Synchronous Web-based Learning during COVID -19 Pandemic: A Survey on Library and Information Science Students of Bangladesh

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Abstract

The coronavirus pandemic has compelled academic institutions across the globe to initiate online teaching, impacting thereby the teaching-learning process to undergo a structural change. Among various pedagogical techniques that have been adopted, organizing synchronous classes has been found to be the most beneficial. It simulates the classroom environment, facilitating thereby parallel knowledge dissemination to a broader audience. This study measures the efficacy of synchronous web-based learning during this ongoing pandemic, among postgraduate Library and Information Science (LIS) students of Bangladesh. Using an online questionnaire, a survey was conducted among the postgraduate students of the Department of Information Science Library Management (ISLM) of the University of Dhaka. The results revealed that limitation of internet data, unstable internet, along with power blackouts were some of the primary inhibitors blocking the participants to attend classes online. Finally, this study concludes that as most students do not seem to be ready yet to study in a

synchronous delivery mode, it recommends educational institutions in Bangladesh to provide an alternative delivery method, in order to sustain academic excellence in these challenging times.

Introduction

Coronavirus 2 (SARS-CoV-2) is a severe and acute respiratory syndrome, commonly known as COVID-19. Thus far, it has had disastrous effects globally, both in terms of the economy and otherwise. At the time of writing this paper, worldwide, there have been 29,189,605 positive infected cases, with over 928,333 deaths (Worldometer, 2020). Given this humongous outbreak, educational institutions across the globe have been compelled to transport learning to the online medium, in order to ensure learning continuity for the students and minimize any loss of knowledge thereby.

The government of Bangladesh, like all governments across the world, took necessary actions, while closely monitoring the World Health Organization (WHO) situation report. Before taking the form of a 'pandemic', wrecking havoc globally, the COVID-19 virus was identified at first in the city of Wuhan, South China in December 2019 (Whitworth, 2020). Seven days after WHO confirmed COVID-19 as a 'pandemic', on 15th March 2020, the government of Bangladesh emphasized upon 'social distancing' within the society. The government also advised the people to work, study, and conduct religious practices from home. In fact, the Ministry of Education in Bangladesh issued a Circular Note for schools and other educational institutions, including higher educational institutions to pause conventional teaching (Daily Prothom-alo, 2020). Thus, *from about 18th March 2020, all educational institutes in Bangladesh were shut down to avert the spread of the virus within the educational fraternity (Anwar et al. 2020).*

Based on this dictum from the government and global practices, the University of Dhaka implemented both synchronous and asynchronous web-based learning methods. Herein, online teaching prevails over lectures in the classroom; lecturers upload informative videos based on the curriculum, and/or use PowerPoint presentations to conduct their classes on learning platforms (Crawford *et al.* 2020). In effect, synchronous learning allows everyone to participate in the learning process concurrently (Chen *et al.* 2015). Until technology offers sync learning,   conventional and asynchronous methods provide the most synchronous ways to learn. With rapid advancements in technology, today synchronous learning tools are easily

available for one and all (Platt *et al.* 1984). Gradually, this mode of learning has been gaining in popularity due to the comfort it provides, and has been proven by numerous researches in this field (Krashen, 1998; Hwang *et al.* 2014; Hwang *et al.* 2016).

