

INSTITUTIONAL ADOPTION AND IMPLEMENTATION OF BLENDED LEARNING: DIFFERENCES IN STUDENT PERCEPTIONS

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ABSTRACT

Blended learning (BL) has been a popular mode of course delivery in higher education, aiming to provide students with better learning experiences by integrating face-to-face (f2f) instructions and affordances of digital technology. However, lack of knowledge about how students perceive BL cross-disciplines can make it difficult for teachers to provide consistent learning experiences to students, yielding inequity in learning experiences. This study aims to explore how university students perceive BL, and to compare differences in perceptions across subjects. Participants were 407 university students from eight subject disciplines. Data were collected through a questionnaire and were analyzed using SPSS. A one-way ANOVA was performed to compare the differences between the groups. Results showed, students were generally happy about the use of BL, despite facing multiple barriers in using the learning approach. Results further revealed that students studying tourism/hospitality, and business subjects were more negative about BL, while students in science, and Islamic studies faculties were more receptive to BL compared to the rest of the university.

Keywords: Blended learning, institutional adoption, TAM, higher education.

INTRODUCTION

Blended learning (BL) is perceived as a promising mode of course delivery and has been adopted in various higher education contexts in recent years (e.g., Jeffrey & Higgins, 2014; Lai, Lam, & Lim, 2016; Mestan, 2019). Research have shown that BL provides increased learner access (Wang & Huang, 2018), increased flexibility to students and teachers (Thai, De Wever, & Valcke, 2020), and enhanced learner engagement (Mestan, 2019; D. Xu et al., 2020). In addition, with the COVID-19 pandemic where universities are being forced to deliver their courses remotely with limited face-to-face (f2f) interactions, blended learning appeared a preferred mode of course delivery for many higher education providers. The pedagogic approach allows teachers to have reduced f2f interactions with students, and also can help to eliminate some of the concerns that may arise in relation to fully online course delivery (Thai, De Wever, & Valcke, 2017).

BL is no longer a new mode of course delivery. In recent times, a plethora of research has been published about the pedagogic approach. It includes effectiveness blended learning (Jesus, Gomes, & Cruz, 2017; Olelewe & Agomuo, 2016), student perceptions on individual subjects (Owston, York, & Murtha, 2013; Posey & Pintz, 2017), application of various technology tools (Sumak, Pusnik, Hericko, & Sorgo, 2017), management approaches for adoption (Singh & Hardaker, 2017; Taylor & Newton, 2013), and barriers for adoption of blended learning (Boelens, Wever, & Voet, 2017; Porter & Graham, 2016), to name a few. However, there is limited empirical evidence to compare the differences in student perceptions about blended learning across various academic disciplines in single university settings. This is problematic because the scarcity of knowledge about the differences in student perceptions can limit teachers' understanding of providing consistent and equitable learning experiences to students. This can further yield student and teacher anxiety and frustrations, and can induce low levels of adoption.

Understanding students' perceptions about BL is important as students' attitudes toward technology-integrated learning often effect their uptake (Sanchez-Prieto, Huang, Olmos-Miguelanez, Garcia-Penalvo, & Teo, 2019). Even though teachers expect to obtain better academic results in blended teaching, without high uptake by students, it may not be straightforward for them to achieve this goal. Research shows users' positive perceptions about technology significantly influence their decisions of adoption and continued usage (Anthony Jnr et al., 2020; Gao, Jiang, & Tang, 2020). Therefore, it is vital for teachers to understand differences in student perceptions about BL to design tailored learning programs for students of different academic disciplines, and to better facilitate adoption of university-wide blended learning. However, the current literature sheds a little light on this aspect of blended learning. This research addresses this gap, with the aim of understanding differences in student perceptions about blended learning across a university. The research can help teachers to better understand students and can help them to design differentiated blended interactions across various subjects. It also can help university administrators to facilitate institutional adoption and diffusion of blended learning and can assist to increase sustainability of the pedagogic practice within universities. In the following sections, a review of literature about blended learning, methods, findings, discussion, and conclusion are presented.

BACKGROUND

Blended Learning in Higher Education

Blended learning is a pedagogic approach that involves purposeful integration of face-to-face (f2f) and technology-mediated instructions (Brown, 2016; Bruggeman et al., 2021). The nature of this interaction can be varied. However, often it involves f2f lectures followed by online asynchronous learning, or online lectures with in-person tutorials, or a mix of both the approaches (Anthony Jr et al., 2019; Dey & Bandyopadhyay, 2019). The aim of blended learning is to enhance learning outcomes, and improving learner success and teaching delivery (Anthony Jnr, 2021). Whilst blended learning has grown exponentially in recent years and has attracted teachers and higher education providers across the globe (e.g., Ibrahim & Nat, 2019; Jowsey, Foster, Cooper-Ioelu, & Jacobs, 2020; Zibin & Altakhaineh, 2018), some aspects of the learning method such as proportion of the seating time, and methods to integrate f2f and online instructions are still in need of further discussions (Boelens et al., 2017; Thai et al., 2017). Taking student perceptions into account is vital because they are the recipients of any learning environment, and without understanding student perceptions and their learning needs, teachers cannot provide them with tailored and rich learning experiences (Chizhik & Chizhik, 2018).

