

Study on the Role of Learning Management System to support the Distance Education in Bangladesh during Covid-19: The Case of Bangladesh University of Professionals and Bangladesh Open University

Khondoker Mokaddem Hossain PhD, Pro VC, Bangladesh University of Professionals (mokaddemdu@yahoo.com)
Mahbuba Nasreen PhD, Pro VC, Bangladesh Open University (mnasreen@du.ac.bd)

Abstract:

The COVID-19 pandemic has led to the disruption of face-to-face education system ever. In order to overcome the situation, Bangladesh University of Professionals (BUP) and Bangladesh Open University (BOU) has introduced different teaching-learning methods by integrating Learning Management Systems (LMS). In line with this, BUP and BOU have applied technology supported online education in their teaching-learning activities. The study investigates how the LMS supports the application of software for administering, documenting, tracking, and delivering of courses, conducting examinations, setting questions, evaluating scripts and publishing results within e-learning system, and support students and faculty activities during classes delivered through Zoom, and/or Google Meet/Google Classroom. This study further investigates factors of adoption of LMS by faculties for teaching-learning during the COVID19 pandemic in the academic year 2020–2021, in which the distance education framework was implemented. The study deployed the case study and qualitative research methods. For better understating the adoption of LMS by faculties, the study collects views from selected faculties and collated with the Diffusion of Innovation (DOI) theory by Rogers. The findings of the study will help the planners, researchers, development practitioners, administrators and policy implementers for better applications of LMS for distance education

1. Introduction

Technology has impacted every aspect of life. Education, of course, is no exception because opportunities for formal learning are also available online. Not only that teacher's use technology in the classroom daily. In addition, they also use technology to improve communication. In this way, technology has been the part of student-teachers' life during the COVID19 pandemic and still now going on. In Bangladesh, during the coronavirus outbreak, educational institutions throughout the nation have transitioned to virtual teaching. 99% area of the country is of under mobile network and teacher--students are using social-media such as Facebook, WhatsApp etc. In this way, a technology culture prevails in the country for last couple of years because of implantation of digital-Bangladesh promised by the last government. Capitalizing this opportunity and by leveraging technologies such as virtual reality, teachers-students in Bangladesh are engaging virtually in teaching-learning. This is just transformation of way of delivery of content. We also see teacher-student platform has been changed from in-person platform to virtual platform what is known as Learning Management System (LMS) which assists the teachers-students delivering & receiving the materials, conducts tests and other tasks, track student performance, and keep records. It is necessary to mention that LMS focuses on online learning, but supports many features to conduct blended learning. During coronavirus most of the educational institutions used virtual classroom activities through Zoom and Google Classroom for the delivery of classes and tutorials. Some described it as distance education which is conceptually wrong because it is one kind of face to face (f2f) education. Technology-Enabled Learning (TEL) is different from f2f. TEL engages students in learning through only technology. On the other hand, the f2f may use technology, but engagement is different form distance learning. Distance learning uses LMS for engaging learners in a single platform. In line with this, Bangladesh Open University (BOU) uses MOODLE for LMS. During the COVID fallout other conventional universities in Bangladesh also adopted the technology to support in-person classes. Bangladesh University of Professional (BUP) as a conventional university uses the LMS during the Covid-19 pandemic. This study depicts the case study of two universities which uses the diverse mode: ODL and conventional f2f mode.

2. Theoretical Framework

This section reviewed the technology adoption models and theories leading to conceptual framework for adoption of technology (here: Learning Management System) for BUP and BOU. This is needed to limit the scope of the collected data from two universities focusing on couple of variables and designing the viewpoint (framework) for the current research on adoption of LMS in the academic year 2020-21.

i) Theoretical frameworks for Technology adoption

The following theories are well known models applied to ICT adoption, and therefore were selected and considered (after review of related literature in this area of study):

- Diffusion of Innovations (DOI) (Rogers, 1995)

