Opportunities and Challenges of Digitalization of Higher Education in Bangladesh

Research Team

Advisor

Professor Dr. A F M Shafiqur Rahman
Ex-Director (Training & Implementation), NAEM &
Ex-Principal, Govt. Saadat College, Karatia, Tangail.

Professor Dr. Md. Shahidur Rahman — Team Leader
Chairman, Department of Accounting,
Joypurhat Government College
Joypurhat, Bangladesh

Md. Khorshed Alam — Member
Training Specialist,
National Academy for Educational Management (NAEM),
Ministry of Education

Dr. Muhammad Abdur Rahman Miah — Member
Assistant Director, Planning & Development,
National Academy for Educational Management (NAEM),
Ministry of Education

National Academy for Educational Management (NAEM), Dhaka

June, 2021

Index

List of table and figures

- **Tables:**

- **Figures:**

Abbreviations

BANBEIS	: Bangladesh bureau of Education Information and Statistics
BTRC	: Bangladesh Telecommunication Regulatory Commission
CA	: Continuous Assessment
FGD	: Focus Group Discussion
ICT	: Information Communication Technology
ISP	: Internet Service Provider
LAN	: Local Area Network
LMS	: Learning Management System
MCQ	: Multiple Choice Question
MGD	: Millennium Development Goal
NAEM	: National Academy for Educational Management
NCTB	: National Curriculum and Textbook Board
NEP	: National Education Policy
NTRCA	: Non-Government Teachers' Registration and Certification Authority
PC	: Personal Computer
SDG	: Sustainable Development Goal
SGI	: Sustainable Governance Indicator
SPSS	: Statistical Package for Social Science
SRS	: Study-Based Reporting System
SWOT	: Strength-Weakness-Opportunity-Threat
UGC	: University Grand Commission
VPN	: Virtual Private Network

Summary

Globally education is one of the significant sectors to witness revolutionary changes in recent times. Education and human development are tied together as an international agenda, at least since 2000. It is in particular a blessing for developing countries, which chronically suffer from ailment of access and affordability. The field of education is mainly reactive, as new technologies are developed, applied and accommodated into existing educational cultures and systems. Teaching and teaching methodology changes the level and gravity of learning. Today with the advent of technology, teaching and learning both process have changed due to need and requirement of the time, environment and need based. As on date, we require fast and easy approach to learn as well as to teach. With hi-tech network and multimedia, the education sector has emerged to be one of the fast emerging fields. Technological advancement has enabled our classroom to be tech savvy. Our Honorable Minister 'Dr. Dipu Moni M.P.', Ministry of Education have declared to digitalize the whole education system in this 'Mujib Centenary-2020'. However, there are various obstacles and barriers to achieve that goal. This study will explore the opportunities and challenges therein and suggest overcoming them. However, the implementation of this process faces various obstacle of multiple strata's. We tried to identify those challenges and make suggestions to combat them. There is no one-size-fits-all solution to these challenges. While it is tempting to think that all institutions are broadly the same, they are of course each unique and we need to make a definite comprehensive approach to get the maximum form this initiative of digitalization of education.

Key Words: Higher education, digitalization, challenges, digital-divide, technology, internet.

Chapter One: Introduction of the Study

This chapter presents introductory aspects of this study, statement of the problem, rationale, objectives, scope and limitation of the study as well as the chapter outlines of the study report.

1.0 Introduction:

Digital Education is the panacea for this anathema of education all over the globe. It is in particular a blessing for developing countries, which chronically suffer from ailment of access and affordability. With wise coverage over various means of communication, it becomes a natural choice to learn even for those in the hinterlands. However, the importance of digital learning may help our young generation to engage in education and shared experience and ideas in a transformative approach. Sustainable Development Goals (SDGs) which follow the Millennium Development Goals (MDGs) have become the code of belief for countries around the world today. In 2015, all countries came together and agreed unanimously on the 2030 Agenda for Sustainable Development that consists of 17 separate goals popularly known as SDGs. These goals are all strongly linked to education especially five of these goals under the theme "Empowering people and ensuring inclusiveness and equality", they are: Goal 8 (Decent Work and Economic Growth), Goal 10 (Reduced Inequalities), Goal 13 (Climate Action), Goal 16 (Peace, Justice and Strong Institutions) and Goal 17 (Partnership). “For a very populous country like Bangladesh, the main strategy for digital transformation and knowledge-based transformation should be to make its human resources digital first and foremost’ (ICT and telecom minister Mustafa Jabbar, 2020). Especially during this ‘corona pandemic’, digitalized education has recognized unanimously as best possible option worldwide. Our government have sworn to make a “Digital Bangladesh” by creating digital generation. Nevertheless, sustainable development cannot be achieved without digitalization of higher education process. Especially during recent worldwide pandemic “Covid-19” shown us the importance of digitalized online education and our unpreparedness.

Promoting digital transformation process in educational institutions means allowing students to access the benefits of their future and technically shaping their mind. Every district of Bangladesh can monitor the digital learning platform and allowing expert teachers in a different area and can trained them up with their knowledge to reach beyond the classroom. Digitalization is the integration

of digital technologies into everyday life by the digitalization of everything that can be. "Instead of considering it as a threat and neglecting our habits, I suggest that we look at this generation as a source of inspiration and guidance on how to adapt our educational systems to meet the needs of our future society" (W. Veen, B. Vrakking, 2011).

We are running into 21st century where technology knows no bounds. This is the phase of radical development where technology is taking over every niche and corner. During this phase, the education system is evolving for the betterment, as this generation's students are not born to be confined by the limits of simple learning. It is vigorously felt during recent worldwide "Corona pandemic' situation. The techno-revolutionary decade, where every sphere of life can change with the process to develop more. The new phase of digital learning has begun and involves various advanced technologies like:

• Online courses: Experts develop online courses for the learners who want to learn a new language or may be to be trained up in some specific courses, but have no time to cover distance.

• Online exams: Digitalization gave way to online exam, making the examination process convenient for both teachers and students.

• Digital textbooks: Also prevalent with other names as if e-textbooks and digital textbooks provide an interactive interface in which the students have access to multimedia content such as videos, interactive presentations and hyperlinks.

• Animation: By offering a visual representation, students grasp the concepts.

Though the number of internet users is huge in our country (99.984 million according to BTRC, February 2020) yet, there is a long way to tread before realizing the actual potential of digitalized education in Bangladesh. Some of the prominent hurdles are Digital Literacy & Infrastructure. The majority of the Bangladeshi population still does not have the required internet bandwidth and many are illiterate in digital terminologies and devices. Moreover affordable internet access, data enabled devices and appropriate internet plans can play a significant role here.

This empirical study aims to discuss about the future of education system which how people, processes, and information technology are involve to transform current education system the opportunity and challenges of digitalization of higher education and to suggest the remedies to

overcome them. We researched the cost and benefits acquire from this project, the system's architecture and design as well as the suggestion for system implementation.

1.1 Statement of the problem

Today's students who are digital natives have different learning styles and understanding than previous generations. Technology is also levelling the playing or learning field for students who have special needs or are non-traditional learners, by enabling them to learn in style or at a pace that works best for them. New digital tools and technologies such as visual, low-code platforms can help schools efficiently automate internal processes, streamline routine activities and enhance communication among the stakeholders especially students, teachers and parents. We speak about considerable efficiency changes that could change what employees do every day. It could make a significant difference by allowing educators to focus on students rather than paperwork. Furthermore, the real life of education must change with the decade. Our present government have sworn with a view to make a "Digital Bangladesh" by creating digital generation. However, sustainable development (according to UNESCO) cannot be achieved without digitalization of higher education. our present government is at war against poverty and quality education is known to be one of the best tool for this quest. Digitalization of education is now a burning thrust and priority. SWOT analysis gives us a birds' eye view of this venture's strengths, weaknesses, opportunities and threats of digitalization of higher education in Bangladesh.

1.2 Rational of the study

With so many different ways to define digital learning and the educational approaches that can be taken in these learning environments, digitalization of education is an innovative approach to learning. It is a holistic way of teaching and learning that meets the needs of today's digital natives. Digitalization of education is a powerful trend in terms of reformation and modernization of global education environment. Digitalization means transformation of all information types (texts, sounds, visuals, video and other data from various sources) into the digital language. Today Khan Academy is a full embodiment of Sal Khan's principle of education of the future: "Study whatever you want the way you want". It is an environment, made of collaboration, choice, and an array of technological resources that supports a successful & effective learning experience. However, for the learners to

be successful in this learning environment, the challenges to digital learning must overcome with proper support and best practice solutions. Instructors and learners must embrace the shift away from traditional classroom practices to a digitalized learning approach to education. In developing countries like Bangladesh, digital education comes with a premonition of "Digital Divide" and therefore government should make efforts to include all stakeholders in this initiative to make this venture "inclusive & sustainable" for all. This is why we are trying to find the obstacles of this initiative of digitalization of education to help government to achieve their target of sustainable development.

1.3 Objectives of the study:

The research has been conducted on the basis of the following objectives:

1.3.1 To explore and understand the concept of 'Digitalization in Education' in detail;

1.3.2 To review the Digitalization in all levels of Education Sector of Bangladesh in general and Tertiary level in particular;

1.3.3 To compare in depth between Traditional Higher Education System and Digitalized Higher Education in Bangladesh;

1.3.4 To identify the Strengths, Weaknesses, Opportunities and Threats/Challenges for Digitalizing the Higher Education in Bangladesh;

1.3.5 To describe the benefits of higher education digitalization that contributes to economic growth;

1.3.6 To suggest measures to overcome the weaknesses and challenges for Digitalizing the Higher Education in Bangladesh.

1.4 Scope and Limitation of the Study:

If we were to define scope of digitalization in Bangladesh today, it is expected to pervade almost all the corners of education. It will be widespread, right from primary education to higher studies and onto research field as well. We find the following limitations accordingly:

- Limitation on system: Research concerned with content, design and delivery of courses;
- Challenges pertinent to individuals' characteristics, students as well as teachers;

- Technological challenges: Research concerned with infrastructure, costs, usability and appropriateness of technology;
- Contextual limitation: Research concerned with organizational, cultural and societal challenges.

1.5 Chapter Outlines

Chapter: One

This chapter presents introductory aspects of this study, statement of the problem, rationale, objectives, scope and limitation of the study as well as the chapter outlines of the study report.

Chapter: Two

This chapter presents the prior related literature of the study. These reviews basically give us a guideline to develop the theoretical framework of the study.

Chapter: Three

This portion of the study discusses research methodology and the strategy of inquiry for this study. The Chapter also presents the data sources, sample & sampling, instruments, data analusis techniques of the study.

Chapter: Four

This chapter describes the findings for the collected data. The current status of digitalization of higher education of Bangladesh, computer related expertise of the stakeholders, the opportunities and challenges of digitalization of education in our country. This chapter also contains the discussion of major findings and recommendations as well.

Chapter: Five

This the chapter that contains conclusion of this study.

