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COVID-19 Pandemic and the Adoption of E-Learning as Alternative Teaching and Learning: Perspectives of Tertiary Students

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ABSTRACT

This study investigated the perceptions, attitudes, and challenges of students towards the adoption of e-learning as alternative teaching and learning approach during the onslaught of the COVID-19 pandemic, in the case of the Ghana Institute of Journalism (GIJ) and the Ghana Communication Technology University (GCTU). The purpose of the study was to investigate and examine perceptions, attitudes, and challenges of students in the adoption of e-learning as alternative teaching and learning during the pandemic. The study adopted a purposive and random stratified sampling technique to respond to hypothetical issues; that there is a significant relationship between students' perceptions, attitudes and challenges and the adoption of e-learning in the COVID-19 crisis. From the perspective of the students, findings include a lack of data bundles, online learning being difficult and the unpreparedness of the institutions to adopt e-learning within the first four weeks of the pandemic. The adoption of e-learning as alternative learning in Tertiary institutions, in the wake of the COVID-19 pandemic, is quite novel and still evolving and educational institutions are quite far from absolute transformation.

Keywords: *COVID-19 pandemic, Perception, Attitude, Challenges, E-learning, Adoption.*

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INTRODUCTION

> "For the students, the most immediate impact has naturally been that the temporary cessation of face-to-face teaching at HEIs has left them, particularly undergraduates and those who are about to finish upper secondary and aspire to enter higher education, in a completely new situation, without a clear idea of how long it will last, immediate impacts on daily life, costs incurred and financial burdens and, of course, learning continuity and international mobility."[1]

These are the words of UNESCO's Impact analysis, policy responses and recommendations on COVID-19 and Higher education report, which investigated the impact of COVID-19 on HEIs in Latin America and the Caribbean region. This a statement which emphasizes the termination of traditional

[1] UNESCO Digital Library, "Crisis-Sensitive Educational Planning," 2020, https://unesdoc.unesco.org/ark:/48223/pf0000373272.

teaching and learning and how it has changed the situation and the immediate impact that has on Higher Educational Institutions (HEIs). There is no doubt that the 2019 Coronavirus pandemic affected HEIs worldwide, leading to the widespread cessation of face-to-face teaching and learning and the subsequent closure of universities.

By the middle of March 2020, over 1.3 billion students were sent out of universities due to government directives for the closure of schools as part of measures to control the spread of COVID-19. The Ghanaian President, Nana Akufo-Addo banned sporting events, and public gatherings and ordered the closure of all schools and universities in a move to stem the spread of the Coronavirus pandemic. On Sunday evening, in a televised address the President ordered the closure of all educational institutions with effect from Monday, March 16, 2020. "All Universities, Senior High Schools and Basic Schools, i.e., public and private, will be closed from Monday, March 16 until further notice," the President said. By this directive, all Universities in Ghana closed down and were thrown into what could be classified as a crisis because universities in Ghana, like many others in the world, were not ready for alternative teaching and learning.

The purpose of this study was to examine and assess the adoption of e-learning for teaching and learning and the impact of the pandemic: the case of GCTU and GIJ; by investigating perceptions, attitudes and challenges of students in the adoption of e-learning as alternative teaching and learning in this era of the pandemic. In the African context, most institutions of higher education continue to struggle to survive with very limited technological capacity and basic resources, such as electricity, equipment, and funding. In the context of higher education in Africa, computer laboratories are typically infrequently accessed, housing old and broken computers, with few or no educational programs installed on them. [2] According to the World Economic Forum, Global Information Technology Report 2005/06, ICT infrastructure development has not progressed rapidly in Sub-Saharan Africa.

Technology integration is the ability to use technological components, resources, and online platforms to facilitate the learning experience.[3] In many universities in Ghana, technology is being used in diverse ways. Usually, the use of technology focuses on computers and their components, software applications, and online learning management systems and platforms.[4] Generally, integration in HEIs in Ghana is entrenched in distance education, e-learning, online learning, web-based learning, and blended learning, powered by the internet.

Recent studies concerning the integration of technology or ICT in Higher Educational Institutions (HEIs) in Ghana have proven that perceptions, attitudes and challenges of learners and tutors are a potential threat to the success of infusion. Students were concerned about this threat since the university curriculum was designed for face-to-face learning, and institutions were unprepared for such a drastic change due to a lack of resources to handle emergency remote instruction.

In the wake of this myriad of challenges facing universities in Ghana, it is evident that the traditional pedagogy has to a very large extent dictated the teaching and learning process in HEIs and there is quite a slow rate of infusion of technology into academic programmes. This also goes to affirm the fact that integration of technology into education has not been prioritized in the university environment and previous attempts to infuse technology into education have seen investments in Distance education and adult education as alternative education.

However, this does not suffice for integration. More so, real Alternative education, which involves alternative teaching and learning with various activities, powered by technology, has been given very little consideration in the university environment. Although in its broadest sense, the term

[2] P. A. Rivers, J. K. Rivers, and Vanessa Hazell, "Africa and Technology in Higher Education: Trends, Challenges, and Promise," *International Journal for Innovation Education and Research* 3, no. 5 (2015): 14–31.

[3] Carol M Shepherd and Madelon Alpert, "Using Technology to Provide Differentiated Instruction for Deaf Learners.," *Journal of Instructional Pedagogies* 16 (2015).

[4] Pledger Fedora, "Integrating Technology Tools for Students Struggling with Written Language," *Kappa Delta Pi Record* 51, no. 1 (2015): 31–35.

"alternative education" covers all educational activities that fall outside the traditional school system (including special programmes for school dropouts and gifted students, homeschooling, etc.[5]
It is in the light of this problem setting that this study sought to find out the perceptions, attitudes and challenges of students concerning the adoption of E-learning as Alternative Teaching and Learning in the wake of a pandemic and the consequences of continuing academic work despite the closure of schools. The Ghana Institute of Journalism and The Ghana Communication Technology University (GCTU) are the two universities that this study investigated.

The general objective of the study was to investigate the adoption of e-learning as an alternative method for teaching and learning, by investigating perceptions, attitudes, and challenges of students in adopting e-learning and the preparedness of the institutions in this era of COVID-19. More specifically, the study sought to first, investigate students' perceptions towards adopting e-learning; secondly, examine students' attitudes towards adopting e-learning and thirdly, investigate the challenges of students towards adopting e-learning as alternative learning at the outbreak of a pandemic. Finally, to investigate the preparedness of the two universities towards the adoption of e-learning as alternative learning in this COVID-19 era.

