BRITISH COUNCIL

Readiness for Blended Education at the Tertiary Level in Bangladesh

Submitted to
David Maynard
Director, English and Education
The British Council, Bangladesh

Conducted by
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Letter of Transmittal

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January 12, 2022

David Maynard

Director, English and Education

The British Council, Bangladesh

Subject: Submission of the research report titled “Readiness for Blended Education at the Tertiary Level in Bangladesh.”

Dear Maynard,

We have the pleasure to hand in the research report on ‘Readiness for Blended Education at the Tertiary Level in Bangladesh.’ The analysis of the report is primarily based on the survey results conducted between June 1 and July 24, 2022, in Bangladesh. The results of the study are distributed around the objectives underpinned. We the undersigned declare that the manuscript has been read by all named authors, and the authors will be responsible for any shortcomings of the report.

We hope this report meets your needs, generates future studies, and educates educators about the blended education mechanism. The complete research report on the above topic is attached to this letter.

Sincerely,

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Acknowledgment

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Abstract

The unforeseen consequences of the pandemic forced the HEIs to shift operations online. At the very beginning, only a few institutions were able to manage the shift, but the majority failed to cope with the criteria. Despite several initiatives undertaken by the government and universities, most institutions still have difficulty shifting academic activities online in the future. The study intends to aid the institutions, which were lagging far behind the first movers, policies and plans to cope with the transition. The study underlies several objectives. Two separate instruments were in use to collect data from 106 educators and 326 students from five divisions in Bangladesh. The data collection procedure took place between June 2022 and July 2022 in several divisions. The first objective was centered on measuring institutional capacity in dealing with the said blended education. The results found that a total of 11 types of educational platforms were being used by educators in imparting knowledge during the pandemic. Several cutting-edge facilities or schemes have been offered by the institutions in coping with the transition. The institutions for building a competitive advantage have already put some initiatives forward. In summary, most institutions yield minimal technological infrastructure to deal with the issues of blended education. The management of most institutions is aware of the wave and holds a positive mindset. Most universities have acquired enough resources to support the transition whenever needed. Overall, most institutions are well prepared to embrace the transition. The second objective was set to evaluate the suitability of the existing educational content/materials (subject matter) for advancing the blended approach. The educators were quite positive about the reuse of the existing educational content in techno-mediated settings. Through the third objective, we wanted to identify key influential

factors affecting users' (learners) behavioral intention to adopt a techno-mediated learning environment in Bangladesh. The results confirmed that the learners were aware of the benefits of the tech-mediated learning system. They have all the technical support in hand to attend classes online from both home and classroom. The interface of Edu-tech is user-friendly, and they have already become skillful in it. The use of technology in the classroom is widely accepted by society. A minimum support system is available, and all the associated payments are done virtually via mobile wallets. Overall, the learners are also ready to embrace the transition. The second to the last objective was set to find out the appropriate blend or mix for the tertiary level. The respondents were given five blends, which were adopted by countries such as Malaysia, Australia, and China. The study also identified some concrete challenges and counter-policies to deal with the transition. At last, it can be argued that the institutions at the tertiary level in Bangladesh are quite ready to embrace blended education.

Keywords: Blended education, challenges, online education, pandemic, tertiary-level education

Chapter 1

Introduction

1.1 Rationale

According to the World Bank (2021), after the outbreak in March 2020, which has continued up to 2021, nearly 38 million students and a million teachers in Bangladesh were roughly affected.

During the COVID-19 pandemic, unlike in other countries, the educational institutions (roughly 160) of Bangladesh were insisted by the government to run all academic activities online. At the very beginning, several institutions at the tertiary level somehow were able to embrace the transitions availing resources in hand, such as MS Teams, Google Classroom, Moodle, Cisco Webex, Web 2.0 technologies, etc., but the majority was unable to transform due to several issues. Several departments of many institutions postponed online classes, as the educators were reluctant to conduct classes without taking examinations (Mondira et al., 2022).

Many universities suffered from technology issues as those institutions were not well equipped with the basic technologies to conduct online classes (Alamgir and Habib et al., 2021).

According to the World Wide Web Foundation (2021), poor internet connection and the high cost of purchasing data were the two vital reasons identified in Bangladesh that eventually restrained students from attending classes online. Other than the above factors, psychological barriers along with environmental and situational barriers were also highlighted as the reasons disrupting users from adopting e-learning in Bangladesh (Islam & Habib, 2021). During the pandemic, universities tried to continue academic activities with a lack of technological resources and readiness (Amin et al., 2021). After an initiative put forward by the Bangladesh Research and Education Network (BdREN), a total of one hundred forty-seven public and private universities were provided with limited technological support, resulting in a huge boost in the digitalization of higher education (Rahman et al., 2020).

The transition to shift online was further triggered by the effective initiatives taken by several leading private universities after the spread of the disease. After conducting classes online for the last 17 months, the universities have been permitted to resume traditional on-campus academic activities with a piece of advice to introduce the blended approach combining face-to-face teaching either in person or virtually and media in hopes of bridging the learning gap (Alamgir and Habib et al., 2021). However, the COVID-19 situation has accelerated and enhanced the use of e-learning solutions globally; challenges remain in incorporating quality educational content to advance the blended approach (Vazquez et al., 2020). Despite a quick recovery, many universities still suffer from after-shock effects, such as being unable to deal with the transition if the outbreak goes out of control. Several large-scale universities have taken enough precautions against the possible outbreak, but the questions remain: Is institutional capacity fair enough to introduce the said blended approach in Bangladesh? Is the existing educational content suitable for advancing the blended approach? What type of blend would be more suitable for the tertiary level? What challenges would the institution at the tertiary level face while dealing with blended education? How may learners' and educators' behavioral intention to adopt a blended learning approach be fostered?

Keeping the above questions in mind, the study has been directed to measure the level of readiness that the institutions yield in dealing with the suggested blended learning approach in the post-pandemic era at the tertiary level of education in Bangladesh. The study also centered on measuring institutional capacity in all the possible aspects, such as existing technological infrastructure, including Edu-Tech, curriculum, and instructional design to boost blended approach, teaching and learning in a blended environment, educators' readiness to embrace Edu-Tech, and adoption behavior from the learners' perspective, etc.

The study will aid the prime movers, such as CEOs of different universities, to develop policies to introduce and advance blended education within the institution in Bangladesh. To look for the answers to the research questions raised earlier, the study will first investigate the level of readiness that the users possess in dealing with the blended approach from all the possible aspects, both from the learners' and educators' points of view. Furthermore, the study will estimate the current capacity of the institutions, including

technological infrastructure to incorporate Edu-Tech to carry out the blended approach. The study will be wrapped up suggesting some viable policies in support of strengthening the initiative suggested by the authorities at the national level.

1.2 Objectives

The study has the following research objectives:

1. To assess the institutional capacity of the institutions at the tertiary level in favor of introducing the blended approach in Bangladesh.
2. To evaluate the suitability of the existing educational content/materials for advancing the blended approach.
3. To identify determinants affecting usersâ€™ (learners) behavioral intention to adopt a techno-mediated learning environment.
4. To suggest an appropriate blend (approach) for the tertiary level institutions in Bangladesh
5. To identify key challenges to the implementation of blended education in Bangladesh.

1.3 Delimitation

The study has the following research objectives:

The research is centered on some dimensions highlighted in the literature; hence, less focus has been given to the component ‘ethical aspect.’ Furthermore, the researchers prioritized the survey approach in obtaining the study, excluding the approaches of a qualitative study. The study covered only the full-fledged universities running under UGC guidelines; therefore, no university colleges (e.g., degree colleges under national university) were chosen for the survey. All the figures and tables presented in the report are in line with the objectives of the study. The study excluded contents, i.e., tables, and figures, which are not associated with the objectives of the study. All the suggested policies are applicable and very much suitable only for the tertiary level.

1.4 Significance of the study

The study has great significance as it reveals some of the finest policies an institution may follow in catching up with the trend, which is not present in the literature. The study is a timely initiative undertaken since most academic institutions are struggling with the transformation in Bangladesh. The results of the study may work as a blueprint for the institutions for introducing and advancing blended education in all firms from all aspects. The study may also contribute to some organizational theories about adopting technology-mediated learning, teaching and learning, and assessment.

Chapter 2

Literature

2.1 Blended Education or Learning

“Blended Education” combines traditional and virtual classrooms. Blended education rose to prominence in the early twentieth century and may be traced to the evolution of technology and the widespread acceptance of the internet, which resulted in the availability of affordable and efficient laptops and tablets. Blended learning is a new educational paradigm that incorporates both online and on-campus aspects into a single educational experience. In this way, traditional classroom methods and approaches are combined with cutting-edge online learning resources, strategies, materials, and possibilities. It necessitates the actual presence of faculty members and students for campus-based and distance-mode virtual classes. According to Graham et al. (2013), blended learning is the combination of online and in-person training. Some face-to-face contact time is effectively shifted by the online element of the program rather than simply being supplemented. Many researchers have attempted to define the phrase “Blended Education”; the majority of them differ in the proportion of online studies to traditional classroom studies (Bonk & Graham, 2006). However, this concept must be made more accessible to students and education stakeholders so that it may be compared to other pedagogies.

Blended education or learning encompasses a variety

of options offered by mixing the internet and digital media with a traditional classroom structure that involves the actual competence of the instructor and students (Friesen, 2012).

As of late 2021, integrated learning for higher educational institutes highlights the need for a blended strategy that combines on-campus classes with synchronous or live virtual classes, despite both components appearing to be of equal importance. It has evolved as a result of the pandemic experiences with virtual classes, their practical needs and limitations, and the reality of the post-pandemic period.

There is harmony in the definition of blended learning, according to a comprehensive evaluation of evidence-based studies in 2015. This meta-synthesis states that blended learning is "considered a combination of traditional face-to-face modes of education with online modes of learning, drawing on technology-mediated instruction, where all participants in the learning process are separated by a distance" (Siemens et al., 2015). Blended learning experiences are more effective than either totally online or fully face-to-face learning, according to evidence-based studies (Siemens et al., 2015).

Training at an enterprise and enrollment in a vocational or professional education program has traditionally been combined under the term "dual education system." Most of Europe and South Korea have followed this technique for a long time.

This study uses the term "Blended Education system of classes to describe either running full-fledged on-campus classes and blended teaching-learning separately or running full-sized campus classrooms and virtual classes under different educational tools, necessary facilities, and support systems by institutes, self-eagerness, plans, and timetables. To adopt this system, during the transition from the pandemic period to the post-pandemic period, universities are facing numerous obstacles, which will necessitate adopting a blended approach to teaching and learning, and may raise the question of how Bangladesh's higher education institutions are going to deal with the transition.

The term "Blended Learning" (BL) refers to a teaching method that produces a "rich" educational setting by combining numerous forms of communication that are facilitated by technology (Geng, Law & Niu, 2019). Higher education institutions (HEIs) across the globe are preparing to embrace blended learning (BL), which stands for "mixed learning" (Ibrahim & Nat, 2019). Blended learning is a hybrid approach to education that combines elements of both traditional classroom instruction and digital resources (Rovai & Jordan, 2004). Accordingly, blended learning is not simply an addition to the current dominant technique or method; rather, the quality of course design is determined by the appropriate integration of face-to-face and Internet Technology (IT) components (Garrison & Kanuka, 2004).

According to recent studies, blended learning is more successful than traditional classroom instruction. A research study showed that in a blended learning setting, studentsâ€™ academic performance, who were exposed to tech-mediated learning, was much better than those who attended regular face-to-face classes, even though both groups were given the same reading material, which the researchers used in the assessment (O'Flaherty & Phillips, 2015). Blended education has also made it easier for teachers to recognize students who are struggling. Consequently, they can devote more time to the student's academic progress (Fleck, 2012). In a blended environment, students have enormous opportunities to go over what they learned at their convenience. When it comes to the slow learners in a classroom, blended education has helped a lot. Likewise, blended learning has helped the need to study foreign languages in Japan, which has increased international students' employment opportunities (Agosto et al, 2013).

