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In search of a Blended Learning Framework for Secondary Education in Bangladesh

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Abstract

This article explores the possibilities of implementing blended learning in secondary classrooms and proposes a framework for secondary education in Bangladesh. A mixed-method approach to data collection was considered. Teachers and students at the secondary schools were the main participants. A questionnaire survey, document review, online class observation, focus group discussion, and in-depth interview sessions were administered. The study found that while the National Education Policy and ICT policy emphasise ICT ensuring quality education, ICT integration in an emergency context was not found. A specific focus on blended learning was also missing. The study identified that the secondary schools conducted online classes and assignments during the covid-19 period; however, students' participation was low. The study also revealed that most schools had a minimum set of ICT resources; however, these were not enough to run a blended education. The teachers and students showed a positive attitude towards blended learning. This article proposes the Preparation-Engagement-Settlement (PES) framework. The secondary schools and the local education office are recommended to ensure the components of Preparation and Engagement; however, the ministry of education is suggested to take care of the Settlement components.

Keywords: Blended education, Blended learning framework, Learning approach, Secondary education, Bangladesh

Introduction

Integration of Information and Communication Technology (ICT) in education is not a new phenomenon; however, the form of integration has rapidly been changing with times and situations. For instance, continuing teaching-learning activities in schools and universities during an emergency such as the COVID-19 pandemic by using various online platforms is a new episode in the educational history of Bangladesh. Though the higher education institutions

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(HEIs) of Bangladesh, particularly the private universities of Bangladesh, have been using several ICT tools and infrastructure (Chowdhury, 2019; Roy et al., 2021) and one of the best ways to implement this is through blended learning. However, the implementation of blended learning program at Higher Education Institutions (HEIs), such practice is comparatively limited in secondary education.

While the Government of Bangladesh (GoB) has been trying to introduce ICT in secondary schools, the National ICT policy of Bangladesh that was framed in 2018 focused on integrating ICT into the curriculum, pedagogy, and teachers' training processes. Several studies proved that computer-assisted learning positively impacts teaching-learning activities and improves the students' performance, particularly in secondary education (Sharmin & Roy, 2011). Therefore, the GoB has provided different kinds of ICT tools such as laptops, projectors, and other internet connectivity equipment in secondary schools since 2010 (Babu & Nath, 2017), and almost all secondary schools have a minimum ICT infrastructure.

Having ICT in secondary schools and effective use of these are two separate issues. Studies show that though secondary schools have been using the ICT infrastructure, the schools faced various challenges in running educational activities during the COVID-19 pandemic. Providing online teaching and learning was a new experience for Bangladeshi schools, and therefore, several challenges were observed (Adnan & Anwar, 2020; Roy et al., 2021). The main intention of such teaching-learning was to bring the teachers and students into educational activities. However, this is still an issue of debate whether the secondary schools of Bangladesh could provide effective online education. Both the teachers and students lack the required resources. In addition, teachers lack proper pedagogical and technical knowledge about online education (Adnan & Anwar, 2020). The encouraging thing that COVID-19 brings is that most educational stakeholders realise the necessity of online education, which will last beyond the pandemic. Evidence from other studies shows that there is enormous scope to integrate ICT into traditional and online teaching-learning activities even in the regular time. Besides, Bangladesh is a disaster-prone country where both human-made disasters and natural disasters are common; thus, mixing both approaches, blended in nature, can be a potential solution for Bangladeshi educational institutions.

Concept of blended learning

Mixing face-to-face instruction and online learning are considered blended learning (BL) (Arabasz et al., 2003; Bliuc et al., 2007). This definition is still controversial. While BL is defined as the mixing of technology with the self-study context that could meet the needs of individuals (Gray, 2006), this term is also often used from the perspective of the teaching process (Oliver and Trigwell, 2005). In many cases, BL is considered a combination of different learning styles incorporating the ICT environment. In these concepts, BL was characterised as a flexible learning environment and student-oriented (Concannon et al., 2005). Institutional preparedness is also a matter of concern in understanding the implementation process of BL. Even though many secondary or higher secondary education institutions are aware of the differences between face-to-face instructions and online modality learning, the implementation process for BL is still questionable as they might not reduce face-to-face

instruction time. Considering these debates, many focused on the learning context while defining the term BL. The educational institutes are not equally equipped, and the learning policies and curriculadiffer at different levels. Therefore, it is suggested to consider the study environment, the capacity of the teacher and students, and the availability of resources while designing and assessing the components of BL.

