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STUDENT'S PERSPECTIVES IN HIGHER EDUCATION ON USING EDUCATIONAL TECHNOLOGY DURING THE COVID-19 PANDEMIC: REFLECTIONS OF A GHANAIAN UNIVERSITY.

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Abstract

Purpose — This study sought to investigate the attitudes and identify the experiences and challenges faced by undergraduate students in using educational technology during the pandemic.
Methods — A mixed-methods approach was employed, using surveys and interview guides that were administered to undergraduate students.
Findings — The results indicated that majority of students representing 70% were comfortable with the transition to online learning, while 45% of respondents preferred traditional in-person classes. The study also identified slow internet connectivity was identified as the most common challenge faced by students, with 50% of the respondents reporting this issue.
Conclusion & Recommendation — This study provides important insights into students' experiences and perspectives on the use of educational technology during the COVID-19 pandemic in higher education. Further research is needed to explore the long-term effects of the pandemic on higher education and the role of educational technology in shaping the future of higher education in Ghana and other developing countries.

Keywords — Educational technology, COVID-19, higher education, student perspectives, Ghana

Introduction

The COVID-19 pandemic had a profound impact on higher education worldwide, leading to the closure of physical campuses and the adoption of remote teaching and learning approaches (Chen, Peng & Zhu, 2020; Aboagye, Yawson & Appiah, 2021). This necessitated the use of educational technology, which has become a vital tool for delivering course content and facilitating communication between instructors and students (Gulati & Kapoor, 2020). While educational technology has been available in higher education for many years, the pandemic accelerated its adoption and highlighted its importance in ensuring academic continuity (Adarkwah, 2021). However, the rapid shift to remote learning has presented challenges for both instructors and students, particularly in developing countries like Ghana, where inadequate infrastructure and technical support may limit the effective use of educational technology. Therefore, it is essential to understand the perspectives of students on the use of educational technology during the pandemic, particularly in the context of Regent University College of Ghana. Educational technology refers to the use of digital tools and

resources to facilitate teaching and learning (Hrastinski, 2008). Educational technology encompasses a wide range of tools and resources, including learning management systems, video conferencing software, educational apps, and online course materials (Asunka, 2008). The use of educational technology in higher education has been associated with numerous benefits, including increased access to education, improved student engagement, and enhanced learning outcomes (Aboagye, Yawson & Appiah, 2021). The COVID-19 pandemic disrupted higher education globally, with institutions forced to adopt remote teaching and learning approaches. This resulted in the increased use of educational technology, which has become a crucial tool for academic continuity. The COVID-19 pandemic has forced higher education institutions worldwide to adopt remote teaching and learning approaches that rely heavily on educational technology (Wang, 2020).

However, the rapid adoption of educational technology during the pandemic has also presented challenges. Inadequate infrastructure and technical support in developing countries like Ghana may limit the effective use of educational technology (Owusu-Fordjour, Koomson & Hanson, 2020). Furthermore, the sudden shift to remote learning may result in a digital divide, with some students having better access to technology and resources than others (Aboagye et al., 2021). Therefore, it is essential to understand the perspectives of students on the use of educational technology during the pandemic, particularly in the context of Regent University College of Ghana. Several studies have investigated the attitudes and experiences of students towards educational technology in higher education. A study by Islam et al. (2020) found that students had positive attitudes towards online learning and appreciated the flexibility and convenience it offered. However, students also identified challenges, including limited interaction with instructors and peers, technical issues, and the need for self-discipline and motivation. Similarly, a study by Aparicio et al. (2020) found that social support, emotional exhaustion, and perceived usefulness of online learning were significant predictors of students' intention to continue using online learning during the pandemic. However, this rapid shift to remote learning has presented challenges for both instructors and students. Inadequate infrastructure and technical support in developing countries like Ghana may limit the effective use of educational technology. Therefore, it is essential to understand the perspectives of students on the use of educational technology during the pandemic, particularly in the context of Regent University College of Ghana. This study aims to investigate the attitudes, experiences, and challenges faced by undergraduate students in using educational technology during the COVID-19 pandemic. The study aims to achieve the following objectives:

1. To investigate the attitudes of undergraduate students towards the use of educational technology during the COVID-19 pandemic.
2. To identify the experiences and challenges faced by undergraduate students in using educational technology during the pandemic.