Literature Review

Rapid technical advancements have enabled online learning (McBrien *et al.* 2009), which in essence is a platform both to teach and learn. Online learning (elearning) is characterized as "learning experiences with internet access in synchronous and asynchronous environments using different devices (e.g. cell phones, laptops). In these circles, students can learn and interact with instructors and other students everywhere (independent)" (Singh & Thurman, 2019). Synchronous learning provides numerous opportunities for social interaction (McBrien *et al*. 2009). The ongoing pandemic has compelled educational institutions worldwide to adopt elearning (Almaiah *et al.* 2020), which effectively assists both educators and learners with learning, managing, planning, execution, and assessment. Importantly, as the 'learning infastructure' is 'open', and not bound by the four walls, dissemination of knowledge and information is wide, provided it is ably supported by the required IT infrastructure. As a matter of fact, its benefits are multitudinous. However, despite its many advantages in online classrooms, including social isolation, the lack of contact between students and teachers is not restricted communication issues (Abbasi *et al.* 2020). The advent of several electronic technologies also made it easier for us to provide training beyond traditional classrooms (Sarket *et al.* 2019). Learning is no longer limited to schools; however, new technological advancements (e.g. computers, Internet, etc.) have allowed the education to be delivered everywhere in the world (Vroeginday, 2005). Massachusetts Institute of Technology (MIT) teachers presented Open Courseware which gave access to the learning resources of nearly 2,300 MIT subjects to near about 200 million students in 2001 (Gupta *et al.* 2015). Massive Open Online Courses (MOOCs) facilitate 6,850 online subjects to participate and engage in their content. In 2016, approximately 58 million MOOC students and just about 700 universities, together with MIT, Oxford, and Harvard, etc., took the initiative to deal with MOOCs (Pheatt, 2017). Nevertheless, given the raging pandemic today, (UNESCO[1], 2020) in a report stated that the closure of educational institutions globally, has had several negative consequences for students' knowledge management (KM). One of them for instance includes 'sporadic learning', which the world body believes leads to lack of opportunities for students to progress and develop. Knowledge management in the 21st-century, can help educational institutions identify what is expected in KM through synchronous learning for solving problems, and thereby help students to achieve learning gains during such unforeseen and cataclysmic situations (like the pandemic) (Anongkhanatrakul, 2004).

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1. https://www.google.com

Objectives and Research Questions of the Study

This study looks to assess the impact of synchronous learning together with KM ideas in a pandemic situation from the students of LIS, as most educational institutions in Bangladesh, begin to shift towards e-learning due to the ongoing pandemic. The study also delves into the following research questions (RQ);

RQ1. Is there any impact of synchronous learning through KM during COVID-19 pandemic on learning gain?

RQ2. Which devices and methods students are using to attend the online class?

RQ3. What are the significant challenges of synchronous learning in pandemic to attend the class?

Methodology

A quantitative approach was used for this study, whereby an electronic questionnaire was circulated through email to the 'Masters' students of the department of ISLM of the University of Dhaka, Bangladesh. Herein, it may be noted that as a country, Bangladesh has a total of 46 public, 106 private, and 3 international universities (University Grants Commission[1], 2020). Among the public universities, only four of them produced LIS students, and among these four, only three universities offered Masters' program for LIS students. Furthermore, the University of Dhaka is the country's largest and oldest University, which opened its doors for students on 1st July 1921. Given its heritage and importance, the university continues to show strong character in fulfilling the higher education needs of a large portion of Bangladesh's population (University of Dhaka[2], 2020).

The ISLM department has about 365 students overall (272 Undergraduates, 64 Masters, 26 MPhil, and 3 PhD students respectively). The electronic survey questionnaire had three sections; the first section primarily solicited demographic information from the students along with a few general questions, like the respondents' gender, age, name etc. The second section included questions on synchronous learning and knowledge management; essentially, this section looked to capture the students' experience of attending classes online in today's situations. Notably herein, the items under each of these questions/ideas were measured on a 5-point Likert- scale, ranging from strongly disagree (1) to strongly agree (5). The last section looked to assess the challenges that the students faced while attending an online class. The responses under this section too was measured on a 5-point Likert-scale. Data were gathered through Google forms, which were sent through Facebook groups with the help of class

1. http://www.ugc-universities.gov.bd
2. https://www.du.ac.bd

leaders. Subsequently, the link to the questionnaire was also sent to the respondents' Facebook messenger.