Some hypothetical propositions were formulated for this study. Proposition 1 – That there will be a significant positive relationship between student perceptions and the adoption of e-learning in the COVID-19 era. Proposition 2 - There will be a significant positive relationship between students' attitudes and the adoption of e-learning in the COVID-19 crisis. Proposition 3- There will be a significant relationship between students' challenges and the adoption of e-learning in the COVID-19 crisis.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In a study conducted by Ozfidan et al, self-motivation was perceived among students as the most critical trait required for online education in the wake of a pandemic.[6] This required a high level of self-motivation to continue and succeed in the online medium. Related studies, all attest to the fact that self-motivation is important for online classes and even more important in the wake of a pandemic.[7] The constructivist approach to teaching and learning actually posits self-paced learning as a driving force, where learners are able to construct knowledge on their own.[8] However, beyond self-motivation as a requirement for online learning, there is also the need for achievement; to what extent can the perception of students be linked to achievement in a self-motivating and self-paced constructivist learning environment?

According to Ozfidan et al, some studies have sought to establish a link between students' perceptions and achievement.[9] Some studies have validated the reliability of student perceptions in educational research.[10] Zimmerman et al. found that students' beliefs in their own efficacy for self-

[5] Brandy Yee et al., "Germany: A System Undergoing Change," *Engaging Adolescent Learners: International Perspectives on Curriculum, Pedagogy and Practice*, 2018, 115–37.
[6] Burhan Ozfidan, Hala Ismail, and Orchida Fayez, "Student Perspectives of Online Teaching and Learning During the COVID-19 Pandemic," *Online Learning* 25, no. 4 (December 1, 2021), https://doi.org/10.24059/olj.v25i4.2523.
[7] Emily Stark, "Examining the Role of Motivation and Learning Strategies in Student Success in Online versus Face-to-Face Courses.," *Online Learning* 23, no. 3 (2019): 234–51; Rachel Berndtson and Lorraine Makanyama, "Online Learning for Geography Undergraduates: Student Perceptions and Motivations," *The Geography Teacher* 15, no. 4 (October 2, 2018): 145–55, https://doi.org/10.1080/19338341.2018.1524779; Japhet E. Lawrence and Usman A. Tar, "Factors That Influence Teachers' Adoption and Integration of ICT in Teaching/Learning Process," *Educational Media International* 55, no. 1 (January 2, 2018): 79–105, https://doi.org/10.1080/09523987.2018.1439712; Halil Yurdugül and Nihal Menzi Çetin, "Investigation of the Relationship between Learning Process and Learning Outcomes in E-Learning Environments," *Eurasian Journal of Educational Research* 15, no. 59 (April 27, 2015), https://doi.org/10.14689/ejer.2015.59.4.
[8] J Piaget, *The Construction of Reality in the Child London* (London; Routledge, 1937).
[9] Ozfidan, Ismail, and Fayez, "Student Perspectives of Online Teaching and Learning During the COVID-19 Pandemic."
[10] Herbert W Marsh, "Students' Evaluations of University Teaching: Dimensionality, Reliability, Validity, Potential Baises, and Utility.," *Journal of Educational Psychology* 76, no. 5 (1984): 707; Wilbert J McKeachie, "Student Ratings of Faculty: A Reprise," *Academe* 65, no. 6 (1979): 384–97; Sezai Kocabas, Burhan Ozfidan, and Lynn M Burlbaw,

regulated learning affected their perceived ability for academic achievement, which in turn impacted the academic goals that they set for themselves and their final academic achievement. Students' readiness for online education reflects in their perceptions related to online vs face-to-face classes. Such readiness covers domains such as student attributes, time management and technical and communication competencies.[11]

Asunka studied Ghanaian university students' general expectations and perceptions of collaborative online learning environments and revealed that students do not respond favourably to online constructivist teaching approaches such as asynchronous discussions and ill-structured project-based learning activities, and perceived collaborative online learning within their context as a complex, more demanding and time-consuming experience.[12] Nevertheless, Tanveer proved that both teachers and learners perceive that e-learning helps students take ownership of their own learning, provides diversification of activities, fosters intrinsic impetus of learning, enables introverted students to interact better, and permits acquiring valuable study and time management skills.[13]

Being forced to transition to online learning was a defining situation for many students, whether for good or bad. Many students viewed online learning as a challenge to overcome and worked to improve their study habits from home.[14] Aldowah, et al studied the Issues and Challenges of using E-Learning in a Yemeni Public University by identifying and addressing the major issues and challenges faced by students.[15] They also gleaned information about the participants' perception of e-learning and the major challenges and problems that face the implementation of e-learning. Attitudinal hampering and cultural barriers plus barriers related to integrating e-learning into traditional teaching pedagogies were some of the threats discovered. Smith, Caputi and Rawstorne state that "computer attitude" is defined as a person's general evaluation or feeling of favourableness or unfavourableness toward computer technologies.[16] According to Smith, et al., there is often a connection between learners' attitudes and their computer usage experience and there are two aspects of computer experience that directly impact the learners' attitude; i. Subjective experience, which relates to the feelings and thoughts of the learners toward their computer usage, ii objective experience, which relates to individual computer interaction.[17]

According to Sujarwo et al. previously, students did not use online learning before the pandemic because learning was conducted in the classroom.[18] During the Covid-19 pandemic, students are interested in using online learning which can be accessed flexibly, anywhere and everywhere. A review of the extant literature on the challenges confronting students during the pandemic indicates that the issue of access to the internet data bundle is a real hindrance to students participating in online learning. Maphosa, in his study, revealed that higher data costs hindered LMS access, a phenomenon

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"American STEM Education in Its Global, National, and Linguistic Contexts," *Eurasia Journal of Mathematics, Science and Technology Education* 16, no. 1 (2019): em1810.

[11] Florence Martin, Brandy Stamper, and Claudia Flowers, "Examining Student Perception of Readiness for Online Learning: Importance and Confidence," *Online Learning* 24, no. 2 (June 1, 2020), https://doi.org/10.24059/olj.v24i2.2053.

[12] Stephen Asunka, "Online Learning in Higher Education in Sub-Saharan Africa: Ghanaian University Students' Experiences and Perceptions," *International Review of Research in Open and Distributed Learning* 9, no. 3 (2008): 1–23.

[13] Muhammad Tanveer, "Integrating E-Learning in Classroom-Based Language Teaching : Perceptions , Challenges and Strategies," 2011.

