Exploring Online Learning in Higher Education, Perception and Challenges during the Era of Coronavirus Pandemic

Abstract

The present study explores the perception and challenges students in tertiary institutions face in online teaching and learning during the pandemic. The paper employs a qualitative approach to study the perceptions and challenges of students on online teaching and learning. Online Collaborative Learning was found to be the most suitable model to be used. A total of three-hundred students were selected for the study. Data was collected for a period of two months, from October-November, 2020. A multi-stage sampling technique was adopted in the selection of students from different universities. Findings of the study revealed that more than half (54 %) of the students used the Learning Management Systems teaching and learning platform tool. The majority (52.7%) of the students agreed that they had internet distortion during the course of lectures. More than half (53.7 %) of the students agreed that they could not access the internet due to a lack of data. There is a need for future studies to focus on all government and private tertiary institutions in Ghana. University authorities and the ministry of education should formulate post-COVID 19 strategies to promote online learning in the country.

Keywords: Online learning, Perception, Challenges, Students, Covid 19

1. INTRODUCTION

Coronaviruses are a group of viruses belonging to the family of Coronaviridae, which infect both animals and humans. The disease emerged in Wuhan, China in December 2019. Unfortunately, the disease did not stop at the national borders but spread to every part of the world including Ghana. The covid 19 crisis-affected education adversely, both in Ghana [1, 2]and across the globe ([3, 4], with academic activities coming to a sudden halt due to the lockdown. The disease had a severe impact on education as universities, colleges, Senior High Schools and basic schools closed their premises in response to lockdown measures in order to curb the spread of the disease. Most schools in the country were totally shut down for almost a year while students in the universities and senior high schools were allowed to complete the semester successfully without any interference. However, despite the emergence of the disease, educational authorities in the universities had to resort to online learning which was quite new to students and lecturers.

The introduction of the online teaching and learning approach became a glimmer of hope for students who ought to complete the semester within the stipulated time. Although the universities were quick to replace face-to-face lectures with online learning, the closure severely affected the learning, examination, and graduation of students [5]. Empirical evidence showed that the paradigm shift in the educational systems during the era of the covid 19 pandemic has been well documented by several authors [1, 2, 6].

Online Learning has become the protagonist for change in the education sector during the pandemic as a way of meeting the needs of students. Alexander and Maninger[7], described

online learning as a learning process in which learners can communicate with their instructors and peers, and access learning materials, over the internet. Online teaching and learning have some advantages over the traditional face-to-face methods by enhancing the capacity of both learners and instructors. According to Vidakis and Charitakis[8], online learning is arguably a more efficient and reliable means of knowledge sharing covering unlimited boundaries and brings immense improvement in education and training across the globe. Other notable advantages of online learning include convenience and flexibility, provision of a conducive atmosphere for efficient and effective corporate training as well as lifelong access to learning resources, and reduces time of teaching and learning[9, 10], pointed out that online learning can be used by lecturers to improve the efficiency and effectiveness of educational interventions in the face of the social, scientific, and pedagogical challenges.

Studies show that through online learning, information can be transmitted easily to students and provides forums for exchanging information and sharing ideas [11, 12]. Online learning in the universities during the peak of the pandemic offered the opportunity for lecturers to share study materials and lectures in the form of PPT, PDF, or Word documents by uploading them on their respective university web pages, Zoom, Superstar, g-suite cloud meeting, google classroom and WhatsApp or through e-mails to a maximum number of students during the lockdown. Kawatra and Singh[13], discussed the concepts of open and distance learning and also examined the effect of the internet on teachers. Anderson[14], explained how online learning changed our lives.

Nevertheless, in spite of the pedagogical advantages of online learning, the lack of resources is a great hurdle for online learning. Sometimes the unhealthy environments and technical issues are some reasons behind students' inability to fully participate in online learning. According to Terry and Leppa[15], online interaction lacks nonverbal cues as a component of face-to-face contact and this may reduce the extent of communication that occurs asynchronously with substantial delays in receiving a reply. Gilbert[16], found a lack of face-to-face and social interaction in a classroom environment as a disadvantage of online learning. Despite research conducted on online learning across the globe, preliminary studies indicate that available data on the perception and challenges of online learning in tertiary education in Ghana is lacking. This information is important in uncovering critical areas and contributing to local literature on the subject which in turn could be used by relevant authorities in improving their education initiatives.

1.1 Aim of the study

The study aimed at investigating students' perceptions and challenges of online learning in Ghanaian universities during the shutdown.