Among the 64 students of the Master's programme, 49 students replied to the online survey questionnaire, and the response rate was 76.56%. We failed to communicate with the rest of the 15 students. The gathered data were analyzed using SPSS version 20. Additionally, we analyzed extant literature on the internet, including journals, articles and books, along with both published and unpublished conference papers, and reports. The following null hypotheses were tested;

H01. There is no significant relationship between bandwidth issues and learning gain

H02. There is no significant relationship between device compatibility issues and learning gain

H03. There is no significant relationship between financial affordability and learning gain

H04. There is no significant relationship between synchronous learning and learning gain

Finally, a conceptual model was developed to display the relationships among learning gain, bandwidth and device compatibility issues, financial affordability, and synchronous learning, and the model was tested by regression analysis.
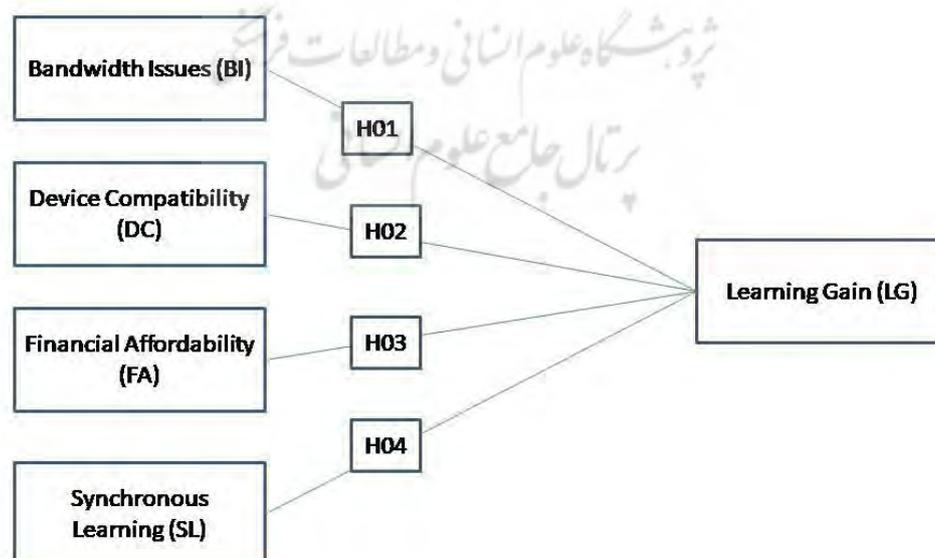

Figure 1. Conceptual model of learning gain with various issues

Under synchronous online learning, there are two critical performers, i.e. teachers and students. Both of them should make this flexible and free use of the educational environment, and enable them to use the teaching and study environment concurrently (Chen *et al.* 2004). Importantly, synchronous learning can give social interaction several opportunities (McBrien *et al.* 2009); for instance, under this fatal virus, we need some online platforms, where (a) videoconferencing is possible for about 40 to 50 students; (b) there could be deliberations with the learners so that organic lessons are kept; (c) network connections are adequate; (d) discussions could be conducted also on mobile devices, and not be restricted to laptops/PCs, (e) the possibility of viewing existing lectures, and finally a mechanism whereby (f) the students may receive instant feedback based on their assignments (Basilaia *et al.* 2020).

Learning Gain

Discussion over learning performance, learning abilities, graduate qualifications, and employability is often regarded as being correlated with learning gains across different countries (Evans *et al.* 2018). Discussions on calculating learning gains are fuelled by a lack of understanding of what is the learning gain vis a vis what is implied by various objectives of the metrics for learning gain and the stakeholders involved; i.e. for who they are, what is measured, and how it is achieved. The instructor often supervises the discussions in a face-to-face atmosphere. For instance, if the instructor asks a question, and/or the student wishes to inquire or share something, a conversation takes place. However, under synchronous online learning, both students and teachers communicate in a message box or audio facilities. Herein, if either of the party wants to communicate/convey something, s/he would raise their hands to draw attention.

Bandwidth Issues

Improved technology and enhanced and far reaching internet connectivity have led to increased demand for synchronous instructional solutions. Advances of scientific knowledge encompass speedy development of technology along with the rising access to internet bandwidth, which would resolve the problem of inadequate bandwidth. Therefore, today, teachers for example, can use their courses both with synchronous or asynchronous methods. Importantly, most people today often use free-data or non-paid internet messenger to stay connected (Dhaka Tribune, 2020). This leads to a challenge too, as many students do not have adequate internet access. In fact, what is of prime concern here is the student's geophysical location; in countries like Bangladesh, many students do not have the luxury of internet access 24/7. Interestingly in this regard, the report published by the Speedtest Global Index, as on September 2020, showed Bangladesh being ranked at 131 under mobile speed, and 101 under fixed broadband (Speedtest Global Index, 2019). This only goes to show that continual access to the internet in this country is not as good as in some of the other developed nations.

