Gender Difference in Attitudes of Learners Towards Online Learning at Higher Education of Bangladesh

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Abstract*: Online learning has created a new window in today's education system. It is an entirely new experience in the education system of Bangladesh. As a result, the pupils, the tutors and the education administration face some challenges adjusting to the new learning mode. The main objective of this study was to compare the attitudes of learners studying at the different programs of the National University central campus by basing on the gender issue regarding online learning. In this study, five independent factors were identified through a literature review that influences the successful execution of online learning. It is a quantitative study where the sample size was 141, which was found by applying the formula of Yamane (1973). A stratified sampling technique was used as the population is not homogeneous. A pilot study has been conducted with 52 responses to test the validity and reliability of the factors. Two factors were excluded from over twenty-six elements through this analysis. Different descriptive statistical tools have been used to analyze the primary data by using the SPSS software version 23. The study founds no gap exists between the responses of male and female learners except for the factor of students' competency level on digital learning technology, the supportive environment for online learning and online assessment. The output of the study also claims that the tutors' and the academic administration's support is significant for the successful execution of online learning. The main limitation of this study is that it ignores the educational programs of NU-affiliated campuses, which does not represent the complete scenario of NU. In this regard, further analysis can be conducted to get a more effective result.*

Keywords: Learning; Online Learning; Gender; Learning Technologies; Higher Education

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1.0 Introduction

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The popularity of online learning is increasing day by day among students and tutors in Bangladesh. This learning platform is a new dimension in the education sector of Bangladesh. The education sector stakeholders have become bound to be involved with online learning after the massive spread of Covid-19. The pupils, teachers and teaching administrations are trying to adapt to the new learning mode. Making the online learning process more effective requires pupils and the faculties to be prepared to interact virtually using a different digital technology, i.e., Zoom.

The National University of Bangladesh (NU) operates tertiary education at central and affiliated campuses. Research-based degrees, i.e., Masters of Advanced Studies, Advanced MBA, M.Phil and Ph.D. programs, work from the main campus. Tertiary education, such as Undergraduate and Master’s degrees, is offered through 2,500+ affiliating campuses. As a key university in the country, NU has incorporated online education from the beginning of the Covid-19 attack to keep students involved with the education process (NU, 2021). In this regard, the students of NU must be equipped with digital learning-related technologies so that they can be connected with distance learning. Here, the efficiency of different taxonomy and the availability of digital technology are the key factors to make online education more effective. However, the gender issue is also a significant factor while performing online learning. In this regard, it is essential to evaluate the attitude of students, i.e., male and female, regarding online education separately.

1.1 Problem Statement

Though the practices of digital taxonomy in the education sector are not new from a global perspective, Bangladesh's education practitioners did not focus on online learning before the Covid-19 attack in March 2020. However, many online learning challenges must be solved to confirm a comfortable learning environment. In practice, the choice of male and female learners towards online learning also varies due to family status, expertise on ICT devices, parents' attitudes towards supporting logistical support etc. Ensuring online education's advantages requires minimizing the significant gender-based challenges of online education.

1.2 Rationality of the Study

Like other sectors, the government of Bangladesh has declared to shut down physical education due to Covid-19 for a long time from March 2020 to 2021. At that time, the government has taken the initiative of online education to minimize students' losses.

There was no opportunity to make stakeholders ready to adapt to online education. People have learned online learning techniques by using different digital taxonomy like YouTube. As a result, a big question arises due to judging the effectiveness of online learning. However, there is a gap between the expertise in technology between male and female students, which may create unwillingness towards this form of learning. In this regard, this study has been conducted to judge the attitude of both groups of students regarding online education, which will help to discover the significant gender-based limitations.

1.3 Research Questions

The present research has been carried out by focusing on the following questions;

i. Are there any gender-based differences in the students' attitudes toward online learning?
ii. Are there any gender-based differences in the level of literacy in digital taxonomy?
iii. Are there any gender-based differences regarding the availability of logistical support for online learning?
iv. Are there any gaps between the attitudes of male and female students regarding online evaluation procedures?
v. Are there any discords between the attitudes of male and female learners towards the tutors' and academic administration's support regarding online education?

1.4 Literature Review

Nowadays, digital technologies in learning are rapidly becoming popular due to global technological breakthroughs. The educational institute must adapt to the advanced technology of the 21st century, which will dramatically change the education system. Online learning was initially known to us as e-learning. This e-learning was first used in the 1980s (Moore, et. al., 2011). The task of defining online learning in one sentence is challenging. This is because a group of arguments opposes online learning (Singh, et. al., 2019). However, the concept of online learning integrates the learning experience using ICT. Moreover, internet access is essential for online learning (Benson, 2002). Stec et al. (2020) defined online learning by indicating three approaches, i.e., enhanced, online and blended learning. The enhanced learning approaches utilize different techniques to ensure

interactive educational directions, whereas the online approach indicates that the course contents are delivered online. On the other hand, blended learning combines both face-to-face and online education. This definition is more pragmatic in online learning because online learning requires different teaching-related taxonomy, such as YouTube, Facebook, WhatsApp, Messenger, Google form, Zoom, Google meet etc., to perform learning tasks.