Blended learning has been used in higher education in various academic disciplines. Owston et al. (2013), for example, investigated some subjects of health and liberal arts, and fine arts to explore relationship between student perceptions and their course achievements in a Canadian university. Pinto-Llorente, Sanchez-Gomez, Garcia-Penalvo, and Casillas-Martin (2017) explored student perceptions in an English language course in a Spanish university. Posey and Pintz (2017) examined undergraduate nursing students' success and challenges in transitioning from regular f2f learning to blended learning in a U.S university. In a more recent study, in another U.S university, Zhang and Dang (2020) investigated a computer science course to explore factors that influence successful blended learning. Furthermore, Mestan (2019) examined how an Australian university facilitated transitioning from f2f to blended learning that had a target for offering 60% of all its subjects in blended mode by 2017. Except for Mestan (2019), all these studies focused on specific subject areas and none of them explored students' perceptions across disciplines. Even though Mestan's study included students from various disciplines, it also did not compare differences in perceptions among students across disciplines. Therefore, more research is needed to compare the differences in student perceptions across subject disciplines to better understand blended learning.

Understanding students' values and beliefs across disciplines is important because approaches to learning and teaching are often affected by subject disciplines and the teaching context (Lindblom-Ylance, Trigwell, Nevgi, & Ashwin, 2006). Therefore, for university-wide blended learning adoption, one-size-fit approach may not be suitable as teachers and students of various disciplines (i.e., physical sciences, engineering, and medicine) may prefer more teacher-centred and f2f interactions (Lindblom-Ylance et al., 2006). This study addresses this gap, aiming to understand differences in perceptions among students of various academic disciplines in university-wide adoption and diffusion of blended learning.

Affordances of Blended Learning

Blended learning offers several affordances for students and teachers. Firstly, it can provide increased access to learning, specifically for students who are unable to attend regular f2f classes. For example, Dziuban, Graham, Moskal, Norberg, and Sicilia (2018) investigated student access, success and withdrawal rates in blended programs over an extended period of time by comparing them with fully online and fully f2f programs in a U.S university. Results of this study indicated that blended approach could increase or maintain learner access for various student cohorts (i.e., minority and non-minority), and can improve student academic success rates. In another study, Wang and Huang (2018) experimented a blended synchronous learning environment to explore how blended learning can allow students to access learning from multiple locations without physically attending classes. In this study in which 24 full-time schoolteachers and adult learners participated, results show blended learning can be a feasible and practical method that can increase learner access and can provide equivalent learning experience compared to regular f2f teaching.

Blended learning can provide students and teachers with increased flexibility. Lightner and Lightner-Laws (2016), for example, investigated blended learning in a U.S university and found that flexibility afforded by the pedagogic approach can cater learning needs of a diverse student group. In a more recent study, Thai et al. (2020) compared students' learning interactions and performance in regular f2f, blended, flipped, and fully online learning in a Vietnamese university. Results of this study showed blended learning can provide students with more flexibility compared to the other modes of instructions. Some other recent studies (e.g., Miguez-Alvarez, Crespo, Arce, Cuevas, & Regueiro, 2020; Vanslambrouck et al., 2019) have also reported similar findings suggesting that blended approach can increase learner flexibility in terms of time, effort, and learning environment, specifically for those who may want to study while having responsibilities such as fulltime employment and family.

Research shows blended learning can also enhance learner engagement. For example, Mestan (2019) examined how an Australian university made transitions to blended learning from f2f teaching, and found blended learning can provide more avenues for learners to engage with course materials and can enhance students' overall learning engagement. In another recent study, Zimba, Khosa, and Pillay (2021) investigated use of blended learning among social work educators in various South African universities in order to increase learner engagement. This study found blended learning can be effective to enhance learning engagement in and outside the classroom. Other scholars also have acknowledged how blended learning can promote students' active engagement in various learning contexts and have identified enhanced engagement as one of the key affordances of blended learning (e.g., Posey & Pintz, 2017; Wanner & Palmer, 2015; Xu, Yau, & Reich, 2020).

User Perceptions and Technology Adoption

Technology is often considered a problem-solver in many aspects of daily life including science, business, health, communication, and education, to name a few. However, in most of these areas, technology adoption may not be straightforward as adoption is often influenced by several factors. These factors can be classified as three main groups: (a) user (e.g., Hsu, 2016; Sanchez-Prieto, Huang, Olmos-Miguelanez, Garcia-Penalvo, & Teo, 2019; Wilson, Raish, & Carr-Chellman, 2017), (b) technology itself (e.g., Pereira & Wahi, 2017; Y. Xu et al., 2020), and (c) organization where technology is adopted at (e.g., Chang, 2015; Porter, Graham, Bodily, & Sandberg, 2016; Singh & Hardaker, 2017). Of these broad areas, user is given a considerable attention, and user perceptions is often considered as one of the key factors that can influence technology uptake (Edmunds, Thorpe, & Conole, 2012; Razmak & Belanger, 2018), specifically in relation to technology-integrated pedagogic practices such as blended learning.