Chapter Two: Review of the literature

This Chapter contains and presents the review of the relevant literature that include education digitalization process; aims to investigate assess the opportunities and challenges of this intervention, the find out the solutions there in.

2.0 Review of the literature :

Teaching and learning is a continuous process, which starts from the day one until the death. The level of learning and its impact on our life varies from stage to stage and time to time. Teaching and teaching methodology changes the level and gravity of learning. Scientists and experts have an insight where in the future, the method of education will be improvised compared to this age, which can be achieved by implementing educational technology to the current education system. In Bangladesh, digitalizing the education sector has been started in order to achieve quality education as per the demand of 21st century. Still side by side ineffective traditional education system is running in most of the institutions. It is the need of time, to analyze the prevailing situation for knowing the effectiveness of digitalization in all levels of education sector of Bangladesh. In this regard, the following studies of this sector will be reviewed which will prove the justification of conducting present study: The British Council Pakistan (2019) mentioned in its study that this process is changing education itself. According to the Boston Consulting Group, the process of digitalization has influenced the learning process in a variety of ways. They identify six dominant trends which are changing the competitive landscape of Higher Education:

- Democratization,
- Lifelong learning,
- Individualization of education,
- Experimental technological advancement,
- Digitized students, and
- Changes in workforce demand.

Navneet Kaur (2019) concluded in his study that Digitalization has no doubt changed our education system, but we cannot say that it has diminished the value of our old time classroom learning. The best part of digitalization of education in the 21st century is that it is combined with the aspects of

both; classroom learning and online learning methods. This way the digitization of education industry in the 21st century proves to be a boon to our society. Horatiu Catalano (2019) gave this conclusion in his study that the prerequisites of the digital era can be translated into digital education, seen as a very dynamic dimension that integrates digital technologies into the teaching process and which can contribute to the development of creative capacities, critical thinking, socialization and student. Md. Sayeed Al-Zaman (2019) recommended in his paper that the concept of "Digitalization of education" is randomly used by the Bangladesh government and other authorities to promote the education system of education upgrade. To what extent the impact of digital technology will have the entire education environment is a matter of speculation. Nonetheless, the lack of developments and mismanaged initiatives are, in part, weakening the administration system in higher educational institutions of Bangladesh. In order to receive the highest potential from digitized education, both constituents- government and civic society are need to be aware of the merits and benefits from digitized education.

Robinson et al (2016) defined educational technology mentioning that the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. Marcinek (2014) highly emphasized that finding the time to integrate technology is an overwhelming task for anyone. According to Wainwright (2017), classroom that equipped with technology can help students to search latest information quicker and easier than before. Wainwright (2017) mentioned in his article that student can have access to digital textbooks that are constantly updated and often more vivid, helpful, creative, and a lot cheaper than those old heavy books. This gives a view that integrating technology is needed to save cost. Kim (2016) pointed out that the quality of education can be improved provided that investment for technology and educator are made". This indicates that, investment for both technology and educator are important to transform the current state into better state.

Ronan (2017) stated in his study that plagiarism has been plaguing teachers forever. Students today can easily access essays, reports, class notes, test, etc. online, making it that much more difficult for teachers to know if the work their students hand in is original. According to him, we can say evidently that technology mobility do have bad side. In spite of that, having technology in school system allows the students and educator to stay connected everywhere. It also allows educator to access with other sources anywhere and anytime. Wainwright (2017) again commented in his study

on engagement that integrating technology in education everyday helps students stay engaged. Today's students love technology so they are sure to be interested in learning if they can use the tools they love. According to Fisher (2014) cloud technology, enable shared services and pooling resources with single source which at the same time reduce the cost. It is clearly seen that integrating technology help information travel anywhere and anytime. Umamaheswari. K and S. Niraimathi (2013) worked with student's socio-demographic variables like age, gender, name, class grade, proficiency and extra skill. Their data analysis result helps recruitment process on interview board through student's grade. Tunmibi, Ayooluwa Aregbesola, Pascal Adejobi, and Olaniyi Ibrahim (2015) was discussed the impact of e-learning and digitalization in primary and secondary school levels. They showed that majority of teachers agreed about e-learning helps our students to gather more knowledge and resources.

Pooja Thakar, Anil Mehta, and Manisha (2015) discussed about educational data mining which was based on different survey results. Machine learning helps us to find out informative information to solve a problem. Radhika R Halde (2016) introduced machine learning approach for predicting the student's performances and also compared different machine learning algorithms. Grant, Malloy & Murphy)2009) stated that the students in many U.S.A states are required to demonstrate computer proficiency early in their educational experience by means of passing an assessment test. Izmirli & Kurt (2009) suggested that the integration of technological instruction should be designed properly in order to make education more effective. For this purpose, instructional technologists are expected to be experienced in instructional design. Husa (2008) mentioned that ICT skill is one of the significant determinants for teachers' competence. Teachers' poor ICT competence and lack of confidence in using new technologies in teaching affect directly the quality of education. Because an instructional technologist is expected to have effective communication skills to produce opportunities for working together with the other shareholders in the institution as well as with those from other institutions.

Amy L. Baylor & Donn Ritchie (2002) found in the study that most expert teachers are not technologically skilled when they entered the profession. Yet to effectively expand the range of instructional opportunities that can be offered to students, teachers must reach and maintain a certain degree of technological competence but when these teachers are provided the opportunity to learn new technology skills and techniques, it appears that they avail themselves of the opportunity with

a resulting increase in their competence. Guclu (2010) showed that having a personal computer or having the possibility to access computer from the lab at the faculty that they attend affected students' computer skills in a positive way. Park & Son (2009) found that teachers' lack of computer skills and knowledge, in particular, make them uncomfortable in front of a class and add extra time for preparing teaching materials and resources. This indicates that teaching with computers requires more time and effort from teachers.

Konan (2010) studied with teachers' skills depend on different variable such as gender, experience and educational level. After investigation, he found that the computer literacy level of teachers' is medium. Angeli (2005) indicated from the findings of his study that student and teachers possessed higher technology competency in learning activities with technology which are statistically significant , and thereafter integrating them with appropriate inquiry-based pedagogy in classroom instruction. Deniz (2007) administered a survey among prospective class teachers in Turkey to identify the computer competence of prospective class teachers and findings showed that the teachers perceived moderate level of competence. Radhika R Halde (2016) was introduced machine learning approach for predicting the student's performances and compared different machine learning algorithms. One of the digitalization impact of Bangladesh is 1 to class 10 including teacher's training and other necessary books are available at this website www.ebook.gov.bd website (2009). The government provides laptops and multimedia projectors to 20,500 public and private educational institutions to improve the classroom teaching-learning process. There are many online social networking sites like Facebook, Twitter, My Space, eBay etc. Among all of these sites, participants of Facebook are the highest. Facebook is an online social networking service. Its name stems from the colloquial name for the book given to students at the start of the academic year by some American university administrations to help students get to know each other (Eldon, Eric, 2008). It is thus, seen that several studies have been relating to different aspects of Digitalization in Education. Nevertheless, there is hardly any separate comprehensive and in depth study that analyzed the issues like opportunities, challenges etc. of digitalization in higher education in Bangladesh. It is evident that our traditional education system mostly failed to generate qualitative human resource. Such being the situation, it is high time to study above issue in depth. This study will be an attempt to fill the reviewed gap.

Chapter Three: Methodology

This chapter describes the sources of data, sampling, data collection tools, methods of data collection, method of data analysis, interpretation and presentation and finally the conceptual framework of the study.

3.0 Method:

This section presents an overview of the research methods to be used in this study. The mixed method approach is followed to conduct this study, which is considered logical for achieving objectives of this research. Both qualitative and quantitative data has been used to interpret the findings.

3.1 Source of data and method of data collection:

In this research, both primary and secondary data have been used. To collect primary data, above mentioned tertiary level educational institutions have been selected. For secondary data, various government report, books, articles, journals, documents, and dailies are treated as source.

3.1.1 Data from students, educators & teachers through survey questionnaire and Focus group discussions;

3.1.2 Data from education experts and government authorities through survey questionnaire, interview;

3.1.3 From various government report, books, articles, journals, documents and dailies.

3.2 Sampling:

All tertiary level educational institutions are considered as population of this study. However, we have selected some major universities both public and private sector and consider some colleges (university level) as sample from both urban and rural areas. Total 50 teachers & educators, 100 students (10 each) from 10 selected institutions and 10 personnel (related with education authority) are considered as sample for this study as follows:

3.2.1 Three public Universities (one from Dhaka, rest from other divisions);

3.2.2 Three Private Universities (one from Dhaka, rest from other divisions) and

3.1.3 Four (university level) Colleges. (One from Dhaka, rest from other divisions).

3.3 Tools of data collection:

For collecting primary data, a well-designed questionnaires (4 sets) interview schedule and checklist will be prepared. The researchers will visit the selected institutes and collect firsthand data. The researcher will also contact with government official of ministry of education, NAEM, NCTB, UGC, NTRCA, Banbeis, Education Board etc. for secondary data. These data will be analyzed with statistical and other methods which seem most appropriate. A number of suitable data collection tools will be used to convey this study, such as:

3.3.1 Survey questionnaire

3.3.2 Interview;

3.3.3 Focus group discussion (FGD);

3.3.4 Content analysis;

3.4 Method of data analysis and presentation:

Proper and systematic data analysis is the most important and integral part of the study. First, we have organized the data, shape them into information to interpret and summarize it and then convert the responses to the structured questions into percentages. The collected and converted data are analyzed by using Excel and SPSS. An (hypothetical) analysis model is made as follows:

Knowledge Gathering Model

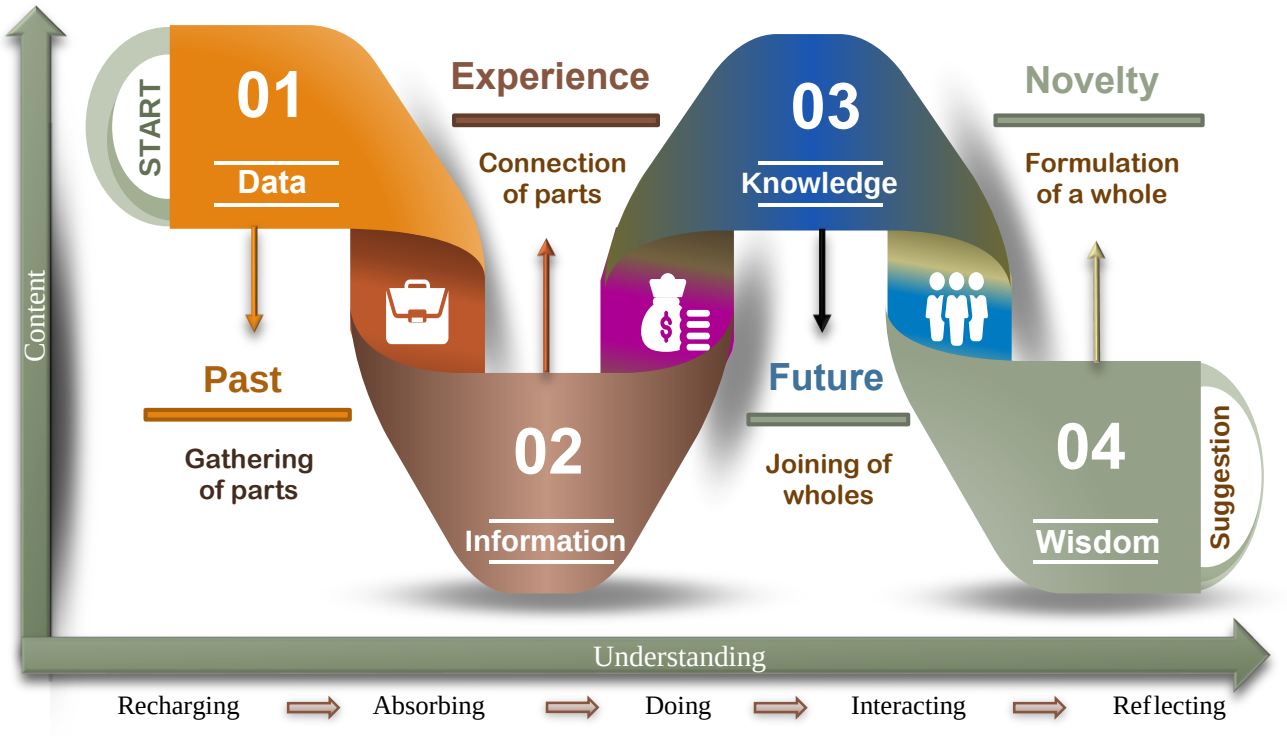


Figure-A

Knowledge gathering model represents that we gather past experience through data then turn them into information by joining those data. By connecting those experiences, we conclude the problem into solution. This gives us knowledge and help us to decide for future. We will understand the contents through recharging, absorbing, doing, interacting and reflecting the knowledge. Thus, we figure out future activities and create wisdom.

3.5 Conceptual framework of the study:

The literature study yielded several challenges belonging to four main categories; Challenges pertaining to individuals' characteristics (both students and teachers); technological challenges; course challenges (different support functions, the course itself with its pedagogy and activities); and contextual challenges (the institutional management and organization as well as the surrounding society with its values and regulations). Table -1 summarizes these findings.

Table-1

Individual Challenges	*Students'*
	Motivation Conflicting priorities Economy Academic confidence Technological confidence Social support (home and employers) Gender & Age
	Teachers'
	Technological confidence Motivation and commitment Qualification and competence Time
Course Challenges	*Course design*
	Curriculum Pedagogical model Subject content Teaching and learning activities Localization Flexibility
	Support Provided
	Support for students from faculty Support for faculty
Contextual Challenges	*Organizational*
	Knowledge management Economy and funding Training of teacher and stuff
	Social / Cultural
	Role of teachers and students Attitude on digitalized learning Rules and regulations
Technological	Access Cost Software and interface design Localization

Digitalization of Higher Education Model

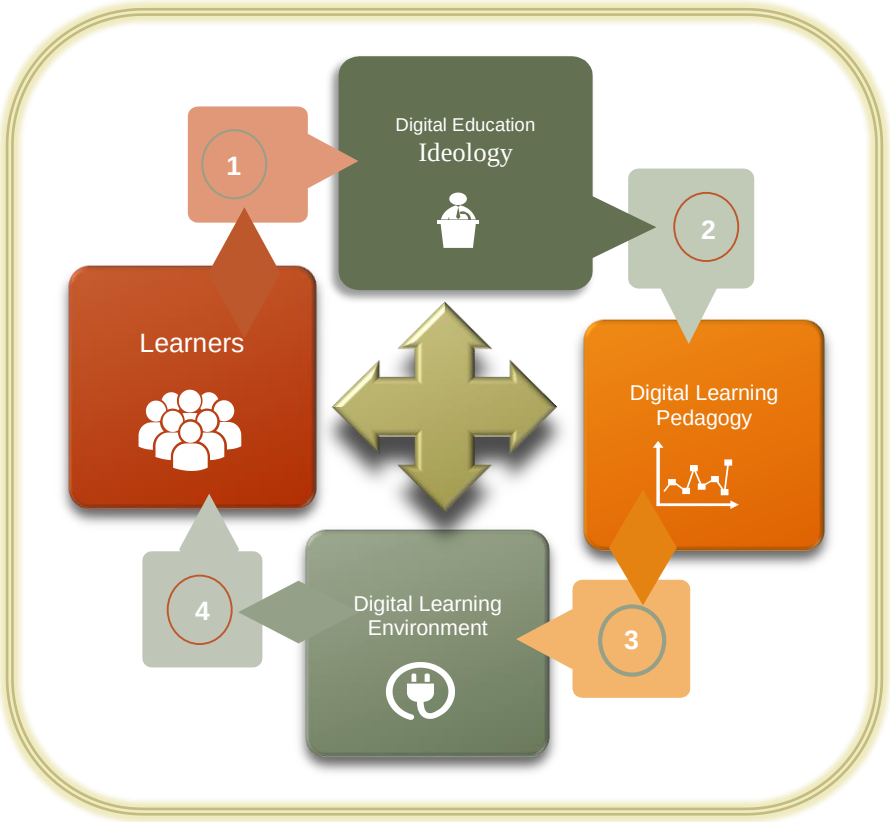


Figure – B

Digitalization Model shows that first, we have to establish a digital education ideology, a concept. Then we have to form a proper digital learning pedagogy. Then we will need a digital learning environment and then we have to reach our learners. Thus, we can achieve our desired higher digitalized education system.

Chapter Four: Results

This chapter presents the findings from the collected data of the study through interpretation and analysis. The current status of digitalization of higher education of Bangladesh, computer related expertise of the stakeholders, the opportunities and challenges of digitalization of education in our country. This chapter also contains the discussion of major findings and recommendations as well.

4.0 Findings, analysis and discussion:

For collecting first hand data, we have developed a questionnaire and interview schedule. With the help of those data collection tools, we have the answers to our question to make some comments.

4.1 Demographic data of the respondents:

A set of questionnaire was prepared specifically designed for the study. We delivered and collected (mostly) the questionnaire to 50 teachers/educators and 100 students from 10 selected institutions. Analysis of respond to those questionnaires are shown below:

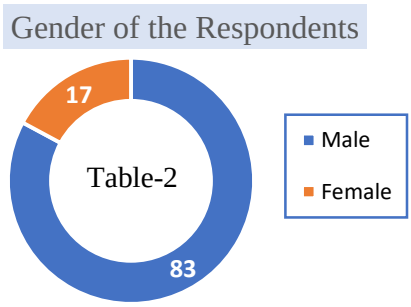


Table-2

According to response to the questionnaires, we found that 83% respondents were male, and rest 17% were female respondents (see table-2).

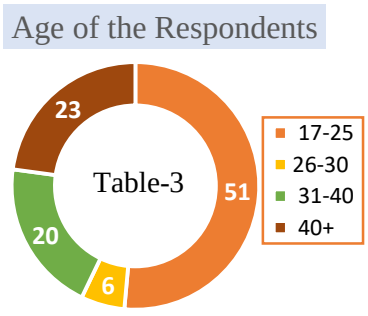
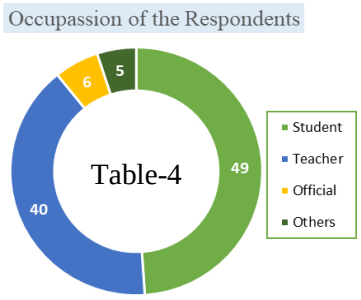
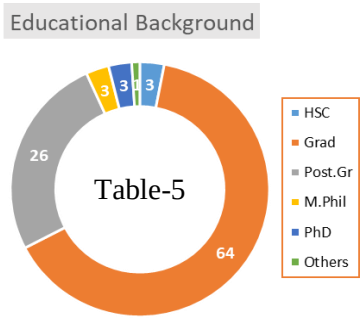


Table-3

Age of the respondents varied from 17 to 40+ years. According to the responses, we found that age ranging 17 to 25 years were 51%, age ranging 26 to 30 years were 06%, age ranging 31 to 40 years were 20% and age above 40 were 23% of the respondents (table-3)



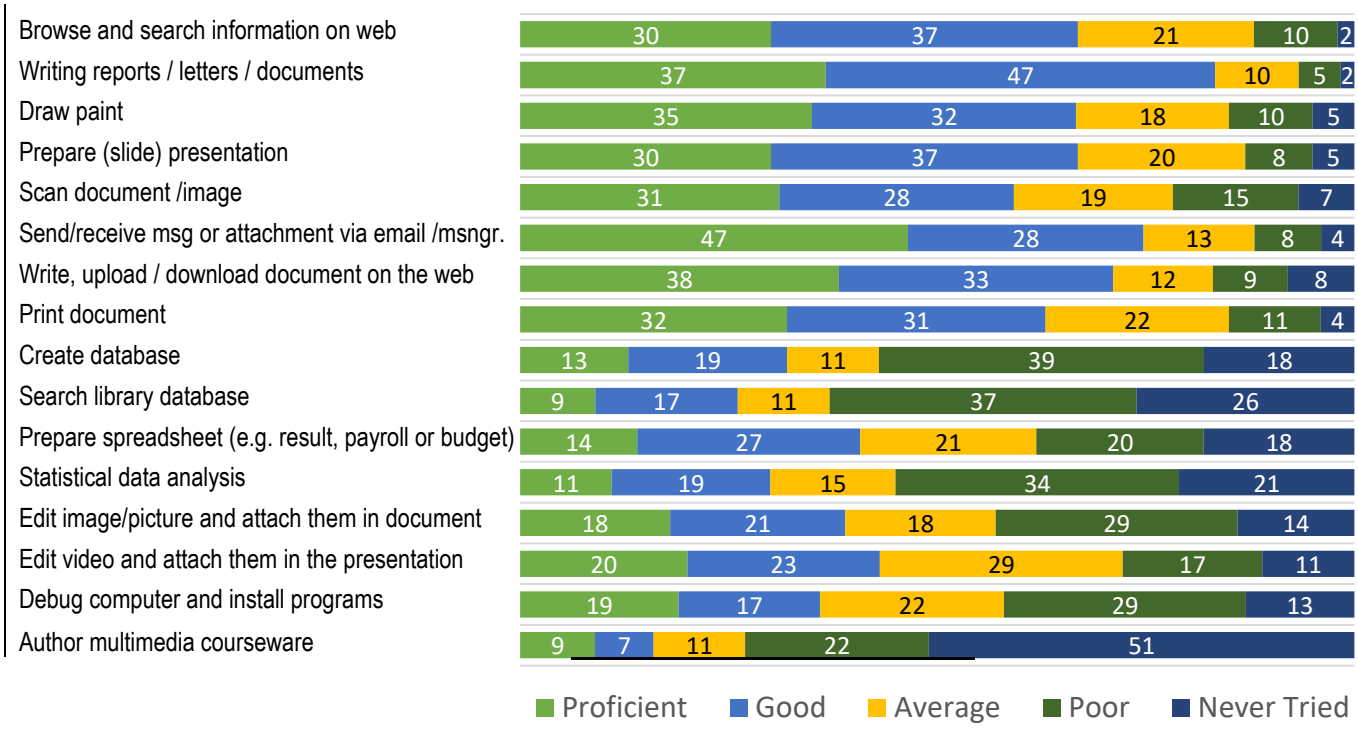
Respondents of those questionnaires were of various profession's. Of them, 49% were students, 40% teachers & educators, 6% officials and 5% of the respondents were of other profession's (see table-4).