2.2 Frameworks of Blended Education

A couple of frameworks have been introduced to guide in designing, developing, delivering, and evaluating open and distance learning environments across the globe. Khan (2005) discusses several factors in his framework named Khan's Octagonal Framework revealing eight independent and interrelated dimensions, such as pedagogical, technological, interface design, evaluation, management, resource support, ethical and institutional. A holistic framework consisting of eight strategic dimensions: Vision and Philosophy, Curriculum, Professional Development, Learning Support, Infrastructure, Facilities, Resources and Support, Policy and Institutional Structure, Partnerships, and Research and Evaluation has been put forward to formulate and implement processes that amplify learning potential in a blended mode (Lim & Wang, 2016).

2.3 Readiness for Blended Learning

The authors of this project portrayed the review of academic literature to entice inferences on how higher

education institutions are currently implementing blended learning. This study establishes the extent to which higher education institutions are prepared to accept the changes, and it also observes students' and teachers' ability to afford technological skills, access technology, and adopt the blended learning environment. After the pandemic, this new method emerged as an alternative to the traditional setting for continuing education activities in Bangladesh. The examination of the literature also suggests a relationship between the current blended learning adaptation mechanisms utilized by HEIs worldwide. Blended learning preparation in HEIs, with an emphasis on teachers' and students' views and perspectives, is the focal point of this study. It has also been argued that the successful implementation of e-learning programs in HEIs may be influenced by the skills and attitude of a user (Rohayani et al., 2015). The word readiness has already been highlighted in many literatures loosely referring to the assessment of how an institution is capable of implementing and adopting e-learning in all aspects, such as technology (Al-araibi et al., 2019).

In 2016, Danish researchers discovered that teachers' perspectives and readiness to adopt blended learning a preference. They then performed research on the Design Framework for an Adaptive MOOC Enhanced by Blended Learning Supplementary Training and Personalized Learning for Teacher Professional Development. A qualitative research approach was used to discover that for teacher preparation, training sessions on MOOC (Massive Open Online Courses) were opened for their professional growth. They were shown how to organize the learning process on an online platform. The findings were then described to students in terms of their affordability of handling learning and how far they may adjust this process of learning with the use of technology (Gynther, 2016). Teachers also observed students' ability to adjust to this new method of learning. According to the study, before adopting blended learning, it is necessary to examine students' capabilities and interactions, which assist them to retain knowledge. The implementation of supplementary training sessions on campus can also facilitate the professional growth and subject-specific competence of teachers.

In 2017, a mixed method was employed to examine the Readiness of Indonesian Students for Blended Learning based on their Attitude Towards Learning Aspects. With a descriptive research methodology, a questionnaire was constructed to gauge the students' readiness for blended learning. The findings showed that students have a favorable impression of blended learning, and both universities and their respective students were made aware of the optimized internet connectivity options (Yulia, 2017). It is interesting to note that students' viewpoint regarding the implementation of blended learning is determined by the technological infrastructure of their respective institutions, which was a finding made by researchers before the issue of COVID-19.

The importance of blended learning research in higher education has received significant attention from researchers since 2018. As a result, the reflection was seen in Pakistan and Trinidad & Tobago, a twin island state in the Caribbean. Using both qualitative and quantitative strategies, researchers in Pakistan have examined the impact of incorporating blended learning into higher education. Findings from this study indicate that higher education institutions in Pakistan are not yet prepared to use Blended Learning. Based on the results of the research, it appears that both students and teachers lacked the necessary competence to implement the strategy. There was a dearth of well-structured training programs for educators. Due to a lack of strategic execution and inadequate information and communication technology infrastructure, Pakistani institutions were also unable to successfully adopt this novel idea (Soomro et al., 2018). In the Caribbean, exploratory factor analysis was utilized to research student teachers' attitudes toward blended learning. The data indicated that students valued Blended Learning much. They discovered freedom in learning which eventually fostered the adoption of the new method. They had easier access to studying course materials and could communicate with teachers at any time. Improved telecommunications services were ensured in Trinidad and Tobago by some companies resulting in tremendous growth in the adoption by mitigating the challenges of technological infrastructure (Birbal, Ramdass, & Harripaul, 2018).

The authors of these studies have suggested that universities invest in new technological resources to facilitate the implementation of Blended Learning. They should implement strategic alterations and have access to advanced technological resources. There is a strong need for professional development training for teachers. Teachers and other stakeholders need to become acquainted with blended learning before it can be implemented in the institutions. They should be the one to receive the benefits and drawbacks first. Therefore, certain programs/courses that incorporate a blended approach must be included in the curricula (Soomro et al., 2018); (Birbal, Ramdass, & Harripaul, 2018).

Researchers kept on investigating the administration's readiness for integrating blended learning across the nation's higher education institutions in 2020. The

researchers used an online survey questionnaire to collect quantitative data from 223 e-learning administrators and managers from Malaysian universities, colleges, and polytechnics. The research showed that the primary barrier to implementing blended learning was the existing institutional structure, motivation, and management. It was found that for institutions to be ready for Blended Learning, fundamental changes in management and strategy were required (Bokolo et al., 2020).

To be prepared for Blended Learning, universities and colleges must revamp their online pedagogy and organize their course materials accordingly. Further, it is suggested to adjust the overall approach to Blended Learning. Affordability of technology, supportive faculty and staff attitudes, strong leadership, and a commitment to innovation are all crucial to the success of any effort to implement this approach to education (Bokolo et al., 2020).

The HEIs are actively participating in the implication of blended learning research as COVID-19 spreads. Extensive studies have been carried out in countries including Malaysia, Saudi Arabia, the Philippines, and many more. The study was conducted in Malaysia in 2020 on the Attitude as a Mediator of Technical Usage Self-Efficacy, Online Communication Self-Efficacy, Technology Access, and Online Media on Blended Learning Readiness. Considering the responses of 305 respondents and prioritizing both quantitative and qualitative methods this study demonstrated a beneficial influence on Blended Learning preparedness. Respondents from HEIs expressed positive attitudes toward online communication and access to technologies for readiness, except for self-reliance in technology usage. However, the overall picture of readiness was favorable (Yasin, Ong, & Aziz, 2020).

A study measuring Faculty Members' Readiness for Implementing E-learning in Higher Education was undertaken in Saudi Arabia in the same year. A cross-sectional quantitative research methodology was used to collect data from 139 faculty members from ten Saudi universities. According to the findings, the majority of faculty members are ready to take on and adopt blended learning since they have experience in the use of technology. However, few faculties were required to attend technological training programs, and they strongly supported and embraced the way of learning and online courses were delivered. They were very interested in Blended Learning (Tayyib et al., 2020).

In the same year, Malaysia conducted a study titled 'Blended Learning Implementation in Higher Education: Students' Readiness Perspective.' Quantitative analysis was used, and the study's findings concluded that students were ready to adopt blended learning except for their reliance on technology. Affordability and technological support were the two critical issues highlighted in the literature (Balan & Saeed, 2020). Another study was conducted on Teacher Readiness and Perception of Blended Learning in Malaysia in 2020. The study found that the teachers' preparation to implement blended learning was determined by the management's perception, technological support, and technical skills. The research also found that professors might use UROX to have online classes with their students accompanied by real-time video and audio contact, as well as slides without having much preparation on how to use the system. Blended learning activities are still being conducted in some classrooms with the use of this instrument (Balan & Saeed, 2020).

A study named â€˜The Readiness of Teachers on Blended Learning Transition for the Post-COVID-19 Periodâ€™ was conducted in the Philippines in 2020. Teachers were willing to adopt blended learning and the study revealed that blended learning adoption relied on the support of technology and the teaching process (Anoba & Cahapay, 2020). Keeping in mind the significance of the topic, in the same year the authors conducted a study on the readiness of faculty and students for online teaching and learning as an alternative delivery mode for the new normal in the Philippines. The conclusions were drawn utilizing a descriptive-correlational quantitative study constructed with an explanatory technique for data analysis. The findings demonstrated that students are increasingly engaged with technology as a result of its increasing prevalence. Teachers were instructed to move all learning activities and instruction to an online platform. As blended learning is a replacement model for physical classes, professors and students of higher education institutions lack access to digital equipment, which was pinpointed as a barrier to the readiness of blended learning (Anoba & Cahapay, 2020).

Convenience sampling was utilized to determine which criteria would be most helpful in determining whether or not university students in Sri Lanka would be prepared to engage in blended learning during the COVID-19 pandemic study, which was undertaken in 2021 using factor analysis. The results of the study indicated that students were in the middle of the preparedness spectrum. Before implementing blended learning, institutions and students would need to participate in intensive training and workshops focused on skill development (Kumari and Jayasinghe, 2021). A further study was undertaken in India in 2021 to assess the readiness of in-service teachers toward a blended learning approach as a learning pedagogy in

the wake of COVID-19. They employed a descriptive survey methodology with a simple random technique for the design of the research. The results of the study showed that educators, who had a favorable outlook toward using online learning materials and demonstrated proficiency in managing and using technical gadgets, were more prepared to adopt blended learning than other teachers who had less access to the gadgets. They identified a positive willingness to modify their approach (Kumari and Jayasinghe, 2021).

Challenges of the new normal: students' attitude, readiness, and adaptability to the blended learning modality was a quantitative and qualitative study conducted in the Philippines in the same year. Students were found to have a favorable attitude toward blended learning and a modest level of interest in getting ready for it. Challenges and issues, such as a lack of access to the internet, the need to organize study materials, and the difficulty of coordinating online and offline lectures. Students were found to have a favorable attitude toward blended learning and a modest level of interest in getting ready for it. Challenges and issues include, a lack of access to the internet, the need to organize study materials, and the difficulty to match online, and offline courses (Abbacan-Tuguic, 2021).

Studies conducted in 2021 suggested the following changes: Governments should invest in infrastructure to improve internet speeds and accessibility. This insight will be useful for both students and universities, as they create content for online courses. The expansion of one's horizons of understanding is facilitated by this innovative approach to education. This innovative teaching method is highly efficient. Students need to be both interested and motivated to be prepared. Blended learning cannot be implemented until the necessary infrastructure is in place, and well-structured online learning resources are made available to students. The Octagonal e-learning design, delivery, implementation, and assessment framework by Khan (2005) included eight dimensions: educational; technology; interface design; evaluation; management; and resource support; as well as ethical and institutional considerations. Pedagogy refers to the teaching and learning needs of e-learners, as well as the relationship between the course material and the suitable methods of delivery to enable learners to attain the learning outcomes. Technology includes infrastructure, hardware, and software; the learning environment and tools utilized for delivery are all examples of technology. Interface design encompasses elements such as page and site design, content design, navigation, and accessibility; however, in the broader context of institutional transitions to enhanced blended learning, this aspect may be deemed too narrow (although accessibility is an ethical requirement). In the United States, evaluation is used to describe the process of assessing students, which falls under pedagogy. This includes the management team, the delivery of e-learning content, and the management of the e-learning environment. The concept of resource support takes into account the various resources (both offline and online) that students have at their disposal. Issues, such as socioeconomic and cultural diversity and the digital divide fall under the umbrella of ethics. Institutional readiness is a term for an institution's ability to run its administrative and academic operations well. It includes things like organization and change, policy, teacher and staff support, and student services.

Despite this, the aforementioned studies did suggest a few important takeaways, such as the fact that blended learning aids students in understanding the concepts of course materials more quickly than the traditional classroom settings. There is a lot of leeway in terms of time and content with this approach to education. These days, blended learning is more popular than learning that occurs in a traditional classroom setting. Higher education institutions are beginning to use this strategy because of the favorable responses they have received from students. Therefore, their attitude influences their level of preparedness.