Sumak et al. (2017), for example, examined factors that affect teachers' perceptions about adoption of interactive whiteboard in Slovenia. The results showed that teacher perception can impact adoption, and their perceptions are affected by the system interface quality, teacher innovativeness, and perceived impact. In another study in which 301 Brazilian university students participated, Cidrala, Oliveirab, Felicea, and Apariciob (2018) investigated e-learning success determinants. This study showed, students' perceived satisfaction had significant effect on adoption, and factors such as system quality and learners' perceived

interaction with peers can explain their satisfaction about the course. Similar findings were reported in a more recent study, investigated Chinese university students' perceptions about using a blended learning platform, and how perceptions affect learner engagement and satisfaction (Gao et al., 2020). Whilst most of these studies are about the use of general technology in the classroom, it is reasonable to relate them to blended learning. Blended learning involves integration of online and f2f instructions and requires use of digital technology in teaching and learning (Anthony Jnr et al., 2020; Brown, 2016). These studies shed some light on the role of user and user perceptions in technology adoption. However, still there are many unanswered questions in relation to the differences in student perceptions about blended learning, specifically the extent to which the differences are among students, and the common factors that contribute to their diverse thinking.

Technology Acceptance Model (TAM)

TAM is a theoretical model proposed by Davis (1989) that explains factors that influence users' behavior of using technological innovations. According to TAM, user's actual use of a technology is directly affected by their behavioral intention (user's willingness to use technology), and the behavioral intention is determined by two key factors: (a) perceived usefulness, and (b) perceived ease of use. Perceived usefulness is, according to Davis (1989), the extent to which a user believes use of a technology will improve their job productivity, while perceived ease of use is the extent to which a user thinks using a technology is free of efforts (Davis, 1989).

TAM is widely used to predict users' voluntary behavior of using digital technology in various contexts (i.e., Dumpit & Fernandez, 2017; Razmak & Belanger, 2018; Villani et al., 2018). It is also one of the commonly used tools to understand and explain users' intentions of adopting technology integrated learning practices such as blended learning. For example, Martin-Garcia, Martinez-Abad, and Reyes-Gonzalez (2019) used TAM to identify stages of adoption of blended learning, and how these stages can relate to users' personal and professional characteristics and attributes in which about 980 academic staff from 43 Spanish public universities participated. Huang and Teo (2021) applied TAM in another study to investigate how policy and teacher beliefs influence on their use of technology in which 696 English teachers from 59 Chinese universities participated. Further, Gao et al. (2020) also used TAM to explore relationship between students' perceptions about a blended learning platform and their course satisfaction based on learner engagement. These studies indicate that the two elements of TAM: perceived usefulness, and perceived ease of use are considered as two key factors that significantly influence teachers and students' behavioral intentions of adopting blended learning. They also suggest that TAM is a robust model to explain user intentions of using technology and can be used to explore users' behavioral intention of using blended learning. Therefore, TAM is adopted in this study to explore students' perceptions about university-wide blended learning adoption. The aim is to investigate students' perceptions about use of blended learning in a university, and to compare the differences in student perceptions across various study disciplines. The study is guided by the following questions:

1. What are students' overall perceptions about the use of blended learning?
2. What are the differences in perceptions among students across disciplines?
2. What barriers can inhibit student adoption of blended learning?

METHODS

Research Context and Participants

This study was conducted in a dual-mode university in the Maldives. The country is an archipelago that consists of total 185 inhabited islands. Population of these islands can be ranged from 200 to 10000. Higher education activities are thus predominantly carried out in Male', the Capital of the nation, along with some regional campuses. Despite the dispersion and the small population of the islands, there is no regular public transportation system for travelling between the islands. Consequently, accessing higher education is very difficult for the island community. The university, therefore, offers several courses using alternative delivery

methods (i.e., blended learning), to reach the remote communities of the nation. To facilitate this better, blended learning was officially adopted by the university in 2019 for its flexible delivery courses, despite the pedagogic approach had been used by some faculties since 2010. Blended learning was implemented across the university, by almost all the faculties, within 6-7 months after the adoption decision was made. The f2f component of blended learning is predominantly held in Male' even though the outreach centers (ORCs) are used by some faculties. The ORCs are an administrative arrangement made by the university in collaboration with some local island/atoll councils to allow students of near-by-islands to gather for their compulsory f2f component. Typically, it is a classroom from the island school, thus, no ORC is owned by the university. Typically, the f2f component is held 3-4 times a semester, over some selected weekends (e.g., weeks 3, 6, 9, and 11), and throughout the semester, students complete the rest of their coursework through Moodle, whilst living in remote islands. However, in the end of the semester, students are required to physically attend their preferred ORCs for the final exams, if any of the subjects involve a written exam.

Participants were 407 students enrolled in blended learning courses in second semester 2019. Of these students, 69.2% live on remote islands, while the remaining 30.8% live in Male' the capital city. Majority of these students (67.3%) were female while male students were about a third of the sample (32.7%). Students' age ranged from 20 – 50 years, whereas 29% students were below 25 years, 43.2% were between 25 and 35 years of age, 20.8% were 36-45, and 6.9% above 45 years of age. At the time of data collection, 84.1% were full-time, and 4.1% were part-time employed while 11.8% were not employed.