Device Compatibility

Synchronous learning is a very recent distance learning process, which geographically separates students and facilitators. The transaction distance (TD) among participants can be reduced by interactive platforms such as Adobe Connect, Zoom, or Blackboard, as well as by other collaboration resources like Instant Messaging; document exchanged, break-out rooms, or even live video and audio (Fallon, 2011; Bower, 2011). TD represents the metaphorical gap between students and teachers, whereby the orientation of 'communication' also includes a psychological element (Moore, 1993). Asynchronous learning, on the other hand, under the circumstances, may be utilized to monitor TD, while synchronous learning provides a wider range of resources and possibilities that support dialogue (such as chat boxes, audio, video), environmental configuration (i.e. purpose-based virtual setting), and most importantly, the learners' autonomy (Phelps & Vlachopoulos, 2020).

Affordability

Synchronous instruction is rapidly becoming an essential mode of communication in online learning with the affordability of broadband/mobile internet accessibility and more diverse advanced technology (Shi *et al.* 2006). It is always a struggle to provide professional e-learning programs. In its education policies on e-learning services, the Bangaldesh government does not stipulate explicitly. Quality management, quality control, e-resource creation and e-content distribution have not been covered sufficiently. Nevertheless, this issue must be solved urgently in order to allow everyone to benefit from quality e-learning education (Cojocariu *et al.* 2014). The benefits of online training in crises, such as the one we have now, must be given its due importance. The government therefore needs to be focused on increasing and developing the standards of a virtual teaching environment (Affouneh *et al.* 2020). Establishment of e-learning is thereby not as simple as it may seem, as a considerable amount of funding is required for both hardware and software, software management, human resources training, and online content creation. A practical and reliable education framework must, therefore, be built for online education.

Data Analysis of the Study

Demographic profile and characteristics of students (N=49; % percentage)

Out of the 49 responses (Table 1) received, 25(51%) of the participants were male, while 24(49%) were female, implying thereby that there has been no gender discrimination in the study. Most of the respondents, 37(75.5%) belonged within the age of 21-23 years, followed by 12(24.5%), who were within the age of 24-26 years. The data in Table 1 indicate their previous experience in online learning. Among all the 49 participants, the largest group, i.e.

27(55.1%) has had previous experience in e-learning, while 22(44.9%) replied negatively to this point. Furthermore, the data in Table 1 also disclosed that most of the students, i.e. 40(81.6%) of ISLM department were familiar with the term 'KM', while only 9(18.4%) did not have any idea on what this term meant. When the participants were asked about the devices they have been using for joining their classes online, most of them, i.e. 31(63.3%) stated that they are using their smartphones, followed by laptop 17(34.7%), while only 1(2%) has been using a PC.

Table 1. Demographic profile and characteristics of students (Source: Authors)

Demographic/personal characteristics	N	%
Gender Male	25	51
Female	24	49
Age 21-23 y	37	75.5
24-26 y	12	24.5
Previous experience in online learning Yes No The idea on KM and synchronous learning Yes No Devices are using for synchronous learning Computer Laptop Mobile	27 22 40 09 1 17 31	55.1 44.9 81.6 18.4 2 34.7 63.3
Total	49	100%

Perceptions on KM and Synchronous Learning

Table 2 reveals that 28(57.1%) participants agreed that synchronous learning through KM is indeed an innovative concept. Further, 26 (53.1%) stated that they like the idea of synchronous web-based learning through KM in this pandemic. 24(49%) accepted that synchronous learning through KM did help them improve their learning skills. 31(63.3%) participants agreed with the fact that there is an impact of KM and web-based synchronous learning in pandemic situations in higher educational institutions, while 4(8.2%) disagreed the statement. Further, 18(36%) participants strongly disagreed that the university and the department provided technical support for joining online class during the pandemic, while 11(22.4%) of them were neutral in their response. Additionally, 27(55.2%) of them agreed that they have the technical skills required to attend synchronous web-based learning, while 8(16.3%) disagreed with the statement.

