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Virtual Learning and Readiness of Tutors of Colleges of Education in Ghana

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Abstract COVID 19 has thrown a new challenge to tutors in the colleges of education in Ghana. The purpose of this study was to examine tutors' readiness in the use of virtual/digital learning classrooms in the Colleges of Education in Ghana. The study employed an analytical survey design. The study targeted tutors in the colleges of education in Ghana. The sample size for the study was 590 (495 tutors and 95 students). Focused group discussion was used to validate the data obtained from the tutors that is why the tutor number is greater than that of the students. The instruments used for data collection were questionnaire and focused-group discussion. The hypotheses formulated for the study were tested using Pearson point-biserial correlation coefficient. The study found that tutors have not acquired any formal training in how to do the blended learning and also use virtual learning platforms in their lesson deliveries. The study also revealed that tutors' pedagogical skills in delivering virtual lessons have a positive relationship on students' achievement. The study recommended that tutors should be adequately trained on how to use virtual learning platforms. The study again recommended that all colleges of education should have a robust LMS that would curb future occurrences, and policies on LMS should be implemented.

Keywords: *virtual learning, ICT, ICT tools, education, teaching, learning, tutors, SAMR, learning management system*

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1. Background of the Study

"ICT, and ICT alone, has the capacity to provide the means by which the widely-used concept of lifelong learning has an operational meaning. Without it, the notion is little more than a noble aspiration. Without ICT, a concept like equal access to education and education for all are condemned to the fate of a slogan: however right they may be, without the means to share the knowledge generated by formal and non-formal educators, they can never be more than an empty call to promote equity and justice" [1]. Information and Communication Technology (ICT) tools are digital infrastructures such as computers, laptops, desktops, data projectors, software programmes, printers, scanners and interactive teaching boxes, smartphones and gaming devices. Information and communication technologies (ICTs) are a set of technological tools and resources used to transmit, store, create, share or exchange information [2]. Today, tutors should develop lessons that teach learners content knowledge and assist them to develop 21st-century skills, taking into consideration the SAMR Model (Substitution Augmentation Modification and Redefinition) so that they can think effectively, actively solve problems and be digitally literate. These technological tools and resources which also include computers, the Internet (websites, blogs, web 2.0, google+, google classroom, SNS, Zoom, VEDAMO's Virtual Classroom, collaborative eLearning tools, EMIS and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players and storage devices) and telephony (fixed or mobile, satellite, video-conferencing, etc.) [3]. The avalanche of students thirst for virtual learning is on high demand in recent times. This has led to online learning in higher educational instructions becoming a major mode of delivery in today's technology-driven environment [4]. Reference [5] argues that "eLearning can be facilitated by use of the Internet or other types of communication technologies but not necessarily eLearning per se does not demand any type of online access" (p. 8). According to [6], eLearning refers to the use of technological tools (primarily those that can be made available over networks such as the internet) for education. He further added that eLearning is a pedagogy that is facilitated by digital technology and maybe offline (and non-networked) technologies on CD-ROM or DVD. The current definition suggests that eLearning thrives on information and communication technologies and the

advancement in technology gives direction to eLearning [7]. Therefore, learner's access to resources such as computers, the Internet, data, smart devices and other digital tools is vital in determining certain learner behaviors. According to [8] "the selection of various online technologies to best enhance student learning may be based on many factors including the learner's preferences and experiences" (p. 1). These preferences are could be influenced by certain key factors. Yet, much has not been done to determine students' preferences for eLearning delivery modes which are one way of meeting learners needs and how learner access to resources influence their preferences. It is an undeniable fact that the learning requirements and preferences of each learner tend to be different. Higher education institutions should make an effort to determine students' e-Learning delivery mode preference in order to avoid students' mode preference mismatch. Historically, teacher education has been at the forefront of educational development world over. This, according to [9], has been done with the help of the provided curriculum and the role teachers play in curriculum development. What the curricula in the colleges of education have failed to do is to equip tutors with General Technology Competency and Use (GTCU) framework, authored by [10], the accompanying online Digital Competency Profiler (DCP) application [11] are positioned as an alternative, readiness learning apparatus in the wake of this deadly COVID19. There is a growing inequality in learning amongst tutors in the colleges of education (CoE) and students. Tutors are not ready to shift from the traditional face-to-face to blended learning to a virtual learning classroom. To this end, this paper seeks to examine virtual learning readiness amongst tutors in the colleges of education in Ghana in the wake of COVID 19 and its influence on learning and teaching.