Students were from eight different subject disciplines that included education, health sciences, nursing, liberal arts, tourism studies, law and Islamic studies, engineering and science, and business. Majority of the students (65.1%) were enrolled in bachelor's degree courses and 23.8% were master's degree students. The remaining students belonged to diploma (6.4%), and certificate four level (4.7%) courses.

Instruments and Procedure

For data collection, a questionnaire was developed based on Owston et al. (2013) and Wanner and Palmer (2015). Questions were adapted from the existing surveys, and few new questions were added to fit the local context. Questionnaire consisted of total 19 items in four main areas: overall perceptions, affordances of blended learning, seeking technical support, and challenges students face in engaging with blended learning. All the questions were on a 5-point Likert-scale (Strongly Disagree to Strongly Agree), with 1 representing Strongly Disagree and 5 representing Strongly Agree.

The questionnaire was piloted prior to data collection in a similar university context with 17 students. For the questionnaire reliability testing, Cronbach's alpha coefficient was calculated. The Cronbach's alpha for the 19 items for plotting was 0.91 suggesting very high reliability. However, given the small number of students participated in the pilot study, Cronbach's alpha coefficient was recalculated with 407 participants after collection of data. The recalculated Cronbach's alpha for the same 19 items was 0.86, again, indicating high reliability.

Data were analyzed using SPSS. Descriptive statistics (frequencies, ranges, means, and standard deviations) were calculated for individual items, and group means were also compared using ANOVA. For comparisons of multiple groups, post-hoc test was performed. All the mean differences were set to be significant at the 0.05 level. According to Emerson (2018), ANOVA is an appropriate test to compare means from multiple groups of scores and the variances among the scores, to explore if the group mean differences are statistically meaningful.

RESULTS

Questionnaire items were grouped and analyzed based on the research questions. The following sections present results of the analysis.

Students' Overall Perceptions

Results showed, overall, students had positive perception about blended learning. Students were asked how happy they are of using digital technology in learning, as blended learning involves integration of digital technology. Results revealed that a large majority of the students were receptive to the use technology for learning. Of the 407 students, 93.1% (n=378) felt they are happy to use digital technology in learning.

Students believed blended learning provided them with multiple affordances. One of the perceived affordances was increased access to learning. Results show 81.6% students believed blended learning allows them to participate in university learning while they live at remote location of the nation. Further, more than two-third of the students (68.3%) felt if they did not have blended learning option, it would have been very difficult for them to pursue higher education. These figures can explain the reason why 74.9% of students believed blended learning is a useful method for learning.

Increased flexibility was also perceived a valuable affordance for students. Large majority (84.1%) of the students were fulltime employed at the time of data collection. Students believed blended learning allows them to study in their own time after employment/family commitments (81.8%), and it also provides flexibility for them to study at their own speed (65.8%). This flexibility afforded by blended learning appeared making learning easier for students. Majority of the students (63.6%) believed flexibility afforded by blended learning makes learning easier compared to regular f2f learning.

Despite the positive views about increased access and increased flexibility, students had mixed perceptions about enhanced learner engagement. Just over one-third (33.8%) of the students felt they get more engaged with learning compared to regular f2f learning. On the other hand, 41.4% (n = 168) students believed blended learning does not provide them with more learner engagement, while the remaining 14.9% (n = 101) responded as 'undecided'. Despite the mixed views about learner engagement, results show overall, students were happy about blended learning. In fact, majority students (58.6%) felt they would take another blended learning course in future instead of a regular f2f course. Of the remaining, 25.6% responded the question with 'undecided', while 15.8% students believed they would prefer f2f learning over blended learning.

Differences in Perceptions

ANOVA was performed to compare means in relation to students' perceptions about blended learning. Results showed, overall, students studying science and engineering, and law and Islamic studies had higher positive views respectively compared to the rest of the cohorts in the study. On the other hand, students studying subjects related to tourism and hospitality, and business had the lowest mean average, respectively.

Overall results showed, blended learning was perceived as a teaching method that can provide increased learner access to students, specifically for those who live on the remote islands. Post-hoc analysis was, therefore, performed to compare if there were differences between the faculties. Table 1 shows the results, indicating the significant differences are between the Faculty of Hospitality and Tourism Studies (FHTS) and the rest of the university except MNU Business School (MNU BS). In addition, significant differences are noted between MNU BS and the remaining faculties, except FHTS, and Faculty of Health Sciences (FHS). [Table 1 near here]