[14] Rebecca Kalman, Monica Macias Esparza, and Christina Weston, "Student Views of the Online Learning Process during the COVID-19 Pandemic: A Comparison of Upper-Level and Entry-Level Undergraduate Perspectives," *Journal of Chemical Education* 97, no. 9 (2020): 3353–57.

[15] Hanan Aldowah, Samar Ghazal, and Balakrishnan Muniandy, "Issues and Challenges of Using E-Learning in a Yemeni Public University," *Indian Journal of Science and Technology* 8, no. 32 (2015): 1–9.

[16] B Smith, P Caputi, and P Rawstorne, "Differentiating Computer Experience and Attitudes toward Computers: An Empirical Investigation," *Computers in Human Behavior* 16, no. 1 (2000): 59–81.

[17] Smith, Caputi, and Rawstorne, "Differentiating Computer Experience and Attitudes toward Computers: An Empirical Investigation,"

[18] Sujarwo Sujarwo et al., "An Analysis of University Students' Perspective on Online Learning in the Midst of Covid-19 Pandemic," *Jurnal Pendidikan Dan Pengajaran* 53, no. 2 (2020): 125–37.

which was also confirmed by Ramli et al., revealing that high data costs hindered learners from fully participating in online learning.[19] Tanveer et al. and Aboagye et al. reported that students struggled to buy internet data because their guardians had lost their means of livelihood, due to the pandemic.[20] Access to technological devices by students has also been a long-standing issue and some studies by Aboagye et al. and Tanveer et al. have confirmed that most students usually do not have access to technological devices such as computers and laptops and this made the abrupt transition to online learning very challenging.[21] According to Gupta et al., students found it difficult to transition to an online environment due to a shortage of internet connectivity and online learning tools.[22] When students were least prepared to access e-learning and had inadequate skills, they were compelled to take a deep dive into the online world.[23] Technical difficulties were probably the most stated challenge. Another challenge was related to time management.[24] Maphosa, in concluding on the issue of challenges and hindrances, recommended that "a multi-stakeholder approach involving institutions, governments, development partners, and telecommunications companies is required to build a resilient digital education system to solve some of the students' challenges."[25]

The Social Cognitive Theory (as indicated in Figure 1), depicts how learning occurs following one's environment.[26] Bandura claims that the environment a student is in affects their ability to learn. What the teachers utilise (content and materials) during the learning process can have an impact on the situational elements. The learners' cognitive variables are in turn influenced by these situational factors. The basic Bandura theory provided the foundation for this study's theoretical framework, which is then scaffolded onto online presence by Garrison and Arbaugh.[27] The online learning environment is one of the situational aspects of e-learning. The teacher's presence in the e-learning environment can affect the learning environment. Next, learning behaviours can both influence and be influenced by situational circumstances. In an e-learning environment, the social presence that is visible in the online class serves as a representation of the behavioural aspects. The learners' cognitive variables might then be affected by the interaction of situational and behavioural factors.

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[19] Vusumuzi Maphosa, "Factors Influencing Student's Perceptions towards e-Learning Adoption during COVID-19 Pandemic: A Developing Country Context," *European Journal of Interactive Multimedia and Education* 2, no. 2 (2021): e02109; Mohamad Faizal Ramli, Muhammad Majid, and Basri Badyalina, "Impeding Factors towards the Effectiveness of Online Learning during Covid-19 Pandemic among Social Sciences Students," *International Journal of Learning and Development* 10, no. 4 (2020): 37.

[20] Yusra Habib Khan et al., "Threat of COVID-19 Vaccine Hesitancy in Pakistan: The Need for Measures to Neutralize Misleading Narratives," *The American Journal of Tropical Medicine and Hygiene* 103, no. 2 (2020): 603; Emmanuel Aboagye, Joseph Anthony Yawson, and Kofi Nyantakyi Appiah, "COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions," *Social Education Research*, June 30, 2020, 1–8, https://doi.org/10.37256/ser.212021422.

[21] Khan et al., "Threat of COVID-19 Vaccine Hesitancy in Pakistan: The Need for Measures to Neutralize Misleading Narratives"; Aboagye, Yawson, and Appiah, "COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions."

[22] Madan Mohan Gupta et al., "Asynchronous Environment Assessment: A Pertinent Option for Medical and Allied Health Profession Education During the COVID-19 Pandemic," *Education Sciences* 10, no. 12 (November 26, 2020): 352, https://doi.org/10.3390/educsci10120352.

[23] Gloria Tam and Diana El-Azar, "3 Ways the Coronavirus Pandemic Could Reshape Education | World Economic Forum," 2020, https://www.weforum.org/agenda/2020/03/3-ways-coronavirus-is-reshaping-education-and-what-changes-might-be-here-to-stay/.

[24] Ozfidan, Ismail, and Fayez, "Student Perspectives of Online Teaching and Learning During the COVID-19 Pandemic."

[25] Maphosa, "Factors Influencing Student's Perceptions towards e-Learning Adoption during COVID-19 Pandemic: A Developing Country Context."

[26] Albert Bandura, "Social Foundations of Thought and Action," *Englewood Cliffs, NJ* 1986, no. 23–28 (1986).

[27] D. Randy Garrison and J.B. Arbaugh, "Researching the Community of Inquiry Framework: Review, Issues, and Future Directions," *The Internet and Higher Education* 10, no. 3 (January 2007): 157–72, https://doi.org/10.1016/j.iheduc.2007.04.001; Bandura, "Social Foundations of Thought and Action."

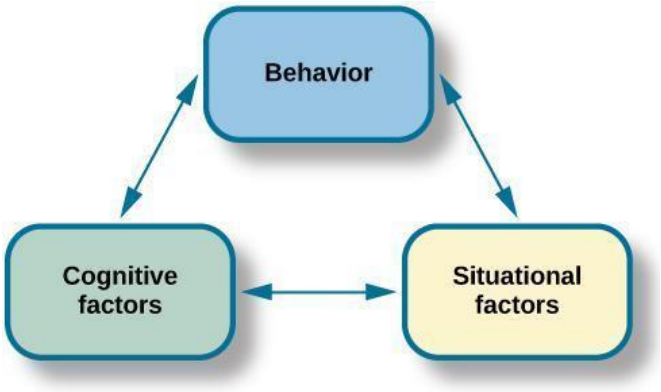


Figure 1: Social Cognitive Theory (Bandura, 1986)

UNESCO's approach to Crises Management in education is critical to this study due to the crisis presented by the pandemic. Crisis-sensitive planning in education is defined by UNESCO as "identifying and analysing existing risks of conflict and natural hazards and understanding the two-way interaction between these risks and education to develop strategies that respond appropriately.[28] It aims to contribute to minimizing the negative impacts of risk on education service delivery and to maximize the positive impacts of education policies and programming on preventing conflict and disaster or mitigating their effects. It also requires identifying and overcoming patterns of inequity and exclusion in education, as well as harmful cultural practices."[29]

METHODOLOGY

The descriptive survey design used for this study involved a cross-sectional survey of students of the GIJ and the GTUC, to collect information relating to the variables of the study. This approach and design were suitable because of the need to collect large amounts of data on different variables.