- Theory of Reasonable Action (TRA) (Fishbein and Ajzen, 1975)
- Theory of Planned Behavior (TPB) (Ajzen, 1985; 1991)
- Technology Acceptance Model (TAM) (Davis *et al.* 1989)
- Technology, Organization, and Environment (TOE) Framework (DePietro *et al.* 1990)
- Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.* (2003)
- Social Cognitive Theory (SCT) (Bandura, 1986).

ii) *Adopted framework for the current study*

DOI of Everett Rogers, considered as father of traditional communications, was considered while formulating the decision to obtain reflections by teachers on adoption of LMS at BOU and BOU. Rogers (1962) developed this theory which is a social science theory, tells about how, over time, an idea, behavior or product gains momentum and diffuses (or spreads) through a specific population or social system. We may have the question – what is the end result of this diffusion? People are part of the social system and finally they adopt any new ‘idea’, ‘behavior’ or ‘product’. This gradually brings in behavioral changes in human beings. According to this theory, adoption does not happen simultaneously in a social system; rather it is a process whereby some people are apt to adopt the innovation faster than others. There are five types of adopters – innovators, early adopters, early majority, late majority, laggards is displayed in Figure 1.



Fig1: Adopters of Diffusion of Innovation Theory
Source: Sahin, (2006)

- Stage 1: Innovators - Highly interested in new idea, Venturesome, only 2.5%
- Stage 2: Early adopter- Represented as opinion leader, 13.5%; embrace change opportunities; already aware of need of change
- Stage 3: Early majority - Need evidence that the innovations works well; find the success stories; this comprises 34%
- Stage 4: Late Majority - Adopt innovation after it has been tried successfully by the majority; special; it comprises 34%
- Stage 5: Laggards - Posses traditional mentality and very conservative; very skeptical of change and it comprises 16%.

This theory explains that adoption of innovation happens through several stages which include understanding, persuasion, decision, implementation, and confirmation.

There are five main factors that influence adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories.

- *Relative Advantage* - Degree to which an innovation is seen as better than the idea, program, or product it replaces.
- *Compatibility* - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
- *Complexity* - How difficult the innovation is to understand and/or use.

- *Triability* - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.
- *Observability* - The extent to which the innovation provides tangible results.

This theory, has been considered while formulating the consideration to obtain the reflections by faculties on LMS in BOU and BUP.

3. Objectives of the Study

The objective of this study is to examine how the diffusion occurred for innovation adoption of LMS in two public universities diverse in mode of delivery. Two universities have placed the LMS, but all teachers did not adopt the LMS in their teaching-learning process. However, it achieves the following specific objectives:

- to identify the essential factors of adoption of the LMS in the mode of delivery;
- to ascertain the process of learner engagement through LMS during coronavirus pandemic;
- to ascertain the benefits of the users of LMS in their teaching-learning activities;
- based on i) and ii), suggest for increase in social interaction through LMS both for distance and f2f students;

The current study has the following research questions:

- What are the existing policies and guidelines in respect of using LMS in two universities?
- Teachers who using the LMS for teaching-learning, what is different from who adopt quickly than others in two universities?
- What is the attitude of the teachers engaged LMS towards the technology-Enabled Learning (TEL), and the status of use of technology by them?

4. Methodology

i) *Research design*

There are some studies that have explored the impact of LMS using variety of research designs (Turnbull, et al., 2021a). Case Study can portray a universal understanding of the research design of an empirical LMS study when an appropriate discussion on the characteristics and applicability exists ((Turnbull, et al., 2021b). Asamoah (2019) investigated the type and quality of learner support services provided to masters students who were engaged in blended learning using LMS. The study used a case study method because it allows the analysis of the conditions within which a phenomenon is situated, adding meaning to the characteristics of the studies phenomenon. Hasan (2019) investigated the efficacy of LMS at a Saudi University from the viewpoints and experiences of institution's LMS users deploying the case study method. McGuinness and Fulton(2019) investigated how students engage with e-learning also used the case study method as research design with appropriate explanations of data collection and analysis techniques. Our study also concentrates on investigating how the teachers and learners are engaged in virtual reality through the LMS in two Bangladeshi universities one uses ODL system and another uses f2f – but during Covid-19 both of them adopted LMS. Therefore, case study method has been deployed for this research.