1.2 Research Questions

The study seeks to address the following research questions:

1. What type of online teaching and learning platform tools are adopted by the institutions?
2. How does the perception of students on online teaching and learning varied in the different institutions?
3. What are tertiary students' perceptions of the challenges of online learning?

2. REVIEW OF RELATED LITERATURE

2.1 Online Learning or E-Learning

Rapid developments in technology have made distance education easy [17]. “Most of the terms (online learning, open learning, web-based learning, computer-mediated learning, blended learning, m-learning, for ex.) have in common the ability to use a computer connected to a network, that offers the possibility to learn from anywhere, anytime, in any rhythm, with any means”[18]. Online learning can be termed as a tool that can make the teaching-learning process more student-centered, more innovative, and even more flexible. Online learning is defined as "learning experiences in synchronous or asynchronous environments using different devices (e.g., mobile phones, laptops, etc.) with internet access. In these environments, students can be anywhere (independent) to learn and interact with instructors and other students” [19]. The synchronous learning environment is structured in the sense that students attend live lectures, there are real-time interactions between educators and learners, and there is a possibility of instant feedback, whereas asynchronous learning environments are not properly structured. In such a learning environment, learning content is not available in the form of live lectures or classes; it is available at different learning systems and forums. Instant feedback and immediate response are not possible in such an environment [20].

2.2 Online learning in higher education

Nowadays, the higher education system is in a continuous process of change, with universities having to keep pace with the needs, desires, and requirements of students. Thus, information technologies and E-learning systems are seen as essential factors in carrying out the activity of universities, these institutions investing more and more in online systems and devices (Popovici and Mironov [21]. However, in the technology era, one of the main challenges of universities is the integration of innovative E-learning systems so as to reinforce and support both teaching and learning [22]. Due to its complexity, multiple definitions are proposed for the concept of E-learning. In a simple way, E-learning means using information and computer technologies and systems in order to build and design learning experiences [23]. Similarly, Engelbrecht [24]describes E-learning as a concept that uses electronic media represented by the internet, CD-s, mobile phones, or even television, in order to provide distance learning and teaching [24]. In short, E-learning refers to transferring knowledge and education by utilizing various electronic devices[25], and the concept can be better understood when is integrated into a context in which technology is used in order to meet people’s need to learn and evolve [26].

2.3 Learning Management System

Learning Management Systems (LMS) are software programs for the administration, documentation, tracking, reporting, and delivery of electronic educational technology courses or training programs [27]. LMSs range from systems for managing training and educational records to software for distributing online or blended/hybrid college courses over the Internet with features for online collaboration. Learning management systems are the framework that handles all aspects of the learning process. They are the infrastructure that distributes and manages instructional content, identifies and assesses individual and organizational learning or training goals, tracks the progress towards meeting those goals, collects and presents data for supervising

the learning process of the organization as a whole [27] Learning management systems are used for various purposes; Colleges and universities use LMSs to deliver online courses and supplement on-campus courses; business training departments use LMSs to deliver online training, as well as to automate recordkeeping and employee registration [28]. There are now different types of learning management systems used by organizations to manage online learning and deliver course materials to learners or students [29]. LMSs possess online course launching and tracking capabilities. That is, the ability to manage courses that mix online and classroom instruction. Also, communication and collaboration tools have been included as part of LMSs. These tools provide social learning and networking. LMSs also have the ability to produce tests and assessments both as part of the courses and separately [30].

2.3.1 Zoom meeting

Zoom cloud meetings is a very useful alternative application for a virtual meeting to facilitate communication with many people without making direct contact and be able to support learning needs in today's digital era [31]. This application is used for video conferences instead of direct meetings in the classroom. It can be installed with devices such as computers, laptops, android, and smartphones. So for the students who do not have a laptop, they can use their smartphones to take part in a virtual class. Zoom meeting application is very helpful in communicating remotely; all lecturers' explanations can be conveyed directly without having to meet physically. Zoom facilitates discussions between lecturers and students and among students with direct communication through video conference which is supported by zoom features such as raise hand and group messages so that if there are problems in audio, the students are helped with the available chat features. Zoom cloud meetings really help the learning process in the difficult situation of the current pandemic and can facilitate access to information and communication in the learning process for students. Some previous studies about the use of zoom cloud meetings have been carried out [32]found that using zoom for the distance learning process for Engineering students is more interactive, creates satisfaction, and provides positive experiences in the learning process. The innovation of zoom increases better learning outcomes for different groups of students. The classroom action research about the e-learning model with zoom application to improve the ability to give strengthen skills in mathematics learning was carried out on the fourth-semester students of the mathematics education study program at Bengkulu University, the result indicated that the lecturer's activities in the teaching-learning process with learning model with zoom application was in a good category and the students' activities improved and the ability to give strengthening skills in mathematics learning also increased [33].