Attitude

The success of any new initiative mainly depends on the stakeholders' mentality to accept or reject the new things. In this regard, students' attitudes need to measure regarding online learning. According to Eagly et al. (1993), there are three major attitude issues, i.e., cognitive, sensory and behavioral. Firstly, the cognitive aspects of attitudes integrate one's expertise in a particular area. Secondly, sensory or feelings represent favoring, disfavoring and reacting to a specific behavior. On the other hand, Dwyer (1993) has identified three components of attitudes, i.e., cognitive element, which represents a concept; perceptual element, which represents an emotion; and behavioral element, which means an action. So, it can be concluded that attitude is a perplexing issue of human behavior through which people perceive knowledge, shows emotions and take steps.

Students' Attitudes on Online Classes

Afroz et al. (2021) conducted a study to identify the students' attitudes toward online learning among the government colleges of Bangladesh. The study has identified the significant positive aspects of the online learning experience, i.e., cost, time effectiveness, and convenience. Moreover, they have identified several problems, including the absence of sound internet connection, poor expertise in ICT, scarcity of educational resources, uncooperative pupils, inadequate support from the tutors etc. Rouf et al. (2021) have conducted a qualitative survey to discover the perception of students, which has identified the actors that impact the online learning process in tertiary education. They have asserted that conducting online classes is more critical than a conventional classroom. They have also identified the significant challenges regarding online learning, including technological barriers, digital divide among the generations, inadequate data package to access the study-related resources, poor network and connectivity, poor learning and sharing environment, technophobia etc. However, a comparative study has conducted by Nasir et al. (2022) to inquire about the attitude of

students toward the online learning system, which is practiced in public and private universities in Bangladesh. They claimed through their descriptive study that the attitudes of public university students are positive regarding interaction and self-efficacy, notwithstanding they did not have a good relationship with course design and technical support. On the contrary, they have argued that private universities invest more in technology installation and its use among the stakeholders, i.e., tutors and students.

Open Educational Resources (OER) for Learning

Different open educational resources are available on other platforms, i.e., YouTube and Facebook, where learners can easily search for essential teaching resources. Both the tutors and the students can be benefited from OER. Learners from anywhere in the world can access OER, repeatedly reducing their learning costs. Akter et al. (2020) have asserted three key concerns to develop a platform for OER, i.e., learners' attitudes, socio-economic status, and access to technology based on Bangladesh's private universities. They have recommended building social awareness towards OER by conducting seminars and workshops. Islam et al. (2009) investigated the experiences of the tutors and learners of the Open and Distance Learning (ODL) system in Bangladesh. The main focus of the study was on the admission process, learning resources, tutorial sessions, radio and TV programs, evaluation, and results publication systems operated by Bangladesh Open University (BOU). The authors have claimed that both the tutors and the learners have a positive attitude towards the ODL system used by BOU compared to the traditional form of education. However, they have suggested ensuring quality course materials and adequate monitoring of the classes.

Factors Affecting Online Learning

Smooth online learning requires several logistical supports. Islam et al. (2017) have identified the factors influencing the online learning process's success by focusing on the different private universities in Bangladesh. The study has concluded that ICT facilities have a good influence on the effectiveness of online learning. They have suggested that the administration of the universities should emphasize improving the capabilities of stakeholders, i.e., tutors and students on ICT, which will bring dramatic results in the overall learning process. Hossain et al. (2022) have identified three significant determinants of the e-readiness of an organization regarding online learning through their quantitative study. The determinants are:

a. Skills to access the different forms of digital taxonomy;

b. Building a positive attitude regarding online learning;
c. Organizational competency and continuous support;

The use of mobile technologies in daily life, such as health, communication, banking, education etc., is rapidly increasing day by day, whereas Bangladesh has lagged in to use of this technology in comparison with other countries, i.e., Japan, Singapore, India, Taiwan, Korea, U.S.A, U.K, etc. Saidouni et al. (2016) conducted a descriptive study to explore the learners' attitudes toward the effectiveness of handheld technology in learning. The output of this research has asserted that the learners positively accepted the Mobile-Assisted Language Learning (MALL) tools are by the learners. On the other hand, Begum (2011) has claimed that the mobile phone has the potential as an instructional instrument along with some threats that the appropriate initiative of teaching administration might solve. Basak et al. (2016) have developed a framework by identifying the influential factors of online learning in tertiary education. They have identified five elements, i.e., technological, institutional, management, ethical and pedagogical, which influence the online learning process. They have asserted that the technical and institutional factors are related to the pedagogical aspects. Moreover, the pedagogical and management factors impact the execution of e-learning at tertiary level.