ii) *Data collection*

The research used a case study method, and teachers were interviewed from BUP and BOU. Qualitative data were analyzed using the Roger's theory of Diffusion of Innovations. Adopters' motivation and factors (leadership decisions, technology, and relative advantage of use) that affect adoptions were mainly considered. Finally, findings of policy and organizational data were correlated with Roger's DOI theory.

iii) *The sample and instrument*

The sample is limited because few teachers use the LMS for their teaching process. Most of them are used Zoom and Google Meet for delivery of classes. A checklist was used to collect data from the 10 faculties of BOU and 10 from BUP. The checklist comprises some guided questions for revealing explanations 'for' or 'against' the adoption of LMS.

iv) *Data analysis*

Data were sorted by response and analyzed to reveal ways for University authority to enhance not only individual adoption, but identify organizational difficulties and best practices, as well.

5. Results and Discussions

5.1 Organizational Analysis

This section presents a comparative adoption of LMS between BOU and BOUP.

i) *Bangladesh Open University (BOU)*

BOU has 6 schools including one Open School which runs the Secondary School Certificate (SSC): Grade 9-10 and Higher Secondary Certificate (HSC): Grade 11-12. University, during COVID-19, all the online classes, teaching materials uploading, viva-voce, all examinations (class test, mid-term, and final), and assignments submission are conducted through the LMS. Fig 2 illustrates the students who used the LMS.

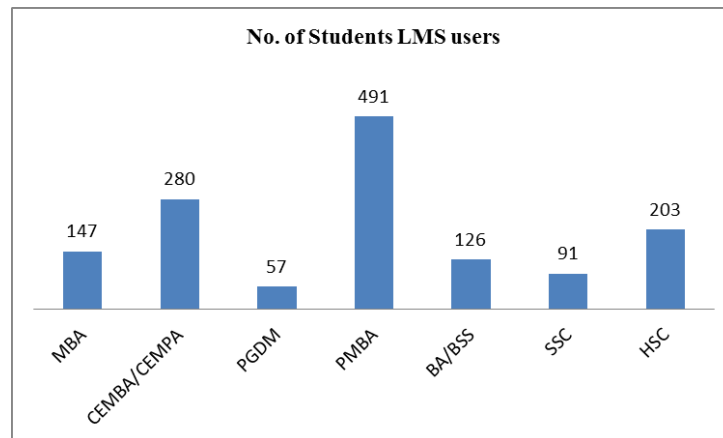


Fig 2: No of students – LMS users at BOU
(Source: ICT Department, BOU)

BOU introduced LMS in 2014 through a project activity sponsored by the Commonwealth Educational Media and Communication for Asia (CEMCA) in 2014. Very few teachers used it for their teaching-learning process although they were given training on it. During COVID19 they started to use LMS. School of Business has been the most users of LMS, and they used it for post-graduate programmes, mainly, three types of MBA and one PGDM. On the other hand, School of Social Sciences, Humanities, and Languages (SSHL) deployed in undergraduate students. BOU also extended the deployment of LMS at the pre-University programmes as well. This is an interesting finding i.e. the BOU has the professionalism in using the LMS and it confirmed at different levels ranging from certificate to postgraduates.

ii) *Bangladesh University of Professionals (BUP)*

In order to affiliate the existing educational and training institutes of the armed forces, Government established BUP in 2008. This is a public university run by the armed forces, and it already marked as provider of quality higher education in the country. It ensures the utmost use of ICT in the teaching-learning process. LMS has been one of the most important tools the University using from the COVID19 fallout, and continued the study programmes at a best effort basis. BUP provides web-based application through LMS and contents are delivered through it. In this way the University creates the blended learning environment for the students. In addition, teachers uses the Zoom and Google meet for conducting the virtual classes for the students. BUP uses LMS for different courses. Fig 2 illustrates the students' use of LMS at BUP.