Challenges of blended learning

Critical barriers to technology adoption in education may be internal or external (Mumtaz, 2000). Straub (2009) reported that for sustainable educational technology, personal factors (e.g., skills and knowledge), innovation characteristics (e.g., personal experimentation), and impacts of the individual's context should never be neglected as part of the planning process. It is also identified that technical infrastructures such as a lack of computers, internet access, and LMS instability could prevent a successful BL journey (Alvarez, 2020). Some difficulties of ICT integration were also highlighted, including a lack of ICT facilities, inadequate maintenance of accessible or existing ICT resources, and a lack of ICT budget. Research revealed that not all faculty members are interested in BL. It is also discovered that designing and developing lecture or teaching materials on a web-based platform takes longer than face-to-face engagement (Alvarez, 2020). Some argue that using a hybrid method is more rigorous regarding teaching and learning preparations. A study suggests that teachers in a BL setting should have at least the necessary knowledge and skills to properly blend the teaching and learning processes (Alvarez, 2020) which are not found in many settings. As a result, the use of technology tools should best meet the needs of the learners while also ensuring the appropriateness of the course's BL nature (Wolfgang et al., 2017). Faculty members' lack of technical capabilities (Maarop & Embi, 2016) impacts students' learning discovery, and, as a result, some academics have a negative view of blended-based approaches (Alvarez, 2020). Some challenges include lack of faculty training and support, language obstacles, and weak promotion incentives for BL initiation.

Blended learning models and frameworks

The BL models and frameworks are made considering the specific situation and contexts. Driscoll (2002) mentioned about four items: 1) combination of various web-based technologies, 2) combination of different pedagogical approaches, 3) combination of instructional strategies and technologies, and 4) combination of instructional technology with job tasks in improving learning transfer. These four items should be considered for starting a BL approach as these altogether could provide holistic implementation guidance for effective BL. On the other hand, from a broader and didactical perspective, Valiathan (2002) identified three BL groups for readiness: skill-driven, attitude-driven, and competency-driven. The preparedness for BL could be different based on the context of the educational institutes. The 3C-model of the didactical component discussed three types of specific readiness for BL (Kerres & Witt, 2003). The first one is content that should be available to the learners. The next one focused on the communication process that emphasises the interaction between students and teachers and among the students. The third readiness is constructive, focusing on guided individual and cooperative learning procedures to meet the learning complexities.

Khan (2010) proposed eight specific areas that should be incorporated into a BL design. In this framework, both pedagogical and technical aspects were considered, and some other additional support from the educational institutions got equal importance to ensure an effective BL system. All eight areas have specific sub-areas that could be used to understand the preparedness of the educational institutions regarding their journey towards BL. Wang et al. (2015)focused on six interrelated sub-systems: institution, teacher, content, technology, learning support and learner, in their Complex Adaptive Blended Learning System model.

The study context

During COVID-19, many secondary schools extended their scope and capacities in using ICT infrastructures; however, it is not yet discovered whether these activities align with the features of BL. The use of ICT is rapidly increasing in Bangladesh, and both teachers and students are using different kinds of ICT equipment in their schools and at home. However, it is a matter of investigation if ICT is being used effectively for teaching-learning activities. During the COVID-19 pandemic, the Ministry of Education of Bangladesh identified the potential of using a blended approach in Bangladesh's educational settings. The University Grants Commission, Bangladesh, has already provided a BL guideline to the universities yet to be implemented. Similar discussions were observed for secondary education too. Chowdhury (2021) discussed the five key elements and three enabling factors for a BL framework in which teaching-learning practices, content and resources, assessment, teachers' capacity development and inclusive infrastructures were discussed as the principal elements for a BL framework. The study team searched for relevant literature to understand the situation of BL in secondary schools but did not find such evidence-based literature. This provides a gap in literature if the secondary schools were prepared for BL. Therefore, this study aims to explore the possibilities of implementing blended learning in secondary classrooms and proposes a model/framework for secondary education in Bangladesh.