Challenges of Online Classes

The learners' readiness is inevitable to attend online classes and assessments. Making people ready requires the availability of needed logistical support, i.e., internet facility, an electronic device including a laptop/desktop, smartphone, electricity and the capacity to operate the machines. Shifat et al. (2021) have conducted a qualitative study to examine whether learners can build their kinship in group discussions and online evaluation. It reveals that the students can participate in online classes, although they face difficulties while participating in online assessments. Sarkar et al. (2021) have asserted through their quantitative survey that most students face challenges while participating in virtual classes due to technological barriers and can’t interact with their co-learners smoothly during online courses. Moreover, the study claimed that most pupils preferred the conventional form of classes to virtual classes due to the absence of a comfortable learning environment. Ahmed (2021) has suggested organizing training sessions to prepare pupils and tutors to adapt to digital teaching-related technologies. Moreover, he emphasized developing a robust, trustworthy and safe system for online examinations, which will remove all the loopholes. Training plays a significant role in improving knowledge, skills and abilities. Regular training can create a highly motivated,

productive, up-to-date and creative workforce. To get this workforce, NU can arrange training related to technology-based learning. Moreover, they can align technology-based training with regular face-to-face training to improve teachers' capacity (Mia, 2017).

The above review represents that a group of scholars has already addressed the opportunities and challenges of online classes. The study shows Rouf et al. (2021), Akter et al. (2020), Basak et al. (2016), Nasir et al. (2022), Islam et al. (2017), Sarkar et al. (2021) have talked about the online learning in the tertiary education sector of Bangladesh by focusing both public and private university. They did not consider NU, whereas a significant part of the higher education of Bangladesh is operated under NU. The review has also found that only Afroz et al. (2021) have conducted a study focusing on students' attitudes regarding online learning by considering the government colleges affiliated with NU. However, using digital technologies is a significant issue in online education. Deubel (2009), Saidouni et al. (2016), and Islam et al. (2009) talked about the technology used in online education, but they were focused only on universities. In that case, it requires judging the students' capacity of NU and whether they can adapt to the academic operations using digital devices. However, there is an urgency to conduct the study by focusing on the above gaps and evaluating existing online education systems.

1.5 Objectives of the Study

The research has been conducted to assess learners' attitudes regarding online learning in higher education by focusing on male and female students of the National University central campus. Along with the fundamental objective, the study also has some specific objectives. These are presented below;

i. To identify the differences in the levels of literacy on digital taxonomy between both male and female students;
ii. To know the students’ observations regarding logistical support for online learning;
iii. To explore the main gender-based barriers to online learning in higher education in Bangladesh.

1.6 Significance of the Study

The journey of online learning has created a new window for learners to learn academic and professional issues cost-effective manner. In the era of globalization, people must be connected with different countries, which is mainly possible by using digital devices. The study has been conducted to discover students' attitudes by focusing on gender separately towards online learning, which will help to confirm quality education. This study has also

been targeted to determine how to operate online learning more efficiently. The stakeholders related to the education sector, i.e., the Government, Ministry of Education (MoE), education institutes, teachers, guardians, students etc. will benefit directly from the study's output.

1.7 Hypotheses of the Study

The following hypotheses have been determined by basing on the variable which has an impact on online learning;

H_O There is no significant disagreement between the attitudes of male and female learners about online classes.

H_O There is no significant difference in skills in digital technology between male and female learners.

H_O There is no significant dissimilarity between the male and female pupils regarding the availability of logistical support for online classes.

H_O There is no significant inequality between the attitudes of male and female learners about online assessment.

H_O There is no significant discord between the attitudes of male and female learners towards the tutors' and academic administration's support in the online learning process.

1.8 Limitations of the Study

It is assumed that the findings will significantly contribute to the online learning arena in Bangladesh, especially in the field of higher education level. However, this study has some limitations that need to be explored by future researchers. Among them, the coverage of primary data collection is a significant limitation of the study. Though the study has been conducted by focusing only on the academic programs of NU central campus, notwithstanding NU's educational activities are expanded over the whole country with about 2,250 affiliated campuses. Moreover, the study has focused only on the post-graduation level, where the students are mature enough to cope with the logistics of online education. On the contrary, a significant part of the students is studying at the undergraduate level. Furthermore, the comparison has been conducted by basing only on gender issues. Still, the output may become more effective if the comparison can be performed by addressing the academic programs. There is an opportunity to conduct more studies by focusing on the above limitations, which will help to identify the challenges.