The population for this study was the bachelor's level 300 and 400 students of both universities. Selecting respondents was based on random stratified sampling technique and purposive sampling, considering the rank of the respondents and also by the short and inadequate exposure to online teaching and learning over the varying periods of pursuing their various academic programmes. In all, a sample size of 413 students was selected.

The Researchers used the research objectives as the basis to construct a questionnaire for the research. The initial development of the questionnaire focused on Demographic Characteristics such as Gender, the educational level in terms of Levels 300-400. There were also questions based on the perception of the respondents concerning COVID-19 and e-learning. Other questions also focused on the respondent's adoption and attitude toward e-learning and online tools for learning, as well as course materials delivered in data or recorded format for e-learning during the COVID era. The questionnaire further focused on challenges encountered by students and their perspective on the preparedness of the Institutions towards e-learning during the COVID era. The questionnaire was also administered through electronic means (Google Forms), which students could access via various class 'WhatsApp' groups, which existed before the pandemic.

Ensuring the validity and reliability of the study was inevitable as data collection followed a rigorous process of piloting and pre-testing to ensure that the questionnaires, were structured with scales of measurements to test perceptions, attitudes, challenges, and feelings vis-à-vis the hypotheses.

[28] UNESCO Digital Library, "Crisis-Sensitive Educational Planning."
[29] UNESCO Digital Library ,"Crisis-Sensitive Educational Planning."

Therefore, scales of measurement were specifically designed based on previous studies.[30] Each scale consists of a number of definite statements that respondents had as options in one scale or another, within which options were provided in ordinal scale and interval scales (in a 5-point Likert scale where 1 meant 'Strongly agree' and 5 meant 'Strongly disagree'). Pre-testing was done with a cross-section of students (N10) to test the validity and reliability of the questions and refine some questions; to avoid respondent biases and researcher biases. The reliability of the data was tested using the SPSS Crombach Alpha statistical instrument to determine the reliability coefficient of data collected and analysed. The acceptable value (alpha or co-efficient) by Crombach should be >= 0.70, however, for less than ten items, the acceptable value is <0.5. The reliability coefficient of 0.918 which is >0.70, was attained for this study, after running the test for 30 items.

Previous studies in Ghana hardly ever discussed the impact of COVID-19 on e-learning and the adoption of online learning as alternative learning in Ghanaian Higher Educational Institutions. This research sought to fill this knowledge gap to comprehend the impact of students' perceptions, attitudes and challenges on the adoption of e-learning as alternative learning in a time of crisis. It is against this knowledge gap and the variables of the Social Cognitive Theory (Cognitive factors, Behaviour and Situational factors) that the authors of this study formulated and tested the following hypotheses:

Cognitive Factors (Perception of Students)
H1: There will be a significant positive relationship between students' perceptions and the adoption of e-learning in the COVID-19 crisis.

Behavioural Factors (Attitude of Students)
H2: There will be a significant positive relationship between students' attitudes and the adoption of e-learning in the COVID-19 crisis.

Situational Factors (Challenges of Students)
H3: There will be a significant relationship between students' challenges and the adoption of e-learning in the COVID-19 crisis.

FINDINGS AND DISCUSSIONS

This section presents the data analysis of the results from the two selected Universities. Using the Statistical Package for Social Sciences (SPSS) software and Pearson Product Moment Correlation and Chi square tests, the following analysis inferred from the results are presented in descriptive and inferential statistics. Pertinent issues emanating from the results are categorized as follows:

Demographic information of respondents
AThe age of Respondents were concentrated between 18 years and 50 years. Majority of respondents were between 18 and 25 years representing (44.6%). The next group of respondents were between 26 and 50 years at (43.6%) and the least age at (1.0%) were those above 50 years. Most of the respondents were, therefore, the youth.

Regarding gender, the results revealed that the respondents consisted of 233 females who represented (56.4%) and 135 males representing (32.7%) of all respondent. Significantly, more females participated in the study than males. However, the large size of the female respondents did not affect the study since the questionnaires were designed to be gender neutral. It can also be inferred from the results that more females indulged in the adoption of e-learning for teaching and learning in the era of

[30] James F Petrick, "Development of a Multi-Dimensional Scale for Measuring the Perceived Value of a Service," *Journal of Leisure Research* 34, no. 2 (2002): 119–34; Chei Sian Lee and Long Ma, "News Sharing in Social Media: The Effect of Gratifications and Prior Experience," *Computers in Human Behavior* 28, no. 2 (2012): 331–39; Mayank Yadav and Zillur Rahman, "Social Media Marketing: Literature Review and Future Research Directions," *International Journal of Business Information Systems* 25, no. 2 (2017): 213–40.

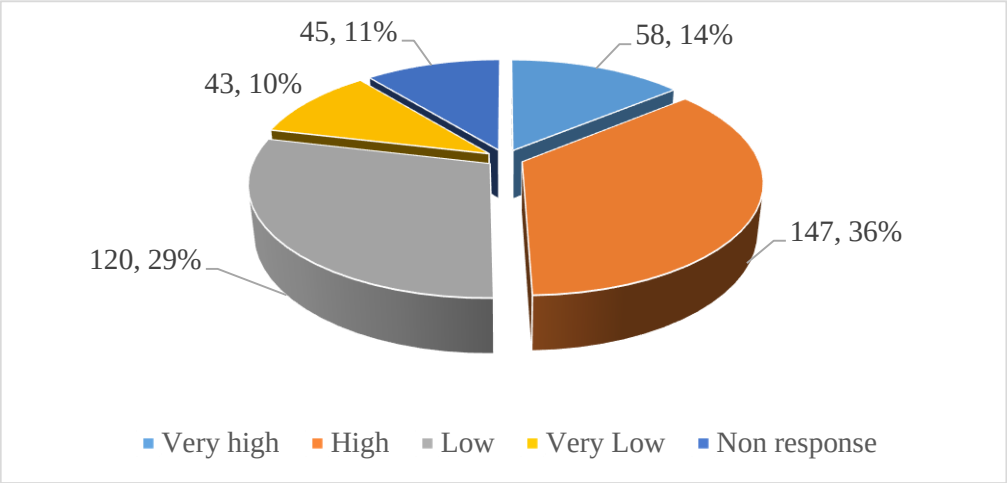
a pandemic. This goes to explain how different sexes evaluated the pandemic and the subsequent adoption of alternative learning through learning technologies.