Methodology of the study

A mixed-method approach to data collection were considered. Quantitative data were collected to understand the situation regarding various aspects of blended and online education. Qualitative data were collected to understand the reasons behind such situations and explore the various phenomena.

Participants

For the survey, 30 secondary schools, ensuring rural-urban representation, that run online teaching-learning activities during the COVID-19 pandemic were purposively selected. This sample size has the adequate power to distinguish normal distribution from other distributions (Greenwood & Sandomire, 1950). For the qualitative part, 20 teachers, 10 from grades 9-10 and 10 from grades 6-8, were selected purposively from the same schools sampled for the quantitative part. A similar strategy was followed in choosing the students; however, additional 8 focus group discussion (FGD) sessions were administered to them. Besides, 20 online class observations were made, both synchronous and asynchronous.

Data collection

Headteachers, subject teachers and students at the secondary schools were the main participants, and five data collection procedures were administered.

Questionnaire survey: To identify the resources of the schools regarding implementing blended education and to understand the teachers' capacity and preparedness, a survey questionnaire was developed. The entire questionnaire was pre-coded, and the survey questionnaire was pre-tested to ensure both validity and reliability. Before data collection, the research team piloted the survey questionnaires in two schools and then made it final.

Online class observation: The study team observed the online class activities of the secondary school teachers. A customised Online Teaching Evaluation for State Virtual School questionnaire was followed to observe the online class (SREB, 2006). Based on the SREB guidelines, the research team thoroughly reviewed the observation checklist and made necessary changes according to the teaching-learning practices in the secondary schools of Bangladesh.

Focus group discussion: A total of 8 FGDs were conducted with students from four schools, and the range of the participants in each FGD session was from 6-10 persons. The FGD sessions were guided by a written guideline covering indicators of the study. In each FGD session, representation from both boy and girl students was ensured.

In-depth interview: 20 teachers and 20 students who continued their teaching-learning activities during the COVID-19 pandemic were selected purposively for the interview sessions. The participant-specific semi-structured questionnaire was followed during interview sessions.

Document analysis: Two policies were reviewed to understand if there are specific policies related to BL in Bangladesh. The National Education Policy (NEP) 2010 and the National Information and Communication Technology Policy (NICTP) 2018 were reviewed, particularly the chapter related to ICT and education.

This study followed the ethical considerations in all stages of the research, particularly in the data collection process (Braun and Clarke, 2006). The study objectives and data collection procedure were explained to them, and after getting their consent, the data collection procedure started. Confidentiality, as well as anonymity of the participants, was ensured. The entire research protocol was made, validated and then finalised after approval from the National Academy for Educational Management (NAEM), Ministry of Education, Bangladesh.

Data analysis

For quantitative data, descriptive statistics were used, while a data-driven thematic analysis procedure was followed for the qualitative part (Braun and Clarke, 2006). The primary data were categorised, developed the new theme, and constructed the thematic map (Cohen, Mannion and Morrison, 2011). All the researchers were involved in reading the initial data and then making the codes separately. After a careful discussion, only the common codes were considered for analysis.While Denzin (1978) proposed two types of methodological triangulation, within and between or across methods, many researchers proposed adding three

more triangulation processes to ensure validity and reliability. Therefore, all the variables selected for the study were triangulated based on the features of all four triangulation, such as data, investor, theoretical, and methodological triangulation.

Results

Review of existing policies

The NEP of Bangladesh emphasises integrating ICT into education components. In Chapter 1 related to aims and objectives of education, it is mentioned, "12. to attach substantial importance to information and communication technology (ICT) along with maths, science and English in order to build up a digital Bangladesh based on knowledge-orientation and cultivation of ICT" (MoE, 2010, p. 2) and "21. to extend the use of information and communication technology (ICT) instrumental in educational process at every level" (Ministry of Education [MoE], 2010, p. 2).The use of ICT is also focused on the vocational and technical education (VTE) section of the policy. ICT integration within the VTE curriculum received the highest importance in the policy as VTE could help the country produce a skilled workforce.