2.0 Methodology of the Study

The study is quantitative to compare the attitudes of male and female students regarding online learning. This is because the primary data has been taken from students in quantitative form through a close-ended questionnaire.

2.1 Research Design

The success of online learning depends on several factors. These factors are considered the independent variable. Here five independent factors are identified through a literature review influencing online learning. These factors are shown below;

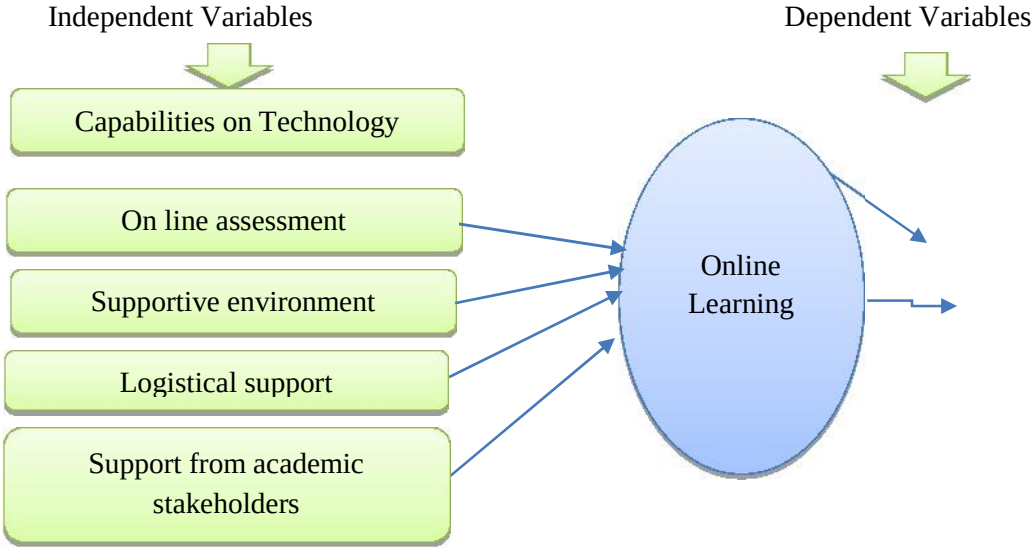

Figure 1: Factors Affecting the Success of Online Learning

2.2 Population and Sampling

The NU central campus students are considered this study's target population. As a result, the population is known, i.e., 500 from five programs PGD, MAS, Advanced MBA, M.Phil and Ph.D. The adjusted formula for calculating sample size, proposed by Yamane (1973), has been applied. The calculation of the sample size is presented below;

$$N = \frac{z^2 * p * q * N}{e^2(N-1) + z^2 * p * q}$$

Where,
N= Population= 500;
p= degree of probability= 50% or 0.5

$$= \frac{1.96^2 * 0.5 * 0.5 * 500}{0.07^2(500-1) + 1.96^2 * 0.5 * 0.5}$$

= 141

q= 1-p or 1-0.5 or 0.5
z= z table value at 95% level of significance is 1.96
e= 7% degree of error
n=sample?

Though the study population is not homogeneous, i.e., male and female, using a stratified sampling technique is better for getting an accurate sample size. Over the 500 students, there is inequality between male and female students (317 male and 183 female). According to Kothari (2018), the number of appropriate respondents can be determined by applying the following formula.

Male respondents n_1 = $\frac{Total\ number\ of\ Male}{Population}$*sample size

= $\frac{317}{500}$*141

= 89.394

= 89

Female respondents n_2 = $\frac{Total\ number\ of\ Female}{Population}$*sample size

= $\frac{183}{500}$*141

= 51.606

= 52

On the other hand, the purposive sampling technique has been used to confirm the balance between genders.

2.3 Data Collection Techniques

This study has been conducted by using both primary and secondary data. Different academic journals, articles, websites, newspapers, books, etc., have been used as secondary sources. On the contrary, a structured close-ended questionnaire was used as the primary data collection instrument. In this questionnaire, there were four points, such as strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD), through which the respondents gave their responses. Moreover, an ethics form, information sheet and consent form have also been developed and delivered to the connected parties, i.e., the head of the faculty and respondents. A total of 282 paper-based questionnaires were

distributed to the respondents, two times greater than the sample size, along with an ethics form, information sheet and consent form.