Table 1. Differences in perceptions in relation to increased access

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FHTS (M = 3.14)	FEST	4.67	-1.52905*	.50	0.003
	FA	4.18	-1.03739*	1.22	0.000
	FLIS	4.35	-1.21239*	.95	0.000
	MNU BS	3.16	-.02148	1.16	1.000
	FHS	4.11	-.96765*	1.10	0.015
	FE	4.31	-1.17667*	.94	0.000
	MNU SN	4.34	-1.20485*	1.08	0.000
MNU BS (M = 3.16)	FEST	4.67	-1.50758*	.50	0.008
	FA	4.18	-1.01591*	1.22	0.001
	FLIS	4.35	-1.19091*	.95	0.000
	FHTS	3.14	.02148	1.32	1.000
	FHS	4.11	-.94617	1.10	0.051
	FE	4.31	-1.15519*	.94	0.000
	MNU SN	4.34	-1.18337*	1.08	0.000

*Note. * $p < 0.05$

Table 1 shows, FHTS and MNU BS had the lowest mean scores with 3.14 and 3.16 respectively, consequently, are significantly different from most of the faculties. Overall, no significant difference was noted within the rest of the faculties in relation to increased access to learning.

Student perceptions about increased flexibility were also compared between the faculties. Results showed, again, FHTS had the lowest mean and was different from four other faculties: Faculty of Arts (FA), Faculty of Law and Islamic Studies (FLIS), Faculty of Education (FE), and MNU School of Nursing (MNU SN). No significant difference was recorded within the rest of the university. Table 2 shows the differences in students' perceptions about increased flexibility. [Table 2 near here]

Table 2. Differences in perception about increased flexibility

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FHTS (M = 3.63)	FEST	4.40	-.76697	.52	.207
	FA	4.25	-.61697*	.95	.010
	FLIS	4.33	-.69197*	.80	.002
	MNU BS	3.80	-.16243	.98	.978
	FHS	4.00	-.36697	.75	.764
	FE	4.39	-.76134*	.73	.000
	MNU SN	4.39	-.75886*	.81	.000

*Note. * $p < 0.05$

Overall, results show majority of the students (58.6%) would opt a blended learning course in future instead of regular f2f once. Students' perceptions were therefore compared between the faculties to explore if this was the case across the board. Figure 1 shows the mean score of individual faculties. [Figure 1 near here]

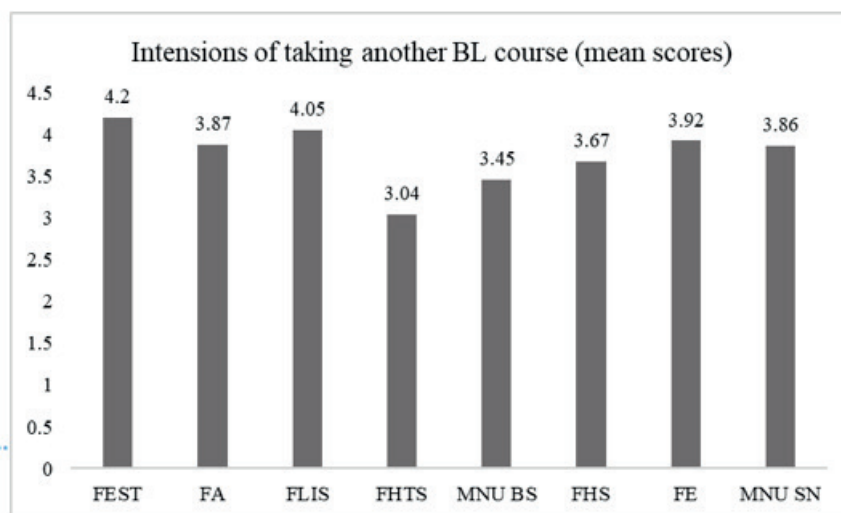


Figure 1. Differences in students' perceptions about taking another BL course

Figure 1 shows, students were generally willing to take another blended learning course in future instead of a f2f one. However, it shows students of FHTS and MNU BS held more negative views compared to the remaining faculties. On the other hand, students of FEST and FLIS were more positive compared to the rest of the university with mean scores, 4.2 and 4.05, respectively.

Students' perceptions were compared between those who live on the islands and Male', the Capital city. ANOVA results show there was no significant difference between the two groups in terms of perceived usefulness ($\alpha = .93$). However, a small difference ($\alpha = .030$) was recorded between these two cohorts in relation to perceived ease of use. Results show students who live on the islands had higher positive perceptions ($M = 3.65$, $SD = 1.09$), compared to their counterparts who live in Male' ($M = 3.47$, $SD = 1.21$).

Students who live on the remote locations also had more positive perceptions about perceived increased access to learning. Results show, these students believed blended learning can allow them to carry on higher education while they live on the islands ($\alpha = .000$, $M = 4.23$, $SD = 0.93$), and it would be very difficult to for them to participated in university leaning if they did not have blended learning ($\alpha = .001$, $M = 4.01$, $SD = 1.21$). These results explain why this student group had more positive perceptions overall ($M = 3.76$, $SD = 1.13$), compared to their peers who live in the city ($M = 3.33$, $SD = 1.29$), and the difference was significant ($\alpha = .001$).