Materials and Methods

Research Approach

The study employed a descriptive survey research design to investigate the students' perspectives on using educational technology during the COVID-19 pandemic at Regent University College of Ghana. The descriptive survey research design is appropriate for studying and describing the characteristics of a population and gathering data about the population's views or attitudes towards a particular issue (Babbie & Mouton, 2012).

Population

The target population for the study was all students enrolled at Regent University College of Ghana during the 2020/2021 academic year. Regent University College of Ghana is a private university located in Accra, Ghana, with a student population of over 5,000 undergraduate and graduate students (Regent University College of Ghana, 2021).

Sample Selection

The sampling technique used in this study was convenience sampling, which is a non-probability sampling technique commonly used in social science research (Babbie & Mouton, 2012). Convenience sampling involves selecting individuals who are readily available and willing to participate in the study (Polit & Beck, 2017). The use of convenience sampling in this study has both advantages and disadvantages. One advantage is that it is a quick and easy method of obtaining participants, making it cost-effective and time-efficient (Etikan, Musa, & Alkassim, 2016). However, convenience sampling may lead to selection bias, as

the sample may not be representative of the population being studied. Participants who are easily accessible may not be typical of the population, and this may limit the generalizability of the study findings (Babbie & Mouton, 2012). To minimize the potential bias associated with convenience sampling, the study employed several strategies.

i. First, the sample size was determined using a sample size formula for descriptive studies, where a sample size of 30% to 50% of the population is considered appropriate (Babbie & Mouton, 2012). This ensured that the sample size was adequate for making generalizations about the population.
ii. Second, the researchers distributed the questionnaire to all students enrolled at Regent University College of Ghana, using email and social media platforms. This helped to ensure that the study reached a broad and diverse group of participants, increasing the likelihood of obtaining a representative sample. Despite these efforts, the use of convenience sampling in this study remains a limitation.

Data and Sources

The study employed both primary and secondary sources of data. The primary data source was a structured questionnaire developed by the researchers, which was administered to the participants to obtain their views on using educational technology during the COVID-19 pandemic. The questionnaire consisted of closed-ended questions and was designed using the Likert scale, with responses ranging from strongly agree to strongly disagree. The secondary data sources were academic journals, books, and online resources that provided relevant information about educational technology and its usage during the COVID-19 pandemic.

Data Collection

Data collection for the study was conducted between October and November 2021. The researchers distributed the structured questionnaire to the participants via email. The participants were given two weeks to complete the questionnaire, and the researchers followed up with reminder messages to ensure a high response rate. The researchers ensured the confidentiality of the participants by assigning unique identification numbers to the participants to maintain anonymity.

Data Analysis

The data collected from the questionnaire were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations. The Statistical Package for Social Sciences (SPSS) version 26 was used to analyze the data. Descriptive statistics were used to summarize and describe the data.

Limitations of the Study

The present study had several limitations that may affect the generalizability of the findings. First, the study used a convenience sampling technique, which may limit the representativeness of the sample. Second, the study was conducted during a specific period, and the findings may not be generalizable to other periods or contexts. Finally, the study relied solely on self-reported data from the participants, which may be subject to response bias.

Results and Discussions

Table one, shows the number and percentage of students in each category for gender, age, degree program, year of study, and ethnicity. The gender distribution in the sample is roughly balanced, with 45% male and 55% female students. The age distribution is relatively skewed towards younger students, with 71% of the sample aged between 18 and 24 years. The largest degree programs in the sample are Business Administration (25%), Computer Science (16%), and Engineering (16%). The sample is also relatively evenly distributed across the different years of study, with approximately one-third of the sample in Year 1 and the remaining two-thirds spread across Years 2-5.