Educational background were as follows: 03% of the respondents were HSC passed, 64% were graduate, 26% were post-graduate, 03% were M.Phil. 03% were PhD. and rest 02% were of other educational background (see table-5).

4.2 Computer Skills of the respondents: We have examined the basic computing and internet using skills of the respondents through a set of questions. We found the following result:

Table-6



From the above data (table-6), it is revealed that respondent are proficient and good in using computer basic operations and internet are 28% and 30% respectively (which is totaling 58% skill). We also found that 22% of the respondents are below average in using computer basic operations and internet which is certainly alarming. Some important issues are discussed in details below:

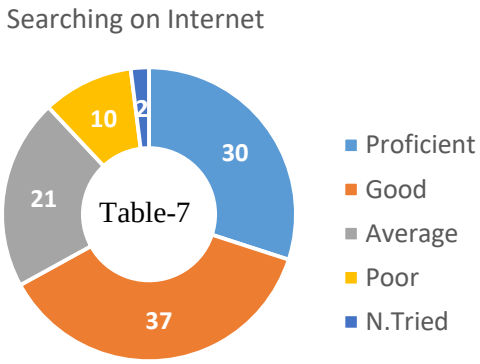


Table-7

Browse and searching on internet and websites are the basic skill of an adult user. Only 30% are found proficient and 37% are good at this. Which means rest 33% are not good at it. It is not at all a good news and it certainly affect the ultimate aim of digitalization of education process in our country (see table-7).

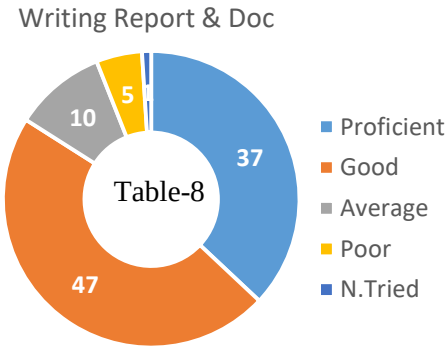
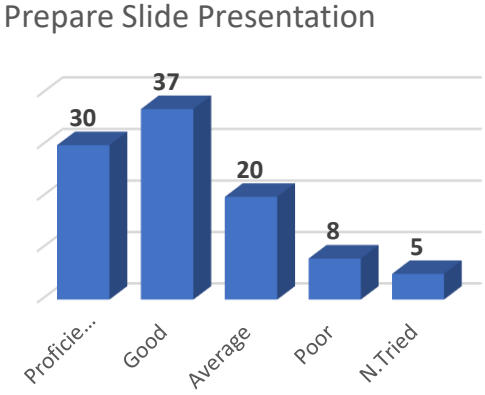


Table-8

Writing report and documents are very core skill in computer usage, but we found that only 37% are proficient and 47% are good at it. Which means rest 16% are still under average (see table-8).

Table-9



Slide preparation and presentation is a very important skill for online and digitalized education system. However, as we found that 30% and 37% are proficient and good at it, rest 33% are not good in this skill (see table-9).

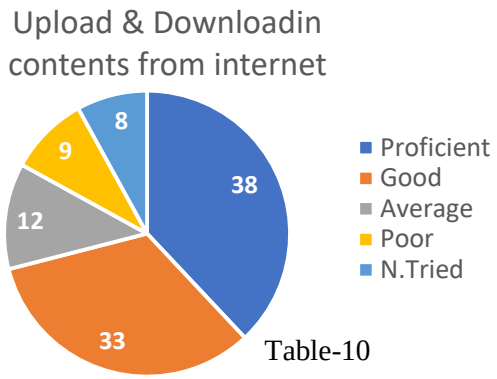


Table-10

For digitalized online education, uploading and downloading educational content from internet is very essential. Only 72% believe themselves good at this, rest 28% accept that they are below average. This skill is also a core need for this kind of initiatives (see table-10).

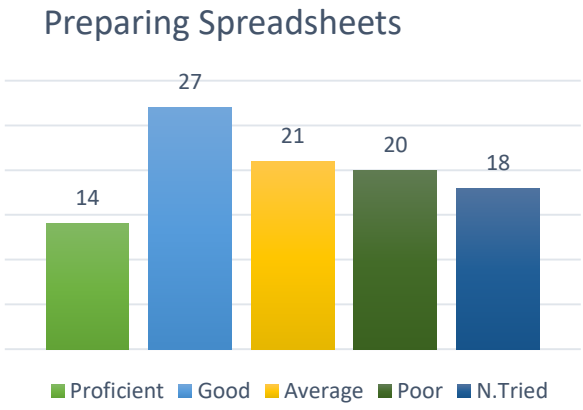


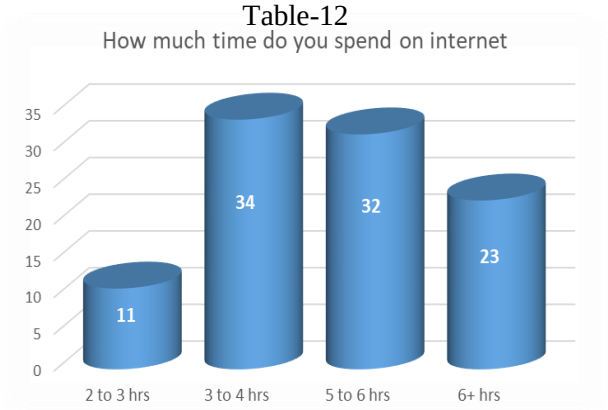
Table-11

Spreadsheet preparation are also a very important skill to fill the competency of digitalized education. We found that very few of our respondents are familiar with this skill. Only (14+27) 41% are good at this, rest 59% are not up to the mark, which is very alarming for the digitalization of our education (see table-11).

The collected data reveals that most of the respondents are average skilled in basic computing skills. Nevertheless, unskilled portion is also big in number which is a big challenge for establishing the digitalized education system in Bangladesh.

4.3 Computer usages of the respondents*:* We have examined the average usage of the respondents through some structured questions, the answers show the following:

Table-12



It is revealed that most of the respondents used internet for 3 to 4 hours a day (34%). 11% respondents uses 2 to 3 hours, 32% uses 5 to 6 hours and 23% uses more than 6 hours a day. On an average, it is seen that respondents spent 4.72 hours a day in Internet (see table-12).

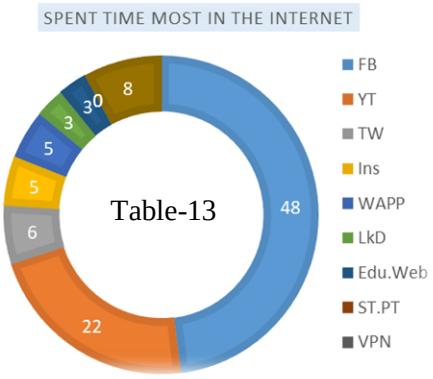


Table-13

Most of the respondents spent their most of the time in internet in Facebook. They visit 48% of their time on FB followed by 22% on YouTube, 08% on streaming platform, 06%, 05% on Tweeter and LinkedIn respectively (see table-13).

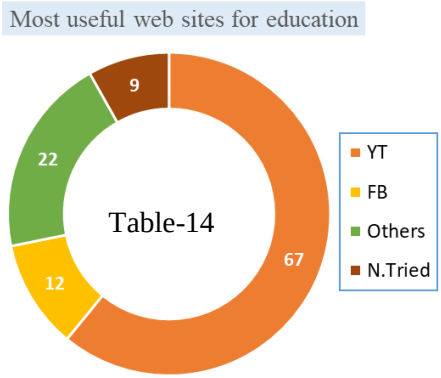


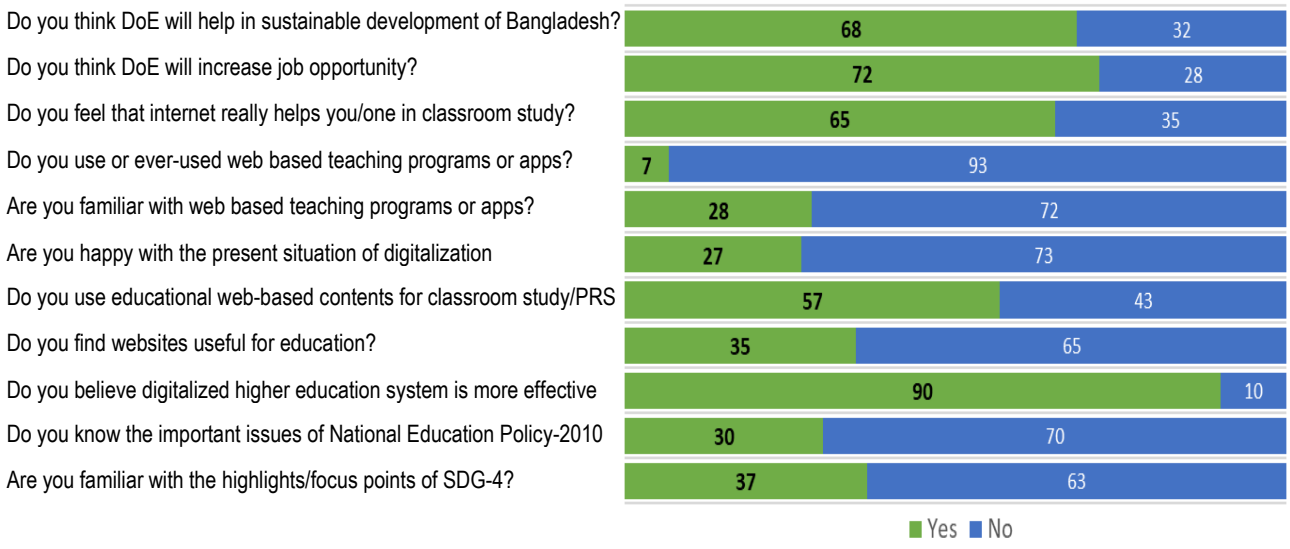
Table-14

The respondents found YouTube most useful website for education. 67% of the respondents voted for YouTube followed by 22% and 12% on others and Facebook respectively. 08% of the respondents never tried the websites for education (table-14).

4.4 Conceptual understanding of Education & Digitalization:

I have tried to examine the conceptual understanding of education and digitalization of education through some structured questions. Answers to those questions helped us to find the understanding and thinking of the respondents about our education and digitalization.