2. Statement of the Problem

For effective learning and teaching to occur in Colleges of Education (CoE) in Ghana, both tutors and students need to appreciate the value of what is being taught and learned. According to [12], ICT capacity in most CoE falls far short of what is required to prepare new teachers to deliver a modern education in schools. The study conjecture that very few CoEs (if any) already have the ICT capacity they need to deliver on this promise. The report finds low levels of ICT capacity in most CoEs, and across a range of domains: infrastructure, human resources, and policy. On another level, only one CoE has a basic level of policy capacity required to manage an ICT system. In all others, the policy capacity is weak. And only 8 CoE (20 percent) have appointed a non-teaching staff member responsible for managing the ICT system (ICT technician), an essential staff post for any institution wishing to have a functioning ICT infrastructure serving hundreds of users. Whilst most CoEs (67 percent) claimed to provide internet connectivity for staff on the day of the survey, internet connectivity was only available at 13 CoEs (33 percent). The ICT in Education specialist role is almost completely absent across CoE at present, but is urgently needed to lead ICT integration in education, and to support other tutors in developing these skills. This staggering evidence gives room to be concerned about how ready is the college tutor, as the world faces this demon called COVID 19 and what is the fate of students across the nation when in the Northern part of the country only a few have access to smart devices according to [12]. This current study intended to examine tutor readiness when all are to go virtual and yet tutor would now be tutelage on how to navigate themselves on plethora technologies opened to them.

3. Research Objectives

1. To examine the tutor readiness towards virtual learning delivery in colleges of education in Ghana.
2. To establish the influence of tutors' pedagogical skills on their virtual learning delivery.
3. To determine the factors influencing students' virtual learning in the colleges of education in Ghana.

4. Null Hypothesis

To obtain the results for objectives, the following null hypotheses were formulated and tested:

HO_1: There is no statistically significant relationship between tutor readiness and their virtual learning delivery in the colleges of education in Ghana.

HO_2: The tutor pedagogical skills have no statistically significant influence on their virtual learning delivery.

HO_3: The factors influencing students' virtual learning have no statistically significant relationship with their academic achievements.

5. Research Design

In this study, analytical survey design was employed because both quantitative and qualitative data were collected. According to [13] cited in [14], a survey is a systematic technique for amassing data from (a sample of) individuals for the purposes of constructing a quantitative description of the attributes of the bigger population of which the individuals are members. Surveys are conducted to collect data that reflects the population's attitudes, behaviours, opinions and beliefs that cannot be observed directly. Reference [30] cited in [14] states that analytical survey design is a research design that allows for both descriptive and inferential statistics to be used in data analysis. Analytical survey design enabled researchers to answer questions such as why, what, where, who, how many and how much. In other words, it is a design that fits research of all purposes descriptive, inferential, explanatory, and exploratory [15].

5.1. Target Population

This study targeted tutors in the colleges of education and students (1884 tutors & 127 students) of colleges of education in Ghana. Table 1 shows the breakdown of the target population.

Table 1. Target population for the Study

Respondents	Population
Tutors	1884
Students	127
Total	2011

5.2. Sampling Techniques

Purposive and simple random sampling techniques were used in this study to enable the researcher to get relevant information needed for the study. The purposive sampling was used to select only first and second-year B.Ed. degree students and tutors in the 46 colleges of education in Ghana. According to [16] cited in [14], the purposive sampling is normally used to select respondents who are likely to provide the relevant data a researcher is interested in collecting. Simple random sampling was used to randomly select students and tutors who formed the sample size for the study. The simple random sampling was used because the researchers cannot collect data from all the target population. Simple random sampling according to [17] is a technique in which every individual in the target population has an equal chance of being selected.