This method of education is a novel approach to learning. Teachers need to be up to date in technology and have solid professional training because of the hybrid nature of the classroom. In addition, inspiration is a critical component of success in the classroom. Before implementing Blended Learning, teachers need to be comfortable with the tools they will be using and the way they'll be organizing their course materials. For Blended Learning to be ready, institutions should prioritize student engagement and outcome-based education.

In a nutshell, technological advancement is required for blended learning to be implemented. Adopting this new way of thinking will necessitate extensive efforts to revise course materials and train educators. Through the use of a combination of online and in-person instruction, blended learning enhances the quality of student-teacher engagement. When they put in the effort, they will be in a position to adjust to the situation. More access to technical support is taken into account while planning for blended learning. Materials and training are required to be offered in a strategic and organized method. The preparedness of blended learning must be a top priority for universities, and they must prioritize policy-making to facilitate it.

Chapter 3

Methodology

3.1 Methodology of the Study

The respondents for the study were the educators working for both the public and private universities, and the learners, i.e., students enrolled in both the graduate and undergraduate programs of the selected public and private universities in Bangladesh. The researchers designed two separate instruments (see Appendix A and Appendix B) to collect data separately from educators and students. The team members verified all the instruments, and the links were finally shared with the funder before it was finalized. To increase the validity and reliability of the items in the questionnaire, the instrument was pretested following some general guidelines highlighted in the literature. However, the survey was conducted in two phases. In phase one, a structured questionnaire designed for the educators was sent to approximately, 130 educators from 35 universities (both public and private) located across the country. A purposive sampling (Homogeneous) technique was opted for to reach out to the respondents, such as educators and students. The study recorded responses from 106 educators from 27 universities in 5 divisions of Bangladesh (see Appendix C). Hence, the calculated response rate is around 81.53%. The researchers started distributing the electronic link to the survey questionnaire using different platforms, such as e-mail, and Facebook in early June 2022. The researchers and the research assistants approached some of the respondents personally using the printed version of the questionnaire drafted in the English language. The study adopted a survey approach in which a structured questionnaire comprising both open-ended and close-ended items was designed by reviewing articles, case studies, and newspaper columns centered on a similar theme. The online forms designed with Microsoft Form were activated from June 1, 2022, and stopped recording responses on June 30, 2022, at 11 pm.

In phase two, using social media platforms, i.e., Facebook, the link to the second instrument, which was designed for students, was sent to 350 (approximately) students of 22 institutions located in 5 divisions of Bangladesh. The online forms designed with Microsoft Form started accepting responses on July 1, 2022, and opened until July 24, 2022, at 11 pm.

The collected data were encoded into a spreadsheet and eyeballed in hopes of eliminating non-responses errors. Finally, the researchers confirmed the responses of 326 participants for analysis.

In all phases, the study ensures ethical standards and procedures for conducting research were followed. Thus, those who desired more information related to the research had been given the option to contact the researchers. To make sure the confidentiality of the data, the researcher undertook the following steps: Individuals' personal data has no longer been recognized in any finding of the report, all information was presented in aggregated form, voluntary participation of the participants was ensured and no monetary benefits in any forms were provided to the participants. The study also protected the environment as well by not ping the copies of the questionnaire at any stage of the study. Furthermore, plagiarism issues were also dealt with integrity and dignity. Furthermore, descriptive statistics, such as percentages and frequencies were analyzed in hopes of deriving concrete policies about the implementation of the newly observed wave in academia.

Chapter 4

Results

4.1 Respondents' Profile

The respondents of the study are educators of different universities in Bangladesh, 29% of them were female, and two-thirds (72%) of the respondents were male. Nearly half (49.07%) of the respondents were aged between 35 and 44 years old. One-third (nearly 34%) of the respondents were in the age group of 25 to 35 years.

Table 1. Demographics (Educators; n=106)

Variables	Categories	Frequencies	Percentage
Gender	Female	29	27.5%
	Male	77	72.64%
Age	18-24	0	
	25-34	36	33.96%
	35-44	52	49.05%
	45-54	10	9.43%
	55-64	5	4.71%
	Avove 64	3	2.83%
Academic fields	Technical (Science, Engineering)	43	40.56%
	Non-technical (Business, Economics, Law, and Social Science)	63	59.43%
Location	In Dhaka city	35	33.01%
	City outside Dhaka	71	66.98%
Usage status (technology)	More than three years	32	30.76%
	Less than three years	74	69.81%

Table 1 shows that the majority (66.98%) of respondents resided in cities outside Dhaka and the remaining 33.01% were in Dhaka. 59.43% of the respondents were educators in non-technical fields, such as business, economics, law, and social science. On the other hand, 43% of the educators were from the technical field teaching science and engineering education. Around 70% of the educators started using technology in education just after the outbreak, but the rest of the educators (32%) were well-equipped with technical skills when the pandemic started spreading to Bangladesh.

Table 2. Demographics (Learners; n=326)

Variables	Categories	Frequencies	Percentage
Gender	Female	105	32.20%
	Male	221	67.79%
Age	18-24	227	69.63
	25-34	48	14.72%
	35-44	1	0.30%
	45-54	0	0
	55-64	0	0
	Avove 64	0	0
Academic fields	Technical (Science, Engineering)	134	41.10%
	Non-technical (Business, Economics, Law, and Social Science)	130	39.87%
	Both technical and non-technical	62	19.01%
Location	In Dhaka city	272	83.43%
	City outside Dhaka	54	16.56%
Usage status (technology)	More than three years	96	29.44%
	Less than three years	239	73.31%
Class Standing	1st year	35	10.73%
	2nd year	51	15.64%
	3rd year	97	29.75%
	4th year	143	43.86%
Types of devices used in attending classes.	Smart Phone	144	44.17%
	PC (Desktop or Laptop)	179	54.90%
	Other devices	3	0.92%

Table 2 shows the demographics of respondents. Of 326 students, three-fourths (68%) of the respondents were male and the remaining 32.20% were female. Almost two-thirds (70%) of the respondents were aged between 18 and 24 years. Nearly 15% of the respondents fell under the age group of 25 and 35 years. The majority (83.43%) of the respondents resided in Dhaka city; likewise, 16.56% of the respondents participated from cities outside Dhaka. Among all, nearly 42% of the respondents were from technical fields of study, including Science and Engineering. 39.87% were in non-technical fields, including Business, Economics, Law, and Social Science, and the remaining 19.01% participated in the survey from both the technical and non-technical fields. 73% of the respondents had been using technology for less than three years. Almost half (43%) of the respondents were in the fourth year at the time of conducting the survey. More than half of the respondents (54.90%) used personal computers, e.g., desktops, and laptops to attend classes online during the pandemic.

4.2 Institutional Capacity to Deal with the Transition

4.2.1 Educational tools/platforms used in disseminating knowledge by the educators

Fig.1 Popular educational tools/systems/platforms/resources adopted by educators to conduct academic activities.

Source: Survey data

Figure 1 shows a complete list of educational tools used by educators during the pandemic in Bangladesh. The researcher reviewed case studies, journal articles, and websites in hopes of identifying the most effective tools and platforms incorporated by educators globally. In fact, through this study, the researchers wanted to know what types of platforms were in use during the pandemic and how did educators cope with the unavoidable situation that arose during the pandemic. Based on the review, a total of ten types of platforms were given on the online questionnaire to be chosen by the educators. The educators were advised to select multiple options if needed. The above table (Table 1) shows two popular types: Free e-learning tools/ Learning Management Systems/ Learning Platforms, such as Google Classroom, etc, and Free or licensed Video Conferencing Applications, such as Zoom, Google Meet, Cisco Webex, etc. were highly prioritized by the educators in conducting academic activities online, followed by Social Media Platforms (Web 2.0), such as Facebook, YouTube, etc. and free messaging and video calling apps, such as WhatsApp, Viber, etc., respectively. Few used a customized Course/Learning Management System designed by the university and Commercial Course management systems, such as Blackboard, Canvas, etc. in completing academic activities. The other varieties of platforms such as Open-source /Cloud-Based Learning Management Systems, e.g., Moodle, Massive Open Online Courses (MOOCs), or Open Educational Resources (OER) were also in use, but the usage rate is quite marginal. The educators also considered chat-based collaboration platforms, such as MS Teams, etc., game-based learning platforms, such as Kahoot, Gametize, Centrical, etc., and a few unknown platforms during the pandemic. A total of 11 types of industry standards and global platforms were highly incorporated by educators in imparting knowledge during the pandemic.

4.2.2 Facilities or schemes currently offered by the institutions in Bangladesh

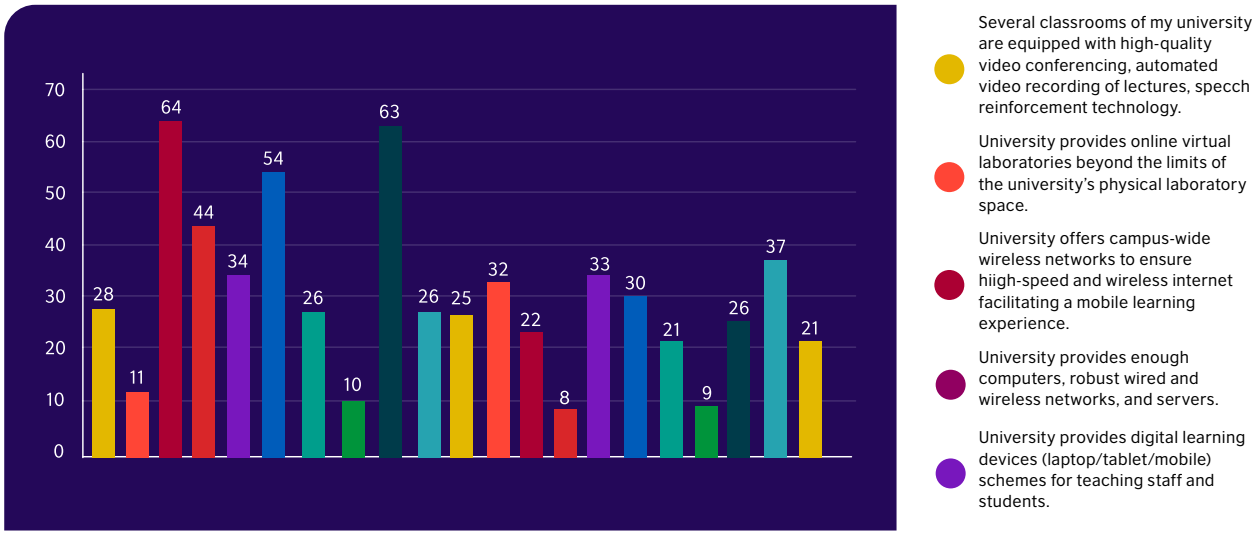


Fig.2 Facilities or schemes offered by the institutions in Bangladesh

Source: Survey data

The study intended to know about the different facilities or schemes the institutions own or yield. So far, the study confirmed around 21 facilities or schemes offered by the institutions for its students and educators. The facilities firmly signify the institutional strengths in coping with the blended educational transformation if implemented. The above figure (Figure 2) shows that 21 types of facilities existed and are currently being used by the faculty members and learners in the institutions. Most universities offer campus-wide wireless networks to ensure high-speed and wireless internet facilitating a rich mobile learning experience, and own dedicated servers and wired and wireless networks to support the mobile learning experience, and this information is shared by most of the respondents. More than half of the educators agreed that the classrooms they use for teaching were fitted with computers, projectors, and sound systems. As shown in Figure 2, several facilities had been identified, that was marginally utilized by several universities in Bangladesh. Most universities offer a campus-wide wireless network to provide online connectivity. Universities own dedicated servers, Wired and Wireless LAN access infrastructure to support connectivity. The classrooms are also fitted with computers, projectors, and sound systems.