Table-15



It is found that 'National Education Policy (NEP)-2010' and 'SDG-4' are not very familiar to the respondents that much. Though they believe that digitalization of education is essential and very much needed for future development of our country in holistic approach, 72% of the respondents are not familiar with the web based education programs or apps from free internet. 93% of them do not use this kind of apps or program though 73% respondents are not happy with the present scenario of digitalization of education in Bangladesh. From this discussion, it is clear that in spite of believing digitalization of education is now a crying need, we are far behind of taking proper initiatives to achieve that goal.

4.5 SWOT Analysis:

Digitalization of education is now a burning thrust and priority. SWOT analysis gives us a birds' eye view of this venture's strength, weakness, opportunity and threat. From the answers of the respondents, the SWOT analysis is done It shows that though there are lots of advantages of digitalization of education, there are also some challenges in achieving this venture (see Figure-C):

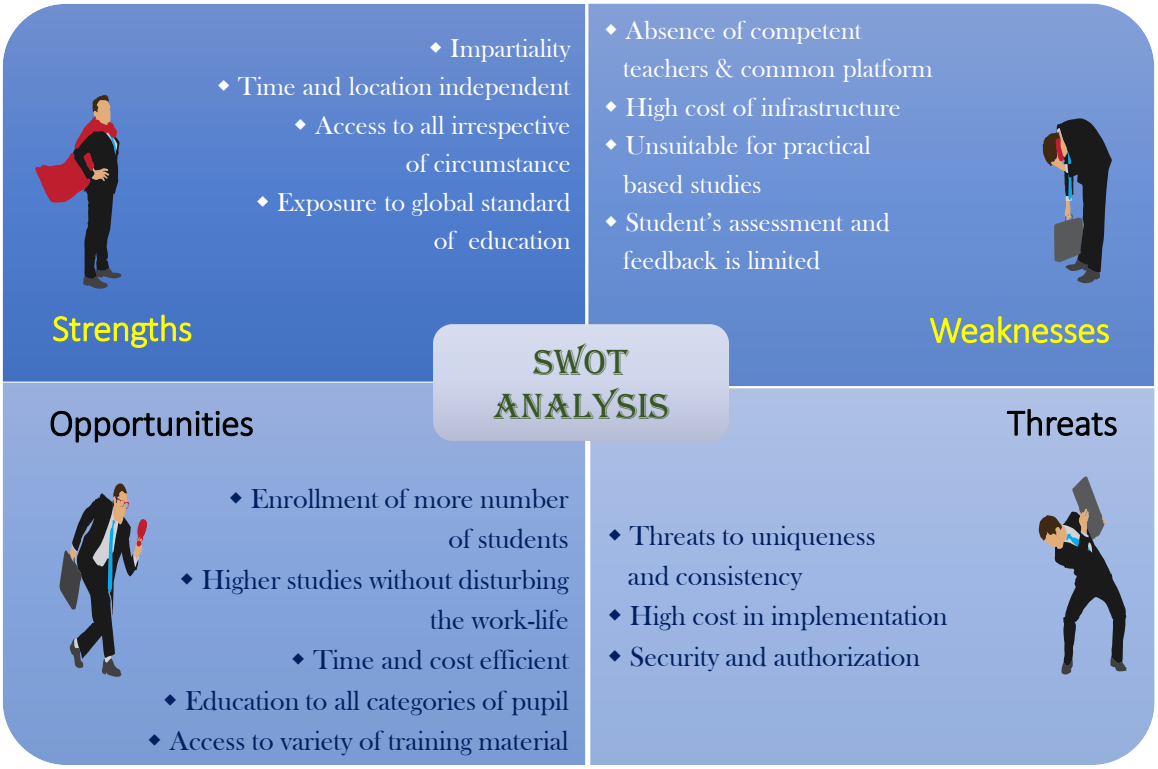


Figure – C

This analysis reveals that digitalization of higher education in Bangladesh contains lots of opportunities and strengths as well as there are many weaknesses and threats to combat with.

4.6 Challenges of Digitalization of Higher Education in Bangladesh:

According to the answers to the questionnaire and interviews, a list of challenges of digitalization of higher education in Bangladesh is found and they are stated below according to their priority (Table-8). According to the respondents, the biggest challenge of digitalization of higher education in Bangladesh is higher cost of internet and the lack of technical knowhow of the teachers' of tertiary level education in our country. A central controlling authority with a clear vision and plan of action for this venture is also felt absent by the respondents. Digital gap in the society and the socio-economic backwardness of the country are revealed as major obstacles for this initiative. Insufficient institutional infrastructural capability is also a major problem. Our educational curriculum also have to co-op with this new process of education. Our education policy (NEP-2010) also need to be revised accordingly**.**

Challenges of Digitalization of Higher Education in Bangladesh

Table – 16

1. High price of Internet connectivity and higher internet bandwidth;
2. Lack of Technical knowhow of the teachers' of tertiary level education;
3. Absence of central authority with vision to lead the digitalized education system;
4. Socio-economic structure of the country and digital-divide in the society;
5. Lack of evaluation / examination process;
6. Lack of Technical knowhow of the students' of tertiary level education;
7. Institutional Infrastructural latency;
8. Insufficient teacher teaching/training programs for digital education;
9. Inappropriate curriculum for digitalized education;
10. Under reformed government policy as well as education policy.

4.7 Steps to be taken to mitigate those challenges:

There is no universal solution to these challenges as they are of course each are unique. We figured some remedial steps from the opinion made by the respondents and got a prioritized list of activities for mitigating the challenges of digitalization of higher education in Bangladesh is stated below:

Steps to be taken to mitigate those challenges

Table-17

1. Make internet bandwidth free or cheaper for the teacher and students;
2. Train the teachers for developing good net based class contents;
3. Make available of computer/laptop/smart phones to the students;
4. Establish a proper central controlling authority;
5. Create/ develop proper exam / evaluation process:
6. Improve institutional internet facility and infrastructure;
7. Establish/create smart classroom for the teacher and students;
8. Develop net-friendly & relevant curriculum for digitalized education;
9. Develop (or upgrade) an appropriate education policy;
10. Improve digitally learning environment by creating digital library.

According to the output of interview and FGD, primarily, the respondents think that internet connectivity and data has to be made free or cheaper for the teachers and the students of our country. The teachers need to be trained for developing and delivering the digital class content. A visionary central controlling authority has to be established along with a central policy. One of the biggest problem we have faced during this pandemic lockout was online exam or evaluation process and we had to cancel several public examination. Through a thorough discussion, a set of targeted series of steps and areas of digitalization of higher education in Bangladesh is pin-pointed and show below:

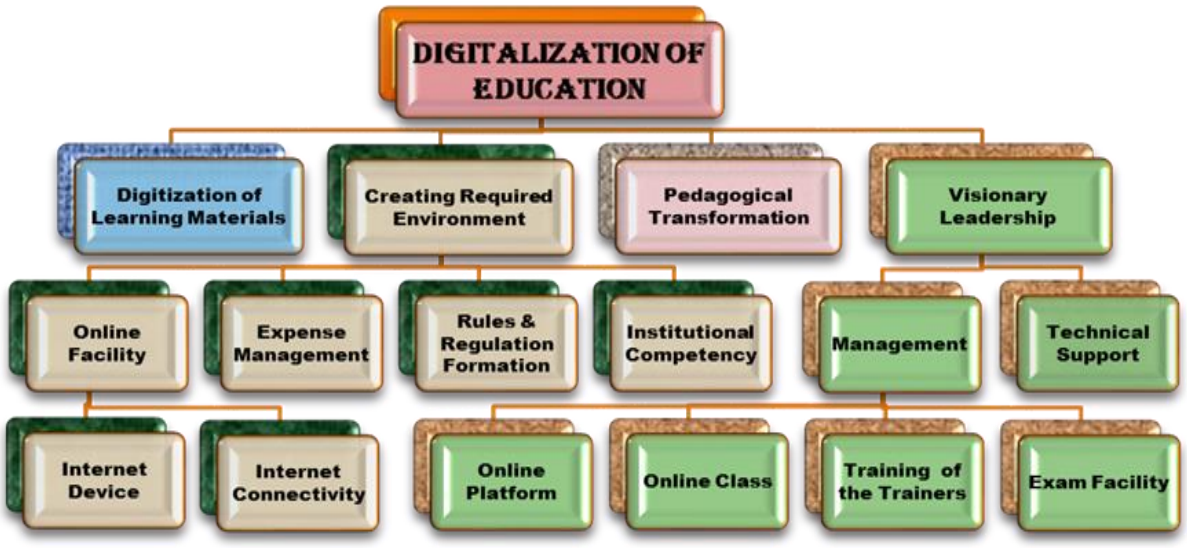


Figure-D

Our research reveals that, digitalization of higher education in Bangladesh stands on four separate efforts such as digitalization of learning materials, creating required environment, pedagogical transformation and a visionary leadership. Creating required environment depends on other four components like online facility, expense management, rules & regulation formulation and institutional competency. Online facility stands on proper availability of internet device and internet connectivity. Visionary leadership depends on sound and proper management and technical support. Proper management consists of properly ensuring of online platform, online class, training of the trainers and exam facilities. In accordance with the previously mentioned efforts, making available the digital equipment like smart-phones, laptops, PC's etc. for the students is also very important. Creation internet based curriculum, digital library, smart class-rooms, digital class contents, revising the education policy is also recommended by the respondents.

According to the respondents, the biggest challenge of digitalization of higher education in Bangladesh is higher cost of internet and the lack of technical knowhow of the teachers' of tertiary level education. A central controlling authority with a clear vision and plan of action for this venture is also felt absent by the respondents. Digital gap in the society and the socio-economic structure of the country a big obstacle for this initiative. Most of the teachers of our country use 'Zoom', Messenger, 'Microsoft Team' or 'Google Duo' as a medium of online classes instead of standard

'Learning Management System (LMS)s' like other educational institutions of the part of the world. In this kind of software, professors can take classes, post and manage assignments, quizzes, take exam, make evaluations as well as can make students database in a single comprehensive digital platform. It is seen that some private universities are using LMS's for effective online classes still public universities are still staying behind. Our government colleges are facing a big challenge of class attendance especially in higher education. LMS can be a solution to this issue also. Continuous assessment like class test, MCQ, quiz etc. can be done through this software. Every class will be followed by an exam (with a very small mark) and it can create a big effect for them and bring the students to the class. Insufficient institutional infrastructural capability is also a major problem. Our educational curriculum also have to co-op with this new process of education.

Backbone of our digitalized education is our internet connectivity. As the total number of mobile users climbed to 108.19 million (which has been double in last 5 years, as it was 54.12 ml. in 2015), about 92% students are dependent on mobile internet (Daily FE Report, 2020). Our mobile operators have very low amount of 'Spectrum' (47%) in the context to their huge need (number of connections), as a result, the internet speed is very poor in the user-end (Daily Ittefaq, 2021) in our country. A survey reveals that the quality of internet connectivity/service of our country is ranked 136th among the 140 mobile internet user countries of the world (SGI Report, 2021). In the context of our poor mobile internet connection and high cost, mobile internet based education can-not be a preferable option for the digitalized/online education for our country.