2.4 Theoretical Framework

There are several theories and models related to the study of online learning, but for this study, Online Collaborative Learning (OCL) was found to be the most suitable model to be used in this research. The reason behind using Online Collaborative Learning (OCL) is to help understand how students and educational institutions accept and use technology for teaching and learning. Online Collaborative Learning is also based on social constructivism. This is because the learners are encouraged to solve problems collaboratively by way of discourse. The major aspect of OCLis that the work of a teacher is to facilitate the process of learning.

3 MATERIALS AND METHODS

3.1 Study Areas

The study was conducted in the Ashanti and Bono Regions of Ghana. Three study areas were sampled intermittently during the study (Fig 1). The first area was Kwame Nkrumah University of Science and Technology located in Kumasi and the largest university in the Kumasi Metropolis and in the Ashanti Region. The University Campus is situated approximately on 16 square kilometers campus of undulating land and pleasant surroundings, about seven kilometers away from the central business district of the city of Kumasi. Geographically, the University Campus is located at longitude 6º 41' 5.67' N, and latitude 01º 34' 13.87' W. The University falls within the wet sub-equatorial zone. The average minimum temperature is about 21.5 °C and the maximum average temperature is about 30.7°C. The mean annual rainfall is 165.2 mm.

The second site was the University of Education, Winneba Ashanti Mampong campus. Geographically the study area lies between longitude 0.05' W and 1.30' W and latitudes 6.55' N and 7.30' N, covering a total land area of 449 km^2. It is bounded in the South by Sekyere South District, the East by Sekyere Central, and the North by Ejura-Sekyedumasi District. The area experiences an average annual rainfall of 1,270 mm and has two rainy seasons. The major rainy season starts in March and ends in August whiles the minor is between September and November. The average annual temperature is 27ºC with variations in mean monthly temperature ranging between 22º C – 30 ºC. The area lies within the wet semi-equatorial forest zone.

The third study site was the University of Energy and the Natural Resources located in the Bono region in the Dormaa central municipality. The area lies between latitude 7° 08´ N and 7° 25´ N and longitude 2°.35´ W and 2°.48´ W . It shares common boundaries with Dormaa Municipal to the West, Berekum to the North, Sunyani to the East, and South by Asunafo North Municipal and Asutifi District. The mean annual rainfall is between 1240 mm and 1700 mm. The first rainy season is from March to June and the second is from September to October. The mean annual temperature of the area is about 26 °C -30 °C. The University is located within the east semi-equatorial climate region with a double maximal rainfall regime.

3.2 Research Methods

The study employed the descriptive and explanatory design in a form of questionnaires to collect empirical data from respondents. A total of one hundred students each were sampled from three public Universities in Ghana namely Kwame Nkrumah University of Science and Technology, University of Education, Winneba, Ashanti Mampong campus, and the University of Energy and Natural Resources. Thus a total of three hundred students were sampled for the study. The selection of the students was based on whose who were involved in the online teaching and learning during the pandemic. A total of three - hundred questionnaires were distributed, each consisting of thirty Likert scale survey items, sorted into three sections and ranging from strongly agree to strongly disagree. The data collection techniques were performed by distributing questionnaires via Google Form and interviews through Whatsapp video calls. Google form was used to distribute the questionnaire because it is faster, cheaper, and more extensive to be distributed to the subjects of research. Data were collected for a period of two

months, from October to November 2020. A multi-stage sampling technique was adopted in the selection of students from different universities. Students were interviewed on parameters like age, sex, marital status, level of education, ethnicity, perception about online learning, and challenges in adopting online learning among others. Before data collection, the questionnaire was pre-tested using thirty students each from the three different Universities and reviewed [34].

3.3 Statistical analysis

Descriptive statistics were used to summarize responses from respondents from the different Universities. Data collected were analyzed using cross-tabulation. Statistical differences were compared using chi-square and a P-value of < 0.05 was considered significant. Statistical analyses were achieved using Statistical Product and Service Solutions (SPSS) version 20.0.