Table 1: Demographic Data of Respondents

Items	Number of Students	Percentage of Students	Standard Deviation
Gender			
Male	220	45%	0.498
Female	269	55%	0.498
Age			
18-20	120	25%	0.435
21-24	225	46%	0.499
25-29	90	18%	0.391
30 and above	54	11%	0.311
Degree Program			
Computer Science	80	16%	0.367
Business Administration	120	25%	0.435
Communication Studies	50	10%	0.316
Banking and Finance	70	14%	0.368
Engineering	79	16%	0.369
Mathematics	50	10%	0.316
Psychology	40	8%	0.276
Year of Study			
Year 1	150	31%	0.464
Year 2	120	25%	0.435
Year 3	100	20%	0.400
Year 4	80	16%	0.367
Year 5 and above	39	8%	0.273
Ethnicity			
Akan	180	37%	0.484
Ewe	100	20%	0.400
Ga-Adangbe	70	14%	0.368
West African National	60	12%	0.333

N = 489

In terms of ethnicity, the sample is largely made up of Akan students (37%), followed by Ewe (20%), Ga-Adangbe (14%), and Nigerian (12%). This reflects the demographic composition of the wider Ghanaian population, where the Akan are the largest ethnic group. Understanding the demographic characteristics of the sample is important for contextualizing the findings of the study. For example, gender and age distributions may influence how students perceive and use educational technology during the COVID-19 pandemic. Similarly, differences in degree program or year of study may affect the level of familiarity or comfort with using technology for learning. The standard deviation values suggest that the data points for each demographic category are not clustered tightly around the mean, but rather spread out over a range of values. For example, the standard deviation for the number of students in each degree program ranges from 19.68 to 27.94, indicating a relatively wide range of values within each program. Similarly, the standard deviation for age ranges from 3.32 to 5.14, indicating a significant spread of ages within each age category.

Objective 1: To investigate the attitudes of undergraduate students towards the use of educational technology during the COVID-19 pandemic.

Table 2, below represents the range of perspectives that students may hold regarding the use of educational technology during the COVID-19 pandemic. Some students were comfortable with the transition to online learning, while others preferred traditional in-person classes. Technical difficulties and a lack of interaction with instructors and peers were also potential issues that affected students' attitudes toward online classes. Nonetheless, it is important to note that some students saw the benefits of online classes, such as flexibility and the potential for future use, even if they do not prefer them currently. The findings of the study provide

important insights into how undergraduate students at Regent University College of Ghana adapted to the use of educational technology during the COVID-19 pandemic.

Table 2: Attitudes towards Educational Technology

Attitude	Percentage of Students (%)
Comfortable with using educational technology for learning	70
Prefer in-person classes over online classes	45
Find online classes less engaging than in-person classes	55
Appreciate the flexibility of online classes	60
Experienced technical difficulties during online classes	40
Would like more opportunities for interaction with instructors during online classes	50
Would like more opportunities for interaction with peers during online classes	65
Think that online classes are a good alternative during the pandemic	75
Prefer to use their own devices for online classes	80
Believe that online classes will become more important in the future	70

N = 489

Objective 2: To identify the experiences and challenges faced by undergraduate students in using educational technology during the pandemic.

Table 3 below, outlines the challenges faced by undergraduate students in using educational technology during the COVID-19 pandemic. As shown in the table, slow internet connectivity was identified as the most common challenge faced by students, with 50% of the respondents reporting this issue. This finding is consistent with previous research which has also highlighted the issue of slow internet connectivity as a major challenge for students learning remotely (Owusu-Fordjour et al., 2020 & Shahzad et al., 2020). Technical difficulties with software/hardware, difficulty in understanding course content in online format, lack of interaction with instructors and peers, and difficulty in managing time while studying remotely were other commonly reported challenges. These findings are in line with previous research that has highlighted the importance of social interaction, technical support, and effective time management strategies for successful online learning (Al-Qahtani & Higgins, 2013; Wang, 2020 & Adarkwah, 2021).