5.3. Sample Size

To obtain the sample size for this study, the researcher used the sample size determination formula provided by Yamane (as cited in [30]) at a 95% confidence level and p= 0.05, to take care of sample error and degree of variability.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size and are the level of precision/sampling error. Using the formula above, with tutors' population of 1884, the study arrived at 330 tutors. However, the researcher theorised that some tutors may not return their questionnaires and so the sample size for the tutors was 5% upward adjusted to cater for non-return of the questionnaires. The tutors' sample size for the study was, therefore, 495. The same formula was employed to arrive at students of (96) out of a total population of 127. Table 2 indicates the breakdown of the total sample size.

Table 2. Sampling Grid of Participants for the Study

Participants	Sample size
Tutors	495
Students	96
Total	591

5.4. Instrumentation

According to [18] research instruments are the tools that help a researcher to gather data and they comprise document analysis, questionnaire, interview guide, and observation. Research instruments are what a researcher utilize to collect data to answer research questions [19]. The research instruments used for collecting data in this study were questionnaire and focus group discussion via zoom. The questionnaire was used to collect data from tutors about their readiness, classroom routines and pedagogical ability used to effectively engage students on the virtual learning for content delivery. The focus group discussion on the other hand was used to amass data from the students about their academic achievements through virtual learning.

6. Data Analysis

The data collected were analysed quantitatively and qualitatively to address the objectives. Statistical Package for Social Sciences (SPSS) was employed to analyze the quantitative data gathered from close-ended questionnaires. Inferential statistics was used in the data analysis. Pearson point-biserial correlation was used to test the three null hypotheses formulated at $p < 0.05$ alpha level of significance. The open-ended questionnaire and interviews conducted were transformed to create records. The transformation of raw data was done by hand under various themes.

7. Findings and Discussions

7.1. Findings

HO_1: There is no statistically significant relationship between tutor readiness and their virtual learning delivery in the colleges of education in Ghana.

To test the null hypothesis which stated that there is no statistically significant relationship between the tutor readiness and their virtual learning delivery in the colleges of education in Ghana, the point-biserial correlation coefficient was used because this statistical tool is normally used to test the relationship between independent variables and dependent variables in research. Table 3 shows the results of these analyses.

Table 3. Point-biserial correlation between tutor readiness and their virtual learning delivery in the Colleges of Education in Ghana

Variable	Point-Biserial Correlation (r)	Sig. (2-tailed)
There is no statistically significant relationship between the tutor readiness and their virtual learning delivery in the colleges of education in Ghana.	.145**	.000

**. Correlation is significant at the 0.01 level (2-tailed).

The results in Table 3 indicate that there is a significance difference between tutor readiness and virtual learning delivery in the colleges of education (r_{pb}= .145, n=591, p=.000, R^2 =.000). The null hypothesis ($H0_1$) that state that there is no statistically significant relationship between the tutor readiness and their virtual learning delivery in the colleges of education in Ghana, has failed to be rejected because the point-biserial correlation coefficient of r_{pb}= .145 and the p-value (.000) was greater than the significance level (0.05). This suggests that there is a significant difference in tutor readiness and their

ability to deliver virtual lessons in the colleges of education in Ghana.

HO_2: The tutor Pedagogical skill has no statistically significant influence on their virtual learning delivery.

To test the null hypothesis $H0_2$ which states that the tutor pedagogical skill has no statistically significant influence on their virtual learning delivery, the point-biserial correlation coefficient was again used. Table 4 shows the results of these analysis.

Table 4. The tutor Pedagogical skill has no statistically significant influence on their virtual learning delivery

Variable	Point-Biserial Correlation (r)	Sig. (2-tailed)
The tutor Pedagogical skill have no statistically significant influence on their virtual learning delivery.	.086*	.036

*. Correlation is significant at the 0.05 level (2-tailed).