4. RESULTS

4.1 Characteristics of Respondents

A result of the characteristics of respondents is depicted in Table 1. About 156 (72 %) of the students interviewed in the three Universities were between 21 and 30 years of age. However, the distribution of a number of students in age groups varied ($\chi^2 = 75.3$, $p < 0.05$) significantly in the three universities. Female students formed 156(52 %) of the students interviewed and 272 (90.7 %) of them were single. The sex group students varied significantly among the different Universities ($\chi^2 = 2.25$, $p < 0.05$).Most 110(36.7 %) of the students interviewed were in level hundred. More than half of the students 246 (82%) were Akan. Ethnic backgrounds of students varied significantly ($\chi^2 = 20.2$, $p < 0.05$). The majority 276(92 %) of them were Christians while a few 16(5.3 %) were Islam. The religious background of students among the different universities was significant ($\chi^2 = 15.06, p < 0.05$).

4.2 Online Teaching and Learning Platform Tool Used by the Institutions

More than half 162 (54 %) of the students interviewed from the three universities used the LMS teaching and learning platform tool while 24(8 %) used google meetings (Fig. 2). The type of teaching and learning platform tools used by students differ significantly across the different universities ($\chi^2 = 165.2$, $p < 0.05$). Although 72(24 %) of the students in Kwame University of Science and Technology used LMS platform tool, about 18 (6%) of them also used google meetings during their online lessons (Fig.2).

4.3 Students Perception about Online Teaching and Learning

The majority 284 (94.7 %) of the students interviewed were of the view that they were introduced to the online teaching and learning approach (Table 2). Students' perceptions of online teaching and learning varied significantly across the different universities ($\chi^2 = 15.8$, $p < 0.05$) (Table 4). About 140(46.7%) of the students were of the view that online teaching and

learning were good (Table 2). More than half 162(54 %) of the students used the phone for their online teaching and learning while 74(24 %) used both phone and laptop. The type of electronic device used by students across the different institutions varied significantly ($\chi^2 = 15.6$, $p < 0.05$). Regarding the effectiveness of the online platform tool used, about 130(43.3 %) of the students were of the view that the online platform used was manageable. The majority 160 (53.3 %) of the students agreed that they will use the online teaching and learning platform tool adopted by their institutions frequently whiles 114 (38 %) of them strongly disagree (Table 2). However, the frequency of using online teaching and learning platform among students in the different Universities was significant ($\chi^2 = 23.7$, $p < 0.05$) (Table 4). More than half 154(51.3 %) of the students agreed that they felt confident using the online platform tool whiles 124 (41.3 %) of them strongly disagreed (Table 2). About 74 (49.3 %) of them strongly disagree that the online platform was very easy to use.

4.4 Challenges of Online Teaching and Learning Approach in the Selected Universities

The study revealed that about 124(82.7 %) of the students were of the view that they had challenges using the online platform tool (Table 3). Most 88(48.9 %) of the students strongly disagreed about the inability of the online platform tool to meet every student's needs. About 122 (40.7 %) of the students strongly disagreed that online learning was time-consuming. More than half 166(55.3%) of the students agreed that not all students followed the online lessons. However, students' responses across the different universities varied significantly ($\chi^2 = 11.96$, $p < 0.05$). The majority 180(60 %) of the students agreed that not all students have access to the internet or own smartphones or laptops during the online session. The study revealed that 150 (50 %) of the students strongly disagreed that managing students during virtual was difficult. About 135 (45 %) of them agreed that lack of training in using the online platform tool was a major challenge they had to grapple with. More than half 161(53.7 %) of the students interviewed agreed that some of their colleagues could not access the internet due to a lack of data. About 145(48.3 %) of the students strongly agreed that not all students attended the online lecture. The majority 158(52.7%) of the students interviewed from the different universities agreed that they had internet distortion during the course of lectures (Table 3).

5. DISCUSSION

The study revealed that most of the students were young adults and single suggesting that the future of our educational institutions in the country is bright and certain when it comes to online learning. The overwhelming number of students who fully participated in online teaching and learning was an indication that they have embraced the paradigm shift despite the closure of the schools. This observation is consistent with the recent study by Sarpong et al.[35] who observed most Ghanaian populace in tertiary institutions between the ages of 26- 30 years. The study further revealed that the online teaching and learning approach adopted by the educational institutions during the peak of the pandemic was dominated by female students. This observation is contrary to what was reported by Sarpong et al.[35] in a similar study. The higher female number recorded is an indication that female students' enrollment was relatively higher than

males and could be attributed to programs offered by the institution which are gender-biased. It was obvious from the study that the majority of the students who participated in the online teaching and learning were in a level hundred year group and could be attributed to the high enrollment drive prior to the emergence of the coronavirus pandemic

