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Manuscript ID:  
ASH-2024-11047092

Volume: 11

Issue: 4

Month: April

Year: 2024

P-ISSN: 2321-788X

E-ISSN: 2582-0397

Received: 13.01.2024

Accepted: 15.03.2024

Published: 01.04.2024

Citation:

Saiful Islam, Md, and Shayla Akter. "Role of Technological Knowledge in Remote Learning/e-Learning: Exploring the Post-Pandemic Scenario of the Tertiary-Level Students of Bangladesh." *Shanlax International Journal of Arts, Science and Humanities*, vol. 11, no. 4, 2024, pp. 79–85.

DOI:


<https://doi.org/10.34293/sijash.v11i4.7092>



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# Role of Technological Knowledge in Remote Learning/E-Learning: Exploring the Post-Pandemic Scenario of the Tertiary-Level Students of Bangladesh

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## Abstract

*The study aims to look into students' technological knowledge from the perspective of academia. The study tried to find out the advantages the students enjoy due to having the essential technological skills and the problems students faced during the online classes for requiring more skills. The results of this study look at the tech skills one should develop for an effective and smooth teaching-learning process. The recent pandemic has had a considerable impact on the studies of graduate students and has made it mandatory to have technological knowledge to conduct studies. Data have been collected through a quantitative approach.*

**Keywords:** Tech Skill, Technological Knowledge, E-Learning, Remote Learning

## Introduction

Technology in education has been invented over the last 50 years. Computers were not standard inside the classroom even 20 years ago. In contrast, today's students and children are considered "digital natives," which means growing up with digital technology such as the internet, computers, Smartphones, etc. The rapid advancement of technology in education cannot go unnoticed as it occurs worldwide. It has been providing students with access to numerous resources and aids them in the learning process (Evanouski). Most universities and educational institutions have already started utilizing technology within their teaching methods. From online colleges to digital certificate programs and hybrid set-ups, technology is reshaping the world of education. The effective use of digital learning tools in classrooms can increase student engagement, help teachers improve their lesson plans, and facilitate personalized learning. It also helps students build essential 21st-century skills. Virtual classrooms, videos, augmented reality (AR), robots, and other technology tools cannot make classes livelier; they can also create more inclusive learning environments with faster collaboration and enable teachers to collect data on student performance (Importance of Technology in Education).

Still, it is essential to note that technology is a tool used in education and not an end in itself. The promise of educational technology lies in what educators do with it and how it is used to support their students' needs (How Important is Technology in Education).

This study will explore the students' advantages or disadvantages due to needing proper knowledge about the available technology. This study also aims to determine the probable required skills a student needs to complete their overall academic process. Based on this research output, the institution can offer a skill development package for participants and practitioners to contribute to future development.

### Research Objectives

Research objectives describe what research is trying to achieve and explain why it is being pursued (Ryan). These are the outcomes that are aimed to be achieved by conducting research. The research objectives aim to drive the research project, including data collection, analysis, and conclusions (Indeed Editorial Team). The entire world faced a pandemic where the teaching-learning process was conducted online. The objective of this research is to look into students' technological knowledge. Data of this study is focused on the advantages and challenges a student faces during online classes for having and needing more tech skills. Another purpose of this research is to determine the required tech skills for an effective and smooth teaching-learning process.

### Research Question

1. What are the advantages the students have due to having the basic tech skills?
2. What are the problems a student faces during online classes for needing basic tech skills?
3. What tech skills should one develop for an effective and smooth teaching-learning process?

### Literature Review

The British have founded the foundation of the Bangladeshi education system. It consists of three levels - primary, secondary, and higher education. In Bangladesh, both Primary and secondary education are compulsory. Primary education consists of eight years, while secondary education lasts four years. Secondary education is divided into a lower level and a higher level, and public examinations are held after each level of schooling. Schools in cities and towns are generally better-staffed and better-financed than those in rural areas. There are hundreds of colleges,

most affiliated with the prominent public universities of Bangladesh. Bangladesh relies on several engineering colleges and a network of polytechnic and law colleges for vocational training. In addition, an array of specialized colleges is dedicated to training students in areas such as the arts, home economics, social welfare and research, and various aspects of agriculture. Literacy improved significantly in the 21st century: less than half of the population could read and write at the beginning of the century, but by the late 2010s, more than two-thirds were literate (Bangladesh - Education).