Table 2. Perceptions on KM and Synchronous Learning (Source: Authors)

Perceptions on KM and synchronous learning	Strongly disagree N (%)	Disagree N (%)	Neither agree nor disagree N(%)	Agree N (%)	Strongly agree N(%)
Synchronous learning through KM in an innovative concept.	1(2%)	5(10.2%)	9(18.4)	28(57.1%)	6(12.2%)
I like the idea of synchronous Web-based online learning through KM in the pandemic.	1(2%)	7(14.3)	9(18.4)	26(53.1)	6(12.2%)
Synchronous learning through KM helps to improve my learning skill	3(6.1%)	4(4.2%)	11(22.4%)	24(49%)	7(14.3%)
There is an impact of KM and Web-based synchronous learning in pandemic situations in higher educational institutions	1(2%)	4(8.2%)	8(16.3)	31(63.3%)	5(10.2%)
The University and department provided technical support for joining online class during the pandemic	18(36%)	14(28.6%)	11(22.4)	2(4.1%)	4(8.2%)
I have technical skills to attend synchronous Web-based learning.	1(2%)	8(16.3%)	8(16.3%)	27(55.2%)	5(10.2%)

Impact of Web-based learning

When the participants were asked questions about the impact of web-based learning, 13(26.5%) of them agreed that web-based synchronous learning does meet their learning needs. 20(40.8%) agreed that it is difficult for them to understand the learning material alone at home, while 11(22.4%) participants disagreed with the statement. Further, 12(24.5%) participants disagreed that the course as a whole was easy and enjoyable while they attended web-based learning, and 15(30.6%) of them were neutral against this statement. 16(32.7%) participants agreed and 14(28.6%) strongly agreed that they are scared about their grades being affected due to online learning. Additionally, 14(28.6%) affirmed that web-based learning did help them to achieve maximum learning gains during the pandemic.

Table 3. Impact of Web-based learning (Source: Authors)

I am Impact of Web-based learning	Strongly Disagree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)	Strongly agree N (%)
Web-based synchronous learning meets my learning needs.	9(18.4%)	10(20.4%)	15(30.6%)	13(26.5%)	2(4.1%)
It is difficult for me to understand the learning material alone at home.	--	11(22.4%)	8(16.4%)	20(40.8)	10(20.4%)
All the course as a whole was easy and enjoyable while attended Web-based online learning	9(18.4%)	12(24.5%)	15(30.6%)	11(22.4%)	2(4.1%)
I am scared about the grades because of online learning	4(8.2%)	4(8.2%)	11(22.4%)	16(32.7%)	14(28.6%)
Web-based learning helped me to achieve learning gain during the pandemic	5(10.2%)	3(6.1%)	12(24.5)	14(28.6%)	9(18.4%)

Challenges of synchronous learning

Table 4 shows that 28(57.1%) of the students agreed that the lack of a suitable device does pose a challenge to synchronous learning. Further, 23(46.9%) of them strongly agreed that the limitation of internet data does pose to be a barrier in web-based learning. 14(28.6%) of them agreed that low internet signal is a major impediment of e-learning, while 31(63.3%) students strongly agreed that unstable internet and power blackouts are their primary concerns during an online class. Additionally, 20(40.8%) students agreed that lack of awareness is a challenge of online learning, while 15(30.6%) of them acceded that communication gap between teacher and student does pose to be a significant challenge in e-learning. Interestingly, 20(40.8%) students agreed that inadequate training on the ICT application is a barrier of e-learning.