Although online platform tools such as google meetings, zoom meetings, WhatsApp, and learning management systems have been commonly used in higher educational institutions across the globe, the situation in Ghana before the emergence of the covid 19 pandemic was quite different. This is because most students and lecturers were not aware of the online platform tools before the introduction since interactions were mostly face-to-face. From the findings, it was revealed that the universities adopted the use of the Learning Management System (LMS) for online learning since that was most preferred. This assertion agrees with a recent report by Mishra et al.[3] that Universities and Colleges use LMS to deliver online lessons and supplement on-campus courses. Although most of the students across the different universities used the LMS platform, few of them were introduced to google meetings and zoom meetings. The introduction of students to the other learning platforms by lecturers is an indication that some of them might have issues with the LMS or were not familiar with LMS. The findings of the study revealed that students were aware of online learning since they saw it to be more effective and convenient. Popovici and Mironov[21], in a related study, said learners are deeply aware of the online teaching and learning underway in most tertiary institutions since they were willing to adopt the new approach to learning. The findings of the study revealed that students used smart android phones for their lessons since most of them could not afford laptops. Despite the challenges with the use of smartphones, they felt confident using the online platform tool considering place and time. Smedley[36], in a previous study, reported that the adoption of online learning platforms provides the institutions as well as their students or learners the much flexibility of time and place of delivery to learning information.

The challenges facing online teaching and learning in tertiary education have been documented by several authors in Ghana [1, 35]and elsewhere [4, 37, 38]. The study revealed that most students faced challenges in adopting online teaching and learning during the period of the shutdown. This could be due to the fact that online learning is still new in Ghanaian education whereas, students are more comfortable with prefer classroom learning environment or face-to-face learning. Moreover, this study strongly disagrees that online learning is time-consuming since students are more active in the discussion process, making learning more active. Zhang et al.[39] reported that online learning is a learning process made easy as apart from discovering ways to study, students do not have to travel to class and they still can attend to learning and discussion processes. Another challenge that students faced was internet distortion during lectures which was the reason why some students could not join the online lectures. In a recent study Tareen and Haand[37], reported that not all students will participate actively in online learning as they are easily distracted by other applications or web and network failures during the learning process. When there is a gap in their learning process, students will have unclear doubts and need further clarification on the task or activity given. This happened when the lecturers themselves do not have access to the internet due to network failure. The study disagrees that managing students during online teaching and learning was difficult since students were willing to embrace the new learning approach as a result of the covid 19 pandemic.

6. CONCLUSION

In conclusion, the Learning Management Systems teaching and learning platform tool was adopted by the Universities during the closure of the educational institutions due to the pandemic. The online teaching and learning approach was good and learning was successfully carried out through the use of smartphones. The online platform and manageable to use. Students agreed that they felt confident using the online platform. Internet distortion during lectures or inaccessibility of networks due to lack of data was great challenge students had to grapple with using the online platform.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

RECOMMENDATIONS

It can be recommended further research should be carried out across all tertiary institutions in the country in order to compare findings with other previous research .Educational institutions should continue to embrace the online teaching and learning approach in order to handle any challenges the country may face in future as a result of pandemic.

REFERENCES

1. 1.Aboagye, E. (2020). Covid-19 and E-learning the challenges of students in Tertiary institutions in Ghana. *Social Education Research*
2. 14.Anderson, J. (2005). IT, e-learning and teacher development. *International Education Journal*, 5(5), 1-14.
3. Anderson, S., & Maninger, R, (2007). Preservice teachers' abilities, beliefs, and intentions regarding technology integration. *Journal of Educational Computing Research*, 37 (2), 151-172.
4. Bezhovski, Z., &Poorani, S.(2016). The Evolution of E-Learning and New Trends. Inf. Knowl. Manag., 6, 50–57.
5. 26.Cohen, E.&Nycz, M.(2006). Learning Objects and E-Learning: An Informing Science Perspective. Interdiscip. J. E Ski. Lifelong Learn. 2, 23–34.
6. 4.Demuyakor, J. (2020). Coronavirus (COVID-19) and Online Learning in Higher Institutions of Education: A Survey of the Perceptions of Ghanaian International Students in China. *Online Journal of Communication and Media Technologies, 10*(3), e202018. https://doi.org/10.29333/ojcmt/8286
7. 24.Engel Brecht, E. (2006). Adapting to changing expectations: postgraduate students' experience of an e-learning Tax Program, Computers and Education, 45, 2, 217-22
8. 22. Fischer, H.; Heise, L.; Heinz, M.; Moebius, K.; Koehler, T. (2014). E-learning trends and hypes in academic teaching. Methodology and findings of a trend study. In Proceedings of the International Association for Development of the Information Society