4.2.3 Initiatives that are put forward by the Bangladeshi institution for catching up with the blended education wave observed across the globe

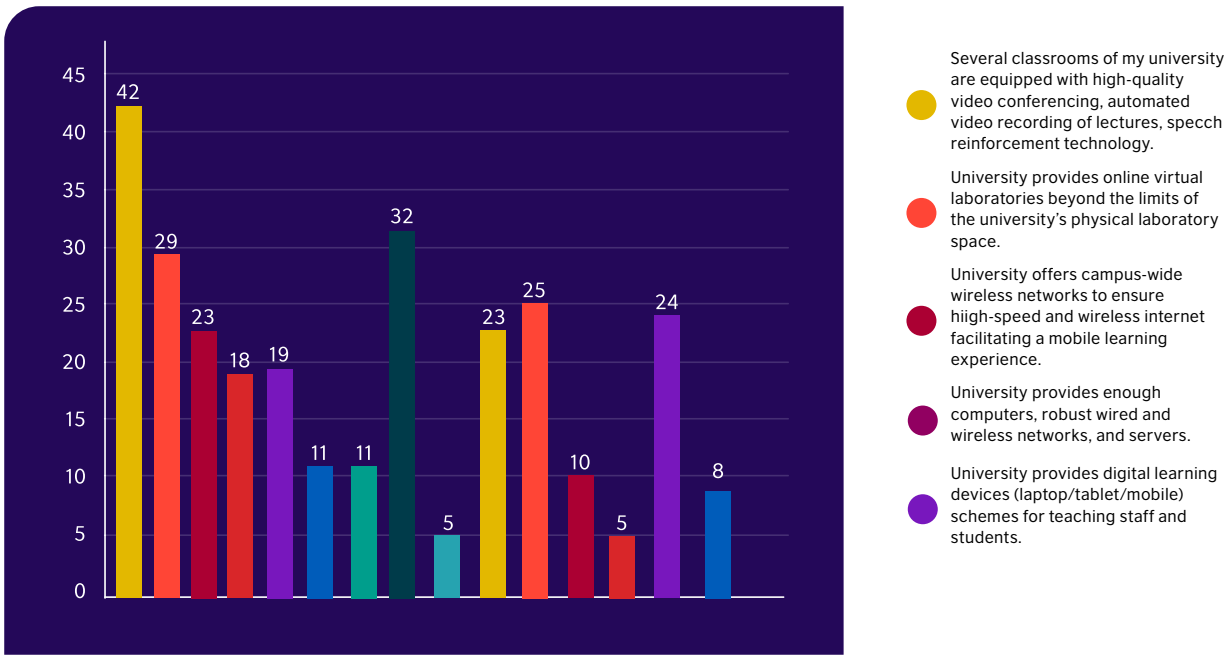


Fig.3 Useful initiative put forward by the institutions in Bangladesh.
Source: Survey data

We wanted to know about the initiatives that were put forward by the institution in the last three years. So far, the study confirmed several initiatives that were put forward by the institutions in dealing with the transition. The initiative firmly signifies the institutional strengths in coping with the blended educational transformation if implemented. The study identified a total of 15 initiatives put forward by the institution in dealing with the newly observed wave found across the globe.

Teaching staff across departments were encouraged by most universities to engage in various knowledge exchange activities related to blended learning, which is deemed crucial for developing a professional learning culture. Parallelly, seminars, workshops, round table discussions, and symposiums on blended education had been arranged by many universities. The overall institution and leadership direction, such as vision, mission, and administrative, academic, and student support had been redesigned by some

universities for the successful implementation of blended learning in higher education. Several universities arranged blended education-related workshops and sharing sessions to highlight innovative blended learning practices. Few universities encouraged the teaching staff to create additional self-recorded material from their PCs at home or in their offices as supplementary content. Several universities formulated the e-Learning Policy and Strategies to ensure that information and communication technology (ICT) would be in use in line with pedagogies, as well as learning and teaching innovations.

4.3 Suitability of the Existing Educational Content/Materials

We had several discussions with the educators while coming up with the items for the questionnaire. Some of the educators were seriously concerned about the suitability of the existing subject matter content in the technology-mediated environment. What would happen to the existing subject matter content that they use in a traditional classroom setting? Would those become obsolete if HEIs insisted on introducing blended education? Hence, the respondents were asked about the effectiveness of the relevant educational content.

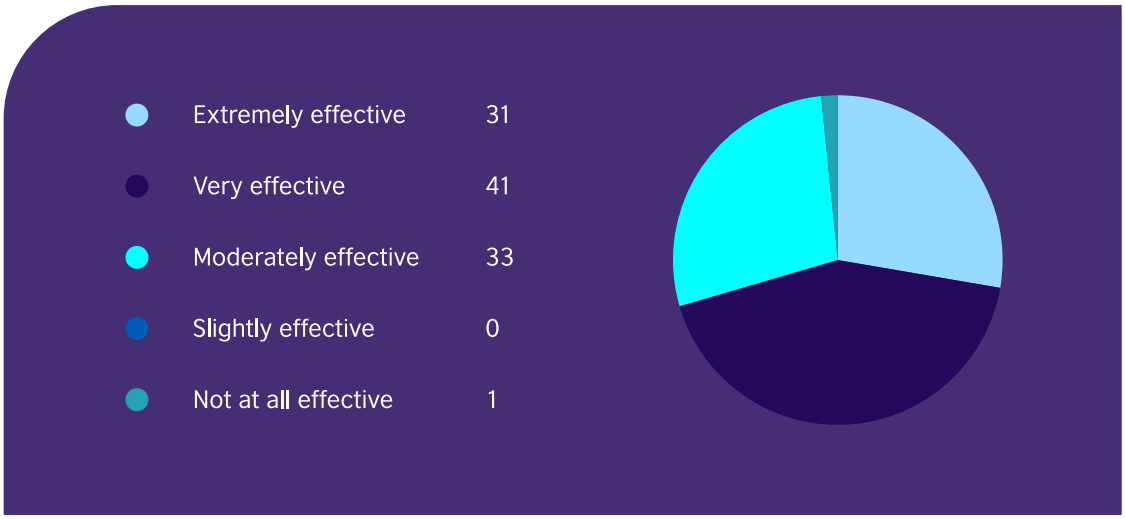


Fig.4 Effectiveness of the existing subject matter content, such as slides, cases, textbooks, and other reading materials in delivering a lecture in a technology-mediated environment.

Source: Survey data

Figure 4 shows that the majority (almost 99%) agreed that the existing educational content, such as slides, cases, textbooks, and other reading materials would be much more effective in imparting knowledge in a technology-mediated environment.

4.4 User Interface Appropriated for HEIs in Bangladesh

4.2.1 Educational tools/platforms used in disseminating knowledge by the educators

	Not at all Important	Slightly Important	Moderately Important	Important	Very Important
Embedded multimedia content, such as video and audio playback	0.9%	3.8%	11.3%	50.9%	34%
Polling feature to conduct a survey		2.8%	19.8%	51.9%	24.5%
Document publishing	0.9%	4.7%	11.3%	58.5%	25.5%
Chat rooms		5.7%	20.8%	49.1%	23.6%
Assignment submission system		0.9%	9.4%	52.8%	36.8%
Content building tools		2.8%	6.6%	53.8%	36.8%
Screen sharing		1.9%	2.8%	50.9%	44.3%
Video Conferencing Applications		1.9%	10.4%	38.7%	49.1%
Maker, a type of software program, to build course materials		2.8%	11.3%	50%	35.8%
Plagiarism detection tool		0.9%	7.5%	33%	58.5%
Assessment tools		0.9%	7.5%	37.7%	53.8%
Centralized learning materials		1.9%	5.7%	39.6%	52.8%
Discussion Board		1.9%	9.4%	45.3%	43.4%
Not listed above	48.1%	10.4%	12.3%	17.9%	11.3%

The educators were requested to opt for useful features, which are much needed to continue classes in a tech-mediated environment. As shown in Table 3, all the given features of a standard LMS were highly prioritized by the educators as those features were deemed highly important to the educators and should be incorporated into a standard LMS in conducting lessons online. Very few (0.9%) of the respondents emphasized less on the following features: Polling feature to conduct a survey and Chat rooms.

4.5 Assessment Style Appropriated for HEIs in Bangladesh

Suitable assessment styles for Bangladeshi institutions in assessing students' performance in a technology-mediated classroom.

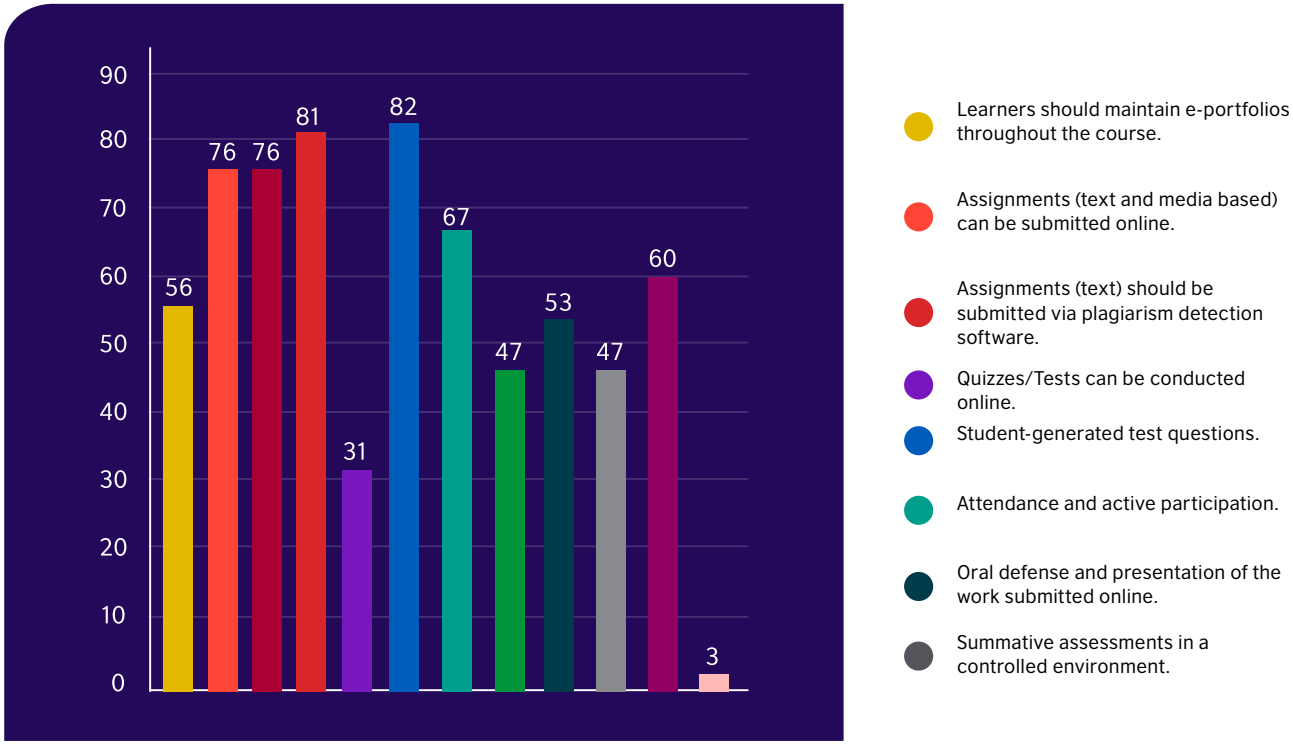


Fig.5 Assessment styles for Bangladeshi institutions

Source: Survey data

We wanted to know what assessment style would be more appropriate for the institutions in Bangladesh if instructed to implement blended education. The majority put stress highly on the conduction of quiz and test online along with recording attendance and active participation. Two-thirds of the educators suggested handing in the assignments (text and media-based) online via plagiarism detection software followed by an online presentation and oral defense. More than half of the educators suggested incorporating instructor assessments, such as such as midterm and final examinations to be conducted in a controlled environment. In addition, learners are advised to maintain e-portfolios throughout the course.

