that teacher low self-efficacy can be a significant barrier to teacher adoption of blended learning.

Teacher workload

Results indicate that overall, teachers spent more time on, and made additional efforts for, blended teaching compared to their regular F2F teaching. Several teachers reported that producing online learning material and providing students with online continuous feedback made blended learning more work-intensive compared to their regular teaching. Reesha taught both blended and regular subjects at the time of data collection. She compared her workload for blended and regular teaching and said, 'Workload involved with blended learning is heavier than normal teaching', because unlike her regular students, she needed several hours every week to produce online learning material for blended teaching and to facilitate learner support for these students such as responding

to online queries and providing students with written feedback for their weekly online learning tasks.

Niyam was another teacher who compared the workload for blended teaching with regular F2F instruction. Niyam believed that in his F2F classes, he could explain every concept until they were properly understood by students, and he could re-explain a lesson if a student had a doubt about what he was teaching. However, for online teaching, Niyam thought he needed to design and produce the learning materials 'in a way that students can learn without major issues in the absence of the teacher which needs extra time, planning, and efforts to happen'. Several other teachers reported the same viewpoint.

In general, teachers believed that blended learning often increased their teaching load, which is in line with the findings of previous research. For example, Gregory and Lodge (2015) explored the effect of technology-integrated learning on teacher workload in higher education. This study suggested that technology integrated teaching practices such as blended learning often demand that teachers do more work and much of the work is not even officially accounted for. In another study, Watty et al. (2016) investigated the reasons why Australian accounting teachers hesitated to adopt new digital technology in higher education. This study also suggested that increased workload can be a major barrier that teachers encounter in using technology in the classroom. Whilst these two studies are about the use of general technology in teaching, it is reasonable to relate them to blended learning because blended learning is a method of teaching that involves the integration of digital technology with F2F teaching (Anthony Jnr, 2021; Porter et al., 2014; Zhu et al., 2016). In sum, blended learning was found to involve more work for teachers compared to their regular F2F instructions, and the increased teacher workload could negatively affect teacher adoption of blended learning.

Policy issues

Policy-related issues were another barrier encountered by the teachers. Results suggest that these issues were related to two main aspects, one being the lack of a written strategy for blended learning. Many teachers reported that at the time of adoption, the university did not have clear written guidelines for blended learning. The document analysis confirmed this and revealed that the university did not even have a strategic plan for 2018–19 which was the time that blended learning was officially adopted. However, even though it was not necessarily about blended learning, 'maximising access and educational opportunity to remote and international students through innovative, flexible and high quality local and distance education' was mentioned in the previous strategic plan of the university (The Maldives National University, 2013, p. 10). Overall, teachers felt that insufficient written policy documents were an issue for them when implementing blended learning. Nazim, an experienced teacher, raised this concern by saying, 'another issue is the university lacking a strategy or a policy for blended teaching'. According to Nazim, due to the lack of a guideline outlining the standards of a blended course, it is very difficult for teachers and faculties to maintain consistency of blended teaching across the university. Document analysis suggests that the essential guidelines for blended learning were limited, even though there was a page-long resolution of the Academic Senate that outlined the format of the F2F component of blended teaching, such as the number and frequency of the F2F classes.

The second issue related to policies was the university offering a fulltime study load for blended courses even though most of the students in blended courses were working fulltime. At the MNU, the fulltime study load is 60 credit points per semester which is typically four subjects. The primary problem with a fulltime load for blended courses was students being unable to cope with the academic requirements of four subjects. The reduced F2F learning time of blended learning was a major contributor to this problem along with students' fulltime employment commitments and other responsibilities such as family and community engagement. Adil, another teacher raised this concern:

> We now offer fulltime study load for all the (blended learning) courses. But each student can be a fulltime husband or a wife. A fulltime father or mother. A fulltime teacher or nurse. A fulltime student too. When we make all these things fulltime, I don't think students can do it properly. (Adil)

Adil was not the only teacher who had serious concerns about offering a fulltime study load to the blended student cohort. Nasir, a teacher who had extensive experience in both F2F and blended teaching, also felt that the university's decision to offer four subjects for blended courses was problematic because it was difficult for students to cope with their learning. Nasir reported that the fulltime study load could not only significantly hinder the overall learning achievements of students, but it could also negatively impact on the quality of the F2F classes in blended subjects.

> Now students usually do 4 subjects every semester, so it's bit difficult. . . . For example, this time I started classes at 2 pm Thursday, and finished at 3.40pm, Saturday (intensive classes for three consecutive days) . . . students were very exhausted, barely had a rest. (Nasir)

Like Nasir, the intensive nature of the F2F classes was highlighted by many other teachers, of whom Fareed was one.

> We have four block classes (a semester), and it could be 7 hours for each subject per block. That means total 28 hours of F2F time (over three days) . . . . Now we start classes on a Thursday afternoon and continue until Saturday evening. (Fareed)

Even though teachers felt that the F2F component of blended learning was too intensive, they thought that there were limited options for the university to solve the issue without a reduction of the study load. As mentioned by many teachers such as Adil and Fareed, weekend classes were 'the only way' for these students to attend the F2F classes of blended learning. This was because, as mentioned before, most of the students enrolled in blended learning were based on isolated islands and were employed fulltime, which significantly reduced their ability to attend daily classes held on campus. Therefore, to solve the issue, the university could have reduced the study load of blended courses and could have changed these courses to part-time for those who work fulltime. This way, students could have had an optimal learning experience during their F2F classes, and throughout the semester this could have reduced the impact of their employment on their learning. The literature suggests that students' work commitments can have a significant negative impact on their course outcomes and can increase dropout rates (e.g. Hovdhaugen, 2015; Logan et al., 2016). In sum, policy issues such as limited written guidelines for blended learning and the university's decision to offer fulltime study loads were found to be barriers for the implementation of blended learning.