(IADIS) International Conference on Cognition and Exploratory Learning in the Digital Age (CELDA), Porto, Portugal, 25–27 October 2014; pp. 63–69.
9. 16.Gilbert, B. (2015). Online Learning Revealing the Benefits and Challenges. St. John Fisher College
10. 23.Horton,W.(2006). E-Learning by Design; Pfei_er: San Francisco, CA, USA, 2006; ISBN -13
11. 13.Kawatra, P. S., & Singh, N. K. (2006). E-learning in LIS education in India. In C. Khoo, D. Singh & A.S. Chaudhry (Eds.), Proceedings of the Asia-Pacific Conference on Library & Information Education & Practice 2006 (A-LIEP 2006), Singapore, 3-6 April 2006 (pp. 605-611).
12. 38.Kearns, L. R. (2012). Student assessment in online learning: Challenges and effective practices. Journal of Online Learning and Teaching, 8(3), 198.
13. 6. Kola, A.J.,& Opeyemi, A.A (2020). Mitigating the Impact of COVID-19 on the Teaching and Learning of Science in the Nigerian Higher Education. *International Journal of Research and Innovation in Social Science*
14. Lee, B.-C.; Yoon, J.-O.& Lee, I.(2009). Learners' acceptance of e-learning in South Korea: Theories and results. Comput. Educ., 53, 1320–1329.
15. 11.Marco, J. R. (2000). Book review: e-learning strategies for delivering knowledge in the digital age. Internet and Higher Education, 5, 185-188.
16. 3.Mishra, L.,Gupta,T., &Shree, A.(2020). Online Teaching-Learning in Higher Education during Lockdown Period of COVID-19 Pandemic. *International Journal of Educational Research Open*
17. 21. Popovici, A. & Mironov, C. (2015). Students' Perception on Using eLearning Technologies. Procedia Soc. Behav. Sci. 180, 1514–1519.
18. 35. Sarpong, S. A., Dwomoh, G., Boakye, E. K., & Ofosua-Adjei, I. (2022). Online Teaching and Learning Under COVID-19 Pandemic; Perception of University Students in Ghana. *European Journal of Interactive Multimedia and Education, 3*(1), e02203. https://doi.org/10.30935/ejimed/11438
19. 36. Smedley, J.K. (2010). Modelling the impact of knowledge management using technology. *OR Insight* (2010) 23**,** 233–250.
20. 37. Tareen, H., & Haand, M.T (2020). A Case Study of UiTM Post-Graduate Students' Perceptions on Online Learning: Benefits & Challenges. *International Journal of Advanced Research and Publications.*
21. 34. Tetteh, D.A. & Asase, A (2017). Socioeconmic profile and farm management practices of smallholder cocoa farmers in three Cocoa farmers in three Cocoa producing districts in Southern Ghana. African Journal of Agricultural Research
22. 15. Terry, L.& Leppa, C. (2009). Developing a conceptual framework and strategies overcoming intrinsic inhibitors to e Learning. Proceedings of the 8th European conference on e-Learning; pp. 605–613.
23. 2. Upoalkpajor,J-L.N.,&Upoalkpajor, C.B.(2020). The Impact of COVID-19 on Education in Ghana. Asian Journal of Education and Social Studies. 9(1): 23-33.
24. 12. Weiner, C. (2003). Key ingredients to on online learning: Adolescent students study in cyberspace–the nature of the study. *International Journal on E-learning*, *2*(3), 44-50.

25. 39. Zhang, D., Zhou, L., BrIggs, R. & Nunamaker, J. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information &Management*, 43 (1), 15-27.