4.6 Approaches

Appropriate approaches are for advancing blended education in Bangladesh

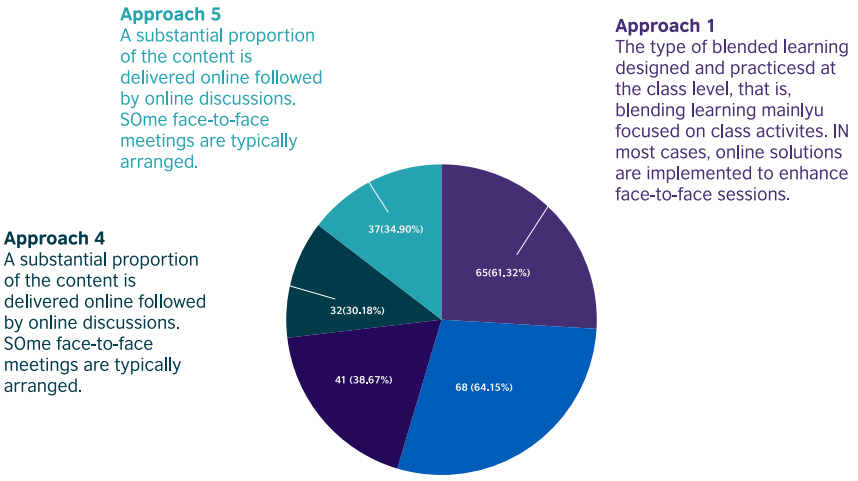


Fig.6 Appropriate approaches for advancing blended education in Bangladesh

Source: Survey data

Figure 6 illustrates the approaches adopted by universities across the globe. The approaches are widely highlighted in the literature. The respondents were instructed to choose suitable approaches to be incorporated by the institutions in Bangladesh. Among the five most used approaches, the majority (64.15%) chose the second approach. Approach 2 mainly is the conduction of academic activities combined over the Internet and in a traditional classroom setting in which study materials might be provided online while lectures are delivered in the classroom (UGC, 2021). On the other hand, Approach 1 was suggested by 61.32% of the educators. Almost one-third of the respondents agreed to apply the remaining three approaches: Approaches 3, 4, and 5.

4.7 Key Challenges of Blended Education in Bangladesh

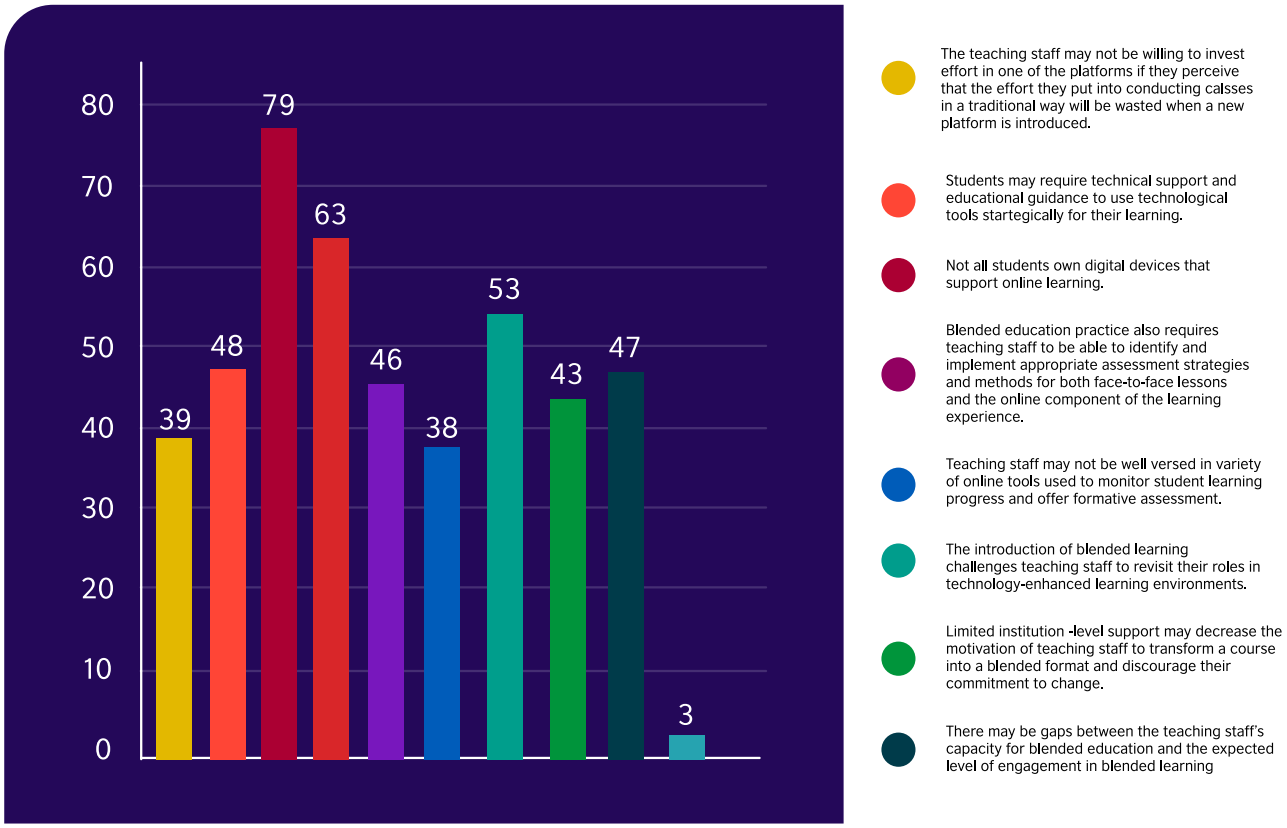


Fig. 7 Challenges may face by the institutions in adopting blended Education at the tertiary level in Bangladesh

Source: Survey data

The study identified a couple of challenges that may prevent educators from adopting blended education in Bangladesh. The majority worried about the availability of digital devices for students in supporting online learning. It has been a universal truth that not all students can afford a digital device to connect online in Bangladesh. In addition, almost half of the educators put much stress on the required technical support and educational guidance to facilitate the use of available technological tools strategically for their learning for both the educators and students. Two-thirds of the educators consented that blended education practice also required teaching staff to be able to identify and implement appropriate assessment strategies and methods for both face-to-face lessons and the online component of the learning experience. Almost half of the educators stated that limited institution-level support might decrease the motivation of teaching staff to transform a course into a blended format and discourage their commitment to change. Nearly half of the educators worried that teaching staff might not be well versed in a variety of online tools used to monitor student learning progress and offer formative assessments. They also thought that the success of blended education would depend mostly on the design of the appropriate instructional content. More than fifty percent of educators mentioned the gaps between the teaching staff's capacity for blended education and the expected level of engagement required in blended learning practices. The teaching staff might not be willing to invest effort in one of the platforms if they perceived that the effort, they put into traditionally conducting classes would be wasted when a new platform is introduced, and this is confirmed by around one-third of the educators who participated in this survey. One-third of the educators realized that the introduction of blended learning might challenge teaching staff to revisit their roles in technology-enhanced learning environments.

4.8 Adoption Behavior (Learners' Perspectives)

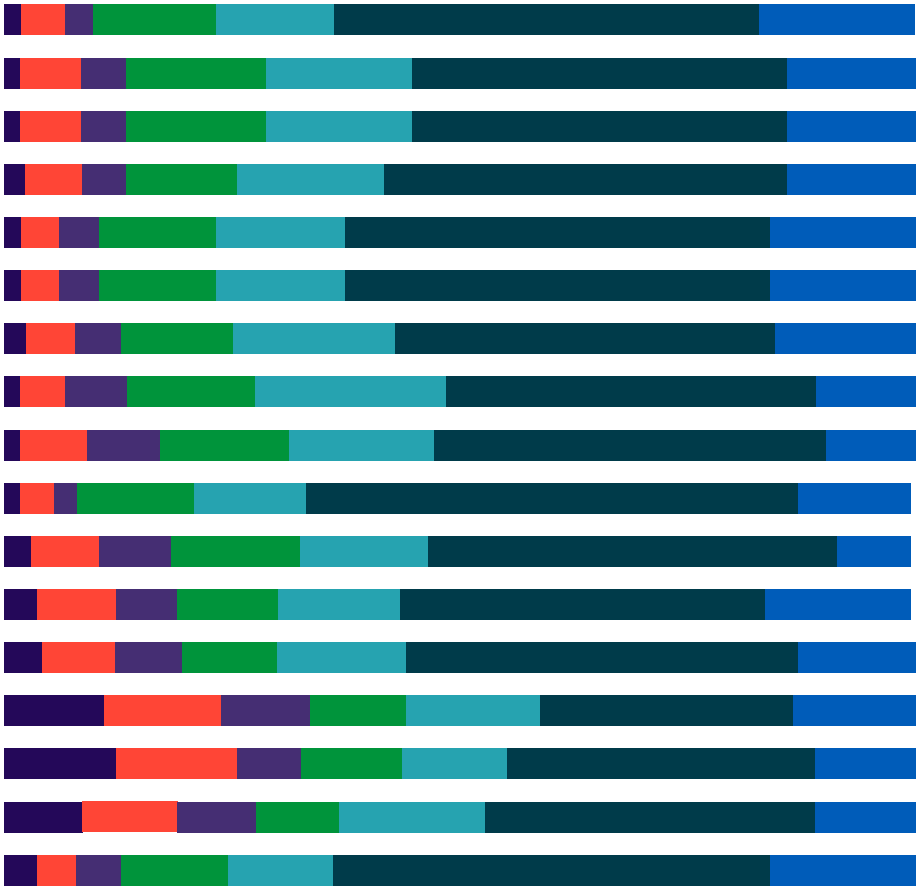
Table 4. Determinants affecting users' (learners) behavioral intention to adopt a techno-mediated learning environment. (n=326)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I know it is necessary to use the e-learning system.	5.2%	4.9%	4%	8.3%	8.6%	42.3%	26.7%
My institution provides a support service or a center for dealing with the technical issues of the e-learning	4.9%	17.2%	2.1%	11.3%	11%	40.8%	12.6%
Using online tools enables me to accomplish my academic needs more quickly and efficiently.	4.3%	11.7%	7.4%	10.4%	12.6%	39%	16.3%

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
My interaction with the tool (e.g. MS team, Google classroom) is clear and understandable.	1.2%	3.4%	3.4%	8%	14.4%	49.7%	21.8%
It is easy for me to become skillful in using the systems.	1.8%	4.6%	2.8%	10.4%	13.5%	46.6%	19.3%
My peers who influence me a lot think that I should use online systems.	1.8%	8%	6.1%	19%	11%	41.4%	10.1%
In general, my university has supported the use of the system.	3.4%	4.3%	4.9%	12%	16.3%	48.2%	16.3%
I have a flawless internet connection to support the use of e-learning tools at home or in the office.	8.3%	10.7%	8.3%	9.5%	11.7%	35.9%	11%
To me, the Internet connection I use is not costly.	12%	13.2%	7.1%	11.3%	12%	33.7%	11%
I always have access to a high-speed Internet connection from anywhere to use online systems to attend classes and assessments, e.g., quizzes, and case studies.	11%	13.2%	8.9%	10.7%	15%	27.9%	13.2%
The device I use to get connected is quite advanced and compatible.	3.7%	8.3%	7.1%	10.7%	13.8%	43.3%	13.2%
All payments related to an internet connection, subscription, and recharge are paid using a mobile wallet, such as bkash, and Rocket.	3.4%	8.9%	6.4%	11.3%	12.9%	40.8%	16.3%