Lack of readiness

A final barrier that emerged from the interview analyses was lack of readiness. Results suggest that the university was not fully prepared for institution-wide blended learning when it was implemented. Teachers believed that the university's technological infrastructure was insufficient for university-wide blended learning. Maya, a teacher who typically teaches at the main campus in Malé and some regional campuses, raised this concern and pointed to the internet network of the university to give an example.

> Also, internet access is a problem. They have given wi-fi to some classes, but it's very difficult to use, simply you can't play a YouTube video (due to low bandwidth). (Maya)

Like Maya, many other teachers talked about the digital infrastructure of the university. Reesha, another teacher who was keen to use digital technology, also flagged the issue and said that she could not use recorded lecture materials in blended teaching. Reesha stressed that, although she was keen to produce video learning materials and had been advocating for it since the beginning of blended learning, she was unable to do so because the necessary technological facilities were not available at her faculty. Reesha concluded her concerns by saying, 'so far, no success'.

Another aspect related to institutional readiness was teacher readiness for blended teaching. Interview analyses suggest that many teachers were not ready for institutional implementation of blended learning. Many teachers felt that they were not sufficiently skilled to use instructional technologies and were not fully prepared for blended teaching. Athia, a teacher new to blended delivery, admitted that she did not have adequate knowledge and experience in managing the online component of blended learning. Asima was an experienced teacher who had over five years of blended teaching experience at the time of data collection. Asima felt that many of her colleagues did not know how to combine online teaching with F2F instructions so 'they just upload the same learning material that are being prepared for their F2F teaching' to Moodle, the learning management system of the university. Overall, interview analyses indicate that many teachers who were involved in blended teaching were not sufficiently prepared for it and did not have adequate knowledge or the skills required to use various online learning tools. Teachers' technological knowledge and skills are essential to enable them to use technology integrated learning such as blended learning (Mishra & Koehler, 2006).

Lack of institutional readiness, such as insufficient infrastructure and lack of teacher readiness, can have a significant negative impact on teacher adoption of blended learning. First, the lack of infrastructure can result in several issues such as unreliable internet, and lack of computer software and hardware for teacher and student use. These issues can result in teacher frustration and can make blended learning incredibly difficult for teachers to use. Literature suggests that when a technology is perceived as difficult to use and the user perceptions are negative, the likelihood of rejection is high (Villani et al., 2018; Wingo et al., 2017). In addition, a lack of teacher readiness for blended learning can also hinder their adoption of it. This is because teachers with limited technological knowledge are less likely to be able to align technology with their learning outcomes (Mirete et al., 2020), and teachers who find no alignment of technology with their teaching are less likely to use technology in the classroom (Q. Liu et al., 2020; Tondeur et al., 2017). In sum, teachers with a limited knowledge of blended learning may perceive the learning method as foreign in the classroom, which

could ultimately result in rejection. Literature suggests that teachers typically do not risk students' learning by using unfamiliar technology or an unfamiliar method of teaching (Howard, 2013; Zhao & Frank, 2003). Therefore, it is reasonable to conclude that lack of readiness can have a significant negative impact on teacher implementation of blended learning.

In sum, in the case of MNU, multiple barriers were encountered by teachers including teacher resistance, teacher low self-efficacy, increased workload, university policy issues, and lack of readiness. Each of these aspects were found to be limiting teacher use of blended learning at the individual level, which could ultimately have a significant negative impact on the implementation and sustainability of blended learning at the institutional level.

Limitations

The current study is a single case study and some of the barriers reported by the teachers could be context-specific and thus may not be generalisable. In addition, this study does not include perceptions of the university executives, even though some of the barriers such as lack of readiness and policy issues are directly related to leadership. By including the perspectives of the leadership, the triangulation of data could be strengthened. Furthermore, this study does not address differences in teacher experiences or perceptions of blended learning across disciplines. Therefore, it is not clear whether the barriers that teachers reported in this study are unique to certain academic disciplines or are widespread within the entire university.

Conclusion

Blended learning has grown in popularity in higher education in the last two decades. Despite its prevalence, this study suggests that teachers can encounter several barriers to the adoption and implementation of blended learning. These can include teacher resistance, teacher low self-efficacy, increased workload, university policy issues, and lack of readiness, specifically, in issues around digital infrastructure and teacher overall readiness. These issues can negatively impact teacher intentions towards using blended learning and can provoke low levels of adoption among individual teachers. This could have substantial negative impact on institutional adoption and implementation of blended learning and could be a threat for sustainability over time.

This study has implications for university-wide blended learning adoption and implementation. Firstly, this study highlights several problems that can be encountered by teachers in technology adoption in general, and specifically in blended learning. University leaders can consider these issues in the process of implementation and can provide internal support structures and mechanisms for teachers, to leverage teacher uptake of online and blended learning methods. This study can also help higher education institutions to harness technology-integrated teaching in general, specifically blended learning, and can minimise issues around inconsistencies and inequity in learner experiences. Future studies can pay attention to these issues and can further explore them to better understand the levels of impact of these barriers on the institutional implementation of blended learning.

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No potential conflict of interest was reported by the author(s).

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