2.4 Research Validity and Reliability

A pilot test was conducted with 52 responses to test the reliability and validity of the factors. Exploratory factor analysis (EFA) and reliability tests have been shown to measure the reliability and consistency of the factors by using SPSS. Cronbach's Alpha is considered as higher internal consistency when the calculated value is more than 0.70, and when it is less than 0.30, it is interpreted as lower internal consistency. The factors which have lower internal consistency have been excluded. After finalizing the factors through the pilot survey, the primary data was collected from the respondents.

2.5 Pilot Study

The survey comprises 26 items under five constructs, i.e., A, B, C, D and E. It is recommended to conduct exploratory factor analysis (EFA) before evaluating internal consistency to investigate whether the items are loaded sufficiently to a specific construct. So, before checking internal consistency (Cronbach's alpha), EFA is conducted. In the third stage of EFA, the KMO measure is found acceptable (0.740) regarding sampling adequacy and significant Bartlett's Test of Sphericity ($\chi^2(276) = 882.44, p < 0.01$) suggests a substantial correlation in the data. Using the principal component extraction method with VARIMAX rotation, 24 items out of 26 items, 'connection with tutors/friends virtually' and 'preferences of online learning from tutors/ academic administrators') are extracted under five constructs explaining 72.18% variation. The Cronbach's of 24 items is found to be 0.94, and each construct value is above 0.70, an essential requirement in research (Price et al. 1986). The result of alpha reliability as a measure of internal consistency is presented in the following table;

Table 1: ***Cronbach's Alpha Reliability of the Constructs***

Sl. No.	Constructs	Cronbach's
A	**Feelings on online class**	**0.830126**
B	**Competency over technology**	**0.765812**
C	**Supportive environment for online learning**	**0.903567**
D	**Online assessment**	0.898438
E	**Tutors and academic administration's support**	**0.847083**
Overall		0.9374

Validity confirmatory factor analysis (CFA) is applied to evaluate the construct. Convergent validity is weighted by the average variance extracted (AVE), and discriminant validity is assessed by comparing the square root of AVEs with inter-correlations among the constructs. According to Fornell et al. (1981), the square root of AVE needs to be higher than inter-correlations among the constructs. But, Kline (2015) has proposed that inter-correlations among constructs should not be greater than 0.85. In addition, when the composite reliability (CR) is more significant than 0.70, it is also considered construct reliability.

The following table shows that AVEs for all constructs except 'B' is above 0.50, indicating convergent validity. But, the AVE of 'B' is found to be 0.46, which is somewhat questionable. Since the measurement model scale is taken from literature so, it can be used for further analysis.

Table 2: ***Convergent Validity and Construct Reliability of Measurement Scale***

Sl. No.	Constructs	AVE	CR
A	**Feelings on online class**	**0.512691**	**0.836976**
B	**Competency over technology**	**0.455118**	**0.762917**
C	**Supportive environment for online learning**	**0.603385**	**0.9107**
D	**Online assessment**	0.65304	0.902249
E	**Tutors and academic administration's support**	**0.672098**	**0.859295**

The following table shows the result of discriminant validity, which indicates that the square of AVE for construct A (0.72) is greater than correlations with other constructs except for D. However, the square root of AVE for B (0.67), C (0.78), D (0.81) and E (0.82) are higher than the correlations with other constructs. So, this result indicates strong discriminant validity of the scale.

Table 3: ***Discriminant Validity of Measurement Scale***

Constructs	**A**	**B**	**C**	**D**	**E**
A	0.72				
B	0.38	0.67			
C	0.62**	0.46	0.78		
D	0.86**	0.49	0.64**	0.81	
E	0.47**	0.42*	0.41**	0.60**	0.82

*Note: Square root of AVE is shown on the diagonal of the matrix. **p<0.01 *p<0.05.*

A- Feelings Regarding Online Classes, B- Capabilities on Digital Technology, C- Supportive Environment for Online Learning, D- Online Assessment, E- Tutors and Academic Administration's Support

2.6 Method of Data Analysis

This study uses different descriptive statistical tools, i.e., mean, standard deviation, one sample independent t-test, Levene's test etc., to analyze the primary data. The test level was assumed to be 3.00, and the significance level was 95%. The four points have been sequentially valued (SA=4, A=3, D=2, SD=1). The responses were analyzed using Statistical Package for Social Sciences (SPSS) software, version 23.