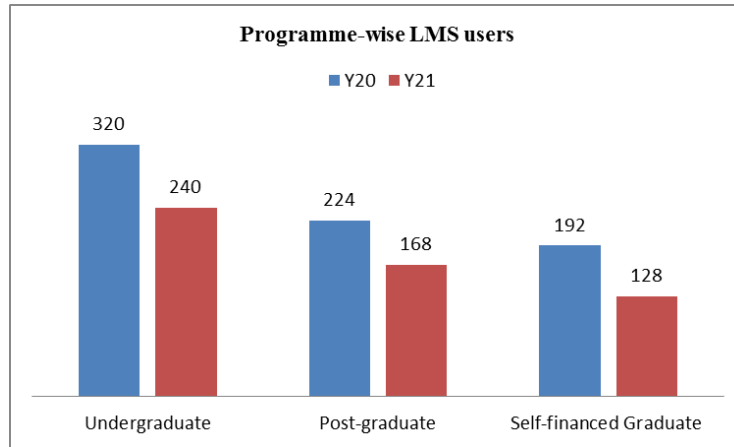


Fig 2: Programme-wise LMS users at BUP

5.2 Analysis of respondents' views

Rogers (1995) defines an innovation as “an idea, practice, or object that is perceived as new by an individual or other unit on adoption” (p.11). In Bangladesh, practice of innovation (LMS) was tremendously increased as was needed for supporting the existing system of education during COVID19. There was consensus from participants:

I have been using MOODLE for long. I think, this a good decision of adopting MOODLE for BOU because the University has lots of courses and students. It also offers lots of learning resources - textbooks and video lectures - for the students. My experience says that interface of MOODLE is quite complicated to understand. BOU IT department is strong enough to manage it for offering courses through LMS(BOU Respondent 1).

No need to say how COVID-19 fallout shocked the entire world and accordingly, my university resumed learning. Teaching community had followed ‘wait and see’, when it was lingered BUP started to use Zoom and Google Meet for online classes. Evaluation had been a channeled through these online meeting tools. Finally, university adopted the LMS for the academic year 2020-21, and it is standing strong (BUP Respondent1).

This also supported by the inventor level of DOI theory and according the Rogers’ (2003) the adoption and diffusion rate of technology increases when it attains ‘*compatibility*’ in terms of values, needs, beliefs, and experiences of early adopters. Here BOU is the early adopter of LMS, and BUP found that LMS is highly compatible to combat the COVID19 situation. This can be termed as diffusion of technology during pandemic and it was compatible.

LMS were the least used technology at BOU and BUP. Four participants believed that there was a need to provide technology for learners to study online during online because they think that LMS had features that added its value. That’s why, LMS has relative advantages.

My teaching subject accounting: I use LMS as it has different features: gasification, social learning, multi-tenant, certification, etc. Initially, I faced difficulty and once it is set, became user-friendly for me and for my students. I proctored more than 300 students using this LMS where I found no cheating as was monitored through video surveillance (BOU Respondent 2).

I adopted LMS because it gives me the ability to keep track leaner progress and ensure that they are meeting their performance milestones. I can offer them supplemental resources to improve their performance. It has feature of reporting and analytics tools that also allow me to pinpoint areas of my course that may be lacking (BUP Respondent 3, 9 and 10).

BUP is full-fledged f2f University. During Covid-19, it used distance education system through LMS. In this way, BUP participants believed that if LMS could be employed successfully it would facilitate f2f teaching. On the other hand, BOU is truly DL University, and technology is the heart of the delivery where adoption of technology is of obligatory rather option.

Some of the participants noted that had already been innovators and highly interested in new idea. They became venturesome because they believe in teaching through distance. There were agreements from the participants:

I use LMS it has familiar dashboard which enables me a logical course creation. Once I create a course, I feel comfortable using the LMS (BOU Respondent 3).

I use the LMS because all content is in one location, which allows me to update my lesson notes with necessary modifications without redoing my entire courses (BOU Respondent 7).

I am very excited to adopt the LMS for my course because once I upload the learning materials to the LMS, the students have unlimited access. They also can login to the platform via their smart phones, Webcam, and it is essential for the Nonresident Bangladeshi Residents (NRB) learners who are staying at the different time zone (BOU Respondent 4)

I adopted the LMS as it compliance laws. Exam regulation is subject to change on regular basis. LMS is a mainstreamed technology adopted by the University and maintained by the IT department. Therefore, I rely on it (BOU Respondent 8 and 10).