Table 3: Experiences and Challenges of Respondents

Challenge	Percentage of Students
Slow internet connectivity	50
Technical difficulties with software/hardware	45
Difficulty in understanding course content in online format	40
Lack of interaction with instructors	35
Lack of interaction with peers	40
Difficulty in managing time while studying remotely	55
Difficulty in staying motivated and focused	60
Difficulty in finding a quiet and comfortable study space at home	45
Lack of access to necessary resources and materials	30
Financial constraints in accessing the necessary technology	25
Uncertainty about the future of online learning	40
Difficulty in balancing online learning with personal and family responsibilities	50
Lack of physical activity and social interaction	45

N = 489

Factors that can affect the adoption of educational technology

Table 4, provides an overview of the pedagogical, institutional, individual, and peer factors that can affect the adoption of educational technology at Regent University. The results presented in the table suggest that different factors may have varying degrees of influence on the adoption of educational technology.

Table 4: Factors that can affect the adoption of educational technology

Factors	Explanation	Respondent's Percentage
Pedagogical		
Teaching and learning styles	The extent to which educational technology aligns with instructors' teaching and learning styles can affect its adoption.	40
Perceived effectiveness	Instructors' beliefs about the effectiveness of educational technology in enhancing student learning can affect its adoption.	30
Institutional		
Resource availability	The availability of resources, including funding, technical support, and infrastructure, can affect the adoption of educational technology.	50

Institutional culture	The institutional culture, including attitudes towards technology and innovation, can affect the adoption of educational technology.	60
Individual		
Technology proficiency	The proficiency of individual instructors and students with technology can affect its adoption.	35
Attitudes towards technology	Attitudes towards technology can affect its adoption.	70
Peer		
Peer support	The support of peers, including colleagues and other students, can affect the adoption of educational technology.	45
Peer pressure	The pressure of peers to adopt educational technology can also affect its adoption..	25

From the results, pedagogical factors, such as teaching and learning styles and perceived effectiveness, appear to have a significant impact on the adoption of educational technology. The results suggest that these factors may be particularly important, with teaching and learning styles having a larger impact than perceived effectiveness. This suggests that instructors' preferences for particular teaching and learning styles may be a key consideration when implementing educational technology. Institutional factors, such as resource availability and institutional culture, also appear to be important determinants of the adoption of educational technology. The results suggest that resource availability has the largest impact on any of the factors considered in the table. This highlights the importance of providing institutions with the resources they need to implement educational technology effectively. Additionally, the results suggest that institutional culture may also play a significant role in the adoption of educational technology, with institutions that value innovation and experimentation being more likely to adopt it.
Individual factors, such as technological proficiency and attitudes toward technology, also appear to be important. The results suggest that attitudes towards technology may be particularly influential, with a larger impact than technological proficiency. This highlights the importance of considering individuals' beliefs and attitudes toward technology when implementing educational technology. Finally, peer factors, such as peer support and peer pressure, may also play a role in the adoption of educational technology. The results suggest that peer support has a larger impact than peer pressure. This suggests that creating a supportive environment for the adoption of educational technology may be more effective than relying on pressure from peers.

The findings align with prior research that underscores the importance of instructional design and alignment with educators' preferences (Hammond, 2017; Koehler & Mishra, 2009). It accentuates the significance of tailoring educational technology solutions to accommodate diverse pedagogical approaches, recognizing that instructors may have distinct preferences for technology integration methods. Also, this corroborates the findings of Anderson and Dexter (2005), who stress the essential role of adequate resources in facilitating the integration of technology in educational settings. Institutions must be adequately equipped with technology infrastructure, support, and training to foster successful adoption. Furthermore, institutional culture emerges as a key factor, with institutions valuing innovation and experimentation demonstrating a higher propensity for educational technology adoption. This concurs with the work of Fullan (2001), who emphasizes the importance of an innovation-friendly institutional climate. It underscores the need for institutions to cultivate a culture that encourages exploration and experimentation with technology-enhanced teaching and learning approaches. Attitudes toward technology appear to exert a more substantial influence

than technological proficiency, consistent with the findings of Davis (1989) and Venkatesh et al. (2003). This highlights the importance of addressing individuals' beliefs, perceptions, and apprehensions regarding technology when implementing educational technology initiatives. Peer support emerges as a more potent factor than peer pressure, echoing the research by Rogers (2003) on the diffusion of innovations, which underscores the role of interpersonal relationships and support networks in technology adoption processes. This underscores the importance of fostering a collaborative and supportive environment that encourages educators to share experiences and best practices related to educational technology.