In terms of differences in perceptions of students who are employed and not working, results show these two groups had quite similar perceptions except increased learner access. There was no significant difference between these two groups in most of the areas. The alphas were for perceived ease of use ($\alpha = .767$), perceived usefulness ($\alpha = .428$), perceived flexibility: studying while living far from university campus ($\alpha = .302$), studying in spare time after work/family commitments ($\alpha = .104$), and intentions of future use ($\alpha = .108$). However, for increased learner access, employed students believed if they did not have blended learning it would have been very difficult for them to participate in higher studies, and the difference between the groups was significant ($\alpha = .000$).

Students' perceptions were also compared based on their level of studies: masters, bachelor, and diploma and below. Overall, results show diploma and below students had more positive views in relation to ease of use ($M = 4.04$, $SD = 0.90$, $\alpha = .011$), usefulness ($M = 4.26$, $SD = 0.83$, $\alpha = .022$), intensions for future use ($M = 4.04$, $SD = 1.06$, $\alpha = .035$), compared to bachelor's groups. There was no significant difference between bachelor's and master's students in terms of ease of use ($\alpha = .764$), usefulness ($\alpha = .376$), and intention of future use ($\alpha = .941$). These results suggest, perceptions of both bachelor's and master's students are quite similar, but different from diploma and below student cohort.

Overall, this study showed, students studying subjects related to hospitality, tourism, and business had lower positive perceptions compared to the rest of the university while students studying science and engineering,

law and Islamic studies subjects had higher positive views compared to the remaining faculties. Results also showed, generally students living in the islands had higher positive views about blended learning compared to those who live in the city and were more willing to take another blended learning course in future. In terms of the differences, between employed and unemployed students, except for increased access to learning, there was no significant difference. The results further revealed, there was no significant difference in perception among bachelor's and master's students, despite the differences between bachelor's and diploma and below were significant.

Barriers for Adoption

Results showed students face multiple barriers in relation to use of blended learning. Barriers included insufficient internet infrastructure, issues related to technical support, and high cost that involve with traveling for f2f classes.

Questionnaire results showed, students had mixed views about the quality of the internet and were somewhat unhappy about the internet facilities available to them. 46.7% students felt they are satisfied with the bandwidth while 39.8% were unsatisfied. The remaining students (13.5%) responded the question with 'undecided'.

In terms of technical support, students were asked about how easy support seeking is, and how timely are support provided when they need it. Overall, students had mixed perceptions for technical support. Only 37.6% students believed it is easy to get support. Of the remaining, 35.6% felt it is not easy while 26.8% students responded the question with "undecided". In relation to timely support, students had somewhat similar beliefs. 41% students believed the university provide them timely support when they need it and 33.6% felt they do not receive timely support. The remaining 25.3% students responded the question with "undecided".

Another challenge for students was significant expenses that involve with travelling for f2f classes. Results show for majority of the students (53%), commuting between the islands for f2f classes is too expensive while 29.3% student believed travelling is not expensive for them. The remaining 17.8% responded "undecided".

Barriers faced by students in engaging with blended learning were compared between the faculties. In terms of the internet bandwidth, results show FHTS had the lowest mean score, and the differences at significant level are between FHTS and five other faculties. Table 3 shows the differences in student perceptions about the internet quality. [Table 3 near here]

Table 3. Differences in perception about internet bandwidth

Faculty	Mean	Mean Difference	Std. Deviation	Sig.
FEST	3.70	-1.25963*	1.70	.038
FA	3.63	-1.18463*	1.21	.000
FHTS	3.25	-.80963*	1.26	.008
MNU BS	2.84	-.40054	1.22	.588
FHS	2.89	-.45437	0.94	.804
FE	3.59	-1.15118*	1.18	.000
MNU SN	3.24	-.80288*	1.21	.000

*Note. * $p < 0.05$

As Table 3 shows, students of FEST, and FA had highest mean scores respectively about the internet quality while FHTS, and MNU BS had the lowest scores, respectively. The results also show the differences at significant level were between FHTS and five other faculties that are FEST, FA, FLIS, FE, and MNU SN.

In terms of differences in relation to technical support, results were quite similar for both the questions: easiness to get support, and timely support. For easiness of support, differences at significant level were between FHTS (M=2.66), and FEST (M=3.80, $\alpha = .014$), FHTS and FA (M=3.48, $\alpha = .000$). For timely support, the differences at significant level were between FHTS (M=2.63) and FEST (M=3.80, $\alpha = .031$), FHTS and FA (M=3.58, $\alpha = .000$), and FHTS FE (M=3.18, $\alpha = .025$), suggesting that overall, students belonged to FHTS had lower positive perceptions about technical support they received from the university.

In relation to travel expenses, students were asked if travelling to participate in f2f classes is too expensive for them. Post-hoc test results show there are significant differences between the faculties. Table 4 show results of comparisons of multiple groups. [Table 4 near here]

Table 4. Differences in perceptions about travel expense

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FE (M = 4.31)	FEST	4.30	.00986	1.16	1.00
	FA	3.50	.80986*	1.40	0.02
	FLIS	4.13	.18165	1.20	1.00
	FHTS	2.76	1.54571*	1.27	0.00
	MNU BS	3.02	1.28713*	1.21	0.00
	FHS	3.39	.92097	1.14	0.08
	MNU SN	3.40	.90708*	1.31	0.00

*Note. * $p < 0.05$

As table 4 shows, students of Faculty of Education (FE) had highest mean, indicating they spend more on traveling compared to the rest of the university while students of FHTS were least concerned about the travel expenses. Results also show between FE and other four faculties. They were FA, FHTS, MNU BS, and MNU SN.