It is revealed by the respondent's answer to the interview schedules and questionnaire that our targeted stakeholders are mostly users of 'Web-1.0'. Which means they are still using the static and non-flexible internet, the first generation of Web-era where people are limited to viewing content in a passive manner. However, the dynamic Web 2.0 website allows users to interact and collaborate and team up with each other through social media dialogue as creators of user-generated content in a virtual community. Web 2.0 does not refer to any specific technical upgrades to the internet. It simply refers to a shift in how the Internet is used. In the new age of the Internet, there is a higher level of information sharing and interconnectedness among participants. Web 2.0 (also known as Participative and Social Web) refers to websites that accentuate user-generated content, ease of use, participatory culture and interoperability (i.e., compatible with other products, devices and systems) for end users. This new version allows users to actively participate in the experience rather

than just acting as passive viewers who take in information. This Web 2.0 can be a perfect solution to our digital-divide in our society.

Cost of internet and higher bandwidth has been found to the main challenge of digitalization of education and its proper disbursement & utilization. Therefore, we have to find a way to provide free or cheap (high speed) internet or connectivity for our teachers and students. Our government already took some initiatives like providing money to buy internet package and loan to buy mobile phone to the students, offering cheap internet package in government controlled mobile operators, but still no effort proved to be successful.

We have discussed with the technical experts for finding a solution to this problem of high cost of internet in our country. According to them, there could be a narrow way to provide our student-teachers free or cheap internet/connectivity for digital/online education. At national stage, we need to buy internet bandwidth or highway to browse servers that situated outside our country. It is like buying a walking space in an information highway to abroad servers (like Facebook, You tube etc.). However, if we can establish a local (ISP) server in our country, establish an Intranet (or LAN) service where we can setup a central LMS (Learning Management System) software to manage day-to-day class, exam, attendance, evaluation etc. and access through mobile network, this service can be free or very cheap. Bangladeshi first-ever geostationary communications and broadcasting satellite '*Bangabandhu-1'* can play a vital role in this intervention. In this process, the students and teachers will use their own mobile network to access that specific website with an app, login and then use the required actions like lesson download, part in an exam, quiz etc. This Intranet (or LAN) service can be free of cost or of very cheap, which can be borne by the government, mobile company and the user collectively. In this process, every institute will become a separate workstation, manage their own students' teaching-learning process, exam, attendance, evaluation separately, and update the results to the central server periodically. We have seen this kind of free services (free Facebook, 'Robi Ten Minute School' etc.) provided by some of our mobile operators previously.

A project is under way to establish a similar software named SRS (Study based Reporting System), started in 2016 in Bangladesh. However, this project was prepared specifically aimed to establish a central control over the students' attendance and continuous assessment evaluation done by the

institute. This project is not finished yet (according to news paper-only 8% have been completed in last four years) and still a long way to go.

International ICT development index shows that our country stands at 147th out of 176 countries (ITA, 2020). We also could not establish an effective online education platform in last 15 months. As this is the situation, we have suggested an alternative way to eradicate the said challenges of higher education digitalization in our country. The suggested process of networking locally need very few amount of investment, arrangement, initiatives and a lot of motivation by the all stakeholders as well as by our government. Therefore, the proposed course of action for this venture may be like this (conceptually):

- Establish a national server (ISP) to provide the Intranet service inside our country only controlled by our own satellite Bangabandhu-1;
- Establish an automated national Intranet service for education;
- Buy/develop, customize and setup a LMS software to the central server;
- Make an agreement with the mobile operators to give access to that server through their mobile network channel;
- Prepare an app/program for the mobile phone/pc to connect the server;
- Systematically include all the institutes and train them to use and manage the software accordingly;
- Establish a central controlling and monitoring authority to manage the whole system properly.

This initiative of establishment of Intranet service can be an alternative to expensive internet service and a solution to the cost barriers of our students-teacher community for our country. Still it is a concept model and further study is needed for establishing a working model in our present context.

4.8 Further research:

The findings of this research opens some further research options like finding an operational model of establishing Intranet to connect the stakeholders of digital education and create a well-balanced net generation as well as mitigate the digital divide among the society. Further research will help us to find the way to get the most from technology and achieve desired progress of our country.

Chapter Five: Conclusion

This chapter is the concluding and final comments that gives us a sharp idea of this whole study.

5.0 Conclusion

Digitalization could be termed as one of the innovation in the sector of education as it highlights the various activities that lead to the modernization of business model or regarding education sector. Education is a basic need for every human being and digital education is the current trend and necessity for every students or learners to be more focused and inclusive in their learning.

We all support 'Digital Bangladesh' but we should be aware of the dangers and setbacks, so that we can prepare ourselves for the upcoming challenge especially in education sector. We need to be mentally prepared for the changes and challenges in implementing digitalized higher education in Bangladesh, only then it would be possible to change it to reality. Digital Education is the panacea for this anathema of education all over the globe. Our educational system and, in particular, the way we learn and teach must therefore be adapted for this era of digitalization. Technology can become the '*wings*' that will let the educational world to fly farther and faster than ever-before. We must change not only '*what*' we learn, but also '*how'* we learn. But we face challenges of digitalization are in every sector right from policy making, changing the work flow up to changing the mentality of the government officials. The best part about the digitization of education in the 21st century is that, it is combined with the aspects of both; classroom learning and online learning methods. Walking hand in hand both act as a support system to each other, which gives a stronghold to our modern students. Digitization does not just bringing a "Smart School" but to have the development of an efficient learning oriented lectures to be given in the technical manner so as to match with the present scenario. This way the digitization of education industry in the 21st century will prove to be a boon to our society.

Bibliography/References

Anderson, T. and Dron, J. (20101): Three generations of Distance Education Pedagogy. *The International review of research in open and distributed learning,* 12(3).

Atkinson, C. (2010): *The Backchannel. Berkeley*, CA: New Riders, Peachpit. Pearson Education.

Blanchard, A. L. & Markus M. L. (2004). The Experienced "Sense" of a Virtual Community: Characteristics and Processes, *in The DATA BASE for Advances in Information Systems* - Winter 2004 (Vol. 35, No. 1).

Bourdieu, P. (2000). Cultural Reproduction and Social Reproduction. In R. Arum and I. Beattie (Eds.) *The Structure of Schooling: Readings in the Sociology of Education*. McGraw-Hill Higher Education. Pp. 56-68.

Bruns, A. (2008). Blogs, Wikipedia, *Second Life and Beyond: From Production to Prod usage*. New York: Peter Lang.

Crook, C. (2008). Web 2.0 technologies for learning: *The current landscape – opportunities, challenges and tensions,* Nottingham: Becta: Leading next generation learning.

Elavsky, c. M. (2012). *You Can't Go Back Now: Incorporating "Disruptive" Technologies in the Large Lecture Hall. in Social Media*. Noor Al-Deen,

Fisher, S. (2014). Schools Turn to Technology to Save Money. Laser fiche. Retrieved March 10, 2017 from https://www.laserfiche.com/simplicity/schools-turn-technology-save-money/.

Foucault, M. (1991[1975]). *Discipline and Punish.* London: Penguin Books.

Greenhow, C., Sonnevend J., Agur, C. (ed. 2016*). Education and Social Media – Towards a Digital Future.* MIT-Press.

Horatiu Catalano, Opportunities and Challenges of Education in the Digital Age. Hana S. & Hendricks, John Allen (Rad). *Lanham, Maryland*: Lexington Books. Pp 75 – 91.

ITA Official website, 2020. *Bangladesh-Commercial Guide*, August, 23, 2020.

Jabbar, Mustafa (2020). *How to transform education digitally*, Daily Bhorer Kagoj, Dhaka.

Jenkins, H. (2008). *Convergence culture: Where old and new media collide. New York:* New York University Press.

Jenkins, H. et. al (2006) *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century.* London: The MIT Press.

Jenkins, H., Ford, S. and Green, J. (2013). *Spreadable media – Creating value and meaning in a networked culture.* New York: New York Uni. Press.

Junco, R., Heibergert G & Loken E. (2010). *The Effect of Twitter on college student engagement and grades, in Journal of Computer Assisted Learning.* August 2010 Blackwell Pub. Ltd.

König, C. J. (2005). *Working Memory, Fluid Intelligence, and Attention Are Predictors of Multitasking Performance, but Poly chronicity and Extraversion Are not, in HUMAN PERFORMANCE,* 18(3), pp 243–266.

Kuznekoff, J. H., Munz, S. and Titsworth, S. (2016). Mobile Phones in the Classroom: Examining the Effects of Texting, Twitter, and Message Content on Student Learning. *In Communication Education.* Vol. 64, No. 3, July 2015, pp. 344–365.

Lee ,J., Lin, L. & Robertson, T. (2012). *The impact of media multitasking on Learning, in Learning, Media and Technology*. Vol. 37, No. 1, March 2012, pp. 94–104.

Lovari, Alessandro & Giglietto, Fabio (2012). *Social Media and Italian Universities: An Empirical Study on the Adoption and Use of Facebook, Twitter and Youtube" In © 2012 Social Science Electronic Publishing, Inc.*: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1978393

Lowe, Ben & Laffey, Des (2011). Is Twitter for the Birds? : Using Twitter to Enhance Student Learning in a Marketing Course. *in Journal of Marketing Education* 2011 pp. 33: 183.

Md. Sayeed Al-Zaman, Digitalization and Transformation of Teaching and Learning in Bangladesh, https://www.researchgate.net/publication/336285003

Meyrowitz, J. (1985). *No Sense of Place: The Impact of Electronic Media on Social Behavior*. New York: Oxford Uni. Press.

Moody, Mia (2010). Teaching Twitter and Beyond: Tips for Incorporating Social Media in Traditional Courses, *in Journal of Magazine & New Media Research*. Vol. 11, No. 2, pp 1-9.

Navneet Kaur(2019), Higher education: Challenges, trends and issues in digitalization, International Journal of Applied Research 2019; SP4:68-71

O'Brien, Jennifer (2011). *UCSF Study on Multitasking Reveals Switching Glitch in Aging Brain*. www.ucsf.edu

Ong, Walter J. (1982) *Orality and literacy – the technologizing of the word*, London: Routledge.

Pashler, H. (1994). Dual-task interference in simple tasks: data and theory. *In Psychological Bulletin*, 16, 220–244.

Probert, E. (2009). Information literacy skills: Teacher understandings and practice. *Computers & Education* 53 (2009) 24–33.

Rakap, S. (2010). Impacts of learning styles and computer skills on adult students' learning online: *The Turkish Online Journal of Educational Technology*, volume 9 Issue 2.

Robinson. K et. al (2016). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century.* London: The MIT Press

Reid, J. (2011). "We don't Twitter, we Facebook": *An alternative pedagogical space that enables critical practices in relation to writing, in English Teaching: Practice and Critique* May, 2011, Volume 10, Number 1. Pp 5880.

Ronan, A. (2017). *The Pros and Cons of Technology. Edudemic connecting education & technology.* Retrieved April 1, 2017 from http://www.edudemic.com/technology-pros-cons/.