The NICTP 2018 clearly emphasises ICT issues, particularly in education. Under the action plan, this policy provides a comprehensive strategy to cover all the areas related to ICT (Ministry of Post, Telecommunication and Information Technology [MoPTIT], 2018). The NICTP emphasises integrating ICT education from the primary level and in all streams. This also focuses on ensuring quality education by using ICT in education. For that, the policy suggested setting up computer labs with high-speed internet connections in all educational institutions. Besides, this policy suggested some strategies aligned with the BL environment. This policy also focuses on providing necessary training to all teachers of the level of education (MoPTIT, 2018). It can be said that the NICTP gives enough emphasis on using ICT in education. This policy identified almost all key areas of development concerning ICT and educational development. The policy also focuses on e-learning and digital education, a base for blended education. All of these can help establish a BL environment.

While both the NEP and the NICTP emphasise ICT and ensuring quality education using ICT resources, integration of ICT and education in an emergency context is not found. Moreover, a specific focus on blended education and online and offline use is missing.

Views of teachers and students

Most of the teachers showed a positive attitude toward BL and discussed how it would help the students. On the contrary, some teachers did not find the necessities for BL at the school level. According to them, the students will not attend online classes if school remains open. A teacher from Rajshahi said, "I don't have a clear concept of blended learning, but online and offline both combinations can be better. If offline classes run at full speed, we do not need to go online." However, some of the teachers viewed it as an opportunity for learning. They opined that the students were already used to online classes, and thus, continuing both online and offline classes will not be difficult for the teachers. Some teachers viewed BL as an initiative that could save time and money. They consider it better than solely face-to-face

classes or online classes. The teachers thought it would help the students to learn better. A teacher's view from Chapai Nawabganj is:

It will be better if we continue this learning. It will be better for the emergency period as well as for the regular period. It will save time and money. And will be more effective than only offline classes. I think our students will learn better. So, it will bring a better outcome. We should be sincere in doing it. And I believe it'll help.

Some teachers also showed negative attitudes towards BL because of networks and other issues. Due to the poor network, there remains a communication gap in online classes as there is a lack of real-time communication.

The students' findings show that most were interested in participating in both online and offline learning. However, like the teachers, they showed concern about students who could not afford any smart device to participate in online learning. Some thought that traditional offline classes are better if the device cannot be ensured for everyone. Because if BL was implemented there, many students who did not have smart devices would not be able to participate in the classes.

Available resources to implement blended learning

The teachers opined that the schools had not enough ICT resources. For instance, the schools had, on average, less than one television and less than one tab; however, the schools, on average, had around ten computers for teaching-learning purposes. The schools in urban areas mainly had sufficient computers, according to the teachers. It is also found that six schools did not have any desktop, 17 schools had 1-5 desktop computers, three schools had 6-10, and five schools had 11-15 desktop computers. The average ratio of desktop and student was 1:90. All the classrooms were not equipped with computers and projectors, which is necessary for a BL environment.While all secondary schools had active internet connections, only 15.6% of classrooms were covered under Internet connection. Findings suggest that the schools have some resources, but teachers thought these were insufficient to run a blended education. Schools in the rural areas were lacking behind in resources and required skills. The existing resources were not up-to-date, and teachers mentioned that most of the computers had low configurations and slow work, which could make it hard to run blended education. No school used any learning management system (LMS) necessary for a BL.

Results also show that around 69 percent of teachers of all categories of schools had ICT-related training. The teachers confessed that they had basic ICT training but did not help run a blended education. The findings show that the school has no plan to enhance its resources as increasing resources depends on the school's budget. However, all the school authorities felt they needed more proper, updated, and helpful resources to run the blended education. They also opined that government support was essential for building basic ICT infrastructure, equipment and internet facilities to introduce blended education at the school level.

It was asked if it was possible to start BL using the existing resources. Most of the teachers informed that it might not be possible to start BL activities using the existing resources. A

teacher from Rajshahi explained, "Our school is not capable of taking classes both online and offline completely but partially. We need Lab classrooms, laptops for teachers, multimedia classrooms, Wi-Fi facilities, etc. Considering that our school is not able to take classes both online and offline."

Proposed blended learning framework

The authors propose a BL framework for secondary education in Bangladesh based on the information mentioned above. The proposed three-stage framework is named as Preparation-Engagement-Settlement (PES) framework.