Overall, results showed, three main barriers can inhibit use of blended learning in the Maldivian context. These were, issues related to internet bandwidth, in adequate technical support, and high expenses that involve with travelling for f2f classes. Results further showed, perceptions about these barriers were somewhat similar among students of various disciplines and significant differences were noted between some faculties.

DISCUSSION

The aim was to investigate students' perceptions about use of blended learning in a university, and to compare the differences in student perceptions across various study disciplines. The study was guided by three research questions that are about (a) students' overall perceptions about blended learning, (b) differences in perception among students, and (c) inhibitors for adoption of blended learning.

In relation to overall perceptions, students were generally happy about the use of digital technology in learning. This finding resembles of the findings of the previous research that show students were receptive to use of technology in and outside classrooms. For example, in their study in which 25 students from a U.S university participated, Adedokun, Henke, Parker, and Burgess (2017) found students held overall positive perceptions about use of technology, and students believed technology had positive impact on their learning climate and motivation. Similar findings were also reported in other studies that show, students generally value integration of digital technology in learning (e.g., Al Zumor, Al Refaai, Eddin, & Al-Rahman, 2013; Amanda, Emily, Kate, & Kathryn, 2019).

Results showed that increased access to learning and increased flexibility were perceived by students as key affordances of blended learning. These affordances are so important because increased access to learning

often makes blended learning useful for learners (Martin-Garcia et al., 2019) whilst increased flexibility can make the learning method easy to use (Wang & Huang, 2018). In the context of the Maldives, these affordances are more significant, because most of the students in blended learning courses live on remote islands (69.2%) and were employed fulltime (84.1%). Therefore, accessing education is a significant issue for these students as it is almost impossible for them to attend regular f2f teaching held on campus, in the city. This finding is in line with the literature that has shown increased access to learning and increased flexibility as key affordances of blended learning (e.g., Dziuban et al., 2018; Lightner & Lightner-Laws, 2016; Thai et al., 2020; Wang & Huang, 2018). Another significance of this finding is related to perceived usefulness and perceived ease of use – the two key elements of TAM. According to TAM, users' behavioral intentions of adopting technology and technology enhanced learning such as blended learning are predicted by their perceptions about usefulness, and easy to use (Gao et al., 2020; Martin-Garcia et al., 2019). The TAM postulates that the more a technology is useful and easier to use, the higher likelihood of adoption by potential users. This suggests that when blended learning is implemented, the student uptake will likely be high, and as a result, the implementation can be relatively faster and smooth. For successful and smoother implementation of institutional blended learning, individual teacher and student adoption is essential (Anthony Jnr et al., 2020).

Despite increased flexibility and enhanced learner engagement were perceived by the students as key affordances of blended learning, they had mixed views about the third affordance – enhanced learner engagement. One possible explanation of this results can be students were accustomed to regular f2f learning, and many students and teachers had just one semester of blended learning experience at the time of data collection. Not having enough time to learn blended learning can significantly impact students' general self-efficacy that can negatively impact students perceived achievement goals and satisfaction. Research show students' general self-efficacy is a factor that explains their achievement goals and satisfaction (Diep, Zhu, Struyven, & Blicke, 2017). Lack of teacher experiences also may have hindered integration of online and f2f instructions, consequently can yield low levels learner engagement within the blended learning environment. Bruggeman et al. (2021) found, insufficient teacher knowledge and experience of blended learning is one of the main barriers to successfully implement blended learning.

As expounded in the previous section, students were generally positive about blended learning and happy to take another blended learning course in future. This can be an enabler for the university to implement blended learning across various subject disciplines as often users' positive perceptions propel high rates of adoption. Research show users' adoption of technology is influenced by their attitudes and perceptions about technology (e.g., Lancelot Miltgen, Popovic, & Oliveira, 2013; Park, Nam, & Cha, 2012). In a more recent study in Brazil in which 381 students from 24 higher education institutions participated, Cidrala et al. (2018) also found students positive perceptions and satisfaction explain their willingness of up-taking e-learning courses.

The current study revealed, overall, students studying in tourism and hospitality courses had lowest positive perceptions about blended learning, following business/accounting students. One explanation for this can be most of the tourism studies subjects involve substantial practical components that need direct guidance and supervision of teachers in class. However, with blended learning f2f instructions are significantly reduced, consequently, students may be anxious of not having sufficient learning opportunities with blended approach. Another possible explanation can be blended learning was introduced in an immediate fashion within the university and was entirely new to the students and teachers of both the faculties. Despite a flexible learning method called "block-mode" was used for these students prior to blended learning, they never had online component incorporated in their courses before blended learning. Research indicate users are often resistant to technology that are unfamiliar to them, consequently the likelihood of adoption can be low (Armstrong, 2019; Sanchez-Prieto et al., 2019).