Sa'ari, J. R., Luan, W. S. & Roslan, S. (2005) Attitudes and Perceived Information Technology Competency among Teachers. *Malaysian Online Journal of Instructional Technology*. 2(3), 70-77.

Shannon, B. Rinald, Tapp, Suzanne, & A. Laverie, Debra (2011). Learning by Tweeting: Using Twitter as a Pedagogical Tool. *in Journal of Marketing Education* 33(2) pp. 193–203.

STRATEGIES. *International Education & Research Journal*. 2017; 3:25-30

The British Council Pakistan(2019), Digital Globalisation of Knowledge and the Impact on Higher Education in South Asia and Europe Islamabad, Pakistan (www.britishcouncil.pk)

Tække, J. & Paulsen, M. (2012a). The challenge of social media – between prohibition and indifference in the classroom. *Conference Paper for the Thirteenth Annual Convention of the Media Ecology Association: The Crossroads of the Word.* 710 June 2012 Manhattan College Riverdale, New York: http://pure.au.dk/portal/files/45108803/MEA_2012_Taekke.pdf

Tække, J. & Paulsen, M. (2012b). Attention to Attention - Reflexions on new Media in Education. *Paper to The Danish Conference of Sociology: Troubled Identities*. 19 – 20 January 2012. Aarhus University. Working group: self-referential systems and network communication.

Tække, J. og Paulsen, M. (2013b). Social Media and Teaching - Education in the new media environment. *Paper to the 40th anniversary Nord media conference: Defending democracy*. Oslo and Akershus University College, 811 August 2013.

Wainwright, A (2017). *10 Reasons Today"s Students Need Technology in the Classroom. Secured network.* Retrieved March 15, 2017, from http://www.securedgenetworks.com/blog/10-Reasons-Today-s-Students-NEED-Technologyin-the-Classroom.

Webb, Lynne M. (2012). *Facebook- How College Students Work it in Social Media.* Noor Al-Deen, Hana S. & Hendricks, John Allen (Rad). Lanham, Maryland: Lexington Books. Pp. 3-23.

Wood, Eileen et. al (2012). Examining the impact of off-task multi-tasking with technology on real-time classroom learning. *In Computers & Education* 58 (2012) pp. 365–374.

Wright, Noeline (2010). Twittering in teacher education: reflecting on practicum experiences. *In Open Learning* Vol. 25, No. 3, November 2010, pp. 259– 265.

Yuen, A. H. K. & Ma, W. W. K. (2008). Exploring teacher acceptance of e-learning technology. Asia-Pacific Journal of Teacher Education. 36(3), 229-243.

https://www.indiatoday.in/educationtoday/featurephilia/story/digital 1027965-2017-08-08

https://www.learndash.com/3-trends-of-digitaleducation.

https://www.khanacademy.org Khan Principles. (n. d.). Date View 06.08.2016

https://www.entrepreneur.com/article/302680.

https://elearningindustry.com/digital-education-scopechallenges-developing-society

https://en.wikipedia.org/wiki/Web_2.0.

https://www.researchgate.net/publication/335881924.

APPENDIX

NATIONAL ACADEMY FOR EDUCATIONAL MANAGEMENT (NAEM)

SURVEY QUESTIONNAIRE (জরিপ প্রশ্নমালা)

Title: Opportunities and challenges of digitalization of higher education in Bangladesh

বাংলাদেশের উচ্চ শিক্ষার ডিজিটালাইজেশনে সহযোগিতার জন্য নিম্নোক্ত প্রশ্নাবলীর উত্তর প্রদানের অনুরোধ জানানো হলো:
To help us best way to provide information regarding digitalization of higher education in Bangladesh, please complete this survey and return it by [click to select date].

Demographic Data (জনতাত্ত্বিক তথ্য):

- Name (optional): _____
- Age (years): ☐ 17-25 ☐ 26-30 ☐ 31- 40 ☐ More than 40
- Gender: ☐ Male ☐ Female ☐ Other
- Name of the Institute/Office (if any): _____
- Designation: ☐ Student ☐ Teacher ☐ Educator ☐ Official ☐ Others
- Education Status: ☐ HSC ☐Graduate ☐Post Grad. ☐M.Phil. ☐PhD. ☐Others

Email Address (optional): _____

Structured Questions (কাঠামোগত প্রশ্নসমূহ):

Statement (A) What kind of Computer Skills do you have? (আপনার কি কি ধরনের কম্পিউটার দক্ষতা রয়েছে?)	Proficient অতি উত্তম	Good উত্তম	Average চলনসই	Poor ভালো নয়	Never Tried কখনো দেখিনি
(Pls Place a 'X' mark in the appropriate box) (অনুগ্রহপূর্বক যর্থাথ উত্তরের ঘরে 'X' মার্ক করুন)					
১) Browse and search information on web (ওয়েবসাইট ব্রাউজ ও তথ্য অনুসন্ধানকরণ)					
২) Writing reports/letters/documents (রিপোর্ট / চিঠি / ডকুমেন্ট লিখন)					
৩) Draw paint (ছবি আঁকা)					
৪) Prepare (slide) presentation (স্লাইড প্রেজেন্টেশন তৈরীকরণ)					
৫) Scan document /image (ডকুমেন্ট ও ছবি স্ক্যানকরণ)					
৬) Send/recv. massage or attachment via email / messenger (মেসেঞ্জার বা ইমেইলের মাধ্যমে মেসেজ ও এটাচমেন্ট পাঠানো / গ্রহণ)					

Statement (A) Contd…	Proficient অতি উত্তম	Good উত্তম	Average চলনসই	Poor ভালো নয়	Never Tried কখনো দেখিনি
৭) Write, upload / download document on the web (ডকুমেন্ট লিখন ও তা ওয়েবসাইটে আপলোড ও ডাউনলোডকরণ)					
৮) Print document (ডকুমেন্ট প্রিন্টকরণ)					
৯) Create database (ডেটাবেজ তৈরীকরণ)					
১০) Search library database (লাইব্রেরী ডেটাবেজ অনুসন্ধানকরণ)					
১১) Prepare spreadsheet (e.g. result, payroll or budget) স্প্রেডশীট তৈরীকরণ (যেমন: পরীক্ষার ফল, মজুরী/বেতন বা বাজেট)					
১২) Statistical data analysis (পরিসংখ্যানগত তথ্য বিশ্লেষণকরণ)					
১৩) Edit image/picture and attach them in document (ছবি সম্পাদনা ও সেটি ডকুমেন্টে সংযুক্তকরণ)					
১৪) Edit video and attach them in the presentation (ভিডিও সম্পাদনা ও সেটি প্রেজেন্টেশনে সংযুক্তকরণ)					
১৫) Debug computer and install programs/softwares (কম্পিউটার ত্রুটি মুক্তকরণ ও প্রোগ্রাম/সফটওয়ার ইন্সটলকরণ)					
১৬) Author multimedia courseware (মাল্টিমিডিয়া কোর্স / পাঠ্যক্রম লিখন)					

Statement (B) (Pls place 'X' mark in the appropriate box) (অনুগ্রহপূর্বক যর্থাথ উত্তরের ঘরে 'X' মার্ক করুন)	Yes	No
১) Are you familiar with the highlights/focus points of SDG-4? (আপনি কি SDG-4 এর মূল/উল্লেখযোগ্য বিষয়সমূহের সাথে পরিচিত?)		
২) Do you know the important issues of National Education Policy 2010. (আপনি কি জাতীয় শিক্ষানীতি-২০১০ এর প্রধান প্রধান বিষয়গুলি সম্পর্কে অবগত আছেন?)		
৩) Do you believe digitalized higher education system is more effective than traditional classroom? (আপনার কি মনে হয় যে বর্তমান সাধারণ শ্রেণিকক্ষের তুলনায় উচ্চশিক্ষায় ডিজিটালাইজড শ্রেণিকক্ষ বেশি কার্যকর?)		
৪) Do you find websites useful for education? (শিক্ষায় ওয়েবসাইটের ব্যবহারকে আপনি গুরুত্বপূর্ণ মনে করেন কি?)		
৫) Do you use educational web-based contents for classroom study / presentation? (আপনি কি শ্রেণি-কার্যক্রম/পাঠদান/প্রেজেন্টেশনে শিক্ষামূলক ইন্টারনেট-ভিত্তিক কনটেন্ট ব্যবহার করেন?)		
৬) Are you happy with the present situation of digitalization of higher education system in Bangladesh? (বাংলাদেশের উচ্চশিক্ষার ক্ষেত্রে ডিজিটালাইজেশনের বর্তমান অবস্থায়/পর্যায়ে আপনি কি সন্তুষ্ট?)		

৭) Are you familiar with web based teaching programs or apps? (আপনি কি ওয়েব/ইন্টারনেটনির্ভর শিক্ষা-প্রোগ্রাম বা অ্যাপের বিষয়ে অবহিত?)		
৮) Do you use or ever-used web based teaching programs or apps? (আপনি কি ওয়েব/ইন্টারনেটনির্ভর শিক্ষা-প্রোগ্রাম বা অ্যাপ কখনও ব্যবহার করেছেন?)		
৯) Do you feel that internet really helps you/one in classroom study? (আপনার কি মনে হয় শ্রেণি-শিক্ষা কার্যক্রমে ইন্টারনেট সত্যিই উপকারে আসে?)		
১০) Do you think digitalization of education will increase job opportunity? (শিক্ষার ডিজিটালাইজেশনে চাকরির সুযোগ বাড়বে বলে কি আপনি মনে করেন?)		
১১) Do you think digitalization of higher education will help in sustainable development of the country? (উচ্চশিক্ষার ডিজিটালাইজেশনের ফলে আমাদের দেশের টেকসই উন্নয়নে সহায়ক হবে বলে আপনি মনে করেন কি?)		