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Using the tool is entirely within my control.	3.1%	7.4%	7.4%	14.1%	14.4%	44.8%	8.9%
I have the resources, knowledge, and ability to make use of the system.	1.8%	3.4%	2.8%	12.9%	11.7%	54.6%	12.2%
The e-learning system has all the necessary features.	1.5%	7.4%	7.7%	14.1%	16.3%	42.9%	10.1%
The e-learning system's interface design is user-friendly.	1.5%	5.2%	6.4%	14.1%	20.9%	41.1%	10.7%
Online learning helped me to become more knowledgeable in the subjects.	2.1%	5.8%	4.9%	12%	17.5%	42.3%	15.3%
Online learning helped me to achieve better academic results.	3.7%	8.3%	2.8%	12%	16.3%	42%	15%
Online learning developed my ability to do group discussions with my classmates virtually using other means, such as Facebook, Viber, etc.	1.8%	4%	4%	13.2%	14.1%	46.9%	16%
I prefer to finish all assessments (e.g. take-home quizzes, case studies) by the deadlines while completing courses online.	2.1%	6.7%	4%	12.3%	16.3%	44.2%	14%
I wish to take class notes of class instruction while attending classes online.	2.1%	7.1%	6.4%	10.1%	13.2%	43.9%	17.2%
I arrange a separate place at home to attend classes online without distractions.	1.8%	6.7%	4.9%	15.3%	15.6%	41.7%	13.8%
I usually participate in online class discussions.	1.5%	4.9%	3.1%	13.5%	12.6%	47.2%	17.2%

Table 4 provides a list of determinants affecting usersâ€™ (learners) behavioral intention to adopt a techno-mediated learning environment. As shown in the above table (Table 4, also depicted in Figure 8), the majority (nearly 85%) have the knowledge necessary to use the e-learning system. Almost 92% of the respondents have stated that their interaction with the tool (e.g. MS Teams, Google classroom) is clear and understandable. Using the tool is entirely within the control of the majority (82%) of learners, and 91% of respondents have said that they have all the resources, knowledge, and ability to make use of the system. The learners were asked about institutional support in dealing with the issues of e-learning. 75% of the learners have confirmed the existence of support services and centers within the institution. In general, universities have supported the use of the system, and the majority (87%) of the respondents confirm this. Almost two-thirds of the respondents (72%) have shared that they have a flawless internet connection to support the use of e-learning tools at home. 67% of the respondents have said that the internet connection they use is not costly. 66% of the respondents have access to a high-speed Internet connection from anywhere to use online systems to attend classes and assessments, e.g., quizzes, and case studies. 81% of the respondents have advanced and compatible devices to get connected. The respondents were also asked about the features and interface of the e-learning that they have used lately. The majority have expressed that that tool has all the necessary features, and the design of the interface is user-friendly. The respondents were also asked to know how all the payments related to an internet connection, subscription, and recharge were paid. 81% of the respondents incorporated various mobile wallet services, such as bkash and Rocket in disbursing payment.



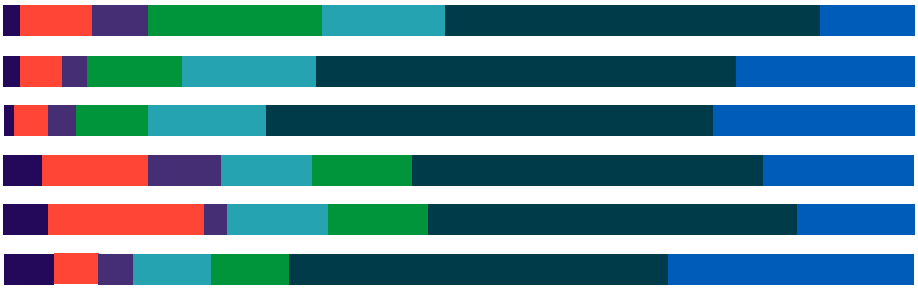


Fig. 8 Determinants affecting users' (learners) behavioral intention to adopt a techno-mediated learning environment.

Source: Survey data

It is also evident that using online tools enabled the learners to accomplish their academic needs more quickly and efficiently, and it was easy for them to become skillful in using the systems. In addition, the respondents have pinpointed strong peer influence.

The majority have expressed that online platforms helped them to become more knowledgeable in the subject matter and eventually supported them to achieve better academic results. Nevertheless, online interaction developed students' ability to do group discussions with their classmates virtually using other means, such as Facebook and Viber, etc.

Indeed, online learning inspired the students well. 86% of the respondents said that they intended to finish all assessments (e.g. take-home quizzes, case studies) by the deadlines while completing courses online. 84% grew the practice of taking class notes of class instruction while attending classes online. The majority (90%) participated in online class discussions. 86% of the respondents somehow arranged a separate place at home to attend classes online without distractions.

Chapter 5

Summary, Conclusion, Recommendations

5.1Key Findings

A total of eleven industry standards and global platforms were used by educators and learners in Bangladesh during the pandemic. Almost half of the learners (54%) prefer to use a PC (Desktop or Laptop) to attend classes online. The majority (70%) of educators have been using various tools/systems/ platforms/resources for the last three years or less. On the other hand, nearly 71%of the students have been using various tools for the last three years or less. Most (80%) of educators consented that conducting classes online using different educational technologies was not as similar to conducting face-to-face classes in the classroom. On the other hand, less than half (41%) of the learners said that attending classes online using different educational technologies was as similar to conducting a face-to-face class in the classroom. 67% of the educators opinioned that the classes conducted online enriched learnersâ€™ knowledge in many ways. On the other hand, 63% of the respondents said that the classes conducted online-enriched learnersâ€™ knowledge in many ways. A

campus-wide wireless network to provide online connectivity is present in almost every university. Most universities own dedicated servers and wired and wireless LAN access infrastructure to support connectivity within the campus. The classrooms are also fitted with computers, projectors, and sound systems. A total of 15 diverse initiatives were put forward by the institutions in coping with the newly observed education wave named blended education. Existing educational content built on different subject matters is much more effective in the blended mode of education.

A total of 15 useful features of a standard LMS have been suggested by the educators to be considered by the developers or administrators. A total of 11 types of assessments have been suggested for the blended mode. The two approaches: Approach 1 and 2 of the 5 proposed approaches are highly suggested by the educators for the HEIs in Bangladesh. 57% of the educators shared that the use of educational technologies is highly appreciated by the members of my society, i.e., family, friends, and neighbors of the community. Almost half (54%) of the educators consented that taking a class online was easier than a regular class conducted onsite (in a classroom). The majority (89%) of the students are hoping to attend some of the courses that incorporate the blended method (combining both the online and offline modes) in the future. On the contrary, the majority (95% the educators are expecting to conduct some of the courses that incorporate the blended method (combining both the online and offline mode) in the future. Online teaching is not effective for courses that require problem-solving and analytical skills, such as Accounting or Mathematical courses. Moreover, there is a huge possibility of unfair means during the examination held online. The digital divide and teachers' technological and pedagogical skills need to be taken care of before the introduction of the blended approach successfully in Bangladesh. 25% to 30% of courses of a program can be taken in a blended mode, or at least 20% of the classes of a course should be conducted via an online platform. The institution should ensure all the technical prerequisites, such as a speedy network, suitable data packages for the students, and the availability of the devices before the introduction of blended education in Bangladesh. Blended learning will be much more effective if we can develop a proper tech ecosystem to spur innovation among the students and teachers. To foster any sort of learning, the job security of the educators must be ensured by UGC and Universities (both public and private). The more interactive learning is designed and delivered online, the easier for students to understand and learn. Online-based classes are not very effective for those who are living in underprivileged areas in Bangladesh. There should be enough scopes and opportunities provided for the learners by the educators to foster creativity.

5.2 Conclusion

The study, which was centered on several underlying objectives, obtained a mixed reactions from educators and learners. Some educators are in favor of adding the blended approach to the traditional ways of teaching, as they believe the learning would be very much effective if a proper technological environment is ensured by the HEIs. Many are urging to adopt blended education as soon as possible despite its visible advantages and disadvantages. The approach, which is blended education, is the demand of the current world. It will ease the process of sharing knowledge. However, some prerequisites, such as network, support service, appropriate use of the devices, management's mindset, students' preparedness, and development of new pedagogy need to be ensured by the HEIs before implementing the approach. However, the HEIs are well equipped with the prerequisites of blended education. Most universities provide moderate technological infrastructure, including campus-wide wireless and wired networks, a good number of devices, their server to store content, and dedicated support services. Overall, HEIs are quite capable of embracing blended education in Bangladesh. The existing subject matter content is suitable for advancing blended education in Bangladesh. However, some challenges remain which may hinder the success of this approach. It has been observed that the pandemic also affected students' mindsets as their aptitude went down drastically. It has been argued that students are reluctant to attend face-to-face classes in a classroom setting. Some of the students are suffering from depression. Further study can be redirected to address these issues by deploying both the initiatives and quantitative approaches.

5.3 What initiatives would be required to expedite the blended learning culture within the university in Bangladesh?

1. Peer coaching by the academic staff member.
2. The new institutional structure, i.e., a Blended Learning Steering Committee chaired by the Provost/Vice-President could be established to lead and support blended education in HEIs.
3. Consultants or instructional designers may be appointed in each of the faculties to support the blended education practices of the teaching staff.
4. The faculties, e.g., Business, Engineering, Science, and Information Technology may work together with the technology and teaching/learning support units to promote and support blended education practices.
5. The faculties, e.g., Business, Engineering, Science, and Information Technology may work together with the technology and teaching/learning support units to promote and support blended education practices.
6. External partnerships, including consultation and dialogue with the government to work out a scalable funding mechanism to secure the financial resources needed to provide full support for blended education.
7. HEIs can work with private-sector corporations and organizations such as Apple, Microsoft, and Blackboard or open-source communities such as Moodle for exploring different learning technologies and shaping the direction of future blended learning practices in institutions with industry experts.
8. Universities can receive financial support from private sector corporations and organizations that are interested in the quality enhancement of higher education learning and teaching.
9. Universities should arrange conferences and regular drop-in sessions on different tracks of Blended Education regularly.
10. Regular e-newsletters need to be sent to teaching staff to promote the momentum of blended education.
11. University should ensure continuous technical support with a robust technical and help desk support structure that is available around the clock both online and offline.
12. A one-stop center of reference for teaching staff and students for learning and teaching.
13. Technological and financial support as well as the growth mindsets of the concerned authority is needed to implement the blended education system in Bangladesh.
14. Those who will be assigned to conduct classes in blended mode should be assigned with less course load as online teaching requires a teacher to be more prepared for the class content and assessment.
15. Extensive training on the technology in delivering lesser and designing content is needed for all to adopt quickly within the institution.
16. Ethics and values need to be improved for both educators and learners in dealing with the lesson and assessments. The departments regularly can arrange workshops on plagiarism.
17. Freedom of teaching should be patronized to enhance the creativity of teachers and students
18. Educational Institutions must provide stable logistics support for both the students and teachers. An easy, error-free information management system can be developed and delivered to all.
19. The management of an HEI should ensure sufficient funds for conducting research and attending seminars or workshops.

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Appendices

Appendix A: Research Instrument (Educator)

Dear Respondents

The study has been pulled off to understand how well Bangladeshi academic institutions at the tertiary level are equipped with the prerequisites for embracing the suggested blended education. The entire questionnaire is centered on several dimensions primarily highlighted in the literature. We would urge you to read through the questions carefully and record your responses on the several measures that adhered to each of the questions. Please be assured that the collected data will be kept confidential and will be presented in an aggregate form for audiences in academia.

The survey will take approximately 10 minutes to complete.