I believe that technology is a part of life; once it is ignored, I am backdated. That's why, I adopt instantly any new thing comes to me. LMS is a platform for delivering learning materials online which is the integral part of the eLearning courses. COVID-19 actually created options for the necessity of diffusion new technology in education (BUP Respondent 4).

They are treated as early adopters, and they adopted its assuming that LMS has relative advantages. Participants passed their views in such a way that LMS has been the best technology solutions. In a different way, one participant felt that LMS is adopted at the BUP was policy-driven and it's very timely:

This has been the alternative of in-person classroom and other administrative services. I did not know about it. My colleague motivated to use it (BUP Respondent 8).

Rogers categorized this kind of adopter as laggards who possess traditional mentality and very conservative; very skeptical of change. Even if the participant's view of LMS was negative, and it has a superior force that determined change. Some of the participants viewed that social media is the key driver of the LMS adoption, and their consensus were as under:

I use the LMS because it integrates social media. LMS is already online, I can include links to Facebook and other online forum that is beneficial for the students (BOU Respondent 5).

I adopted LMS because I can store all of my resources in one location, and a natural fit for online collaboration. I can proctor the students from any remote corner (BUP Respondent 5, 6 and 7).

The University students are mature enough to cope with the flaws of LMS as they are very much used to Facebook and other social media, I adopted the LMS without any delay, and I did not have any difficulty in accessing its functions. I also motivated my colleagues for using the LMS as it provides more services, particularly the evaluation (BUP Respondent 2).

Rogers termed them as late majority who adopt innovation after it has been tried successfully by the majority.

Botha et al. (2018) stated that diffusion is a social process that involves interpersonal communication relationship. In this study the respondent BUP 9 said, "I use LMS as my University provided it. I am happy that this technology is the supplement of face-to-face teaching. I am serious about it and just adopted". In this instance, it was found that the interpersonal channels were powerful to change strong attitudes held by individuals, who became pertinent at the decision stage (5), and the respondents are treated in the Group of 'Observability'.

Analysis revealed that adopters of the LMS found advantages in using for their teaching-learning though using peers, trying new pedagogical strategies and tools, and/or believing that technology was necessary to prepare students for today's students.

Key findings:

1. online technology i.e. LMS was diffused during the COVID19, and is being defused;
2. Policy driven technology (LMS) adoption approach of the BUP during COVID19 has contributed an environment that promotes minimal technology diffusion and supports technology use that compatible to existing conditions;

3. diffusion of technology at BOU is, with compared to BUP, is at higher rate;
4. COVID-19 has changed the attitudes of teachers and students towards the technology.

6. Implications

The implications for practice are that technology diffusion at BUP need to be encouraged as it was top-down adoption where participatory approach to be emphasized for adoption of technology. On the other hand, this study has implications for BOU policy-makers as the LMS is tested at the level ranging from certificate to postgraduate level, Therefore, it BOU is capable of using LMS professionally.

7. Conclusions

This study would suggest a need for leadership to focus on providing more opportunities in the future for scientific interaction and face-to-face training involving the new technology, for teachers-students and management to rapidly adopt and utilize the LMS. It was established that there was synergy between the lessons learned for BOU and BUP, and that the teaching-learning through LMS had been effective during the COVID-19. Online learning for DE does not exist despite overt intentions by the BOU. This is due, mostly, to larger infrastructural problems. Surprisingly, the most use of online technology is in the in-person classroom. While the use of online technologies in f2f classrooms is still low, diffusion of technology is happening. At BUP, in 2022 the users of LMS are declined with compared to 2020-2021. This is due to the decline the prevalence of Covid-19 infection. But both BUP and BOU are committed to continue the LMS supported system in future. Dintoe (2018) has identified technology in f2f classroom is early adoption and this technology innovation in the transition from teaching f2f to distance education to online learning.

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