Statement (C) What are the challenges of digitalization of higher education in Bangladesh? বাংলাদেশের উচ্চশিক্ষার ডিজিটালাইজেশনের প্রধান প্রতিবন্ধকতাসমূহ কি কি? (অনুগ্রহপূর্বক নিম্নোক্ত বিকল্পসমূহ হতে সর্বাধিক উপযুক্ত ৫টি উত্তরে 'X' চিহ্নিত করুন)	
১. Digital divide/ gap in the society (সমাজে বিদ্যমান ডিজিটাল-বিভাজন)	
২. Lack of Technical knowhow of the students' higher education of Bangladesh. (আমাদের দেশের উচ্চ শিক্ষার ক্ষেত্রে শিক্ষার্থীদের প্রযুক্তিগত জ্ঞানের অভাব)	
৩. Lack of Technical knowhow of the teachers' higher education of Bangladesh. (আমাদের দেশের উচ্চ শিক্ষার ক্ষেত্রে শিক্ষকদের প্রযুক্তিগত জ্ঞানের অভাব)	
৪. Appropriate curriculum (উপযুক্ত পাঠ্যক্রম)	
৫. Institutional Infrastructural Backwardness (প্রাতিষ্ঠানিক অবকাঠামোগত পশ্চাৎপদতা)	
৬. Lack of Internet connectivity and higher internet bandwidth (ইন্টারনেট সংযোগ ও উচ্চ ইন্টারনেট ব্যান্ডউইথের অভাব)	
৭. Insufficient prepared/digitally trained teachers (উপযুক্ত ডিজিটাল শিক্ষায় প্রশিক্ষিত শিক্ষকের অপ্রতুলতা)	
৮. Insufficient teacher teaching/training programs (শিক্ষকদের ডিজিটাল শিক্ষায় প্রশিক্ষণের সুযোগের অপ্রতুলতা)	
৯. Authority with vision to lead the digitalized education system (ডিজিটিালাইজড শিক্ষাকে নেতৃত্ব দানকারী স্বপ্নদর্শী / দূরদর্শী কর্তৃপক্ষ)	
১০. Lack of evaluation / examination system/process (শিক্ষায় উপযুক্ত পরীক্ষা/মূল্যায়ণ পদ্ধতির অভাব)	
১১. Ability to spend enough money for developing the system promptly (এই পদ্ধতি তৈরী ও বাস্তবায়ণে দ্রুত এবং সঠিকভাবে অর্থ ব্যয়ের সক্ষমতা)	
১২. Absence of central controlling authority for the venture (এই উদ্যোগ বাস্তবায়ণে কেন্দ্রিয় নিয়ন্ত্রনকারী কর্তৃপক্ষের অভাব)	

১৩. Under reformed government policy as well as education policy (সরকারি নীতি তথা জাতীয় শিক্ষা নীতিতে এ বিষয়ে সঠিক দিক নির্দেশনার অভাব)	
১৪. Socio-economic structure of the country (আমাদের দেশের আর্থ-সামাজিক অবস্থার/কাঠামোগত প্রতিবন্ধকতা)	
১৫. Insufficient money in the country budget (সরকারের বাজেটে এ কাজের জন্য পর্যাপ্ত অর্থ বরাদ্দের অভাব)	
১৬. Others (অন্যান্য)	

Statement (D) Suggestion to overcome the challenges of digitalization of higher education in Bangladesh: বাংলাদেশের উচ্চশিক্ষার ডিজিটালাইজেশনের প্রতিবন্ধকতা নিরসনের উপায়সমূহ কি কি: (অনুগ্রহপূর্বক নিম্নোক্ত বিকল্পসমূহ হতে সর্বাধিক উপযুক্ত ৫টি উত্তরে 'X' মার্ক করুন)	
১. Train the teachers for developing good internet-based class contents (শিক্ষকদের ইন্টারনেট-ভিত্তিক ক্লাসের বিষয়বস্তু প্রস্তুত করণের/তৈরীর প্রশিক্ষণ প্রদান)	
২. Make available of computer/laptop/smart phones to the students (শিক্ষার্থীদের জন্য কম্পিউটার / ল্যাপটপ / স্মার্ট ফোন প্রাপ্তি সহজিকরণ)	
৩. Develop net-friendly & relevant curriculum for digitalized education (ডিজিটাল শিক্ষার জন্য ইন্টারনেট-ভিত্তিক যথোপযুক্ত পাঠ্যক্রম প্রস্তুতকরণ)	
৪. Improve Internet facility and infrastructure (ইন্টারনেট সুবিধা ও উপযুক্ত অবকাঠামোর উন্নয়ণ)	
৫. Make internet bandwidth free or cheaper for the teacher and students (শিক্ষক ও শিক্ষার্থীদের জন্য ইন্টারনেট ব্যান্ডউইথ বিনামূল্যে বা সস্তায় প্রদানের ব্যবস্থাকরণ)	
৬. Establish/ Create smart classroom for the teacher and students (শিক্ষক ও শিক্ষার্থীদের জন্য স্মার্ট শ্রেণিকক্ষ স্থাপন)	
৭. Improve digitally learning environment by creating digital library (ডিজিটাল লাইব্রেরি তৈরীর মাধ্যমে ডিজিটাল শিক্ষার পরিবেশের উন্নয়ণ)	
৮. Develop an appropriate education policy (এর জন্য শিক্ষা নীতির যথোপযুক্ত সংস্কারকরণ)	
৯. Prioritize in establishing computer related industry in Bangladesh (বাংলাদেশে কম্পিউটার সম্পর্কিত শিল্প স্থাপনে অগ্রাধিকার/সহযোগিতা প্রদান)	
১০. Create/ develop proper exam / evaluation process. (পরীক্ষার যথার্থ মূল্যায়নের জন্য উপযুক্ত পরীক্ষা/মূল্যায়ন পদ্ধতির বিকাশ/তৈরী করণ)	
১১. Establish a proper central controlling authority (এর জন্য উপযুক্ত কেন্দ্রীয় নিয়ন্ত্রণকারী কর্তৃপক্ষ স্থাপন)	
১২. Create smart visionary leadership (স্মার্ট ও স্বপ্নদর্শী / দূরদর্শী নেতৃত্ব তৈরীকরণ)	
১৩. Others (অন্যান্য)	

Statement (E)	(Pls place 'X' mark in the appropriate box) (অনুগ্রহপূর্বক যর্থাথ উত্তরের বক্সে 'X' মার্ক করুন)
1. How much time do you spend on internet? (আপনি কতটা সময় ইন্টারনেটে ব্যয় করেন?) ☐ 1 to 2 hrs. ☐ 3 to 4 hrs. ☐ 5 to 6 hrs. ☐ More than 6 hrs.	
2. Where do you spent time most in internet? (ইন্টারনেটে কোথায় আপনি সবচেয়ে বেশি সময় থাকেন?) ☐ Facebook; ☐ YouTube; ☐ Twitter; ☐ Instagram; ☐ WhatsApp; ☐ LinkedIn; ☐ Educational Websites; ☐ Streaming platform ☐ VPN ☐ Others;	
3. Please state/mention three most useful web sites for education/learning according to you (আপনার মতে শিক্ষার জন্য সবচেয়ে উপযুক্ত/কার্যকর তিনটি ওয়েবসাইটের নাম উল্লেখ করুন। i. ii. iii. Or iv. ☐ No Idea / Never Tried. (কোন ধারনা নেই/ কখনো চেষ্টা করিনি)	

Interview Schedule (সাক্ষাৎকার প্রশ্নসমূহ):

১. Please inform us (in brief) your understanding about SDG-4 and quality education. According to you, how quality education can be achieved (some quick points)?
(SDG-4 ও গুনগত শিক্ষা সম্পর্কে আপনার ধারনা অনুগ্রহপূর্বক সংক্ষেপে বলুন। আপনার মতে কিভাবে গুনগত শিক্ষা অর্জন করা সম্ভব - কয়েকটি গুরুত্বপূর্ণ পয়েন্ট উল্লেখ করুন।)

২. Do you think, there are digital gap/divide in the present society? If therein, how can we minimize that gap? (আপনি কি মনে করেন যে আমাদের সমাজে ডিজিটাল-বিভাজন রয়েছে? যদি থেকে থাকে, তবে তা কিভাবে দুর করা বা কমানো সম্ভব?)

৩ Do you believe that digitalization of higher education in Bangladesh is achievable? How? (আপনি কি মনে করেন যে, আমাদের দেশে উচ্চ শিক্ষার পূর্ণ ডিজিটালাইজেশন অর্জন সম্ভব? আপনার উত্তর হ্যাঁ হলে তবে তা কিভাবে?)

৪. How the proper institutional leaders with vision can be created for this venture?
(এই লক্ষ অর্জনে কিভাবে উপযুক্ত স্বপ্নদর্শী / দূরদর্শী প্রাতিষ্ঠানিক নেতৃত্ব তৈরী করা যাবে?)

৫. Please let us know what do you think about the IT competency of the students' of higher education in Bangladesh. Please rank it from 1 to 5 (where 5 represents the highest value). (অনুগ্রহ করে আমাদের উচ্চ শিক্ষাস্তরের শিক্ষার্থীদের আইটি দক্ষতা বিষয়ে আপনার ধারনা বলুন। ১ হতে ৫ এর মধ্যে তার অবস্থান/পর্যায়/র‍্যাংক উল্লেখ করুন যেখানে ৫ দ্বারা সর্ব্বোচ্চ মান বোঝায়।)

৬. Please make us know what do you think about the IT competency of the teachers of higher education of Bangladesh. Please rank it from 1 to 5 (where 5 represents the highest value). (অনুগ্রহকরে আমাদের উচ্চশিক্ষাস্তরের শিক্ষকদের আইটি দক্ষতা বিষয়ে আপনার ধারনা বলুন। ১ হতে ৫ এর মধ্যে তার অবস্থান/পর্যায়/র‍্যাংক উল্লেখ করুন, যেখানে ৫ দ্বারা সর্ব্বোচ্চ মান বোঝায়।)

৭. Please mention the challenges of digitalization of higher education in Bangladesh.
(আপনার মতে বাংলাদেশের উচ্চ শিক্ষার ডিজিটালাইজেশনের প্রতিবন্ধকতাসমূহ কী?)

৮. What are the tools that plays a vital role in digitalizing of higher education in Bangladesh?
(বাংলাদেশের উচ্চ শিক্ষার ডিজিটালাইজেশনের প্রতিবন্ধকতাসমূহ সমূহ দূরীকরণে আপনার মতে কি কি পদক্ষেপ সবচেয়ে বেশি ভূমিকা রাখতে পারে?)

৯. Do feel that this initiative will create a more capable generation for the job market? How? (আপনি কি মনে করেন যে এই উদ্যোগ আমাদের পরবর্তী প্রজন্মকে কর্মক্ষেত্রে আরো বেশি গ্রহনযোগ্য করে তুলবে? আপনার উত্তর হ্যাঁ হলে তবে তা কিভাবে?)

১০. Do you believe that digitalization in tertiary level education will make a big positive change in poverty alleviation program of Bangladesh? How?
(আপনি কি মনে করেন যে, উচ্চ শিক্ষার ডিজিটালাইজেশনে বাংলাদেশের দারিদ্র বিমোচন উদ্যোগে গুরুত্বপূর্ণ ভুমিকা রাখবে? আপনার উত্তর হ্যাঁ হলে তবে তা কিভাবে?)

১১. Do you think that quality education and sustainable development of the country are connected? Please describe (in brief). (আপনি কি মনে করেন যে, গুনগত শিক্ষা ও দেশের টেকসই উন্নয়ণ পরস্পর সম্পর্কযুক্ত? আপনার উত্তর হ্যাঁ হলে তবে তা কিভাবে সংক্ষেপে ব্যাখ্যা করুন ।)

১২. Do you feel that digitalization of higher education is essential in Bangladesh right now? Why? (আপনার মতে উচ্চশিক্ষার ডিজিটালাইজেশন কি বর্তমানে বাংলাদেশের জন্য অপরিহার্য? আপনার উত্তরের স্বপক্ষে সংক্ষেপে ব্যাখ্যা করুন ।)