Inferring from the results, Level 300s participated most in the study represented by 44.1%, followed by Postgraduate students, represented by (20.1%) while (10.4%) were Level 400 students. The results of the respondents' institutions emerged as GIJ representing (74%) and GTUC representing (15%). The majority of the respondents therefore were from the Ghana Institute of Journalism.

Level of adoption of online teaching and learning

Another issue of concern to this study was to probe respondents' candid opinions about the level of adoption of online teaching and learning, in this COVID-19 era where students have been compelled to adopt a mode they did not subscribe to. Pie chart 1 reveals respondents' knowledge about the level of adoption to e-learning in this COVID-19 era. A greater number of the respondents representing (36%) perceived the level of adoption of e-learning to be high and (14%) very high; while (29%) perceived the adoption rate to be low, and only (10%) very low. On the whole (approximately 50%) admit that the level of adoption of e-learning in this COVID-19 era was high.

Pie chart 1: Level of adoption to e-learning in this COVID-19 era



Source: Field Survey (2020).

Attitude towards adoption of e-learning and online tools for learning.

This section opens the discussion on the attitudes of students concerning online tools that were available for teaching and learning during the pandemic. At the end of the study, Google Classroom, Whatsapp and Zoom, were the 3 most favourite online tools for majority of the students.

To further ascertain the Attitude of students towards the adoption of these e-learning tools for teaching and learning, students revealed that the adoption of these e-learning tools for teaching learning was positive (51%) and extremely good (highly skilled).

The next in the attitude series sought to determine the attitude of students towards course materials delivered in data or recorded format for e-learning/online learning. Table 1 presents the scores of the top three attitudes that students demonstrate when trying to access course materials online. The first attitude that students demonstrate in this regard is that they tend to skip or reject course materials which consume too much data bundle; as indicated by the mean and the standard deviation (Mean = 3.27; SD = 1.304) in Table 1. The second attitude that students demonstrate is loss of concentration while studying, if the course materials are too long or voluminous; as shown by (Mean = 3.17; SD = 1.182). The third attitude that students demonstrate is that students are able to learn if only the course materials delivered in data or video format is just okay (concise); as revealed by (Mean = 3.04; SD = 1.053).

Table 1: Attitudes toward course materials delivered in data or recorded format for e-learning

Items	Mean	Std. Deviation
They consume too much data so I skip it or reject it.	3.27	1.304
They are too long so I lose concentration	3.17	1.182
They are just okay so I am able to learn	3.04	1.053

Source: Field Survey (2020)

The attitude of students towards the various aspects of online learning indicating attitude towards the various aspects of online learning and the results are as follows; Access to Course materials (Mean = 3.6; SD = 1.07), Access to information whenever wanted (Mean = 3.54; SD = 1.187), Attend classes online from any location (Mean = 3.46; SD = 1.276) Using technology (Mean = 3.37, SD = 1.028).

Challenges Encountered by Students

This study, therefore, sought to investigate the challenges that students experienced in the switch to 'alternative learning' (e-learning) within a 4-week exposure period. Table 2 revealed the experiences of students in e-learning and the challenges they encountered.

Table 2: Challenges encountered by students in this COVID-19 era?

Items	Mean	Std. Deviation
Internet bundle is expensive for online learning in this COVID-19 era	4.34	1.019
Network is slow and inconsistent for online learning	4.18	1.054
Network is inaccessible for online learning in this COVID-19 era	3.87	1.196
Lack of orientation and training	3.72	1.181
Power outage is a hindrance to online teaching and learning	3.69	1.228

Source: Field Survey (2020)

Inferring from the detailed results, the twelve most challenging issues were drafted into a scale of measurement to determine the most upfront challenges confronting students. As indicated in Table 2, the Mean (M) and Standard Deviation (SD) indicate that respondents, after four weeks of experiencing e-learning/online learning, encountered upfront challenges such as; the Internet bundle is expensive for online learning in this COVID-19 era (M4.34), Network is slow and inconsistent for online learning (M4.18), Network is inaccessible for online learning in this COVID19 era (M3.87), Lack of orientation and training (M3.72), Power outage is a hindrance to online teaching and learning (M3.69), Lack of E-libraries and Online books (M3.48). Amidst all these challenges it was essential to know the level of challenges that students experienced while pursuing e-learning in the COVID-19 era. Majority of the students (42.6%) were of the view that the challenges were generally moderate and manageable.

Students' Perspective on the preparedness of the Institutions

This segment presents the results on the preparedness of the institutions under study. To what extent were the institutions prepared to engage and migrate students to an alternative learning environment called e-learning or online learning? From the per-view of the students, to what extent were school administrators and lecturers and IT support staff prepared to conduct e-learning during the pandemic? Table 3 revealed respondents' estimation of how prepared their institutions were, for the adoption of online teaching and learning in this COVID-19 era.

Table 3: In your estimation, how prepared was your institution for the adoption of online teaching and learning in this COVID-19 era?

Options	Frequency	Percent
Not at all prepared	177	42.9
Strongly prepared	13	3.1
Prepared	35	8.5
Quite prepared	143	34.6

Source: Field Survey (2020)

In Table 3, almost half of the students in both universities (43%), were of the view that their institutions were not prepared, while a little over one-third of the sampled population (35%) thought that their institutions were quite prepared for the adoption of e-learning. In contrast, it was only a fraction of the students who affirmed that their institutions were either prepared (8.5%) or strongly prepared (3.1%). This implies that from the perspective of the students, at the outbreak of the pandemic and subsequent engagement and migration to an 'alternative teaching and learning' ecosystem, their institutions were not prepared for the adoption of online teaching and learning within the first four weeks of COVID-19 induced closure of schools.

More specifically, this study further inquired about the pertinent variables that hold the impetus to confirm or otherwise overturn the belief that their institutions were indeed not prepared for e-learning before COVID-19 lockdown. Table 4 revealed the pertinent variables that indicate whether or not, their institutions were prepared for e-learning before COVID-19 lockdown.

Table 4: The following variables indicate whether institutions were prepared for e-learning or not before the COVID-19 lockdown.