Table 4. Challenges of synchronous learning (Source: Authors)

Challenges of synchronous learning	Strongly disagree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)	Strongly agree N (%)
Lack of devices.	2(4.1%)	8(16.3%)	4(8.2)	18(36.7%)	17(34.7%)
Limitation of internet data.	3(6.1%)	3(6.1%)	2(4.1%)	18(36.7%)	23(46.9%)
Internet signal.	2(4.1%)	8(16.3%)	13(26.5%)	14(28.6%)	12(24.5%)
Unstable internet and power blackouts.	2(4.1%)	2(4.1%)	4(8.2)	10(20.4%)	31(63.3%)
Lack of Awareness among students	3(6.1%)	6(12.2%)	15(30.6%)	20(40.8)	5(10.2%)
The communication gap between teacher and students	3(6.1%)	7(14.3%)	14(28.6%)	15(30.6%)	10(20.4%)
Inadequate training on the application of ICT	4(8.2%)	4(8.2%)	15(30.6%)	20(40.8)	6(12.2%)

Hypothesis Testing

H01. There is no significant relationship between bandwidth issues and learning gain.

A chi-square test was conducted to assess the relationship of bandwidth issues with learning gain. The test results showed that there's no significant relationship between these variables (X^2=15.226[a], N=49, Df=16, p=.508), and the effect size was minimal (Cremer's V=.279). Therefore, we can retain the null hypothesis (Table 5).

Table 5. Bandwidth issues with learning gain

Chi-Square Tests	Value	Df	Asymp.Sig. (2sided)
Pearson Chi-Square	15.226[a]	16	.508
Likelihood Ratio	16.817	16	.398
N of Valid Cases	49		
Symmetric Measures	**Value**		**Approx. Sig.**
Nominal by Nominal Phi Cremer's V	.557 .279		.508 .508
N of Valid Cases	49		

H02. There is no significant relationship between device compatibility issues and learning gain.

A chi-square test was conducted to assess the relationship of device compatibility issues with learning gain (Table 6). The results showed that there is no significant relationship between device compatibility issues with learning gain (X^2=14.000[a], N=49, Df=16, p=.599). Notably again, the effect size was minimal (Cremer's V=.267); thus, we can retain the null hypothesis.

Table 6. Device compatibility issues with learning gain

Chi-Square Tests	Value	Df	Asymp.Sig. (2sided)
Pearson Chi-Square	14.000[a]	16	.599
Likelihood Ratio	18.176	16	.314
N of Valid Cases	49		
Symmetric Measures	**Value**		**Approx. Sig.**
Nominal by Nominal Phi Cremer's V	.535 .267		.599 .599
N of Valid Cases	49		

H03. There is no significant relationship between financial affordability and learning gain

In order to determine the financial feasibility and learning advantage relationship, a chi-squares test was carried out. The results showed that there was no significant correlation between financial accessibility and learning benefit (X^2=18.732[a], N=49,Df=16, p=.283); in

fact, the effect size was minimal (Cremer's V=.309). Thus, we cannot reject the null hypothesis (Table 7).

Table7. Financial affordability issue with learning gain

Chi-Square Tests	Value	Df	Asymp.Sig. (2sided)
Pearson Chi-Square	18.732[a]	16	.283
Likelihood Ratio	22.388	16	.131
N of Valid Cases	49		
Symmetric Measures	**Value**		**Approx. Sig.**
Nominal by Nominal Phi Cremer's V	.618 .309		.283 .283
N of Valid Cases	49		

H04. There is no significant relationship between synchronous learning and learning gain

Chi-square test was performed to determine the relationship between synchronous learning and learning gain. The findings showed that the variables are strongly interrelated (X^2=43.739[a], N=49, Df=20, p=.002), and the effect size was minimal (Cremer's V=.472); thus, the null hypothesis can be rejected (Table 8).

Table 8. Synchronous learning issue with learning gain

Chi-Square Tests	Value	Df	Asymp.Sig. (2sided)
Pearson Chi-Square	43.739[a]	20	.002
Likelihood Ratio	42.901	20	.002
N of Valid Cases	49		
Symmetric Measures	**Value**		**Approx. Sig.**
Nominal by Nominal Phi Cremer's V	.945 .472		.002 .002
N of Valid Cases	49		

Regression results for Research Model 1

Linear Regression analysis was conducted to describe the statistical relationship between dependent and independent variables. The ANOVA results depicted in Table 9 shows that the regression model is not significant with p-value (.052), because it is greater than 0.05.

