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Impact of Technological Advancement on the Educational Sector of Bangladesh - An Empirical Study on Teachers of Higher Education

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Abstract:
With the drastic change in the modern technology a significant revolution has clearly been visible in the teaching and learning process of higher education. Digital technology introduces more scopes for educators that precipitate blended, e-learning, and online in higher education; suggests a multiple of ways to communicate, learn, correspond, cooperate, and collaborate. Also, digital technology has been more and more widely used in higher education for the continuous development of the economy as a whole. E-learning, Learning Management System (LMS), Content Management System (CMS) etc. are recent and popular forms of technological development in the teaching and learning process of higher education in the context of Bangladesh. This study focuses on the current development of technology in higher education from the educators' point of view. Every sector is adapting new technology to make things more efficient. Education sector is one of it, which started using technology not only just for administration purposes but also for changing the way of teaching methods. Technology getting involved in education has mixed influence on the educators. This paper discusses the impact of technology in the higher educational sector of Bangladesh.

Keywords:
Technology, Advancement, Higher Education, Teachers, Bangladesh

1. INTRODUCTION:

Technology has a prominent role to play in the future of education and to disseminate knowledge. New technologies create dynamic learning opportunities which enhance the quality of teachers to make the classes more attractive. Courses that are delivered using modern technologies are more conducive to the learning style of students. By the adoption of technology, an introverted student also becomes active in the group discussion of a particular class. LMS, Moodle and Repository have not only made it easier for students to access a large variety of information but also for educators to engage in various teaching tools and to enter in enriched research.

Over the last few decades, the digital medium has become very important in higher education. With this prominence, there is an increasing demand that educators utilize, and even grab, technology in order to enhance the delivery of course content in keeping current with societal and future workforce demands (Blake, 2013)

Nowadays, technology extends over many fields and is very popular for both educators and learners. According to academics, technology is needed to change the methods of teaching process and to explain the outcome of this process resulting in the development and adaptation of technology. Explanations of such processes are clearly visible in new lab/classroom instructional settings that enhance the teaching of problem-solving skills.

2. LITERATURE REVIEW:

Most higher education institutions have developed strategies, with varying related appellation, that pertain to the acceptable use of electronic devices. The focus of these strategies for technology commonly ranges from acceptable use of information technologies such as smartphones, tablets, laptops, online mail and internet browsing and also includes computing practice, and use of institutional computers. These strategies are typically geared towards all members of the college/university community. Researcher examines broader institutional strategies that focus on the use of technology, highlights reflections in this regard to factors that could emphasize the nature and standard of course content delivery for educators, and proposes indications for technology policy development in higher education. (Ginette et al., 2014)

Research has shown that policy relating to the use of technology has not only become increasingly important in higher education, but is frequently a prominent factor for institutional and pedagogical change (de Freitas & Oliver, 2006). This fact states the importance of having a detailed and broadly formulated strategy for technological adaptation that allows for educators and students to reap the benefits afforded by the use of technology in the classroom. In this regard, Selwyn (2007) observed that policy for adaptation of new technology is too strictly and inflexibly formulated, which limits the potential empowerment of technology promoted by educational technologists. Evans and Nation (2006) inscripted that there is a massive stock of knowledge that is globally reachable and available through technology, and that policymakers should consider the multiplicity of experience that it potentially makes available.

A well-designed distance learning and online programs and courses attached to essential elements of Universal Design for Learning including clear goals, planning for learner variability; flexible methods and materials; and timely progress monitoring should be developed to adopt modern technology (Nelson & Basham, 2014). Student engagement has been confirmed by considering the Community of Inquiry (COI) model (Shea & Bidjerano, 2009) which postulates learning consists of three "presences:" teaching (i.e., well- designed and expedited courses), social (i.e., learning interactivity with peers and instructors), and coherent (i.e., exploration and resolution of problems).

A recent study on the problems of accomplishing blended learning among university instructors (Mozelius & Rydell, 2017) revealed that the most recent limitations are the lengthen time to learn new technology tools, a lack of reinforce for learning complex functions of the LMS, and disconcert with understanding and implementing productive online methods of teaching.