Items	Mean	Std. Deviation
No provision for data bundles and internet for students?	4.43	0.996
Lack of training and orientation for students?	3.98	1.119
Unavailability of resources for online and distance learning?	3.77	1.165
Unavailability of Distance Learning Centers?	3.74	1.15
No policy direction for e-learning/online learning?	3.71	1.189
Unavailability of Learning Management Systems?	3.7	1.175

Source: Field Survey (2020)

The descriptive statistics reflecting the mean scores and standard deviations reflect whether the institution was prepared for e-learning or not before the COVID19 lockdown are shown in Table 4. The most relevant variable that came up tops within the scale of measurement, is 'No provision for data bundles and internet for students' (M4.43).

Hypotheses Analyses

The present study examined the perception, attitude and challenges in the context of the Social Cognitive Theory assumptions for adopting e-learning as alternative teaching and learning domain for two public universities in Ghana in this COVID-19 era. Perception, attitudes and challenges appear to be the main issues confronting learners and tutors in the adoption of online teaching and learning amid COVID-19 in public universities. Hence the need for these hypothetical issues to be addressed and resolved. Using SPSS software and Pearson Moment Correlation (Chi-square test), the following research hypothesis was formulated and tested in the study:

H_1: That there will be a significant positive relationship between students' perceptions and the adoption of e-learning in the COVID-19 crisis.

The hypothesis that there will be a significant positive relationship between students' perceptions and the adoption of e-learning in the COVID-19 crisis was tested and the chi-square value of (19.468, df = 2, p-value = 0.000 < 0.05) was attained. In other words, student perceptions highly influenced the adoption of e-learning in the COVID-19 crisis. Also, the proportion (57.10%) of respondents who had positive perceptions agreed with the high adoption of e-learning in the COVID-19 crisis. The perceptions of students relate positively to the adoption of e-learning in the COVID-19 crisis. Since the null hypothesis was rejected, this study supports the assertion that there is a significant positive relationship between students' perceptions and the adoption of e-learning in the COVID-19 crisis.

H_2: That there will be a significant positive relationship between students' attitudes and the adoption of e-learning in the COVID-19 crisis.

The second hypothesis, that there will be a significant positive relationship between students' attitudes and the adoption of e-learning in the COVID-19 crisis was also tested. The chi-square value of (42.105, df = 2, p-value = 0.000 < 0.05) was attained. In effect, student attitudes did highly influence the adoption of e-learning during the COVID-19 crisis. Also, that the proportion (65.60%) of respondents who had a positive attitude agreed with the high adoption of e-learning during the COVID-19 crisis. The attitudes of students relate positively to the adoption of e-learning in the COVID-19 crisis. Since the null hypothesis is rejected, this study supports the assertion that there is a significant positive relationship between students' attitudes and the adoption of e-learning in the COVID-19 crisis.

H_3: That there will be a significant relationship between students' challenges and the adoption of e-learning in the COVID-19 crisis.

It was revealed from Table 10 that there is a significant negative relationship between students' challenges and the adoption of e-learning during the COVID-19 crisis. The chi-square value of (47.19, df = 2, p-value = 0.000 < 0.05) was attained. In effect, the challenges that students faced did significantly influence the adoption of e-learning during the COVID-19 crisis. Also, the proportion (79.80%) of respondents who had low challenges agreed to high adoption of e-learning during the COVID-19 crisis. And those who had high challenges (69.40) agreed to low adoption of e-learning during the COVID-19 crisis. The challenges of students relate negatively to the adoption of e-learning in the COVID-19 crisis. This study, therefore, asserts that there was a significant negative relationship between students' challenges and the adoption of e-learning during the COVID-19 crisis. Because the lower the challenges that students face, the higher the rate of adoption, and the higher the challenges that students face, the lower the rate of adoption of e-learning in the midst of a pandemic.

DISCUSSIONS

Regarding the perceptions and feelings of the students concerning online teaching and learning in this COVID-19 era, this research discovered that students have a feeling that teaching and learning online requires training and orientation for students to be able to effectively participate in online teaching and learning. This is consistent with Boison's discovery, that training of students and faculty members must not remain a threat to the infusion of technology into mainstream education because challenges relating to training and teacher-competencies in the online environment pose more serious negative effects in higher educational institutions in Ghana.[31] It is also consistent with, Tanveer, that in order to utilize the full potential of ICT and to equip students with skills to be lifelong learners, it follows that teachers' and learners' confidence to use technology should be raised by duly facilitating them with the required

[31] T. K. Boison, "The Transformative Role of Information Communication Technology on Learning in Higher Educational Institutions in Ghana" (OUM/AIT, 2019).

electronic equipment, training and time resources.[32] That also pre-supposes that the students expect or perceive the Lecturer to also be trained with the nascent skills to be able to effectively serve them.

The Social Cognitive Theory (SCT model) posits that the online learning environment is one of the situational aspects of e-learning. The teachers' presence in the e-learning environment can affect the learning environment.[33] If students perceive teachers as lacking the nascent skills required for e-learning that presents a situation that potentially denigrates the attitude and behavior of the learner. Because learning behaviours can both influence and be influenced by situational circumstances induced by teachers. It is imperative for policy-makers and policy implementers within the school environment to consider these concerns of students prior to deploying learning technologies. Other students also perceived that online teaching is more rigorous or difficult, while others perceived online learning to be a good method for teaching and learning. In context, it is worth noting the emergence of three major issues; namely training, rigor and method, and that prior to the pandemic students probably did not have these perceptions, thoughts and feelings. However, having experienced online teaching and learning, a phenomenon they were not used to, during the pandemic learners probably have had to evaluate the pros and cons of online learning and adopt and adapt to it. Policy-makers and implementers must therefore take into account these three emerging constructs and leverage technology to alleviate what may be considered by students as deterrents to online teaching and learning.

