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Impact of Technology Integration on Secondary Level Education in Bangladesh: A study in Dhaka City

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Abstract

Considering the growing technical proficiency of the education system, it is imperative for learners to stay current on developing digital trends while simultaneously acquiring a comprehensive understanding of the subject matter. Educators possess a remarkable potential to engage and foster academic achievement using technology throughout the curriculum. In accordance with the prevailing global pattern, students in Bangladesh exhibit a substantial level of engagement with information and communication technology (ICT) components. The aim of this study is to examine the effects of incorporating technology into secondary education in Bangladesh. Also, to assess the level of technological integration in secondary schools, together with the perceived advantages and obstacles associated with its implementation. The present study employs a mixed method approach. Qualitative data was collected through focus group discussions with instructors in order to gain insights into their experiences, opinions, and attitudes towards the integration of technology. Quantitative data was obtained through the utilization of questionnaires. The research encompassed a cohort of seven (7) educators at the secondary school level, as well as a group of forty (40) students from three educational institutions within the Dhaka City. The results indicated that the integration of technology had a positive impact on student engagement, academic achievement, and instructor efficacy. Nevertheless, some challenges have been identified in relation to infrastructure, accessibility, and training. The results of the study suggest that the incorporation of technology into secondary education in Bangladesh holds promise for improvement.

Keywords: Technology Integration, Secondary education, Impact, Academic achievement, Engagement, ICT.

1. Introduction

The integration of technology in secondary school has a significant impact on academic achievement and student engagement. The use of technology in the classroom has been shown to improve learning outcomes and encourage student participation. The purpose of this introductory section is to provide an overview of the topic at hand. The use of technology into the educational process offers enhanced prospects for educators and learners to effectively collaborate and achieve improved outcomes (Salehi & Salehi, 2012).

We are currently living in an era characterized by the prevalence of information and communication technologies. The fact has a profound impact on the domains of socioeconomics, communication, and technical advancement. In contemporary society, individuals increasingly rely on technology as a means of networking, surpassing traditional face-to-face communication methods. According to Heiberger and

Harper (2008), Within the realm of secondary education in Bangladesh, the incorporation of technology poses distinctive obstacles and offers significant advantages. The insufficient knowledge and skills possessed by educators provide a significant obstacle to the integration of technology in educational settings, regardless of a country's level of development (Nisar M. W., 2011; Nwigbo, S. and Madhu, 2016). According to Parvin (2013), facilitators could engage in discussions regarding their perspectives on innovative classroom practices as well as their research endeavors. According to scholarly consensus, policymakers across the globe assert that the integration of technology inside educational institutions should yield substantial educational and pedagogical advancements, proving advantageous for both students and educators (Jimoyiannis & Komis, 2007).

In a study undertaken by Parvin (2013), the primary objective was to examine the problems and tactics associated with the integration of technology. The findings of this study offer significant insights that may be applied to the specific context of Bangladesh. This paper seeks to make a scholarly contribution to the current understanding of technology integration in secondary education in Bangladesh, building upon the insights derived from earlier studies.

In brief, the incorporation of technology within the context of secondary education in Bangladesh has the promise of narrowing educational disparities, enhancing pedagogical encounters, and equipping students with the necessary skills to meet the challenges of the contemporary digital era. This article provides an analysis of the present status of technology integration in secondary school in Bangladesh and presents suggestions for educators and policy makers to optimize the advantages of technology in the educational setting. The objectives of the study are:

- to examine the impact of technology integration on secondary education in Bangladesh.
- to identify and comprehend the issues connected with incorporating technology into the education system.
- to add substantial information to the present body of knowledge on the adoption of technology in secondary education.

Literature Review

The integration of technology in education has been implemented with the underlying assumption that it has the potential to enhance teaching and learning experience. The transition from a typical teacher-centered classroom to a learner-centric classroom can be facilitated by the innovative use of technologies, allowing for flexibility in time and location. In the contemporary digital era, it is widely acknowledged that conventional approaches to teaching, learning, and school administration have become less efficacious. Consequently, governments and education stakeholders are increasingly inclined to allocate resources towards technological advancements to enhance educational outcomes. In recent years, Bangladesh has also embraced the utilization of technology for educational advancement, aligning with the prevailing trend.

A substantial body of research has provided evidence in support of the notion that the integration of technology in educational settings facilitates meaningful learning, enhances the utilization of prior knowledge, fosters the development of hierarchical cognitive structures, promotes elaboration and encourages innovative practice (Hillman, 2014). The implementation of this integration results in a shift in the learning environment, placing greater emphasis on student-centeredness and allowing students to acquire control and independence over their learning (Mo, 2011).

According to Kirkscey (2012), educators perceive that receiving suitable training in professional digital competences enables them to effectively utilize technological resources in the educational setting, hence augmenting the learning experience for students. The advantages associated with the utilization of technology in the realm of education are contingent upon the nature of the course content as well as the educators' inclination towards embracing innovative approaches. (Sagrà and Gonzalez-Sannamed, 2010)

The examination of students' viewpoints about the incorporation of technology into the instructional process holds significance in comprehending the impact of technology integration. According to a study conducted by Sun, Lee, Lee, and Law (2016), students are more inclined to accept and utilize a particular

technology for enhancing their understanding of course material when they see its qualities as engaging and advantageous to their learning. The utilization of technology, whether within the classroom or outside of regular school hours, provides students with enhanced opportunities for engaging with instructors, collaborating with their classmates, and actively participating in the process of learning. According to Schindler et al. (2017), Numerous studies have undertaken a comparative analysis of the disparities in academic performance between pupils who have received instruction augmented by technology and those who have received instruction without such enhancements.

2.   Materials and Methods

This research used a mixed methods approach to gather data from secondary school instructors and students in Dhaka Division, Bangladesh, encompassing both qualitative and quantitative data collection methodologies. To gather the most relevant data in alignment with the research objectives, the study employed a focused random sampling approach. This approach enabled researchers to selectively target individuals who were more likely to possess the desired knowledge and were willing to provide it. In this research, a sample of forty secondary level students was selected using a random sampling technique, while a purposive sampling technique was employed to select seven secondary school teachers.

Using multiple data collection methods, primary data were acquired directly from respondents in the research area. The data collection instrument utilized by the students consisted of a standardized questionnaire comprising of Likert scale items and demographic information. The utilization of Focus Group Discussion was employed for the purpose of gathering data from the teachers. Quantitative data derived from Likert scale items was analyzed using descriptive statistics. Statistical software tools, such as SPSS and Excel, were utilized for the purpose of data analysis. To enhance comprehension and visualization of the data, the findings were presented in the form of tables and graphs. Table 1 presents the comprehensive research strategy employed in this study.

Table 1: Comprehensive research strategy employed in this study

Participants	Number of respondents	Sampling technique	Tools for data collection	Data analysis technique
Student (Secondary Level)	40	Random	Structured questionnaire	Both narrative and statistical analysis
Teacher (Secondary School)	7	Purposive	Focus Group Discussion (FGD)	Qualitative (Theme based)

3.   Results and Discussion

A thematic analysis was performed on the data obtained from the focus group conversations to discover recurring themes and patterns associated with the use of technology at the secondary level. Figure 1 illustrates the preference for utilizing technology in educational instructional methods. It was revealed (figure 1) that most of the participants (85.7%), show preference for incorporating technology into their teaching practices. In contrast 14.3% of individuals express a preference for conventional teaching methods without any technological interventions. To explore the teacher's perception on technology integration the participants of the focus group discussions (FGDs) were also requested to convey the rationale for their inclination towards using technology in their pedagogical approaches After looking at their answers, we found some common reasons why they prefer using technology. They emphasize the advantages associated with integrating technology into their pedagogical methodology.
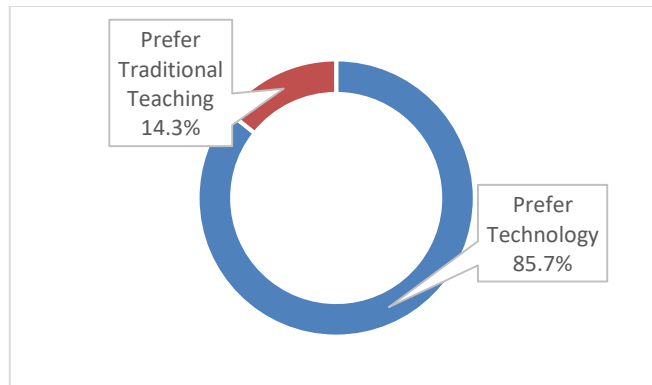
Figure 1: Preference for utilizing technology in educational instructional methods.

Educators underscored numerous advantages associated with the incorporation of technology into their pedagogical approaches. Table 2 presents the advantages of incorporating technology as indicated by the educators in the focus group discussions.

Table 2: Advantages of Technology Integration

Advantages of Integrating Technology in Education
The enhancement of student involvement and motivation.
Enhanced accessibility to educational resources.
Improved interactive learning experiences.
Opportunities for personalized and self-paced learning.
The development of collaboration and critical thinking skills.

Table 3 presents the replies provided by the teachers regarding the various forms of technology employed in their instructional practices. The percentages in the data indicate the relative distribution of respondents who utilized different types of technology, while the frequencies represent the absolute count of respondents.

Table 3: Types of technology used in teaching practice

Technology	Percentage of Respondents	Frequency
Computers	85.7%	6
Interactive whiteboards	14.3%	1
Projectors	42.8%	3
Smart phones	71.4%	5
Tablets	14.3%	1
Other	14.3%	1

Figure 2 illustrates the influence of technology use on student engagement and academic performance. Based on the findings of the survey, it can be inferred that a majority of respondents, specifically 71.4%, hold the view that technology exerts a positive influence on student participation. A total of 14.3% of respondents indicated that there was a unfavorable effect on student engagement. In contrast, 14.3% held the belief that technology did not exert any influence on student engagement.

The figure presented herein also highlights the responses provided by the teacher regarding the influence of technology on the academic performance of students. The majority of the participants, specifically 71.4%, indicated that the utilization of technology has a beneficial influence on the academic performance of students. A total of 28.6% of respondents indicated that there was no visible influence of technology on their academic performance. Nevertheless, none of the participants said that technology has a negative effect on academic performance.
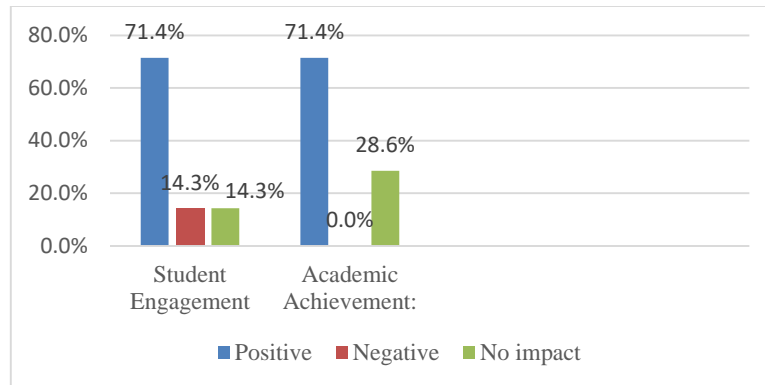
Figure 2: Influence of technology use on student engagement and academic performance.

Challenges and barriers to technology integration identified by the teachers

Figure 3 depicts the challenges and barriers to the integration of technology as reported by the teachers. From the study it is seen that the obstacles most highlighted by respondents was insufficient training and technical help, expressed by all participants. The findings of the survey indicated that 85.7% of the participants reported having restricted access to technology. 28.6% of the participants indicated that tended to prevent change in their interactions with students and coworkers. Another 42.9% of the participants revealed affordability and the digital gap as prominent challenges.
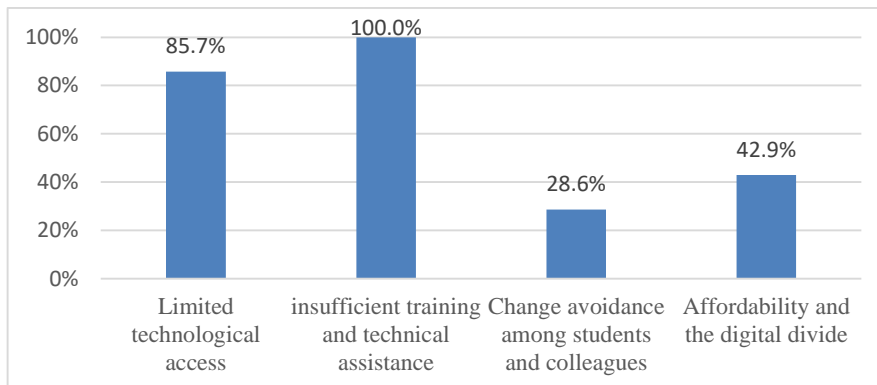

Figure 3: challenges and barriers to technology integration identified by the teachers

Perspectives of students on technology integration

The study also reflects the perspectives of students regarding the incorporation of technology in secondary school. According to the study, a significant number of students have access to technology, although there is variation in how often they use it. Some students report having little or no access.

The frequency of technology utilization for educational purposes

The frequency of technology used by the students for educational purposes is depicted in Figure 4. The findings stated that there is a diverse range of frequencies of students utilize technology for instructional reasons. Among the participants 27.5% indicated that they use technology frequently, 52.5% reported using it regularly. Furthermore, a notable percentage of students (25%) indicated irregular utilization of technology. Merely 10% of participants indicated that they rarely use technology for educational purposes. Among the participants, no one was found
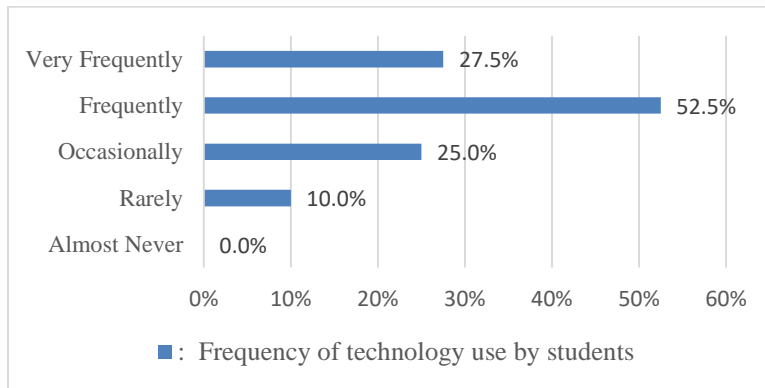
who never use technology.

Figure 4: Frequency of technology use for educational purposes

Advantages of using technology in the learning process

The students were asked about the advantages of using technology in their learning process. The replies provided by the students have been compiled and shown in Table 4.

Table 4: Perspectives on the advantages of incorporating technology in the educational process

Statements	Yes	No	Not sure
Technology integration has improved understanding of the subject matter.	75%	5%	20%
Technology integration has enhanced engagement and motivation to learn.	45%	17.5%	37.5%
Technology integration has provided the access to a wider range of information and resources for my studies	97.5%	0%	2.5%
Using technology in secondary education has improved my problem-solving and critical thinking skills.	27.5%	7.5%	65%
Technology integration has made learning more interactive and engaging for me.	45%	10%	45%
Technology integration has positively impacted my overall academic performance.	57.5%	0%	42.5%

The responses have been categorized into three distinct groups: Yes, No, and Not sure. The distribution of respondents' viewpoints is indicated by the percentages associated with each category. 75% of the participants expressed that the integration of technology has had a positive impact on their understanding of the subject matter. While 5% answered no and 20% remained uncertain. Regarding the aspects of engagement and motivation, 45% expressed agreement with the notion that the incorporation of technology had a positive impact on their engagement and motivation to acquire knowledge. 17.5% expressed disagreement and 37.5% of the participants expressed uncertainty. In relation to the acquisition of a broader array of knowledge and resources, 97.5% expressed their agreement that the integration of technology facilitated improved access. None of the participants disagreed, but a little 2.5% expressed uncertainty. In relation to the enhancement of problem solving and critical thinking abilities, 27.5% of respondents expressed agreement with the notion and 7.5% expressed disagreement, whilst 65% indicated uncertainty regarding the statement. According to the survey data, 45% of participants expressed their agreement with the notion that the incorporation of technology has effectively enhanced the dynamism and engagement of the learning process. However, a minority of the respondents (10%) disagreed. A further 45% expressed uncertainty over the potential consequences. Again, 57.5% of

participants stated that the integration of technology has had a positive impact on their overall academic performance. Remarkably, not a single participant disagreed with the statement. However, 42.5% of the participants stated uncertainty over the potential impact of the technology integration on their academic performance.

The focus of the study was to explore the impact of technology integration on secondary level education in Bangladesh. This study tends to find out the advantages of technology integration and the challenges and barriers to technology integration in the learning process. From the result part we can see that many students acknowledge the advantages such as easier access to information and greater participation. The study highlights differences in students' access to technology, with a notable percentage reporting limited or no utilization. A positive link was found between higher engagement and academic performance. It was found from the survey that many of the respondents believed that technology integration has improved the understanding of their subject matter and provided a wider range of information related to their study. Still, the worries expressed by a small percentage of students call for more research into any problems or disadvantages related to integrating technology. The study revealed that while many teachers recognize the potential benefits of technology integration, they face several challenges in effectively using technology in their teaching practices. Limited access to technology devices and reliable internet connectivity, inadequate technical support and training opportunities, resistance to change among students and colleagues, and concerns about affordability and the digital divide were identified as significant barriers. However, despite these challenges, teachers highlighted various benefits of technology integration, including increased student engagement and motivation, improved access to educational resources and development of critical thinking skills.

Recommendation

Based on the outcomes of this study, some recommendations can be derived to enhance the integration of technology in secondary education in Bangladesh. These are:
- Need to enhance the technology infrastructure, with a specific focus on ensuring dependability.
- Offer training initiatives for educators.
- Regularly examine and adapt technology integration methods based on observed facts.

4. Conclusion

The findings of the study provide valuable insights into the status, challenges, and potential of technology integration in secondary education of Bangladesh. Through this survey, important visions into the opinions, experiences, and recommendations of secondary school teachers regarding the use of technology in the classroom were obtained. The research findings indicate that educators are aware of the potential benefits of technology integration into their teaching practices. But they faced several challenges when trying to integrate technology into their teaching methods. This study contributes to the existing literature on technology use in secondary education in Bangladesh. The study addresses the challenges and opportunities faced by teachers and students. By addressing the challenges and capitalizing on the benefits of technology use in secondary education, Bangladesh may eventually move toward a more successful educational system.

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