To support this objective, the NETP recommends that educators be provided with professional learning experiences using technology to enhance their capacity to create "compelling learning activities that improve educating, evaluation, and pedagogical practices," and teacher preparation programs that "emerge a teaching force expertise in online and blended instruction" (U.S. Department of Education, 2016, p. 37)

The future priority of the technology tools available for content delivery were also considered when deciding on the most desirable mode of instruction (Shand et al., 2013). Scoring guidelines and samples were included as appropriate, and all work was submitted or linked through the LMS to ensure a consistent and available course environment. All categories of grading, assessment, and course information were accommodated in the LMS for uniformity, accessibility, and support.

3. OBJECTIVES OF THE STUDY:

- To study the effectiveness of technology in the higher education sector of Bangladesh.
- To analyze the worth of modern technology from educators point of view.

4. METHODOLOGY OF THE STUDY:

Both primary and secondary information are analyzed in this study. Due to the lack of adequate published studies about the online classes, most of the studies have been based on preliminary data. A well-structured questionnaire was designed which contained some information about technological advancement of LMS, institutional compatibility, practice demand, online classes, repository and attractiveness of classes regarding the impact of modern technology in the sector of Higher education in Bangladesh. Questionnaire link was sent to respondents using 'Google form' through Email, Whatsapp and Facebook messenger. A total of 513 participants send complete information regarding this survey. SPSS version 20 has been used to analyze and present the result of collected data.

The research conducting period of this study was from May - September 2021 . Therefore, supported the enquiry discussed above, the researcher came to the hypothesis that:

H1: Learning Management System (LMS) has a positive relationship with technology.

H2: Institutional compatibility & conformity have a positive relationship with technology.

H3: Practice demand has a positive relationship with technology.

H4: Online classes & repositories have a positive relationship with technology.

H5: Attractiveness of classes has a positive relationship with technology.

Here technology. is a dependent variable whereas Learning Management System (LMS), Institutional compatibility & conformity, Practice demand, Online classes & repositories, Attractiveness of classes are independent variables.

5. RESULTS AND DISCUSSIONS:

5.1 Gender

Studies showed that about 56.1% of the respondents are male teachers which is 288 and 43.9% of the respondents are female teachers which is 225.