Pursuant to the above issue under discussion in this category, the study further probed the level of current thoughts and feelings of students towards online teaching and learning in the Covid-19 season and that was significantly low level (46%). While (41.4%) had moderate levels of feeling and thoughts. Only (1.7%) had a high level of good feelings and thoughts toward online teaching and learning. This result was not quite scandalous because, the sudden switch of academic work from the traditional pedagogical environment to online platforms, certainly had the propensity to whittle down the zest of students to embark on independent, synchronous and asynchronous studies and still attain high academic performance or better-still complete the academic year. A high level of feeling for online learning taking a nose dive (1.7%), meant that the stakes for online teaching and learning among students were very low; as compared to the Low level of feeling for online teaching and learning. It is therefore, imperative for policy-makers and school administrators, at least within the universities under study, to consider raising the stakes higher and motivate students to have a blended learning approach in order to forestall confidence in online teaching and learning, before the onslaught of another pandemic**.**

The attitude of students is of grave concern in this research. Therefore, in order to determine whether or not adopting these online tools motivate students to participate in the teaching and learning process, about 40.7% agreed to the fact that they were motivated to participate in online learning due to the availability of these online tools and the positive intent or attitude to use them. One can, therefore, infer from the results that the students have the view that adopting these online tools for teaching and learning, motivates them to positively participate in online learning. This is consistent with the study of Vasbieva and Saienko, which assert that about (85%) of students demonstrate a positive attitude to technology-enhanced learning environment proving the effectiveness of technology-mediated learning.[34] It further strengthens the TAM theory by Davis and Venkatesh et al., that user acceptance of new technologies (online tools) is affected by Perceived Use and Perceived Ease of Use.[35] The assumptions of TAM are therefore confirmed in this research due to the positive attitude of students as motivated by online tools. It also confirms the assumptions of the Social Cognitive Theory that the

[32] Tanveer, "Integrating E-Learning in Classroom-Based Language Teaching : Perceptions , Challenges and Strategies."
[33] Bandura, "Social Foundations of Thought and Action."
[34] D G Vasbieva and N V Saienko, "Exploring Students' Perception and Efficiency of Technology-Mediated ESP Teaching," *XLinguae* 11, no. 1XL (2018): 127–37.
[35] Fred D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* 13, no. 3 (September 1989): 319, https://doi.org/10.2307/249008; Venkatesh et al., "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* 27, no. 3 (2003): 425, https://doi.org/10.2307/30036540.

content and materials that teachers utilize during the learning process can have an impact on the situational elements and the learners' cognitive abilities are in turn influenced by these situational factors.[36] To put it in context, COVID-19 presented students with a situation that gravely altered their learning environment and the introduction of online tools and materials/content that they had to adjust and adopt in order to be able to complete the academic year and achieve satisfactory academic performance. By the 'Behavioural' variable and principle in the Social Cognitive Theory (SCT model), certainly the behavioural and attitudinal traits of students, in the COVID environment did not turn out to be negative, but rather positive, in spite of the introduction of new online teaching and learning content, materials and tools.

To further ascertain the attitude of students towards the adoption of these e-learning tools for teaching and learning, students revealed that the adoption of these e-learning tools for teaching learning was positive (51%) and extremely good (highly skilled). The opposite is confirmed by the study outcome of Vasbieva and Saienko that students, with negative perceptions, were less skilled in technology use and that more importantly, the successful use and integration of technology into the classroom largely depends on students' attitudes and beliefs.[37] This outcome is supported by the TAM assumptions, by Davis and Venkatesh et al., that the individual must have basic skills to use the technology and also know the benefits of using it.[38] This further vindicates their assumptions that Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU) will determine how and when the individual will use the technology.

The next in the attitude series sought to determine the attitude of students towards course materials delivered in data or recorded format for e-learning/online learning. Table 1 presents the scores of the top three attitudes that students demonstrate when trying to access course materials online. The first attitude that students demonstrate in this regard is that they tend to skip or reject course materials that consume too much data bundle. This is in sync with the study outcome of Maphosa who revealed that higher data costs hindered LMS access, a phenomenon which was also confirmed by Ramli et al., revealing that high data costs hindered learners from fully participating in online learning.[39] The second attitude that students demonstrate is loss of concentration while studying, if the course materials are too long or voluminous. The third attitude that students demonstrate is that students are able to learn if only the course materials delivered in data or video format are just okay (concise). There is a clear indication that the first form of attitude that students demonstrate is 0.10 points higher than the second form of attitude. While the second form of attitude is also 0.13 points higher than the third. These are significant point differences that must be considered, providing enough grounds for school administrators and lecturers to regulate the volume of materials delivered to students for teaching and learning**.** All four outcomes as described in this section can be consolidated and declared to be consistent with the findings and conclusions of Smith et al. that "computer-attitude" is defined as a person's general evaluation or feeling of favourableness or unfavourableness toward computer technologies.[40]

There is often a connection between learners' attitudes and their computer usage experience and there are two aspects of computer experience that directly impact the learners' attitude; i. subjective experience, which relates to the feelings and thoughts of the learners toward their computer usage, have also been demonstrated by students in this research, since students from both universities understudy, reserved the right to subjectively accept or reject course materials and other learning

[36] Bandura, "Social Foundations of Thought and Action."
[37] Vasbieva and Saienko, "Exploring Students' Perception and Efficiency of Technology-Mediated ESP Teaching."
[38] Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology"; Venkatesh et al., "User Acceptance of Information Technology: Toward a Unified View."
[39] Maphosa, "Factors Influencing Student's Perceptions towards e-Learning Adoption during COVID-19 Pandemic: A Developing Country Context"; Ramli, Majid, and Badyalina, "Impeding Factors towards the Effectiveness of Online Learning during Covid-19 Pandemic among Social Sciences Students."
[40] Smith, Caputi, and Rawstorne, "Differentiating Computer Experience and Attitudes toward Computers: An Empirical Investigation."

technologies, as long as they did not favour them; ii. the experiences of students also emerged as individual learners participated in computer interactions with software, apps, LMSs and other online tools, either favourably or unfavourably amidst the challenges posed by the pandemic in the year 2020. Rivers et al, in an essay entitled "Africa and Technology in Higher Education: Trends, Challenges, and Promise", stated that there are several challenges confronting the smooth integration of technology into the curriculum.[41] Obviously, there are countless studies which have digested the issue of ICT challenges and the issues that tend to confront students in their quest to use technology to learn effectively. Prior to the pandemic, many universities were struggling to integrate technology into academic programmes. However, the onslaught of a worldwide pandemic presented novel challenges to policy-makers, school administrators, lecturers and students; to the extent that academic work within the 2019/2020 academic year was halted abruptly. This study, at the onslaught of the closures of schools, identified a serious research gap. The thrust of the gap was in the field of 'alternative teaching and learning' and what that means for instructors and learners. Hence, there was the need for this study to investigate the potential and novel challenges that were likely to confront students while switching to 'alternative teaching and learning' online.