Preparation: In this first step, there are five specific groups or areas that need to be prepared for BL, such as school, teacher, students, parents and technological system (Table 1).

Table 1.

Component and factors of the preparation stage

Components	Factors
School infrastructure	1) Installation of ICT equipment (based on school's demand), 2) Electricity connection, 3) School environment, 4) LMS, 5) Teaching aids and materials
Teacher	1) Teachers' training on integration of ICT and pedagogy, 2) Training on software use, 3) Motivation
Student	1) Training on software and LMS use, 2) Attitude on building shared knowledge
Parents	1) Creating learning environment at home, 2) Understanding the student's needs
Technological system	1) Power sources, 2) Devices, 3) Internet connection

For school infrastructure, this framework proposed to have five specific resources in every secondary school (Table 1). Besides, teachers should be prepared to implement a successful BL program. Notably, teachers' training is necessary for both ICT and pedagogical issues so that effective use of ICT resources is possible. Using specific software is important, and motivation toward BL is another important issue. Like teachers, students should also be trained particularly for using specific software. Establishing a mechanism for a shared learning environment is important, and engaging students in such a system is one of the important components. Parents also need to be prepared to support their children. It is necessary to ensure a reliable internet connection for all students. Similarly, uninterrupted power sources and smart devices should be available to teachers and students. Such a supporting and advanced technological system must be established in schools and students' homes.

Engagement: This second step illustrates the seven dimensions and their relationships: the learner, the teacher, the technology, the content, the learning support, society and the institution (Table 2). At the institutional level, it must be demonstrated that BL is compatible with the institution's values and capable of improving the institutional goal. The institutional dimension concerns organisational, administrative, academic, and student services issues.

Personnel planning a learning program may inquire about the school's readiness, the accessibility of content and infrastructure, and the learners' demands. The institution's inclusion as a framework sub-system elevates BL from the course to the institutional level. Institutional support mechanisms such as strategy, guidelines, assistance and service should be given to enable BL. These mechanisms are linked and influenced by the learner, the teacher, technology, content and learning assistance. In turn, the institution becomes a major driving force in developing the sub-systems surrounding it.

Table 2

Component and factors of the engagement stage

Components	Factors
Institutional perspective	1) Institution's values and capability, 2) Organisational structures, 3) Inclusiveness, 4) Support service
Instructional design perspective	1) Content and learning objectives, 2) Learning materials, 3) Pedagogical orientation
Technological perspective	1) Specified delivery process, 2) LMS, 3) Learning environment
Teacher role	1) Teachers' capacity and motivation, 2) Facilitation process, 3) Communication and connection
Learner perspective	1) Learners' engagement, 2) Shared knowledge
Assessment perspective	1) Monitoring, 2) Individual and collective feedback, 3) Continuous evaluation, 4) Online and offline exams, 5) Flexible assessment
Social perspective	1) Collaboration, 2) Sharing and interaction, 3) Networking

Settlement: The final step of this framework is the settlement, in which performance, support system, monitoring and feedback are the four components (Table 3). The first two steps need to be implemented at the school level; for this one, the central education authority will also be a part.

Table 3.

Component and factors of the settlement stage

Components	Factors
Performance	1) Administration, 2) School, 3) Teacher, 4) Student
Support system	1) Technological, 2) Psychological
Monitoring	1) Ministry/directorate, 2) Local education authority
Feedback	1) Teachers, 2) Students

Administration refers to the local education authority responsible for demand assessment, planning and policymaking, workforce recruitment, and arranging training for the administrative body. The task of the authority will be to ensure quality training for school administration, such as SMC members, head teachers and other teachers. Teachers will need to get and use the device when necessary. On the other hand, some psychological issues need to be addressed to ensure proper BL. Ensuring social participation and communication could play an imperative role and the school authority needs to motivate the teachers and students. These three groups, family, school and society, need to work jointly. The Ministry of Education or respective directorates, local education offices, and the school authority will play key roles in monitoring activities. Regular feedback from teachers and students should be taken so that if something goes wrong or a new problem arises, it needs to be resolved as soon as possible.