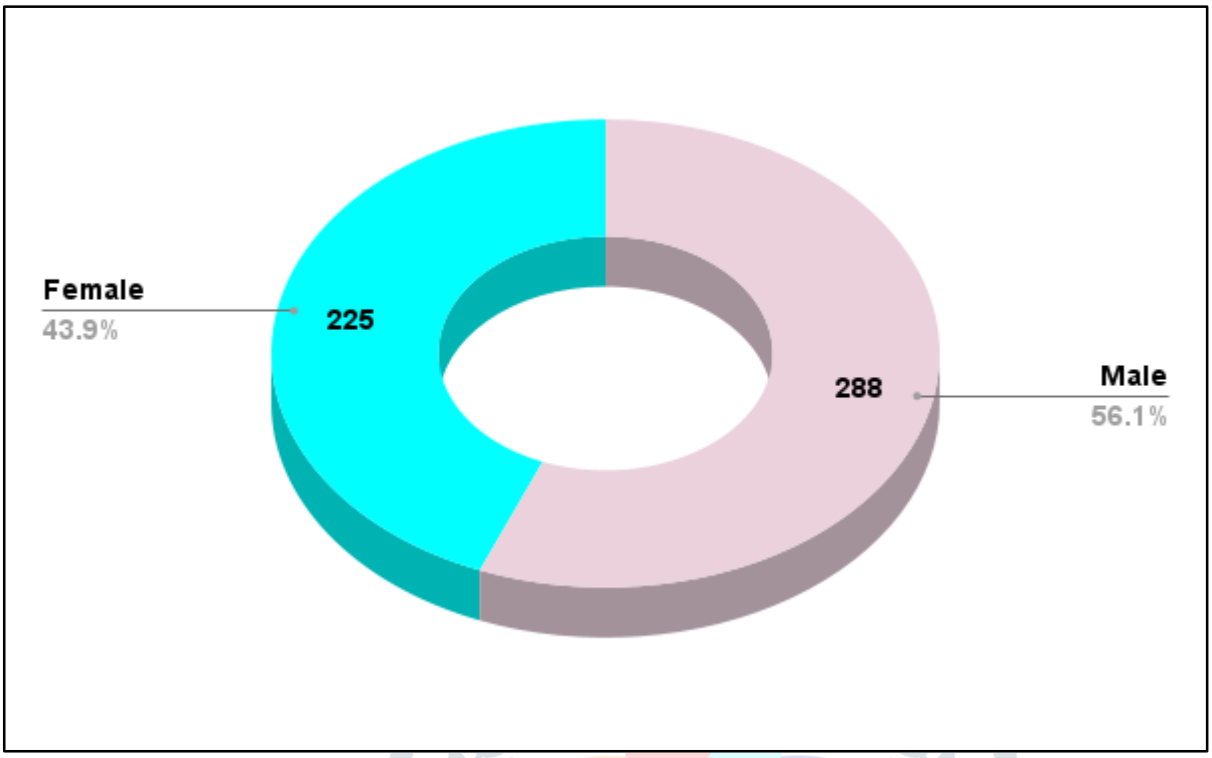

Figure-1: Age of respondents

5.2 Name of Institutions

There are 53 Public Universities, 103 UGC approved Private Universities, 2 International Universities, 31 Specialized Colleges, 2 Special Universities and 2,154 Public and Private affiliated colleges operating under the National University in Bangladesh. Among these about 241 respondents are from public universities, 151 respondents are from private universities and 121 respondents are from colleges and institutions affiliated under National University.

Table-1: Name & Types of Institutions

Types of Institutions	Names of Institutions	Number of respondents
Public University	University of Dhaka	20
	Jagannath University	23
	University of Rajshahi	7
	University of Chittagong	14
	University of Jahangirnagar	15
	Islamic University, Bangladesh	10
	University of Comilla	25
	Jatiya Kabi Kazi Nazrul Islam University	13
	Bangladesh University of Professionals	15

	Begum Rokeya University	10
	University of Barisal	12
	Shahjalal University of Science and Technology	15
	Noakhali Science and Technology University	10
	Rangamati Science and Technology University	2
	Bangladesh Agricultural University	15
	Sher-E-Bangla Agricultural University	16
	Bangladesh University of Engineering & Technology	11
	Rajshahi University of Engineering & Technology	5
	Hajee Mohammad Danesh Science & Technology University	3
Private University	North South University	7
	Independent University, Bangladesh	4
	International University of Business Agriculture & Technology	15
	Ahsanullah University of Science and Technology	15
	American International University-Bangladesh	10
	East West University	7
	University of Asia Pacific	9
	BRAC University	11
	Daffodil International University	21
	State University of Bangladesh	15
	Green University of Bangladesh	14
	Manarat International University	5
	Sonargaon University	5
	University of Liberal Arts Bangladesh	9
	Prime University	4
	Daffodil Institute of IT	17

National University	Dhaka City College	17
	Crown Institute of Business & Technology	5
	University Women's Federation College	15
	Sk. Borhanuddin College	6
	Tejgaon College	15
	Central Women's College	14
	Mohammadpur Kendriya College	17
	Dhaka Commerce College	15
Total		513

5.3 Reliability Test

Reliability analysis is the type of analysis which allows researchers to study the properties of measurement scales and the items that formulate the scales. The methods of Reliability Analysis calculate a number of generally used measures of scale reliability and also deliver information about the relationships between particular items in the scale.

Table-2: Reliability (Case Processing Summary)

Case Processing Summary			
		N	%
Cases	Valid	513	100.0
	Excluded[a]	0	.0
	Total	513	100.0
a. Listwise deletion based on all variables in the procedure.			

The basic rule of Cronbach's alpha is that . 70 and above is good, . 80 and above is better, and . 90 and above is best. According to this study, the alpha coefficient for the six items is .882, which indicates that the items have relatively high internal consistency.

Table-3: Reliability (Reliability Statistics)

Reliability Statistics	
Cronbach's Alpha	N of Items
.882	6

5.4 Correlations

Correlation in SPSS is such a statistical method that shows how strongly two variables are related to one another or the degree of interrelation between them. This study shows that the most influential factor on technology is Compatibility of institutions which is .870.