Lack of training and orientation for students was the next highest variable of concern to students. At the outbreak of the pandemic and the introduction of e-learning, no training or very little orientation was given to students to prepare them to use Learning Management Systems (LMSs) or third-party online tools such as Google Classroom, Zoom, and Office 365, among others. This indeed reflects the fact that the institutions under study were not prepared for alternative teaching and learning within the online ecosystem. The unavailability of resources for online and distance learning as well as the Unavailability of Distance Learning Centers were also found to be barriers confronting students. Resources such as mobile devices (mobile phones, tablets, PDAs, laptop computers) are basic resources that students are expected to possess. Unfortunately, at the outbreak of a pandemic, some socio-economic factors wouldn't permit students to quickly acquire such devices to facilitate synchronous and asynchronous teaching and learning, anywhere, anytime. This is consistent with the study outcomes of Aboagye et al. and Tanveer et al.[42] The institutions were also not ready to provide such devices and students were left to their fate. Under such debilitating conditions or circumstances, the majority of the students who experienced this lack would certainly believe that their institutions were not prepared for them to migrate online for effective teaching and learning. In the wake of all these, the students further believed that there was no policy direction for e-learning/online learning in their institutions vis-a-vis the 'unavailability of learning management systems. Policymakers and school administrators, though perceived by students as unprepared, were not oblivious to these challenges and must, therefore, prepare for the next possible pandemic.

LIMITATIONS AND FUTURE DIRECTIONS

This study has provided rich quantitative data to report on E-learning as an alternative teaching and learning method in the period of COVID19 Pandemic; however, the findings should be considered in the scope of ad hoc or interim policy directions that compelled students to participate in the e-learning as an alternative mode of learning to complete the 2020-2021 academic year. Future research should, therefore, look at the current or future policies that have been institutionalized for the integration of technology in public and private universities and its impact on the integration of technology among students, because as a limitation, this study did not consider the provisions of the ad hoc or interim policies that were put in place as a result of the onslaught of the pandemic.

[41] Rivers, Rivers, and Hazell, "Africa and Technology in Higher Education: Trends, Challenges, and Promise."
[42] Aboagye, Yawson, and Appiah, "COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions"; Khan et al., "Threat of COVID-19 Vaccine Hesitancy in Pakistan: The Need for Measures to Neutralize Misleading Narratives."

RECOMMENDATIONS

The following recommendations present higher educational institutions with the critical issues that must be considered for the adoption and adaptation of e-learning as alternative teaching and learning to forestall academic progression, rather than the closure of schools, in the wake of a pandemic.

Student perceptions towards e-learning as alternative learning on the outbreak of a pandemic, have been inclined towards the fact that online learning requires training and orientation because online learning is difficult or rigorous. Policy-makers within the institutions under study, must therefore take these perceptions into account and find ways to revise policies to forestall confidence in training activities that will equip students with the requisite skills and prepare them for online learning ahead of the outbreak of a future pandemic. Since the students perceive online teaching and learning to be difficult, the authors recommend that there is the need for Help-Desks to be created both online and offline, for students to receive more support and training. IT support staff must also be equipped with the necessary logistics to enable them to embark on regular training sessions for both students and online instructors in the universities under study.

This study demonstrated student views regarding e-learning as an alternative learning option at the time of school closure. Students were inspired to patronize online learning due to the availability of online tools such as Google Classroom, Zoom, Whatsapp, and Office 365, among others and that is what insight into their attitude to adopt and adapt to online teaching and learning. Vasbieva and Saienko, assert that about 85% of students demonstrate a positive attitude to technology-enhanced learning environments proving the effectiveness of technology-mediated learning.[43] It is, therefore, recommended that Higher educational institutions must rapidly integrate such online tools into their Learning Management Systems and other repositories in order to boost the attitude of students and teachers toward effective e-learning. Through routine exercises in e-learning, students and lecturers will eventually close the digital divide.[44]

It is also recommended that the management of the two universities under study must take into account the various challenges that confront students in the adoption and adaptation of e-learning as an alternative approach. Such challenges, in times past, focused on power outages and the lack of connectivity. However, in recent times, the upfront challenge to students is the lack of Internet data bundle and the high-cost bundle for online learning considering the invention of Video conferencing tools such as Zoom and Microsoft Teams and the cost involved in sustaining patronage of such tools for learning over a period of seven weeks. It is recommended that the management of universities must negotiate with the Telecom companies to provide some subsidized rates for data bundles for students and lecturers, by 'whitelisting' the URLs and domain names of the LMS/ERPs and E-Libraries for students to be able to freely access internet data or highly subsidized cost of bundles.

The study further recommends that the issue of the slow, inconsistent and inaccessible network must be tackled by the provision of numerous network ports/jacks, fibre optics, enhanced broadband connectivity, lectons/MiFi and WiFi hotspots to enable students to freely connect to the internet anywhere, everywhere. Bandwidth and Synchronous Transport Moodles (STMs) 1 and 2, provided by National platforms such as the Ghana Academic Research Network (GARNET), must be made mandatory for all universities and Management boards of the universities under study must be mandated to subscribe to the GARNET, so as to ensure that all students benefit from the internet speed and the numerous resources that the GARNET offers. All universities will be better-off if they invest in Network Operating Centers (NOCs) that wield the capacity to ensure seamless connectivity and access to internet bandwidth, uninterrupted internet speed, and constant power supply that is required for smooth online teaching and learning.

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[43] Vasbieva and Saienko, "Exploring Students' Perception and Efficiency of Technology-Mediated ESP Teaching."
[44] Hillar Addo and Yaw Odame Gyau, "Blogging as an E-Learning Tool in Tertiary Communication Institutions in Ghana: An Exploratory Study," *Journal of Communications, Media & Society (JOCMAS)* 5, no. 1 (2018), https://repository.gij.edu.gh/xmlui/handle/123456789/66.

Against the backdrop that students perceived the unpreparedness of their universities vis-a-vis the lack of orientation and training, the researchers, recommend that regular training sessions must be tactically and periodically organized for students and lecturers in both online and face-to-face modes, synchronous and asynchronous modes via the use of Online Help-desks, emails, WhatsApp and sensitization videos to constantly inform, equip and prepare students with the nascent skills to participate and academically engage in online learning at all times. Because it is imperative for the management of the universities to be fully prepared for the next pandemic, to avert any possible closures and undue interruption of academic work, within a given academic year.

CONCLUSION

The study set out to investigate and examine perceptions, attitudes, and challenges of students in the adoption of e-learning as alternative teaching and learning method during the pandemic. The adoption of e-learning as alternative learning in Tertiary institutions, in the wake of the COVID-19 pandemic, is quite novel and this research has demonstrated that the adoption, though incessant, is still evolving and educational institutions are quite far from absolute transformation. The researchers, therefore, recommend that further studies be conducted by other researchers in other universities, while the pandemic is still lingering around as this study was conducted in two out of twelve public universities in 2020, at the outbreak of the pandemic and the results could not be generalized.

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