The introduction of the first four-bit Intel microprocessor 4004 in 1971 and the subsequent overwhelming growth of personal computer use in every sphere of life has established that development in the IT sector will be the primary key to a nation's success. Realizing this truth and observing the successful history of neighboring countries like India, Sri Lanka, Singapore, Thailand, Malaysia, and many others, the Bangladesh Government has recently declared IT a thrust sector (Information Technology Education in Bangladesh). The education sector has experienced tremendous growth as a result of technological development. Innovation has enhanced educational technology, a field of study that specializes in evaluating, designing, and developing new techniques, implementing them, and assessing the productivity of the instructional environment. Educational technology allows students to learn and appreciate new technologies as soon as they emerge. Today's learners are more inclined toward using new technologies more efficiently. Understanding emerging innovations allows them to weigh new tools' positive and negative outcomes before implementing them in professional careers and studies (Enos).

In Bangladesh University of Engineering and Technology, formal computer education was first started in 1984 with the foundation of the Computer Science and Engineering Department. After that, IT education gradually extended to bachelor's, higher secondary, and secondary levels. Because of the poor economic conditions, most schools in the country cannot afford to buy computers for their students. A few city-based schools need more computer laboratory facilities. However, they fail to familiarize their students with the internet, emails, and related technology because of the lack

of nationwide telecommunication infrastructure and internet facilities. In addition, the teaching community of these levels needs more IT training (Information Technology Education in Bangladesh).

The world was fighting the coronavirus, which had spread to nearly every point of the globe over the first three months of 2020. At the end of May, the death toll crossed 369,124, while the total quantity of infected was over 6 million across the world. Aside from the economy, the sector that has been harmed the most by the outbreak of COVID-19 is the education sector. The disease started spreading from China at the start of 2020, and infection became quicker in March. Consequently, by this time, different educational institutions across the globe began to shut down gradually, and Bangladesh shut down all its educational institutions on March 17. COVID-19 forced digital education on teachers and students, where students use their home computers, laptops, or smartphones through the internet, staying away from their academic institutions (Khan et al.). Educational technology has become essential for today's learners because it allows them to learn much faster than they would if they were not using such tools and programs. Similarly, teachers need to use the latest tools available in their work to engage students. To engage students in learning, one needs to be innovative, and new ideas should be introduced so that students get excited about what they are learning. Educational technology has become essential for teachers because of its importance in today's education industry (Lim).

**Methodology**

This research is on the undergraduate students of different universities in Bangladesh under different faculties regarding their technological knowledge for academic purposes. The undergraduate students of the modern world usually learn technology as they want to come up with modern technology. As Bangladesh is not yet part of the modern world and our style is somewhat different from the modern world, we aimed to see how much technological knowledge students have in education and to know how much technological knowledge they used during the pandemic, and what problems they faced due to lack of technological knowledge. Data from this research have been collected through a quantitative approach.

**Instrument**

The study has benefited from a quantitative research approach. Data was collected through a digital questionnaire containing 18 questions, and it was distributed among 120 students.

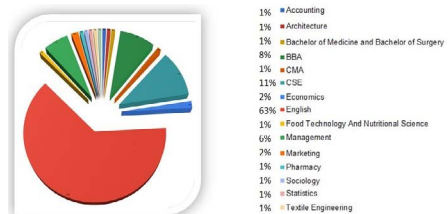
Among them, 15 are close-ended, and three are open-ended. Data was collected from undergraduate students of different universities in Bangladesh under different faculties.