Table-4: Correlations

		LMS	Compatibility	Demand	Repositories	Attractiveness	Technology
LMS	Pearson Correlation	1	.785**	.478**	.443**	.478**	.863**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
		513	513	513	513	513	513
Compatibility	Pearson Correlation	.785**	1	.440**	.489**	.474**	.870**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
		513	513	513	513	513	513
Demand	Pearson Correlation	.478**	.440**	1	.392**	.316**	.652**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	513	513	513	513	513	513
Repositories	Pearson Correlation	.443**	.489**	.392**	1	.531**	.729**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
		513	513	513	513	513	513
Attractiveness	Pearson Correlation	.478**	.474**	.316**	.531**	1	.700**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	513	513	513	513	513	513

Technology	Pearson Correlation	.863**	.870**	.652**	.729**	.700**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
		513	513	513	513	513	513
Correlation is significant at the 0.01 level (2-tailed).							

5.5 Regression

Regression is used when we want to predict the value of a variable based on the value of another variable. The table shown below provides the data about standard error of estimate, which is denoted by the *R*, R^2, adjusted R^2 and this can be used to estimate how well a regression model fits the data.

Table-5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000[a]	1.000	1.000	.00000
a. Predictors: (Constant), Attractiveness, Demand, Compatibility, Repositories, LMS				

According to the ANOVA table, the *F*-ratio tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically remarkably predict the dependent variable, $F(5, 507) = 35220762440111624.000$, $p < .0005$ (i.e., the regression model is a good fit of the data).

Table-6: ANOVA test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	166.597	5	33.319	35220762440111624.000	.000[b]
	Residual	.000	507	.000		
	Total	166.597	512			
a. Dependent Variable: Technology						

b. Predictors: (Constant), Attractiveness, Demand, Compatibility, Repositories, LMS

Unstandardized coefficients define how much the dependent variable differs with an independent variable when all other independent variables are held equivalent. Study shows that the value of Beta for LMS is .304; Compatibility is .323; Demand is .202; Repositories is .248 and Attractiveness is .205.

Table-7: Coefficient test

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.007E-015	.000		.000	1.000
	LMS	.200	.000	.304	75732523.729	.000
	Compatibility	.200	.000	.323	80753314.531	.000
	Demand	.200	.000	.202	72186041.963	.000
	Repositories	.200	.000	.248	82116756.495	.000
	Attractiveness	.200	.000	.205	68941029.915	.000

a. Dependent Variable: Technology

Study shows that "**Sig.**" column that all independent variable coefficients are statistically significantly different from 0 (zero).

CONCLUSION:

Modern Technology enables educators to promote teaching methods which enhance the innovation in the system of education. Modern technology ensures the presence of open education resources by which educators are able to access enriched research studies. The concept of blended learning which is a combination of both online and offline classroom is also introduced with the help of technological advancement. By the use of E-library students can easily get the updated books and information which would not be possible for the traditional library within a very short period of time. By adopting modern technology academicians can able to:

- Enhance the depth of knowledge
- Ensure quality education
- Improve practical working skills
- Collaborate and communicate with students easily
- Motivate students to engage in the classroom
- Easy access and storage to information
- facilitate more productive learning experience

By adopting modern technology, different emerging educational models have been introduced which ensures the educators to achieve quality education.

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APPENDIX

- Gender
  - Male
  - Female
- Name of Institution

1. My institution gives me full support for using LMS which allows me to plan, access, facilitate, implement and monitor Students' learning process.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

2. LMS in my institution centralizes educational content, resources and course preparation and tracks various student activities including discussion and collaboration.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

3. I have got full institutional support such as training, gadget and infrastructure facility to adopt modern technology for teaching
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

4. My institution is compatible enough to cope up with the change in the technological era.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

5. The demand for collaboration and communication through technology in the teaching sector has increased day by day.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

6. Over the past few years the use of technology in classrooms has increased to create student motivation, social interactions and to enhance student learning.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

7. Online classes, digital workshops and webinars make education more flexible, efficient and effective.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. Both live and recorded class enables students to access from remote locations and offer massive open online courses.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. Modern technology introduces more innovative and attractive teaching methods which enables teachers to engage more students in the classroom.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

10. Technology provides teachers with digital learning tools which can attract students to concentrate on their study more than before.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree