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ORIGINAL SCIENTIFIC PAPER

Resilience and Organizational Adaptation in Online Education

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ABSTACT

The objective of this study was to investigate the effectiveness of the online learning system at Bangladesh Agricultural University and its role in fostering resilience among students, faculty, and the institution during the COVID-19 pandemic. Drawing from first-hand academic experience, this study examined the benefits and challenges of virtual education as perceived by learners and academicians in a period of crisis. Designed as a cross-sectional study, it employed a quantitative survey method with simple random sampling, focusing on students' learning systems and teaching methods.The findings reveal that most students demonstrated a positive attitude toward online classes due to their flexibility for both learners and instructors, which

contributed to maintaining educational continuity and organizational resilience. However, from the perspective of both teachers and students, online classes presented significant challenges compared to traditional classrooms. These included technological constraints, limited internet access or insufficient data packages, delayed interactions, and teachers' difficulties in managing digital tools and communication technologies effectively.Despite these barriers, students benefited from structured content and the ability to revisit recorded lectures multiple times, enhancing learning flexibility and personal adaptability—key aspects of resilience in education. The increasing reliance on online platforms also signals a shift in organizational needs, requiring universities to invest in robust digital infrastructure, teacher training, and innovative strategies for sustainable virtual learning environments. This study contributes original insights into how online education, as implemented in Bangladesh Agricultural University, can serve not only as a learning tool but also as a mechanism for resilience in higher education

Keywords: online, learning, pandemic, resilience

JEL classification: I21, I23, L21

INTRODUCTION

Online education has shown significant potential globally [2]. While it was already gaining popularity in developed countries, the COVID-19 pandemic accelerated its adoption worldwide, including in Europe, Australia, New Zealand, America, and many developing nations ([4],[5],[8]).

Among all sectors, education was one of the hardest hit by the pandemic. In Bangladesh, the government announced the closure

of all educational institutions on 17 March 2020, with no immediate prospects of reopening [10]. This prolonged shutdown led to the collapse of traditional face-to-face teaching and learning. Although some private institutions introduced online education from April 2020, most institutions delayed implementation, awaiting a return to normalcy. However, as the pandemic situation worsened, authorities were compelled to adopt online education urgently, often without adequate preparation or strategic planning ([3],[10],[12],[14]).

While this transition was necessary, it revealed major gaps in infrastructure, digital literacy, and pedagogical strategies. Many students and teachers struggled with poor connectivity, limited access to devices, insufficient training, and lack of interactive tools, which hindered the effectiveness of online education. Nevertheless, this experience underscored the importance of resilience—the ability of educational institutions, teachers, and students to adapt, recover, and maintain learning continuity during a crisis. Developing resilience in education means creating flexible learning environments, leveraging technology effectively, and strengthening organizational capacity to withstand future disruptions.

In the context of Bangladesh, a developing country with resource constraints, building resilience in higher education is not only crucial for managing crises but also for ensuring long-term sustainability of digital learning ecosystems. A well-planned, comprehensive strategy supported by strong institutional commitment can transform online education from a temporary emergency response into a resilient, inclusive, and efficient system ([1],[14],[20]).

The objectives of this study are:

i) To explore the efficacy of online learning as experienced by teachers and students in Bangladesh Agricultural University;
ii) To identify the challenges they faced (including technological and operational barriers) during online classes;
iii) To assess overall perceptions regarding the integration of online education into the formal education system;
iv) To propose recommendations for improving online education services and fostering resilience within higher education institutions.

THEORETICAL REVIEW

Applying Critical Discourse and Communication Theories, student engagement in online courses emerges as a complex and sometimes challenging process, requiring learners to decode unfamiliar disciplinary norms and course practices [6]. According to Pace [16], by making disciplinary expectations explicit, academics can help students understand often implicit rules and identify potential learning bottlenecks [13]. Furthermore, Pace [16] emphasizes the need for systematic steps to overcome these barriers, while role modeling these processes for students improves comprehension and engagement [13].

Kilgour [11] confirm that academics play a critical role in these decoding processes, assisting students in adapting to new pedagogies and digital tools. Similarly, Clark and Mayer [7] argue that effective communication and expectation management are essential for supporting engagement, while Wanner [25] highlights the importance of clearly articulating course intentions and rules of engagement to help students adjust expectations and cope with unforeseen challenges. These strategies are particularly crucial in

online learning contexts, where engagement and expectation management are often more fragile than in traditional classroom environments [23].

Moreover, resilience emerges as a vital dimension in online learning, enabling students to adapt to uncertainty and persist through challenges. Research on organizational resilience underscores how adaptive capacities foster continuity and innovation in dynamic environments ([18], [9]). Drawing from these insights, educational resilience can be viewed as a learner's ability to maintain motivation and performance despite disruptions—such as those experienced during the COVID-19 shift to remote education [23]. Embedding resilience-oriented pedagogical strategies—such as developing critical literacy, fostering self-regulation, and providing clear support mechanisms—enhances learners' capacity to navigate complexity.

Critical literacy, as noted by Stone [22], involves equipping students with the skills to interpret the discourses and practices of online environments. This helps mitigate "eco-shock" by making unfamiliar processes transparent. Practical measures include clarifying course structures, providing FAQs, and explaining institutional procedures. Similarly, research on entrepreneurial resilience ([19];[9]) indicates that transparency and adaptability significantly improve engagement, which is equally applicable to digital learning ecosystems.

In sum, combining critical discourse approaches, communication strategies, and resilience frameworks can create an inclusive and adaptive online learning experience, ensuring that students not only decode academic expectations but also develop the resilience required to thrive in uncertain and evolving educational contexts.

METHODOLOGY

The study employed a cross-sectional design to investigate the experiences and perceptions of online education at Bangladesh Agricultural University (BAU). Primary data were collected using structured questionnaires, and the sample size was determined through a justification method under a simple random sampling technique. Prior to data collection, participants were informed about the study objectives and provided consent.

Data collection was conducted through face-to-face interviews using two distinct questionnaires:

1. **Students' Socio-Economic and Demographic Profile:** This questionnaire captured students' age, gender identity, religion, home district, academic program (faculty, degree level, semester), and academic achievements. Socio-economic information included family size, parental education and occupation, monthly family income, students' personal income, part-time employment, and internet accessibility in their area.

2. **Facilities and Challenges of Online Education at BAU:** This structured questionnaire explored students' and instructors' perceptions of online learning during the pandemic over the past two years. Key areas included:

    - Internet access and technical challenges (e.g., poor connectivity, low broadband speed, electricity issues, distance from network towers)
    - Technical proficiency in using devices and applications (Google Meet, Zoom, FoxFi, Audiobook)

- Academic challenges such as attendance, submitting assignments, completing exams on time, and interacting in online classes
- Mental well-being concerns, including demotivation, stress, sleep disturbances, and anxiety due to prolonged online learning
- Teachers' observations regarding online exam monitoring, preventing academic misconduct, and evaluating the efficiency of online instruction

The questionnaire employed a two-point Likert scale (Yes = 1, No = 0) for all items.

The calculation of sample size is as follows (Radović, et.al. 2025):

$$n_0 = Z^2S^2/d^2 = (1.96)^2 \times 0.1464 / (0.05)^2 = 0.5624/0.0025 = 225$$

[N=300 (sample size from previous study) Z=1.96, S^2= 0.1464, d=0.05]

$$n = Nn_0/N+n_0 = 300 \times 225/300+225 = 300$$

The study was conducted across various residential hostels at BAU from November 2022 to January 2023, involving 300 respondents, including university students, faculty members, and administrative officers. Participation was voluntary, with data collected only from those who agreed to participate, ensuring adherence to ethical standards.

Descriptive analysis technique was applied to analyze the collected data. This technique was used to explore the student and teachers' perception regarding the impact of COVID-19 pandemic on different aspects of accounting teaching and learning areas in Bangladesh Agricultural University.

Key findings

The demographic characteristics of the participants were analyzed in terms of age, gender, religion, residence, faculty, level

of study, monthly income (student and family), part-time employment, and parents' occupations. The mean age of the students was 22.56 ± 1.70 years, with 138 students (50.2%) aged 19–22 years and 137 students (49.8%) aged 23–26 years. Gender distribution included 45.5% male and 54.5% female students.

Most participants came from rural areas (65.3%), while 34.7% were from urban areas. Family size predominantly ranged from 3–6 members (89.5%), with 10.5% comprising 7–10 members. The monthly income of students ranged from Tk. 2,000 to Tk. 15,000, whereas family income ranged from Tk. 2,000 to Tk. 200,000, reflecting varying economic conditions that influence access to internet and other study resources.

Regarding part-time employment, 17.8% of students were involved in tuition, 4.8% in catering or similar businesses, while 77.5% did not participate in income-generating activities. Fathers' occupations included business (26.9%), government service (20.7%), non-government service (17.1%), retired (11.3%), unemployed (8.4%), and other occupations (15.7%). Most mothers were homemakers (75%), while others worked in business (1.1%), government service (8%), non-government service (5.5%), retired (0.4%), or other professions (10.2%).

In terms of faculty representation, students were drawn from six faculties: Agricultural Economics & Rural Sociology (30%), Agriculture (18%), Agri-Engineering (16%), Animal Husbandry (14.7%), Fisheries (12.7%), and Veterinary Science (8.7%). The study included both undergraduate students (four levels) and postgraduate students (three semesters).

Table **1.** Socio-demographic and Socio-economic Situation of the Students

	[Mean ± SD (n)] or n (%)		**[Mean ± SD (n)] or n (%)**
Age	22.56±1.70	**Area/Residence**	
19-22	138(50.2)	Rural	120(43.6)

	[Mean ± SD (n)] or n (%)		[Mean ± SD (n)] or n (%)
23-26	137(49.8)	Urban	155(56.4)
Religion		**Monthly Income (Student)**	
Muslim	245(89.1)	0-2000 Tk	69(25.1)
Hindu	30(10.9)	2500-5000 Tk	124(45.1)
Sex		5500-7000 Tk	67(24.4)
Male	125(45.5)	7500-9000 Tk	11(4.0)
Female	150(54.5)	9500-15000 Tk	4(1.5)
Faculty		**Family Size**	4.92±1.58
Veterinary science	28 (10.2)	3-6 7-10	246(89.5) 29(10.5)
Agriculture	56(20.4)	**Part time job**	
Animal husbandry	46(16.7)	Tuition	49(17.8)
		Others (online business, catering)	13(4.8)
		Nothing	213(77.5)
Agricultural Economics and Rural sociology	85(30.9)	**Monthly Income (Family)**	
		2000-9000Tk.	7(2.5)
Agricultural engineering	33(12.0)		
Fisheries	27(9.8)	10,000-30,000 Tk.	114(41.5)
		31,000-50,000 Tk.	104(37.8)
		51,000-70,000 Tk.	25(9.1)
		71,000-90,000 Tk.	11(4.0)
		91,000-2,00,000 Tk.	14(5.1)
Mother's Occupation		**Father's Occupation**	
Business	3(1.1)	Business	74(26.9)
Non-government service holder	15(5.5)	Non-government service holder	47(17.1)
Govt. officer	22(8.0)	Govt. officer	57(20.7)
Homemaker	206(75)	Retired	31(11.3)
Retired	1(0.4)	Unemployed	23(8.4)
Others	28(10.2)	Others	43(15.7)
Level			
Level 1	45(16.4)	MS semester 1	17(6.2)
Level 2	82(29.8)	MS semester 2	23(8.4)
Level 3	63(22.9)	MS Thesis semester	13(4.7)

	[Mean ± SD (n)] or n (%)		[Mean ± SD (n)] or n (%)
Level 4	32(11.6)		

Source: [17].

DISCUSSION

People's internet use depends on their social class, cultural background, gender identity, rural-urban context, ability etc. It clearly indicates that people from all walks of life do not have equal access to internet networks [21]. From survey it shows that 32% of students assured us of having good internet access and 40% said they have moderate internet facilities in their area. 20.7% of students have observed to have poor net connections and 7.3% suffered for not getting cyber space entrée at all (Figure 1). A significant number of students (92%) have complained about insufficient internet facilities to continue the classes and exams. They have purchased internet packages to continue the study which are expensive for middle income families. Students have used different devices to get access with the internet. The highest number (76.7%) of students used mobile to do the online classes, 20% used laptop, only 1.3% and 2% used desktop and PC individually (Figure 1). Approximately 80% of students have faced technical problems in using electronic devices while doing the classes. Due to insufficient internet facilities in rural area, all students could not attend the classes at a time- 47.3% of students attended 80-90% classes, 38% students were present in 60-70% tutorials and only 4% students joined in online classes figured as 100% .

From this study it has been found that 43.3% of students have skipped classes intentionally, 86.7% students have thought that online learning is not effective as physical classes, 92.7% students have faced problems in internet connection, 77.3% students had

technical difficulties in computer or smartphone, 51.3% students were confined in hotline Google invites results in missing classes, 66% students faced difficulties in downloading apps like Google Meet, Zoom, Foxfire, Audiobook etc. (Figure 1).

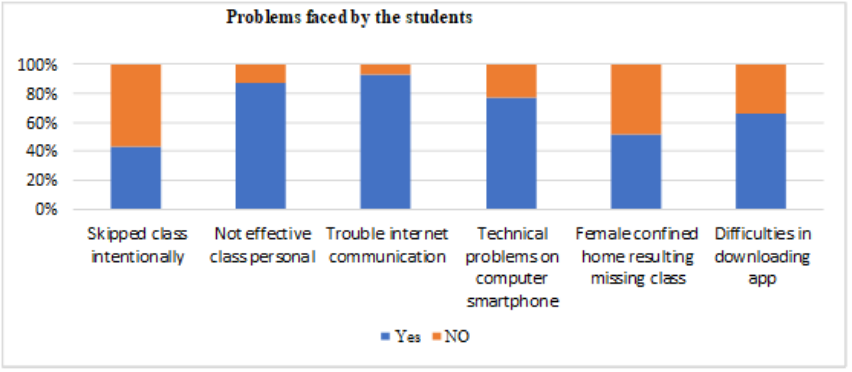

Figure 1. Problems faced by the students in online classes
Sorce:Authors

Students have participated in online examination in Bangladesh Agricultural University during the pandemic. In the time of examination, 37.8% of students could not make their attendance properly as the teachers made the attendance in Google form. It was not possible for all students to stay in the class until finishing time. Filling the answer script and uploading it on time could not be accomplished by 25.1% and 27% of students separately. The students were asked about the efficacy of the online education system. In view of 50.2% of students, online education is very effective, 26.2% of students evaluated this learning system as effective and 23.6% assessed it as not effective at all.

During the pandemic, online education prevents the students from sitting idle at home (86%), and from developing trauma because of frequent death and infection witnessed around (85.5%). The guardians were also pleased to see their children participating in an online class being safe and sound (92.7%). To have the

chance to attend online classes frequently, students could easily communicate with the teachers, which boosts their mental strength, preventing them from being depressed (80%). Students enjoyed conversation with each other during the online class or before attending the class, sharing their day-to-day activities with their classmates and helping to release their stress (88%) (Figure 7). A good number of students (57.5%) have experienced mental wellbeing issues for doing online classes-they felt demotivated and discouraged towards study (21.8%), being tensed to access internet facilities (18.2%) and stress (24.7%) also and getting sleep disturbances (20%). The students also think that the teachers and students need more training for proper online classes (91.3%), and they also agree that the government should provide subsidies or allowances on internet access to make it easy for both teachers and students. To recognize the efficacy of online education, more than 50% of students opinioned starting this education system as a main alternative of physical education.

In this study, information has also been collected from teachers about online teaching experience. In teachers' view, online teaching is not beneficial like physical education (37.5%). In the query of its efficacy, 75% of educators stated in positive and 25% answered in negative. They have faced technical problems in taking online classes due to low literacy of the internet (62.5%), they also had difficulties in downloading google form and others (72.5%) and managing sequencing activities (87.5%). They were also pleased to join the classes at their convenience and show different images, lectures and videos, and presentations from the websites if required. They gave emphasis for proper online education training and use software to get easy access.

CONCLUSION

Based on the research, online education is efficient for several reasons, which can be grouped into flexibility, accessibility, learning reinforcement, and mental well-being:

1. **Flexibility for Students and Teachers**
    - Students do not need to rush through morning routines (breakfast, dressing, reaching class), allowing them to join classes from anywhere ([10], [12]).
    - Both students and instructors can join classes at flexible times without strict schedules. In the study, **83% of participants were happy about flexible timings**, and **89% could join classes without prior preparation**.
2. **Closer Interaction and Engagement**
    - Students can focus on the screen from a closer distance, which enhances attention and engagement compared to a traditional classroom.
    - Digital platforms allow real-time interaction among students and with instructors, **boosting communication and understanding**.
3. **Reinforcement of Learning**
    - Lectures are recorded, allowing students to **replay content as needed** (88% of students used this feature), which helps in comprehension and revision.
    - Digital tools like videos, images, and articles can be integrated instantly into lessons, enriching the learning experience.

4. **Reduced Physical and Psychological Stress**
    - Students perform academic activities (attending class, exams, assignments) without physical effort and can stay in the comfort of their homes.
    - Stress from commuting or strict classroom routines is removed. About 82% of students attended exams without stress, and 86% felt online learning prevented them from sitting idle, which reduces anxiety.
5. **Promotes Self-Learning and Autonomy**
    - Students explore their own interests and take responsibility for completing tasks using online resources. In this study, 77.3% of students reported that online learning encouraged self-learning.
6. **Safety and Mental Well-being During Pandemic**
    - Online learning allowed students to continue education safely during COVID-19. 92.7% of guardians were pleased with the safety of their children.
    - Maintaining social connections through online classes reduced isolation and stress (88% of stude**nts** felt peer interactions helped release stress).
7. **Positive Overall Perception**
    - A large number of students (90–98%) believed online education was beneficial, providing a different and valuable learning experience despite the pandemic challenges.

In addition, the efficiency of online education during the COVID-19 pandemic also reflects the resilience of both students

and educational institutions. Resilience, in this context, refers to the ability to adapt and continue academic activities despite unprecedented disruptions ([15],[24]). By adopting online learning, students maintained continuity in their studies, adapted to new digital tools, and developed self-learning skills, demonstrating individual resilience. Similarly, instructors and universities showed organizational resilience by rapidly implementing virtual classrooms, recording lectures, and providing digital resources to ensure uninterrupted education. The flexibility, accessibility, and safety offered by online education not only mitigated the adverse effects of the pandemic but also strengthened the capacity of learners and institutions to cope with future challenges, fostering a more robust and adaptable academic environment.

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