3.0 Analysis and Findings

The analysis of the responses of respondents is presented below;

Table 4: ***Students' Feelings Regarding Online Class***

Sl. No.	Factors	*M*	*SD*	*t*	*p*
1.	Comfortable class	3.16	0.78	2.38	0.02
2.	Cost effectiveness	3.12	0.82	1.85	0.07
3.	Time effectiveness	3.52	0.66	9.29	0.00
4.	Adequate interaction	2.82	0.85	-2.48	0.01
5.	Preference on online class	2.74	0.94	-3.21	0.00
	Overall Response	**3.07**	**0.58**	**1.52**	**0.13**

Table 4 represents the feelings of students regarding online classes. The study found that the average score of the three factors is above average (3.00), and the two factors are less than average (3.00). Specifically, average perception toward "factor 3" is the highest (M=3.52, SD=0.66), while the response towards "factor 5" is the lowest (M=2.74, SD=0.94). The overall average is 3.07, and SD is 0.58.

Table 5: ***Group Statistics and Independent Samples t-Test for Hypothesis 1***

Factors	Gender		Group Statistics		Independent Samples Test			
					Levene's Test		t-test	
			M	*SD*	*F*	*P*	*t*	*P*
1.	Male	*	3.20	0.76	0.02	0.89	0.92	0.36
	Female	**	3.08	0.81				
2.	Male	*	3.17	0.82	0.04	0.84	0.78	0.44
	Female	**	3.06	0.83				

3.	Male	*	3.58	0.62	2.28	0.13	1.57	0.12
	Female	**	3.40	0.72				
4.	Male	*	2.79	0.88	1.63	0.20	-0.46	0.65
	Female	**	2.86	0.79				
5.	Male	*	2.65	0.97	3.59	0.06	-1.53	0.13
	Female	**	2.90	0.86				
Overall	**Male**		**3.08**	**0.57**	**0.28**	**0.60**	**0.19**	**0.85**
	Female		**3.06**	**0.59**				

Table 5 represents the group statistics and independent t-test to test hypothesis 1. The table represents the mean value of both groups is greater than 3.00 for factors 1, 2 and 3 and less than 3.00 for factors 4 and 5. The mean value of factor 3 is higher among the five factors. Levene's test shows that the p-value of all aspects is greater than 0.05, which indicates equal variances. The independent t-test shows that the overall p-value is more than 0.05, which means the acceptance of hypothesis 1.

Table 6: ***Students' Capabilities on Digital Technology***

Sl. No.	**Factors**	***M***	***SD***	***t***	***P***
1.	Skills on basic computer	3.41	0.69	7.11	0.00
2.	Adaptation with digital apps	3.56	0.64	10.45	0.00
3.	Use of video conferencing tools	3.56	0.62	10.78	0.00
4.	Social networking technology in learning	3.39	0.72	6.58	0.00
	Overall Response	**3.49**	**0.51**	**11.32**	**0.00**

Table 6 represents the student's responses regarding their capabilities in digital technology. The study found that all factors' average score is above average (3.00). Specifically, the average responses toward "factors 2 and 3" is the highest (M=3.56, SD=0.64 and 3.62), while the perception towards "factor 4" is the lowest (M=3.39, SD=0.72). The overall average is 3.49, and SD is 0.51.

Table 7: ***Group Statistics and Independent Samples t-Test for Hypothesis 2***

Factors	**Gender**		**Group Statistics**		**Independent Samples Test**			
					Levene's Test		**t-test**	
			M	***SD***	***F***	***p***	***t***	***P***
1.	Male	*	3.60	0.58	0.85	0.36	4.16	0.00
	Female	**	3.11	0.78				

2.	Male	*	3.69	0.58	6.22	0.01		
	Female	**	3.34	0.68			3.01	0.00
3.	Male	*	3.65	0.55	7.53	0.00		
	Female	**	3.42	0.72			1.97	0.05
4.	Male	*	3.48	0.69	0.04	0.83	1.88	0.06
	Female	**	3.25	0.74				
Overall	**Male**	*****	**3.60**	**0.45**	**5.31**	**0.02**		
	Female	******	**3.28**	**0.55**			**3.56**	**0.00**

Table 7 represents the group statistics and independent t-test to test hypothesis 2. The table represents that the mean value of both groups is greater than 3.00 for all factors. The mean value of factor 2 is higher for males (Mean 3.69, SD 0.58), and the mean of factor 3 is higher for females (Mean 3.42, SD 0.72). Levene's test shows that the p-value of factors 2 and 3 are less than 0.05, which indicates that equal variances do not exist for these factors. The independent t-test shows that the overall p-value is 0.00, which suggests the rejection of hypothesis 2.