**Data Analysis**

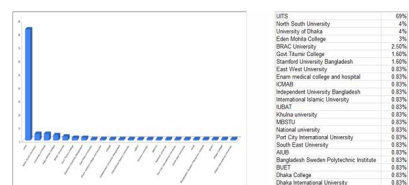
The data generated from the questionnaire were analyzed using Google Forms. Descriptive statistics were used to analyze and represent data.

**Study Group**

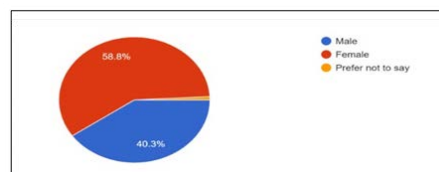
The participants of this study were undergraduate students studying in different departments throughout Bangladeshi universities. Both male and female students participate in answering the required questions.



**Figure: Frequency Distribution of Department Students' Response**



**Figure: University-wise Distribution of Respondents**

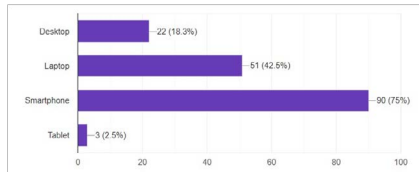


**Figure: Gender of the Frequency Distribution of Student's Response**

### Findings

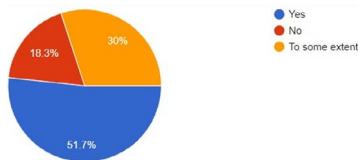
The following conclusions are drawn from the responses provided by university students to the questions contained in the statistics series tool.

### Which Device(s) do you use for Academic Purposes?



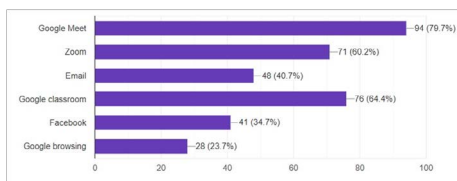
Most of the survey respondents (75%) are using smartphones and other devices. Then, the second majority (42.5%) use laptops for academic purposes. 18.3% of the survey respondents use desktops, while only 2.5% use tablets.

### Are you Skilled in Different Tools used for Academic Purposes?



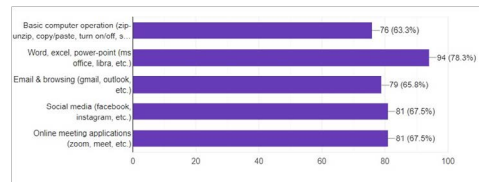
51.7% of survey respondents have responded with yeses, 30% have responded to some extent, and 18.3% have responded with no.

### Which Platform did you use for Academic Purposes during the Pandemic?



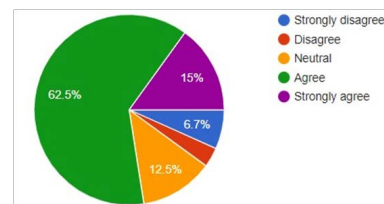
Students used multiple platforms for academic purposes during a pandemic. The most frequently used platform was Google Meet (79.7%). The second highest platform was Google Classroom (64.4%). Zoom was in third position (60.2%). Email (40.7%), Facebook (34.7%), and Google browsing (23.7%) were also used for academic purposes during the pandemic.

### What are your Tech Skills? (You can Choose Multiple)



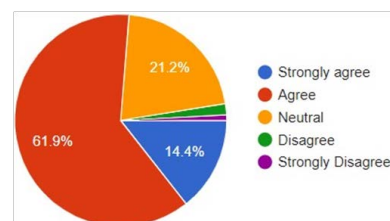
We can observe that students have multiple technical skills. However, most students (78.3%) are skilled with office packages. 67.5% of the respondents are skilled with social media and online meeting applications. In comparison, the skills of sending emails and browsing the internet are 65.8%, and essential computer operation is the lowest, 63.3% of the respondents.