1. Gender Female Male

2. Please select your age group.

18-24 25-34 35-44 45-54 55-64 Above 64

3. Which of the following academic fields does your department offer?

Technical (Science, Engineering) Non-technical (Business, Economics, Law, and Social Science)

4. Location of your university.

In Dhaka city City outside Dhaka

5. Type of institution.

Government Private International Autonomous

6. What educational tools/systems/platforms/resources have you already incorporated to conduct academic activities, such as lectures, and assessments remotely? (Multiple options can be selected)

- Free e-learning tools/ Learning Management Systems/ Learning Platforms, such as Google
- Classroom, etc.
- Commercial Course management systems, such as Blackboard, Canvas, etc.
- Social Media Platforms (Web 2.0), such as Facebook, Youtube, etc.
- Chat-based collaboration platforms, such as MS Team, etc.
- Free or licensed Video Conferencing Applications, such as Zoom, Google Meet, Cisco
- Webex, etc.
- Free messaging and video calling apps, such as WhatsApp, Viber, etc.

- Game-based learning platforms, such as Kahoot, Gametize, Centrical, etc.
- Open-source /Cloud-Based Learning Management Systems, e.g., Moodle.
- Massive Open Online Courses (MOOCs) or Open Educational Resources (OER).
- A customized Course/ Learning Management System designed by the university.
- Not listed above.

7. How long have you been using the above tools/systems/platforms/resources?

More than three years Less than three years

8. To me, conducting classes online using different educational technologies is as similar as conducting a face-to-face class in the classroom.

Yes No

9. In my opinion, the classes conducted online enriched learners' knowledge in many ways.

Yes No

10. Conducting classes online using various educational technologies is highly appreciated by the members of my society, i.e., family, friends, and neighbors of the community.

Yes No

11. Is taking a class online easier than a regular class conducted onsite (in a classroom)?

Yes No

12. Please indicate whether you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I have the knowledge necessary to use the e-learning system.							
My institution provides a support service or a center for dealing with the technical issues of the e-learning system.							
I am confident in using an e-learning system even if there is no one around to show me how to do it.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I am confident in using an e-learning system even if I do not have an online manual for reference.							
I am confident about using an e-learning system even if I have never used such a system before.							
I am confident in using an e-learning system even if I have never watched someone using it before trying it myself.							
I could complete the academic activities using the e-learning system even if I could not find anyone for help when I got stuck.							
E-learning system enables interactive communication between the instructor and students.							
E-learning system facilitates interactive communication between the educators and students.							
Communication tools in e-learning systems (chat, e-mail, and forum) are effective in facilitating interactivity between the users.							
E-learning system provides an opportunity to control communication between instructors whenever students require it.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
E-learning system allows controlling the learning sequence.							
E-learning tools provide useful assistance online when there is a problem.							
E-mail inquiries can be made with the service provided when there is a problem.							
E-learning system offers good technical support.							
I have technical difficulty in accessing and using e-learning in the university.							
Most of the educators in my department use the e-learning system.							
Most of the educators in my faculty use the e-learning system.							
Most of the educators in my university use the e-learning system.							
As more educators use the e-learning system, I think related services and support will soon be developed.							

13. Please select the option which most accurately reflects your agreement/disagreement with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Using online tools enables me to accomplish my academic needs more quickly and efficiently.							
Using online tools enables me to accomplish tasks quicker than conducting classes face to face.							
Using online tools would improve my learning performance.							
Online tools enhance equality among all students (Example: System offers an equal chance for students to carry out tasks and communicate with faculties).							
Using online tools increases the quality of the teaching process.							
Using online tools would enhance my effectiveness in learning.							
Learning to operate the e-learning tool (e.g., MS team, Google Classroom, Moodle) is easy for me.							
My interaction with the tool (e.g. MS team, Google classroom) is clear and understandable.							
I would find the e-learning systems easy to use.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
It is easy for me to become skillful in using the systems.							
I would find it easy to get the online systems to do what I want them to do.							
My peers who influence me a lot think that I should use the online systems.							
People (e.g. family members, opinion leaders) who are important to me think that I should use the system.							
In general, my university has supported the use of the system.							
I have a flawless internet connection to support the use of e-learning tools at home or in the office.							
To me, the Internet connection I use is not costly.							
I always have access to a high-speed Internet connection from anywhere to use online systems to conduct classes and assessments (e.g. quizzes, case studies).							
The device I use to get connected is quite advanced and compatible.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
All payments related to an internet connection, subscription, and recharge are paid using a mobile wallet, such as bkash, and Rocket.							
I would be able to use the e-learning tools in the future.							

14. Please select how much you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Using the tool is entirely within my control.							
I have the resources, knowledge, and ability to make use of the system.							
I intend to use the tools in the future if an opportunity is given.							
I plan to use online systems in the future whenever needed.							
I predict I would use the system whenever I get instructed.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I would recommend this platform to my friends.							
I intend to continue using the e-learning system in the future.							
I prefer to conduct classes and take all assessments online if there is a need for this.							
I like to use online platforms for teaching purposes.							
I often use e-learning platforms to boost my knowledge.							
I very often use e-learning to conduct classes.							
The e-learning system runs stable.							
The e-learning system is fast and responsive.							
The e-learning system has all the necessary features.							
The e-learning system's interface design is user-friendly.							
The e-learning system provides a wealth of high-quality learning resources.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
The e-learning system provides a wealth of high-quality learning resources.							
The e-learning system provides courses that cover only the main points.							
The courses offered by the e-learning system are very attractive to me.							
I have the resources necessary to use the e-learning system.							

15. What facilities or schemes are offered by the institution you currently work for?(Multiple options can be selected)

- Several classrooms of my university are equipped with high-quality video conferencing, automated video recording of lectures, and speech reinforcement technology.
- University provides online virtual laboratories beyond the limits of the university's physical laboratory space.
- University offers campus-wide wireless networks to ensure high-speed and wireless Internet facilitating a mobile learning experience.
- University provides enough computers, robust wired and wireless networks, and servers.
- University provides digital learning devices (laptop/tablet/mobile) schemes for teaching staff and students.
- University's classrooms are fitted with computers, projectors, and sound systems.
- University has Introduced a LMS (Learning Management System) for sharing educational resources (e.g., courseware, notes, presentations, videos, images).
- University has set up an archive of digital assets (open digital repository system), i.e., DSpace. University owns a dedicated server, wired and wireless network.
- University provides tutorial rooms designed to bring students together to facilitate social interactions and small group discussion.
- University has several partnership agreements with edX or Coursera on Open Educational Resources (OERs).
- University employed learning technologists with the necessary skills and experience.
- University provides facilities to record lectures, which are available for students to download.
- Students are given the response devices widely known as 'clickers', which are mainly student response system software, to enable peer-to-peer learning and interactive engagement with teaching staff during lectures or tutorials.
- Classrooms and lecture halls can be converted into collaborative learning spaces with flexible

seating, multiple displays, and a variety of multimedia capabilities.

- Campus-wide dedicated browsing labs are available for the students.
- Classrooms are equipped with lecture capture technologies.
- The Design Studio or Media Center is installed with useful software resources, e.g., Adobe Flash, Adobe After Effects, and Adobe Premiere to facilitate the design of the rich content, including various learning media from basic streaming media to high definition.
- One-Stop Service or Unit for dealing with the technical issues of e-learning systems.
- Coupled with traditional lecture halls, few classrooms are equipped with multiple whiteboards and improved ICT facilities, which facilitate collaborative work, group discussion.
- Smart Classroom integrates the use of all types of learning devices (e.g., tablets, laptops, smartphones, PCs, clickers, cameras, AV tools) and other system software.

16. What initiatives would be required to expedite the blended learning culture within the university? (Multiple options can be selected)

- Peer coaching by the academic staff member.
- The new institutional structure, i.e., a Blended Learning Steering Committee chaired by the Provost/Vice-President could be established to lead and support blended education in HEIs.
- Consultants or instructional designers may be appointed in each of the faculties to support the blended education practices of the teaching staff.
- The faculties, e.g., Business, Engineering, Science, and Information Technology may work together with the technology and teaching/learning support units to promote and support blended education practices.
- The faculties, e.g., Business, Engineering, Science, and Information Technology may work together with the technology and teaching/learning support units to promote and support blended education practices.
- External partnerships, including consultation and dialogue with the government to work out a scalable funding mechanism to secure the financial resources needed to provide full support for blended education.
- HEIs can work with private-sector corporations and organizations such as Apple, Microsoft, and Blackboard or open-source communities such as Moodle for exploring different learning technologies and shaping the direction of future blended learning practices in institutions with industry experts.
- Universities can receive financial support from private sector corporations and organizations that are interested in the quality enhancement of higher education learning and teaching.
- Universities should arrange conferences and regular drop-in sessions on different tracks of Blended Education on a regular basis.
- Regular e-newsletters need to be sent to teaching staff to promote the momentum of blended education.
- University should ensure continuous technical support with a robust technical and help desk support structure that is available around the clock both online and offline.
- A one-stop center of reference for teaching staff and students for learning and teaching.
- Not listed above.

17. How important are the following features of an LMS (Learning Management System) appropriated for Bangladeshi HEIs? (Multiple options can be selected)

	Not at all Important	Slightly Important	Moderately Important	Important	Very Important
Embedded multimedia content, such as video and audio playback					
Polling feature to conduct a survey					
Document publishing					
Chat rooms					
Assignment submission system					
Content building tools					
Screen sharing					
Video Conferencing Applications					
Maker, a type of software program, to build course materials					
Plagiarism detection tool					
Assessment tools					
Centralized learning materials					
Discussion Board					
Not listed above					

18. What assessment styles are suitable for Bangladeshi institutions in assessing students' performance in a blended learning environment? (Multiple options can be selected)

- Learners should maintain e-portfolios throughout the course.
- Assignments (text and media-based) can be submitted online.
- Assignments (text) should be submitted via plagiarism detection software.
- Quizzes/Tests can be conducted online.
- Student-generated test questions.
- Attendance and active participation.
- Oral defense and presentation of the work submitted online.
- Summative assessments in a controlled environment.
- Self-assessment activities that utilize rubrics and online journals.
- Peer assessment allows students to assess other students (their peers) in a course.
- Instructor assessments, such as such as midterm and final examinations to be conducted in a controlled environment.
- Not listed above.

19. What approaches are more appropriate for implementing blended education in Bangladesh? (Multiple options can be selected)

Approach 1: The type of blended learning designed and practiced at the class level, that is, blending learning mainly focused on class activities. In most cases, online solutions are implemented to enhance face-to-face sessions.

Approach 2: The conduction of academic activities combined over the internet and in a traditional classroom setting in which study materials might be provided online while lectures are delivered in the classroom.

Approach 3: The sessions are conducted in the classroom, and students are instructed to spend approximately the same amount of time on the online learning platform.

Approach 4: This type of blending focuses on the entire program in which students learn online for more than half of the course and attend the face-to-face sessions once during summer and winter vacations.

Approach 5: A substantial proportion of the content is delivered online followed by online discussions. However, face-to-face meetings are typically arranged.

20. How effective are the existing subject matter content, such as slides, cases, textbooks, and other reading materials in delivering a lecture in a technology-mediated environment?

- Extremely effective
- Very effective
- Moderately effective
- Slightly effective
- Not at all effective

21. What challenges would the institutions face if they adopted blended education at the tertiary level in Bangladesh? (Multiple options can be selected)

- The teaching staff may not be willing to invest effort in one of the platforms if they perceive that the effort, they put into conducting classes in a traditional way will be wasted when a new platform is introduced.
- Not all students own digital devices that support online learning.
- Blended education practice also requires teaching staff to be able to identify and implement appropriate assessment strategies and methods for both face-to-face lessons and the online component of the learning experience.
- Teaching staff may not be well versed in a variety of online tools used to monitor student learning progress and offer formative assessment.
- The introduction of blended learning challenges teaching staff to revisit their roles in technology-enhanced learning environments.
- Limited institution-level support may decrease the motivation of teaching staff to transform a course into a blended format and discourage their commitment to change.
- There may be gaps between the teaching staff's capacity for blended education and the expected level of engagement in blended learning practices.
- The success of blended education will depend mostly on the design of the appropriate instructional content.
- Not listed above.