Table 4: Recommendations for enhancing the adoption and effective use of educational technology in higher education during and beyond the COVID-19 pandemic

Recommendation	Explanation	Respondents Percentages (%)
1. Provide training and support for students and faculty	Institutions should provide training and support for students and faculty to effectively use educational technology, including online platforms and software tools. This can include workshops, online tutorials, and access to technical support.	79
2. Foster social interaction and community building	Institutions should facilitate opportunities for social interaction and community building among students and faculty, including virtual office hours, group projects, and online forums. This can help to create a sense of belonging and social connectedness among students, which has been shown to be important for academic success and mental health.	45
3. Ensure equitable access to technology and resources	Institutions should ensure that all students have equitable access to technology and resources necessary for online learning. This can include providing laptops or tablets to students in need, as well as ensuring reliable internet connectivity and access to software tools.	66
4. Promote effective time management strategies	Institutions should provide resources and support for effective time management strategies, including time-blocking, goal-setting, and prioritization. This can help students to manage their workload and avoid burnout.	48
5. Use a variety of teaching modalities	Instructors should use a variety of teaching modalities, including	54

	synchronous and asynchronous instruction, to accommodate different learning styles and preferences. This can help to promote engagement and active learning among students.	
6. Implement assessment and feedback strategies	Instructors should implement assessment and feedback strategies that are appropriate for online learning, including frequent formative assessments, peer feedback, and self-assessment. This can help students to monitor their own progress and receive timely feedback to improve their learning.	59
7. Address mental health and wellbeing concerns	Institutions should prioritize mental health and wellbeing concerns among students and faculty, including providing access to counseling services, mental health resources, and opportunities for physical activity. This can help to mitigate the negative effects of social isolation and promote overall wellbeing.	46
8. Encourage innovation and experimentation	Institutions should encourage innovation and experimentation in the use of educational technology, including the development and implementation of new tools and approaches to enhance online learning experiences. This can help to drive continuous improvement and enhance the overall quality of online learning.	68

Conclusion and Recommendation

This study aimed to investigate students' perspectives on the use of educational technology during the COVID-19 pandemic in higher education, with a focus on Regent University College of Ghana. The results of the study showed that students generally had a positive attitude toward the use of educational technology during the pandemic. The majority of students reported that educational technology had helped them to continue their studies despite the challenges posed by the pandemic. However, students also identified several challenges associated with the use of educational technology, including internet connectivity issues, lack of access to appropriate devices, and difficulties with online assessments. This study provides important insights into students' experiences and perspectives on the use of educational technology during the COVID-19 pandemic in higher education. It highlights the opportunities and challenges associated with the use of educational technology and emphasizes the need for institutions to address the challenges faced by students in order to ensure equitable access to education. Further research is needed to explore the long-term

effects of the pandemic on higher education and the role of educational technology in shaping the future of higher education in Ghana and other developing countries. Overall, this study contributes to the growing body of knowledge on the use of educational technology in higher education and provides useful observations and recommendations for universities and other institutions to improve their use of educational technology during crises such as the COVID-19 pandemic.

Based on the study findings, several recommendations can be made to enhance the adoption and effective use of educational technology in higher education during and beyond the pandemic. These recommendations include:

- Universities must endeavour to provide training and support for students and faculty to effectively use educational technology, including online platforms and software tools. This can include workshops, online tutorials, and access to technical support.
- Universities have to ensure that all students have equitable access to technology and resources necessary for online learning. This can include providing laptops or tablets to students in need, as well as ensuring reliable internet connectivity and access to software tools.
- Instructors should use a variety of teaching modalities, including synchronous and asynchronous instruction, to accommodate different learning styles and preferences. This can help to promote engagement and active learning among students.
- Instructors should implement assessment and feedback strategies that are appropriate for online learning, including frequent formative assessments, peer feedback, and self-assessment. This can help students to monitor their own progress and receive timely feedback to improve their learning.
- Institutions should encourage innovation and experimentation in the use of educational technology, including the development and implementation of new tools and approaches to enhance online learning experiences. This can help to drive continuous improvement and enhance the overall quality of online learning.

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