### Having the Required Tech Skills Helped me to Join the Class on Time



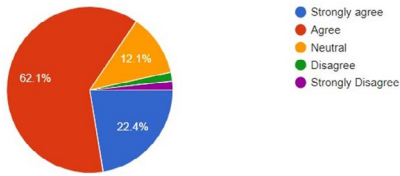
The majority of the students (62.5%) agree with the above statement. 15% of the survey respondents strongly agree with this. 12.5% of students are neutral, while only 3.3% of the respondents disagree, and 6.7% strongly disagree with this statement.

### Having the required tech skills helped me to interact actively in the online class



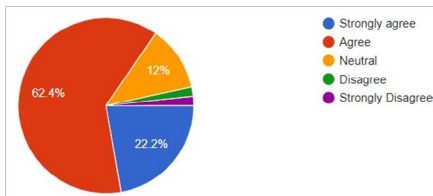
The statement above was agreed upon by 61.9% of students, and 14.4% strongly agreed. 21.2% of students were neutral. Besides this, 1.7% of students disagreed, and only 0.8% of students strongly disagreed.

### Having the Required Tech Skills helped me to Submit My Class Work on Time and Properly



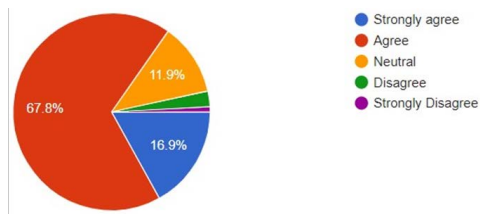
62.1% of respondents in this survey agreed, and 22.4% strongly agreed with this statement. 12.1% were neutral. Besides, only 1.7% disagreed, and 1.7% strongly disagreed.

### Having the Required Tech Skills helped me to take the Assessment Smoothly



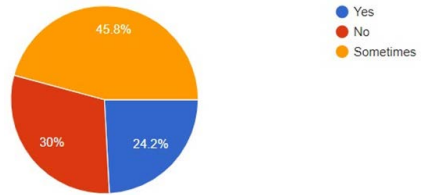
The majority of the survey respondents (62.4%) agree with the above statement, and 22.2% of students strongly agree that the required tech skills helped them to take the assessment smoothly. 12% of the students were neutral, only 1.7% disagreed, and 1.7% strongly disagreed with this statement.

### Having the Required Tech Skills helped me Get/ Give Feedback Effectively and Promptly



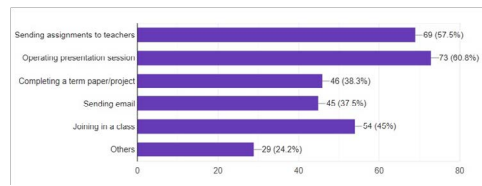
67.8% of students agreed, and 16.9% strongly agreed with this statement. 11.9% of the total respondents to this survey were neutral, while only 2% disagreed and 1.4% strongly disagreed.

### Did you Need help with Online Classes if you Need the Required Technical Skills?



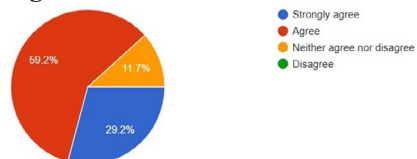
Most students (45.8%) responded with sometimes 'with this question. 24.2% of students responded yes 'while only 30% responded no'.

### In your Experience, what Problems may Students who Need to Gain basic Tech Skills Face? (You can Choose Multiple)



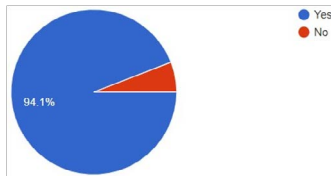
60.8% of respondents need help with presenting a presentation. 57.5% of students are facing challenges in sending assignments to their teachers. 45% of the respondents are facing issues while joining an online class, 38.3% of participants in this survey are facing problems in completing a term paper, 37.5% are having problems sending emails, and 24.2% of students are facing other technical problems.