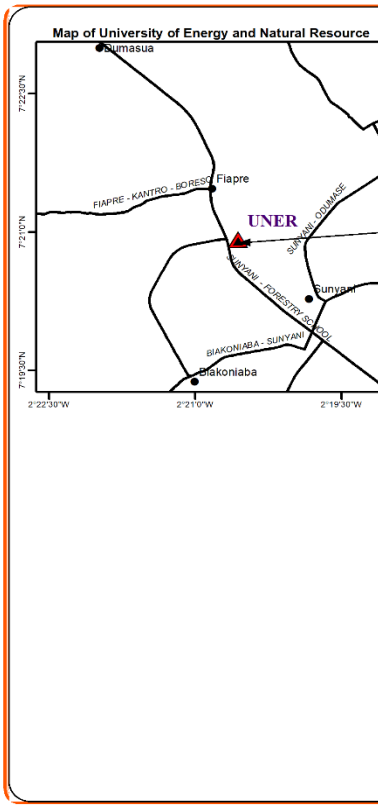

Fig. 1. Map showing the study areas

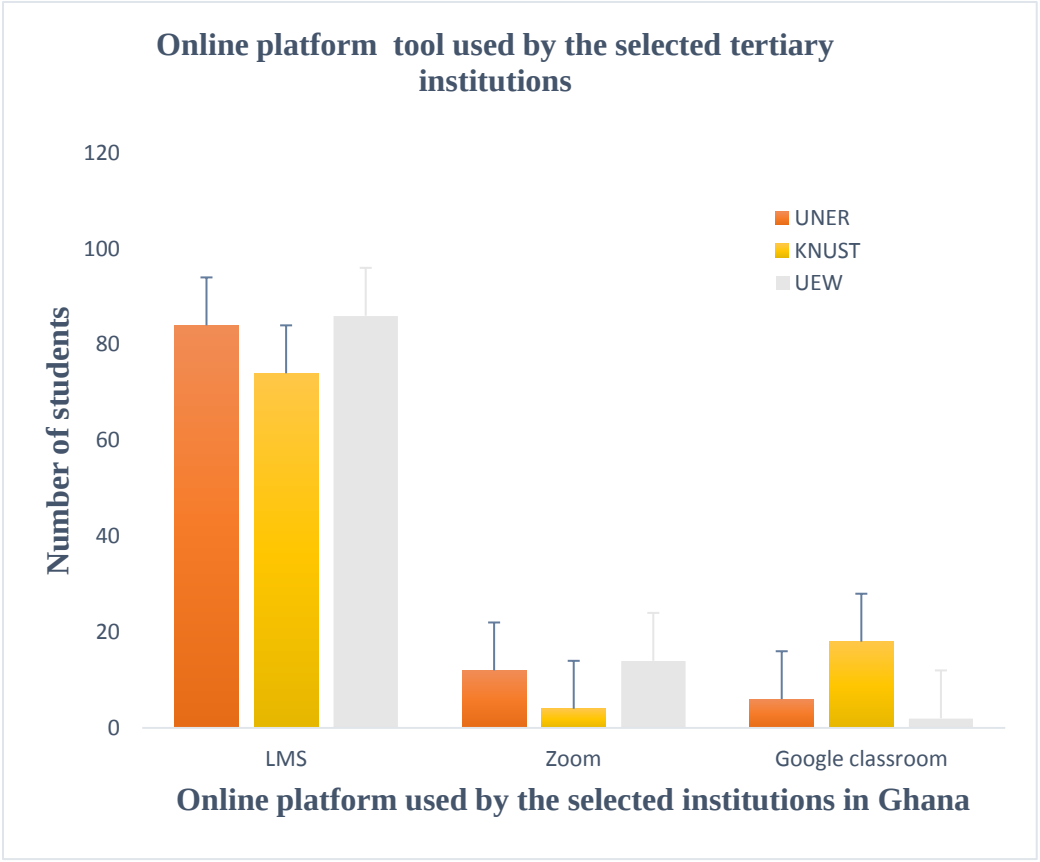

Figure 2. Online platforms

tools adopted by the different tertiary Institutions

Table 1.Summary of Characteristics of respondents

VARIBLE	CATEGORY	UENR	KNUST	UEW-M	TOTAL FREQUENCY
Age	Under 20 years	10	56	10	76
	21- 30 years	90	42	84	216
	Above 30 years	4	2	2	8
Sex	Male	52	42	50	144
	Female	52	58	46	156
Level	100	44	56	10	110
	200	46	32	24	102
	300	14	10	56	80
	400	0	2	6	8
Marital status	Married	6	8	10	24
	Singled	96	92	84	272
	Separated	2	0	2	4
Ethnicity	Akan	86	86	74	246
	Dagbani	10	0	4	14
	Ga	2	4	2	8
	Ewe	2	2	8	12
	Others	4	8	8	20
Religion	Christianity	94	94	88	276
	Islamic	8	0	8	16
	Traditional	2	6	0	8