Table 8: ***Students' Response Regarding Supportive Environment for Online Learning***

Sl. No.	**Factors**	***M***	***SD***	***T***	***p***
1.	Use of PC/Laptop/smartphone at home	3.35	0.69	6.12	.00
2.	Use of broadband connection at home	3.26	0.79	3.90	0.00
3.	Supportive hands at home	3.02	0.81	0.31	0.75
4.	Adequate support from parents	3.02	0.80	0.42	0.67
5.	Supportive friends to solve technical problems	3.22	0.71	3.63	0.00
6.	Internet facility at home	3.07	0.86	0.97	0.33
7.	Stable electricity facility at home	2.95	0.86	-0.68	0.49
	Overall Response	**3.13**	**0.57**	**2.71**	**0.00**

Table 8 represents the student's responses regarding a supportive environment for online learning. The study found that the average score of all factors is above average (3.00) except for factor 7. Specifically, the average response towards "factor 1" is the highest (M=3.35, SD=0.69), while the reaction towards "factor 7" is the lowest (M=2.95, SD=0.86). The overall average is 3.13, and SD is 0.57.

Table 9*: **Group Statistics and Independent Samples t-Test for Hypothesis 3***

Factors	**Gender**	**Group Statistics**	**Independent t-Test**

					Levene's Test		t-test	
			M	***SD***	***F***	***P***	***t***	***P***
1.	Male	*	3.47	0.62	0.06	0.79	2.70	0.00
	Female	**	3.15	0.75				
2.	Male	*	3.33	0.78	0.24	0.62	1.45	0.14
	Female	**	3.13	0.81				
3.	Male	*	3.05	0.80	1.01	0.31	0.66	0.50
	Female	**	2.96	0.83				
4.	Male	*	3.07	0.75	1.17	0.28	0.97	0.33
	Female	**	2.94	0.87				
5.	Male	*	3.06	0.90	1.31	0.25	-0.06	0.95
	Female	**	3.07	0.81				
6.	Male	*	2.98	0.87	0.20	0.65	0.68	0.49
	Female	**	2.88	0.85				
7.	Male	*	3.22	0.75	0.38	0.53	0.10	0.91
	Female	**	3.21	0.66				
Overall	**Male**	*****	**3.18**	**0.53**	**3.22**	**0.08**	**1.24**	**0.22**
	Female	******	**3.05**	**0.64**				

Table 9 represents the group statistics and independent t-test to test hypothesis 3. The table represents that the mean value of male response is 3.47 for factor 1, which is greater among all variables between males and females. On the contrary, the highest mean value of the response of females is 3.21, SD 0.66 for factor 7. The mean value is less than 3.00 for factor 6 for both groups. The overall mean value for both groups is above 3.00. Levene's test shows that the p-value is 0.08, which indicates equal variances, and the independent t-test shows that the overall p-value is 0.22, which means the acceptance of hypothesis 3.

Table 10: ***Students' Response Regarding Online Assessment***

Sl. No.	**Factors**	***M***	***SD***	***t***	***p***
1.	Comfortable online assessment	3.01	0.85	0.19	0.84
2.	Comfortable online group activity	3.00	0.87	0.00	1.00
3.	Comfortable interaction	2.98	0.84	-0.19	0.84
4.	Preference of recorded video class	2.84	0.97	-1.90	0.05
5.	Use of open sources of evaluation	3.29	0.76	4.53	0.00

Overall Response	**3.03**	**0.67**	**0.48**	**0.63**

Table 10 represents the student's responses regarding online assessment. The study found that the average score of factors 1, 2 and 5 are above average (3.00). Specifically, the average response towards "factor 5" is the highest (M=3.29, SD=0.76), while the response towards "factor 4" is the lowest (M=2.84, SD=0.97). The overall average is 3.03, and SD is 0.67.

Table 11: ***Group Statistics and Independent Samples t-Test for Hypothesis 4***

Factors	**Gender**		**Group Statistics**		**Independent Samples Test**			
					Levene's Test		**t-test**	
			M	***SD***	***F***	***p***	***t***	***p***
1.	Male	*	3.04	0.81	0.51	0.47	0.55	0.57
	Female	**	2.96	0.92				
2.	Male	*	3.02	0.83	0.57	0.45	0.40	0.69
	Female	**	2.96	0.92				
3.	Male	*	2.98	0.81	0.40	0.52	0.05	0.95
	Female	**	2.98	0.89				
4.	Male	*	2.79	1.00	1.47	0.22	-0.73	0.46
	Female	**	2.92	0.92				
5.	Male	*	3.40	0.71	0.10	0.74	2.35	0.02
	Female	**	3.09	0.79				
Overall	**Male**	*****	**3.05**	**0.62**	**1.04**	**0.31**	**0.57**	**0.57**
	Female	******	**2.98**	**0.75**				

Table 11 represents the group statistics and independent t-test to test hypothesis 4. The table represents that the mean value of males is highest at 3.40, SD 0.71 for factor 5, which is greater among all variables between males and females. On the contrary, the highest mean value of the response of females is 3.09, SD 0.79 for factor 5. The mean value is less than 3.00 for factors 3 and 4 for both groups. The overall mean value for males is 3.05, and for females is 2.98. Levene's test shows that the p-value is above 0.05, which indicates equal variances. The independent t-test shows that the overall p-value for all factors is 0.57, which means the acceptance of hypothesis 4.