### Do you Agree that Specific Tech Skills are Required for an Effective and Smooth Teaching-Learning Process?



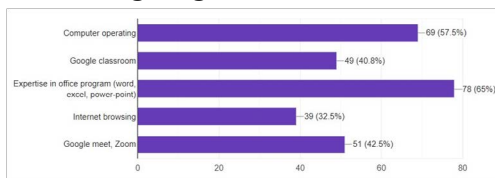
59.2% of the students agree, and 29.2% of students strongly agree with this question. 11.7% of students neither agree nor disagree, and none disagree with this question.

## Should there be a Basic Skill Training Facility for Developing Tech Skills?



94.1% of students think there should be a basic skill training facility for developing tech skills, while only 5.9% of the respondents think there should be something other than that.

## Which of the Following Items should be Included in the Training Program?



Most survey respondents (65%) have responded that office programs should be included in the training program. 57.5% of respondents think computer operating should be included in the training program. 42.5% of respondents expressed that the training should also include operating Google Meet and Zoom. 40.8% of students want to learn to operate Google Classroom, and 32.5% of students want to get training on internet browsing.

## Discussion on the Findings

Having technological skills gives students several advantages. 76.3% of students agree (14.4% strongly agree) that required tech skills helped them actively participate in the online class. 84.5% of respondents agree (among the 22.4% strongly agree) that the required technological skills helped them to submit class work on time and correctly. Not only did 67.8% of students agree, but 16.9% strongly agreed that the required tech skills helped them get/give feedback effectively and on time. In the questionnaire, the Response illustrates that students have diverse advantages due to tech skills.

Students need help with online classes, such as needing basic technological skills. As per the questionnaire, the Response illustrates so. 24.2% of students confirmed that they faced problems, and 45.8% of students confirmed that sometimes they

faced problems during online classes because of not having the required technical skills. According to the survey questionnaire responses, 60.8% of respondents need help presenting a presentation session. 57.5% of students are facing challenges in sending assignments to their teachers. 45% of the respondents are facing issues while joining an online class, 38.3% of participants in this survey are facing problems in completing a term paper, 37.5% are having problems sending emails, and 24.2% of students are facing other technical problems.

As per the questionnaire, the Response illustrates that certain tech skills are required for an effective and smooth teaching-learning process. 88.4% of students agreed (among the 29.2% strongly agree) on this. 94.1% of students think there should be a basic skill training facility for developing tech skills. 65% of respondents feel that the training program should include an office package (word, spreadsheet, presentation), 57.5% feel that computer operating should be included in the training, 42.5% and 40.8% respondents think that the training should include Google Meet, Zoom, and Google Classroom respectively. 32.5% of students also think internet browsing should be in the tech training program.

## Limitations

The study is based on a few participants from different public and private universities in Bangladesh. As the survey was conducted online, most of the students skipped filling out the questionnaire. The defensibility and reliability of this research could be increased if the number of participants was more than this. Although, the results will remain consistent if we conduct the research again. Another limitation is that the instruments used here to collect data digitally may have been misinterpreted by many and have provided incorrect information. Many things need to be addressed due to time constraints. The validity and reliability of this study can be increased if more research is conducted on more prominent participants.

## Conclusion and Recommendations

Students get an advantage if they have the necessary technical skills. It helps them in many ways, such as actively interacting in the online class,

submitting class work correctly, and getting/giving timely feedback. We found that students face different problems, such as needing more technological skills in their academic life, such as presenting presentation sessions, sending assignments to teachers, completing term papers, even joining online classes, and other difficulties. On the basis of the Response to the questionnaire of this research, students who are backed up with technological knowledge are getting an advantage in their academic life in terms of efficient class activity, submitting class works, presentations, etc. Those needing more technological knowledge face different issues, including presenting presentation sessions, submitting assignments and term papers, and even joining online classes. We found that most students (94.1%) feel they need technological training to overcome this problem. Our recommendation is based on the Responses to the survey questionnaire. We recommend that a technological training workshop be held to help the students develop the necessary technological skills for their academic life, which should include essential computer operation, office package (word, spreadsheet, PowerPoint), and online conference and class applications such as Google Meet, Zoom, and Google Classroom.

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