Notably, the F-test is also not significant; thus, we can assume the there is no linear relationship between the variables in our model (Srinivasan & Mukherjee, 2018).

Table 9. ANOVA table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.472	4	3.118	2.551	.052
	Residual	53.773	44	1.222		
	Total	66.245	48			

a.   Dependent Variable: Learning gain
b.   Predictors: (Constant) DC, BI, SL, FA

Table (10) showed that the regression summary and overall fit statistics. We found that adjusted R Square of our model is 0.114, that means the regression explains 11.4 % of the variance in the data. 'R^2 Change' showed the increase in variation explained by the addition of the interaction term (i.e. the change in R^2). Adjusted R^2 changes from 0.114 to 0.188. This change was not statistically significant; p greater than .005(F change 2.551; Df1=4; Df2 =44; Sig. F change .052, Durbin-Watson1.820). The Durbin Watson d =1.820, which is between 1.5 < d< 2.5 and therefore, there is no first-order linear auto-correlation in our multiple linear regression data.

Table 10. Model Fit Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	Df1	Df2	Sig. F Change	
1	.434[a]	.188	.114	1.10550	.188	2.551	4	44	.052	1.820

a.   Dependent Variable: Learning gain
b.   Predictors: (Constant) DC, BI, SL, FA

Coefficients

From Table 11, it is evident that the coefficient on the interaction term is positive and not statistically significant, which means that we cannot accept the null hypothesis. However, there is a significant relationship of learning gain with bandwidth issues with .045. The table helps in formulating the final regression equation LG=0.141DC+0.131BI+0.146SL+0.144FA. The table also shows the collinearity statistics of tolerance and VIF. The PP-Plot (Fig.2) points out that in our multiple linear regressions analysis, there is no tendency in error terms (Natrajan & Mukherjee, 2016).

Table 11. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.184	.797		1.486	.144		
DC	.160	.141	.164	1.133	.263	.882	1.134
BI	.270	.131	.287	2.065	.045	.955	1.047
SL	.278	.146	.263	1.902	.064	.964	1.038
FA	.078	.144	.079	.545	.589	.880	1.137

Dependent Variable: Learning gain

The results reveal that the largest group of students has had prior experience in e-learning. Importantly, most of them have been familiar with the term KM and synchronous learning. The results also shows that synchronous learning through KM is an innovative concept, and the participants did like the idea of synchronous web-based learning through KM, especially during the pandemic. Notably, most of the participants accepted that synchronous learning through KM did help them improve their learning skills, while a few of them believed that there is an impact of KM and web-based synchronous learning in pandemic situations in higher educational institutions. Further, most of the students said that it is difficult for them to understand the learning material alone at home. In fact, some of them stated that the entire course as a whole was easy and enjoyable, while they were attending the web-based learning. Importantly, the study found that lack of device, limitation of internet data, unstable internet, and power blackouts were some of the major challenges for the participants in terms of elearning.

Figure 2. Normal P_P Plot of Regression Standardized Residual
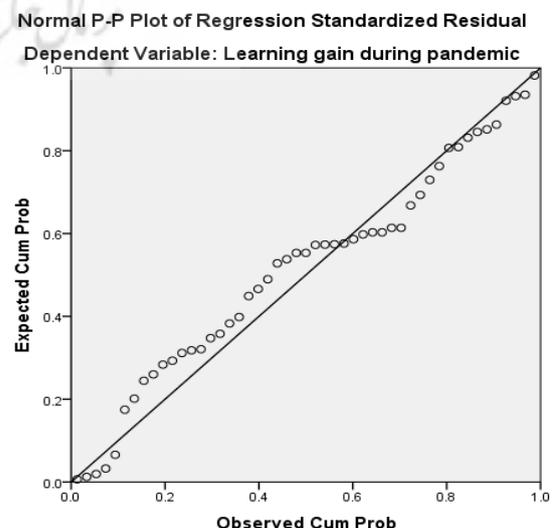
Policy level Implications