Table 12: ***Students' Response on the Tutors and Academic Administration's Support***

Sl. No.	**Factors**	***M***	***SD***	***t***	***p***
1.	Supply of teaching resources	3.21	0.79	3.19	0.00

2.	Tutor's support to adapt with digital technology	3.12	0.81	1.85	0.06
3.	e-learning friendly university	3.17	0.78	2.67	0.00
	Overall Response	**3.17**	**0.67**	**3.08**	**0.00**

Table 12 represents the student's responses regarding tutors and the academic administration's support. The study found that the average score for all factors is above average (3.00). Specifically, the average response towards "factor 1" is the highest (M=3.21, SD=0.79), while the response towards "factor 2" is the lowest (M=3.12, SD=0.81). The overall average is 3.17, and SD is 0.67.

Table 13: ***Group Statistics and Independent t-Test for Hypothesis 5***

Factors	**Gender**		**Group Statistics**		**Independent Samples Test**			
					Levene's Test		**t-test**	
			M	***SD***	***F***	***p***	***t***	***p***
1.	Male	*	3.23	0.75	2.28	0.13	0.45	0.65
	Female	**	3.17	0.85				
2.	Male	*	3.23	0.70	3.83	0.05	2.08	0.03
	Female	**	2.94	0.95				
3.	Male	*	3.21	0.73	0.53	0.46	0.71	0.47
	Female	**	3.11	0.87				
Overall	**Male**	*****	**3.23**	**0.59**	**6.03**	**0.02**		
	Female	******	**3.08**	**0.78**			**1.21**	**0.23**

Table 13 represents the group statistics and independent t-test to test hypothesis 5. The table indicates that the mean value of males is highest at 3.23 for factors 1 and 2, which is higher among all variables. On the contrary, the highest mean value of female response is 3.17 for factor 1. The lowest mean value of the male's response is 3.21 for factor 3, and female's is 2.94 for factor 2. The overall mean value for both males and females is above 3.00. Levene's test shows that the p-value of all aspects is above or equal to 0.05, but the overall result is 0.02, which indicates equal variances not exists. The independent t-test shows that the overall p-value for all factors is 0.23, which means the acceptance of hypothesis 5.

4. Conclusions and Recommendations

4.1 Conclusions

Online learning is a reality in today's learning systems. Most of the world's developed countries have accepted this form of learning from the very beginning of its origin. The

experience of online learning in the education systems of Bangladesh is due to the Covid-19 attack. Information and communication technology plays a crucial role in online learning. Technophobia among the teachers, learners and teaching administrations may work as a vital hinder in assuring quality online learning. This study is a comparative study focusing on the attitude of pupils to measure the present challenges of online learning systems. The study's findings represent that no gap exists between the responses of male and female learners except for the competency level on digital learning-related technologies, which are needed to be reduced. However, it also shows that both students are positive toward online learning. On the contrary, the study founds no gap between the students' responses regarding the supportive environment for online learning. The responses of both learners have also shown that online assessment is not favorable to them. Moreover, the students have agreed that the tutors' and the academic administration's support is significant in online learning. The concerned authorities, including MoE, universities, tutors, guardians etc., should focus on the issues that will help to make the online learning process more interactive and practical. The concerned parties can redesign their strategy to make online learning more successful by focusing on the findings of this study.

4.2 Recommendations

Based on the findings of the study, the following recommendations are suggested to improve the current practices of online learning in Bangladesh;

i. The academic administration needs to ensure sufficient interaction between the tutors and students. In this regard, pedagogical knowledge can be provided to the tutors to make online classes more effective. Moreover, the study shows that both students still prefer conventional learning. In this regard, concerned stakeholders need to invest more to change the view of students toward online learning.

ii. Academic administrators should invest more to reduce the gap between the efficiency level of gender over learning-related digital technology by arranging training and ensuring adequate digital technologies.

iii. The guardians should accept the social trends and ensure logistical support to the students regarding online learning. There should be a learning and sharing environment among the students so that one can help others to solve their technical problems.

iv. The tutors and the students need to be well trained regarding different innovative pedagogical approaches and online assessment. Moreover, the MoE, the university authority, must accept the change and discover the solutions to existing problems regarding online evaluation instead of the conventional form of paper-based assessment.

v. The tutors and academic administrators must take adequate steps to create the educational institute as an e-learning-friendly organization.

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