Discussion and recommendations

While the NEP and the National Information and Communication Technology Policy provided several specific recommendations and strategies to implement ICT components in education; however, there are scopes to integrate ICT and education in different ways. For instance, there are no recommendations and strategies on how education and teaching-learning activities can be continued during an emergency. Bangladesh faces natural and human-made disasters each year, so a provision of alternate education is necessary. BL can be a solution to continue teaching-learning activities during an emergency. However, it is important to note that the secondary schools in Bangladesh have some ICT resources, and many teachers have already received ICT training (Sharmin& Roy, 2011). To implement BL in secondary education, teachers must be trained on specific issues such as integrating ICT and pedagogy, using software, using computers and the internet in the classroom, online assessment systems, etc. (Mumtaz, 2000). The analysis shows that if all the recommendations and strategies of both the policies can be implemented, it will establish a strong base in both school and home to build the capacity of the people, including the teachers and students, and it will help implement the features of BL easily.

It is also important that most secondary school teachers showed a positive attitude toward implementing BL in their schools. In general, it may take a reasonable amount of time to change the mind of a group of people to a new idea or new approach. In this lens, the teachers at the secondary schools were already motivated as they thought the BL approach could be fruitful for the students. Students also hold a similar view. Most students considered online and blended education fruitful for them; however, many of them argued that many of their peers could not utilise this system because of the limited resource.

To implement BL in secondary schools, it is necessary to have adequate resources. Without enough ICT resources, it will not be possible to run all the features of blended education. The study identified that while the secondary schools had some resources, the allocation needs to be increased considering the number of teachers and students. To ensure a suitable environment for BL, all secondary schools should have adequate desktop computers, laptop computers, high-speed internet connections and an uninterrupted power supply. One of the important findings is that the schools had no specific plan to increase their resources. Instead, they depended on the local authority and the government as they expected to get resources from them.

This study proposed a BL framework. While there are many models and frameworks worldwide (Driscoll, 2002; Khan, 2010; Valiathan, 2002; Wang et al., 2015), this specific framework is made particularly for the secondary schools of Bangladesh. One of the differences between this framework and others is that while most frameworks provide one-step activities, this framework offers three-step activities. In the first steps, the schools, teachers, students and parents should be prepared for blended education. Besides, school infrastructure and technological systems are two essential components for preparing schools for blended education. This is mainly the school-level preparation; however, necessary support from the local and central authorities is also important as some practices might not be possible without their extended support. In the second step, all the stakeholders related to the secondary schools need to be engaged. After ensuring all the preparations, all the stakeholders need to be involved with the blended education using this step's seven dimensions and perspectives. To ensure an effective blended education, these interrelated perspectives discussed in the result section are important as the entire system needs to be considered holistic. The final one is the settlement, as both the school and the local and central education authorities have to do some settlement-related work so that the best output from the BL activities can be possible. Both local and central monitoring and feedback from the field are expected in this step. The last two stages are interrelated as the second stage's success depends on the third stage's good implementation.

This study has some limitations. While the study report presents the existing BL situation regarding policy, resources, capacity, views, and perception, the components cannot be generalised as the sample was too small to provide representative findings. The proposed framework might be less appropriate for secondary schools with very few or no resources.

Recommendations

The research team proposes four recommendations to ensure a BL environment and implement the features of BL in the secondary schools of Bangladesh. Firstly, a specific guideline on BL should be made and provided to the secondary schools of Bangladesh. In addition, specific policies or procedures on education in emergencies should also be made so that teaching-learning activities can be continued through blended education without any learning gap. Secondly, both the teachers and students should be prepared for BL. Teachers and students should get specific training on using specific software for blended education. Thirdly, resources should be available to both teachers and students. All the teachers and students must have a smart device with high-speed internet. The Ministry of Education can make arrangements with the banks and device companies so that the teachers and students can buy the smart device with a low-cost option or using soft loan facilities. On the other hand, the ministry should also work with broadband internet companies and mobile phone companies so that all the teachers and students can get high-speed internet properly. And finally, this proposed framework is based on perceptions of the teachers and students; however, this needs to be examined. It is recommended to do piloting in some specific secondary schools to understand how this framework works. On the other hand, an experimental study should also be conducted that will consider both the control and experimental group to determine if the framework could provide a specific difference in terms of the components and factors of the framework.

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