22. I am hoping to conduct some of the courses that incorporate the blended method (combining both the online and offline mode) in the future.

Yes No

Please provide constructive comments or suggestions or feedback that you want to share with us.

Appendix B: Research Instrument (Learner)

Dear Participants

It would be so nice if you would spare a few minutes to answer the following questions. We expect your honest responses in dealing with the questions. Furthermore, we believe that your feedback will help us to conduct an impactful study on blended education.

The survey will take approximately 10 minutes to complete.

1. Name of your Institution

_____

2. Gender

Female Male

3. Please select your age group.

18-24 25-34 35-44

45-54 55-64 Above 64

4. Which of the following academic fields does your department offer?

Technical (Science, Engineering)

Non-technical (Business, Economics, Law, and Social Science)

5. Location of your university.

In Dhaka city City outside Dhaka

6. Type of institution.

Government Private

International Autonomous

7. Class standing.

1st year 2nd year

3rd year 4th year

8. Types of devices you prefer to use to attend online classes.

Smart Phone PC (Desktop or Laptop)

Other devices: _____

9. What educational tools/systems/platforms/ resources have you already incorporated to attend academic activities, such as attending lectures, and submitting assessments remotely?

(Multiple options can be selected)

- Free e-learning tools/ Learning Management Systems/ Learning Platforms, such as Google Classroom, etc.
- Commercial Course management systems, such as Blackboard, Canvas, etc.
- Social Media Platforms (Web 2.0), such as Facebook, Youtube, etc.
- Chat-based collaboration platforms, such as MS Team, etc.
- Free or licensed Video Conferencing Applications, such as Zoom, Google Meet, Cisco Webex, etc.
- Free messaging and video calling apps, such as WhatsApp, Viber, etc.
- Game-based learning platforms, such as Kahoot, Gametize, Centrical, etc.
- Open-source /Cloud-Based Learning Management Systems, e.g., Moodle.
- Massive Open Online Courses (MOOCs) or Open Educational Resources (OER).
- A customized Course/ Learning Management System designed by the university.
- Not listed above.

10. How long have you been using the above tools/ systems/platforms/resources?

More than three years Less than three years

11. To me, attending classes online using different educational technologies is as similar as attending a face-to-face class in the classroom.

Yes No

12. In my opinion, the classes conducted online enriched my knowledge in many ways.

Yes No

13. Attending classes online using various educational technologies is highly appreciated by the members of my society, i.e., family, friends, and neighbors of the community.

Yes No

14. Is attending a class online easier than a regular class conducted onsite (in a classroom)?

Yes No

15. Please indicate whether you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I have the knowledge necessary to use the e-learning system.							
My institution provides a support service or a center for dealing with the technical issues of the e-learning system.							
I am confident in using an e-learning system even if there is no one around to show me how to do it.							
I am confident in using an e-learning system even if I do not have an online manual for reference.							
I am confident about using an e-learning system even if I have never used such a system before.							
I am confident in using an e-learning system even if I have never watched someone using it before trying it myself.							
I could complete the academic activities using the e-learning system even if I could not find anyone for help when I got stuck.							
E-learning system enables interactive communication between the instructor and students.							
The e-learning system has all the necessary features.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
The e-learning system's interface design is user-friendly.							
The e-learning system provides a wealth of high-quality learning resources.							
E-learning system facilitates interactive communication between educators and students.							
Communication tools in e-learning systems (chat, e-mail, and forum) are effective in facilitating interactivity between users.							
E-learning system provides an opportunity to control communication between instructors whenever students require it.							
E-learning system allows controlling the learning sequence.							
E-learning tools provide useful assistance online when there is a problem.							
E-mail inquiries can be made with the service provided when there is a problem.							
E-learning system offers good technical support.							
I have technical difficulty in accessing and using e-learning in the university.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Most of the students in my department use the e-learning system.							
Most of the students in my faculty use the e-learning system.							
Most of the students in my university use the e-learning system.							
As more educators use the e-learning system, I think related services and support will soon be developed.							

16. Please select the option which most accurately reflects your agreement/disagreement with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Using online tools enables me to accomplish my academic needs more quickly and efficiently.							
Using online tools enables me to accomplish tasks quicker than attending classes face to face.							

	Strongly Disagree		Somewhat Disagree	Neither agree nor disagree	Somewhat agree		Strongly Disagree
Using online tools would improve my learning performance.							
Online tools enhance equality among all students (Example: System offers an equal chance for students to carry out tasks and communicate with faculties).							
Using online tools increases the quality of the learning process.							
Using online tools would enhance my effectiveness in learning.							
Learning to operate the e-learning tool (e.g., MS team, Google Classroom, Moodle) is easy for me.							
My interaction with the tool (e.g. MS team, Google classroom) is clear and understandable.							
I would find the e-learning systems easy to use.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
It is easy for me to become skillful in using the systems.							
I would find it easy to get the online systems to do what I want them to do.							
My peers who influence me a lot think that I should use online systems.							
People (e.g. family members, and opinion leaders) who are important to me think that I should use the system.							
In general, my university has supported the use of the system.							
To me, the Internet connection I use is not costly.							
I always have access to a high-speed Internet connection from anywhere to use online systems to attend classes and assessments (e.g. quizzes, and case studies).							
The device I use to get connected is quite advanced and compatible.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
All payments related to an internet connection, subscription, and recharge are paid using a mobile wallet, such as bkash, and Rocket.							
I would be able to use the e-learning tools in the future.							

17. Please select how much you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Using the tool is entirely within my control.							
I have the resources, knowledge, and ability to make use of the system.							
I intend to use the tools in the future if an opportunity is given.							
I plan to use online systems in the future whenever needed.							
I predict I would use the system whenever I get instructed.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
I would recommend this platform to my friends.							
I intend to continue using the e-learning system in the future.							
I prefer to attend classes and take all assessments online if there is a need for this.							
I like to use online platforms for teaching purposes.							
I often use e-learning platforms to boost my knowledge.							
I very often use e-learning to attend classes.							
The e-learning system runs stable.							
The e-learning system is fast and responsive.							
The e-learning system has all the necessary features.							
The e-learning system's interface design is user-friendly.							
The e-learning system provides a wealth of high-quality learning resources.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
The e-learning system provides courses with clear learning objectives.							
The e-learning system provides courses that cover only the main points.							
The courses offered by the e-learningsystem are very attractive to me.							
I have the resources necessary to use the e-learning system.							

18. Please rate the following aspects of online learning.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Online learning enlarged my scope of learning beyond the textbook.							
Online learning helped me to become more knowledgeable in the subjects.							
Online learning helped me to achieve better academic results.							
Online learning developed my ability to do group discussions with my classmates virtually using other means, such as Facebook, Viber, etc.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Disagree
Online learning developed my ability to work with my teacher both online and offline.							
Online learning developed my abilityto ask critical questions while attending classes online.							
I prefer to finish all assessments (e.g. take-home quiz, case study) by the deadlines while completing courses online.							
I wish to take class notes of class instruction while attending classes online.							
I usually participate in online class discussion.							

19. What facilities or schemes are offered by the institution you currently work for?

(Multiple options can be selected)

- Several classrooms of my university are equipped with high-quality video conferencing, automated video recording of lectures, and speech reinforcement technology.
- University provides online virtual laboratories beyond the limits of the university's physical laboratory space.
- University offers campus-wide wireless networks to ensure high-speed and wireless Internet facilitating a mobile learning experience.
- University provides enough computers, robust wired and wireless networks, and servers.
- University provides digital learning devices (laptop/tablet/mobile) schemes for teaching staff and students.
- University's classrooms are fitted with computers, projectors, and sound systems.
- University has Introduced a LMS (Learning Management System) for sharing educational resources (e.g., courseware, notes, presentations, videos, images).
- University has set up an archive of digital assets (open digital repository system), i.e., DSpace.
- University owns a dedicated server, wired and wireless network.
- University provides tutorial rooms designed to bring students together to facilitate social interactions and small group discussion.
- University has several partnership agreements with edX or Coursera on Open Educational Resources (OERs).
- University employed learning technologists with the necessary skills and experience.
- University provides facilities to record lectures, which are available for students to download.

- Students are given the response devices widely known as 'clickers', which are mainly student response system software, to enable peer-to-peer learning and interactive engagement with teaching staff during lectures or tutorials.
- Classrooms and lecture halls can be converted into collaborative learning spaces with flexible seating, multiple displays, and a variety of multimedia capabilities.
- Campus-wide dedicated browsing labs are available for the students.
- Classrooms are equipped with lecture capture technologies.
- The Design Studio or Media Center is installed with useful software resources, e.g., Adobe Flash, Adobe After Effects, and Adobe Premiere to facilitate the design of the rich content, including various learning media from basic streaming media to high definition.
- One-Stop Service or Unit for dealing with the technical issues of e-learning systems.
- Coupled with traditional lecture halls, few classrooms are equipped with multiple whiteboards and improved ICT facilities, which facilitate collaborative work, group discussion.
- Smart Classroom that integrates the use of all types of learning devices (e.g., tablets, laptops, smartphones, PCs, clickers, cameras, AV tools) and other system software.

20. How important are the following features of an LMS (Learning Management System) appropriated for Bangladeshi HEIs? (Multiple options can be selected)

	Not at all Important	Slightly Important	Moderately Important	Important	Very Important
Embedded multimedia content, such as video and audio playback					
Polling feature to conduct a survey					
Document publishing					
Chat rooms					
Assignment submission system					
Content building tools					
Screen sharing					
Video Conferencing Applications					
Maker, a type of software program, to build course materials					
Plagiarism detection tool					

	Not at all Important	Slightly Important	Moderately Important	Important	Very Important
Assessment tools					
Centralized learning materials					
Discussion Board					
Not listed above					

21. I am hoping to attend some of the courses that incorporate the blended method (combining both the online and offline mode) in the future.

Yes No

Please write comments or suggestions or feedback that you want to share with us.

Appendix C: Division-wide Participating Institutions (Educators)

Divisions	Districts	The number of institutions that participated
Chattogram	Chattogram	4
Dhaka	Dhaka	15
	Shariatpur	1
	Gazipur	1
Khulna	Khulna	1

Divisions	Districts	The number of institutions that participated
Rajshahi	Nawabganj	1
	Rajshahi	1
	Natore	1
	Dinajpur	1
Sylhet	Sylhet	1

Appendix D: Participated Universities (Learners)

Divisions	Districts	Name of the institution	The number of participants
Chattogram	Comilla	1. CCN University of Science & Technology	5
	Noakhali	2. Comilla University	4
		3. Noakhali Science and Technology University	4
Dhaka	Dhaka	1. American International University –Bangladesh	45
	Gazipur	1. Bangladesh University of professionals	1
		2. BGMEA University of Fashion and Technology	11
		3. BRAC University	25
		4. City University	17
		5. Daffodil international University	18
		6. East West University	3
		7. International Standard University	29
		8. International University of Business Agriculture and Technology	31

Divisions	Districts	Name of the institution	The number of participants
Dhaka	Gazipur	9. Islamic University of Technology	33
		10. Jahangirnagar University	12
		11. North South University	11
		12. Northern University Bangladesh	31
		13. Southeast University	1
		14. University of Information Technology and Sciences	31
		15. 16. United International University	1
		16. 17. University of Dhaka	9
		17. 18. Uttara University	1
Rajshahi	Dinajpur	1. Hajee Mohammad Danesh Science and Technology University	3