Previous research has reported similar findings in relation to students' perceptions about online instruction in tourism and accounting courses. For example, a study that involved 113 hospitality students in a Chinese university, Pang, Penfold, and Wong (2010) found despite students had moderately positive views about blended learning, in order to become blended learning accepted by students, it needs to be introduced overtime to let users to be familiar with the teaching method. In another study in which 29 accounting students of a U.K university participated, Osgerby (2013) found students opted regular lecturers and step-

by-step in-class instructions over blended learning, despite they appeared having initial positive attitude about blended learning.

Results also revealed overall, students belonged to engineering and science courses had higher positive views about blended learning compared to the rest of the university. This finding is in line with the previous research such as Martinez-Caro and Campuzano-Bolarin (2011). This study in which 2658 students from 21 engineering courses in a Spanish university participated, the authors found blended learning students' satisfaction was greater and students were more positive compared to those enrolled in regular f2f courses.

This study showed students who live on remote islands were more receptive to blended learning and were more willing to take another blended learning course in future compared to those who live in the city. There may be several reasons for this. As mentioned before, the islands of the Maldives are geographically dispersed, and students located at remote locations and there is no reliable public transportation system for students to travel between the islands. Further, most of these students are fulltime employed in the islands therefore, attending daily f2f teaching is nearly impossible for these students. For these reasons, students may perceive blended learning as the only feasible option for them to have flexibility and access higher education as it does not require them to attend daily f2f classes. Research show blended learning often provides students with increased flexibility (e.g., Lightner & Lightner-Laws, 2016; Thai et al., 2020), and increased access to learning (e.g., Dziuban et al., 2018; Wang & Huang, 2018).

Results revealed students face several barriers in relation to use of blended learning. One of the barriers is issues related to the internet facilities which can be one of the common inhibitors for embracing technology integrated teaching. Previous studies have also shown issues related to students' access to technology infrastructure such as internet and the internet-based learning tools can inhibit use of blended learning among students (Ocak, 2011). Another barrier for students was issues related to technical support, specifically Moodle-related support. This finding also resembles of those in the previous studies. For example, Bower, Dalgarno, Kennedy, Lee, and Kenney (2015) found in blended learning, it is critical for students to be provided with sufficient advice and support on how best leverage technology. Porter and Graham (2016) also highlighted the same issue and found technical and pedagogical support are vital for institutional adoption of blended learning.

Another inhibitor for blended learning was high expenses that involve with travelling for f2f classes, which can be somewhat a unique matter for the country. One explanation for this issue can be, as expounded previously, students live on remote islands and there is no regular public transport system for commuting between the islands. Therefore, students need to make their own travel arrangements, often hiring a private speedboat or traveling by a plane. Some students may need to use both sea and air travelling to attend their f2f classes. Travelling thus, can be significantly expensive for many students in addition to the logistical complications that they encounter. As a result, the use of blended learning would likely be difficult for these students. This can have substantial implications for students' adoption of blended learning. Research indicate that ease of use is a factor that explains users' decisions of adoption of technology (Gao et al., 2020; Park et al., 2012), suggesting, students would likely be avoiding technology-integrated instructions such as blended learning if they think they are difficult to use.

LIMITATIONS AND FURTHER RESEARCH

This study reveals some insights about student perceptions in institutional implementation of blended learning, specifically, the differences between academic disciplines. However, it does not probe into the reasons why these differences exist between the faculties. In addition, whilst this study investigates institutional implementation of blended learning and teachers are those who take the key responsibilities of the implementation, it does not include them in this study which limits our understanding of how the institutional efforts were perceived across various level of the university. Further research, therefore, can explore user perceptions across the three levels of the university – students, teachers, and the executives, to better understand the effect of perceptions of all the stakeholder groups for institutional implementation. In addition, to understand the reasons why perceptions are different between the faculties, a mixed method approach with in-depth interviews can be helpful to investigate the actual reasons why a certain practice is accepted or not by the users throughout the implementation process, across the board.

CONCLUSION

The aim of this study was to investigate students' perceptions about use of blended learning in a university, and compare the differences in student perceptions across academic disciplines. Results showed, overall students were positive about use of digital technology and blended learning. Students believed blended learning provides them with increased access to learning and increased flexibility, despite they had mixed views about enhanced learner engagement. In terms of differences in student perception across various subject disciplines, results showed students studying in tourism/hospitality, and business faculties had more negative perceptions compared to the rest of the university. On the other hand, students of the faculties science and engineering, and law and Islamic study had more positive attitude toward blended learning compared to their counterparts studying in other subject disciplines. Further, results revealed, students face three main challenges that can potentially inhibit use of blended learning. These include insufficient internet infrastructure, technical support, and high expenses that involve with travelling for f2f classes. Overall, results of this study showed while students' positive perceptions about blended learning can be an enabler for adoption of blended learning, barriers that are faced by students can inhibit adoption and implementation of the learning approach within the university. This suggests that institutional implementation efforts need to be well planned and appropriate measures must be undertaken by university leaders to minimize potential barriers so the implementation can be smooth and sustainable.

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