In digitally advanced countries (Basilaia & Kvavadze, 2020) online learning can be useful; however, in the context of Bangladesh, it did seem ineffective. Notably, in the country, considerable learning and teaching and administration is done manually by academic bodies (Salam *et al.* 2017). Lack of internet connectivity for rural residents, affordable and fast internet links, do prevent the propagation of online learning because only those students who have internet connections via smartphone can only join online learning. The unforeseen shift to online learning was a measure of institutional resilience because most academic institutions focus on transmitting knowledge of educational methods (Wu, 2020). However, it recalled the absence of online learning opportunities in few universities and who lacked internet access to communicate with their students (Zhong, 2020). Another major issue related to online learning is the lack of adequate contact with teachers. Besides, questions about any online course material are typically handled by email with the respective course teacher, which needs response time (Auma & Achieng, 2020). Some basic requirements must be made available to the students and teachers for conducting online classes. Digital devices, high-speed internet and a network, are possibly the three most important primary specifications. Devices could include a personal desktop, a laptop, or at least a smartphone. Importantly, without high-speed internet, we may be able to browse the internet and use Facebook or WhatsApp, but not stream live videos. A user-friendly interface, or learning management system, comes next in line in terms of the mandatory facility. Several online platforms, including Google Classroom, Zoom, Moodle, among others are available. Students and teachers can use those channels with quick instruction. Additionally, a brief training needs to be imparted to both students and teachers when it comes to remote learning, as it needs some digital user literacy (Gilbert, 2015). The world has also been more technically advanced than ever, and education and learning are no exception (Almaiah & Alismaiel, 2019). Similarly, YouTube's online tools, TED Talks, Udemy etc. have been instrumental in making education accessible and competitive (Sarker *et al.* 2019).Though scarcity of online classes prevents the benefit from being realized (Almaiah *et al.* 2019; Almaiah & Al-Khasawneh, 2020), research on this subject is still in its infancy, where the students' views are not thoroughly explored (Tarhini *et al.* 2017). Studying the adoption of the online classroom system wouldlead universities and higher educational institutes (HEIs) to understand the needs of their students better, and ultimately lead to an effective online class system (El-Masri & Tarhini, 2017; Alksasbeh *et al.* 2019). The University of Dhaka is one of the most prominent universities in Bangladesh of having about 34 thousand students. The University has started online classes using the platform Bangladesh Research and Education Network (BdREN) provided by the University Grants Commission of Bangladesh (UGC) from 9th July 2020 to reduce the adverse consequences of academic interruption of the students. To our full knowledge, the students and teachers at the University of Dhaka during COVID-19 pandemic did not have a detailed

study of the problems and factors affecting the use of the online class system. Therefore, this research sought to examine the perception of LIS students at the University of Dhaka about online classes, along with the underlying factors that influence effective online class arrangement during such a crisis. In this challenging time, maintaining digital equality is critical. Not everybody has access to all digital gadgets. Therefore, the government in close coordination with HEIs should look to ensure that both students and professors have access to the 'basic' services needed. Stepping up on the digital distance seems mandatory in times to come.

Discussion, Conclusion and Future Research

Because of the COVID-19 pandemic, the worldwide education process was disrupted. As social isolation at this point is of the utmost importance, this has negative impacts on opportunities to learn. School associations fail to find ways to resolve this complicated situation. This situation tells us that scenario preparation is a must for HEIs (Dhawan, 2020; Joseph Ekhayemhe & Oguzie, 2018). This research prioritized multi-criteria methods used by various e-learning programs. This study also established that student openness to use online learning, fulfilment the demand of teachers, and application of KM in the universities would be a vital issue in the success of online learning during the COVID-19 pandemic (Alqahtani & Rajkhan, 2020; Aljamal, 2018). With technological advancements when studying, such as bandwidth internet connectivity or video compression techniques, synchronous learning becomes increasingly essential (Chen *et al.* 2005; Alves, 2018). This paper explored a synchronous online learning model that aims to identify various types of synchronous, online learning. In future, the synchronous learning management system (SLMS) needs to be strengthened, and a more versatile, easy, and more accessible educational environment for both instructors and learners need to be developed. The effects of learning from students and teachers must also be taken into account to boost student learning experiences (Kinshuk *et al.* 2001).

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