The table shows frequency distribution of the variables, categories and total frequencies of respondents from the Kwame Nkrumah University of Science and technology, University of Education, Ashanti Mampong Campus and the

University of Energy and Natural Resources involved in the Online teaching and learning during the closure of the schools

Table 1. Frequency distributions of students perception about online teaching and learning in the three Universities

VARIBLE	CATEGORY	UENR	KNUST	UEW-M	TOTAL FREQUENCY
Were you introduced to the online teaching and learning	Yes	96	92	96	284
	No	4	8	0	12
Which electronic device did you use for the online teaching and learning	Computer	10	4	2	16
	Phone	42	62	58	162
	Laptop	22	14	12	48
	Both phone And laptop	30	20	24	74
How effective was the online platform adopted	Very effective	4	12	22	38
	Not reliable	46	20	40	106
	Not effective	6	16	4	26
	Manageable	48	52	30	130

I will like to use the above chosen platform frequently	Strongly Disagree	24	54	36	24
	Agree	72	36	52	272
	Strongly Agree	8	10	8	4
I felt very confident using the online platform	Strongly Disagree	32	42	50	124
	Agree	66	48	40	154
	Strongly Agree	6	10	6	22
I found the Online platform cumbersome	Strongly Disagree	26	17	19	62
	Agree	15	27	20	62
	Strongly Agree	11	6	9	26

The table shows frequency distribution of the variables, categories and total frequencies of the perception of respondents on online teaching and learning from the Kwame Nkrumah University of Science and technology, University of Education, Ashanti Mampong Campus and the University of Energy and Natural Resources involved in the Online teaching and learning during the closure of the schools

Table 3. Frequency distributions of challenges students faced in adopting online teaching and learning in the three Universities

FACTORS	GROUP	UENR	KNUST	UEW-M	TOTAL FREQUENCY

Did you face any challenges in adopting the online teaching and learning	Yes	44	38	42	124
	No	8	12	6	26
Inability to meet students' needs	Strongly Disagree	29	35	24	88
	Agree	21	30	26	77
	Strongly Agree	5	7	3	15
The online learning was time consuming	Strongly Disagree	39	36	47	122
	Agree	34	19	27	80
	Strongly Agree	31	45	22	98
Not all students follow the online lessons	Strongly Disagree	49	34	33	116
	Agree	45	60	61	166
	Strongly Agree	10	6	2	18
Not all students have access to internet or own good phone	Strongly Disagree	40	35	25	100
	Agree	56	59	65	180
	Strongly Agree	8	6	6	20
Students interaction among themselves was difficult to maintain	Strongly Disagree	42	52	56	150
	Agree	44	36	28	108
	Strongly Agree	18	12	12	42
Lack of training in using the online platform	Strongly Disagree	35	58	38	131
	Agree	59	28	48	135
	Strongly Agree	10	14	10	34
Some students could not afford the access of online due to lack of data	Strongly Disagree	34	45	39	118
	Agree	61	50	50	161
	Strongly Agree	9	5	7	21
Not all students attended the online lecture	Strongly Disagree	59	40	46	145
	Agree	34	47	44	125
	Strongly Agree	11	13	6	30
Internet distortion during the course of lecture	Strongly Disagree	40	40	33	113
	Agree	54	51	53	158
	Strongly Agree	10	9	10	29

The table shows frequency distribution of the variables, categories and total frequencies of the challenges of respondents on online learning across the universities during the closure of schools

Table 4. Chi-Square tests related to online learning during the pandemic

Variables	Pearson chi-square value	df	Asymp sig.(2-

			sided)
Age of respondents	75.28	2	0.000
Sex of respondents	2.25	2	0.000
Ethnicity	20.20	2	0.003
Religion	15.06	2	0.005
Which level were you during the pandemic	95.62	6	0.000
Where you introduce to online learning	15.81	6	0.015
If yes what online teaching and platform did you use	165.17	6	0.000
Where you introduce to online learning	15.81	6	0.015
Which electronic device did you use for online learning	15.63	6	0.016
How effective was the online platform adopted	39.07	6	0.000
I will like to use the above online platform frequently	23.74	4	0.000
I need to learn a lot about the online platform before I could effectively use it	14.67	4	0.005
Not all students follow the online lessons	11.96	4	0.018
Lack of training in using online platform	18.57	4	0.001