The results in Table 4 show that there is a significant relationship between tutor pedagogical skill and the influence of these skills on their virtual learning delivery (r_{pb}= .086, n=591, p= .036, R2 = .036). The null hypothesis ($H0_2$) which stated that tutor Pedagogical skill have no statistically significant influence on their virtual learning delivery was rejected because the point-biserial correlation coefficient of r_{pb}= .086 and the p-value (.036) was less than the significance level (0.05). It has been concluded that tutors' pedagogical skills in delivering virtual lessons have a positive relationship on students' achievement.

HO_3: The factors influencing students' virtual learning have no statistically significant relationship with their academic achievement.

To test the null hypothesis which stated that there is no statistically significant relationship between factors that influence students' virtual learning and their academic achievement, the point-biserial correlation coefficient was again used because this statistical tool tests the relationship between independent variables and dependent variables in research. Table 5 shows the results of this analysis.

Table 5. The factors influencing students' virtual learning have no statistically significant relationship with their academic achievement

Variable	Point-Biserial Correlation (r)	Sig. (2-tailed)
HO_3: The factors influencing students' virtual learning has no statistically significant relationship with their academic achievement.	.220**	.001

Correlation is significant at the 0.01 level (2-tailed).

The results in Table 5 show that there is a significant relationship between factors that influence students' virtual learning and their academic achievement (r_{pb}= .220, n=591, p= .001, R2 = .001). The null hypothesis ($H0_3$) which stated that factors that influence students' virtual learning and their academic achievement were rejected because of the point-biserial correlation coefficient of r_{pb}= .220 and the p-value (.001) was less than the significance level (0.05). It has been concluded that factors that influence students' virtual learning have a positive relationship with students' academic achievement.

7.2. Discussions

Objective 1: To examine the tutor readiness towards virtual learning delivery in colleges of education in Ghana

It has been revealed in this study that tutors have not been adequately trained on how to use virtual learning platforms. The study found that tutors were used to the face to face model to teaching and were not very comfortable with the virtual learning; since it requires a lot of skill and time on their hand to find materials and prepare for these myriad ways of contacting students.

This is evident from [20], in his work 'Ten lessons for education in the developing world', identified reasons why information and communication technology (ICT) education in Ghana is facing numerous challenges. In contrast, the mainstream universities in Ghana and Africa for that matter seem to have few challenges in this perspective. This is buttressed by This is evident from the study by [21], who found out that 47 percent of 54 tertiary institutions from 27 African countries have installed educational technologies in their institutions. In a similar study, [22] also discovered that 52 percent of 447 universities in Africa were using e-learning systems by the end of the year 2012. Again, the present findings are also consistent with [23] in that several studies on virtual learning readiness have been conducted in Ghana and outside Ghana. In the abovementioned studies, some features of successful virtual learning were mentioned. These features include working with computers and Internet skills, self-learning skills, spontaneity, problem-solving and critical thinking, time management skills, interest in learning, leadership skills, and ability to communicate with the group, self-assessment, questioning authority, debate skills, responsibility, skills to use online resources and learning strategies.

The interview questions for the first research question delved into the areas of online readiness in the colleges of education and teaching style of tutors. The study used the Google document retrieval tool to categorize the interview responses by question. This retrieval method simplified coding and allowed me to select the more relevant areas to analyze. The responses were categorized by introductory questions, teaching environments, experience with online learning management tools, and critical next steps.

The research participants were comfortable sharing information via telegram. Most research participants described their ideal teaching environment as traditional (blended learning). The research participants described web tools like telegram, WhatsApp, google class, edmondo, discussion boards, and the interactive aspects of virtual teaching as good features for online learning; however, using multi-media applications still created a disparity for certain tutors and students to effectively learn the course material. Interestingly, both natives and migrants did not respond to this question concerning the learning management system training for tutors.

The digital natives had a perception that virtual learning and teaching were easier. The reality for all

research participants is that online teaching requires more individualized attention on the part of the tutor.

To this end, the study revealed that all research participants wanted a higher level, more sophisticated technology added to their virtual learning.

Objective 2: To establish the influence of tutors' pedagogical skills on their virtual learning delivery

The study revealed that tutors' pedagogical skills in delivering virtual lessons have a positive relationship on students' achievement. [24]), chronicles that, pedagogical structures powered by computer technology, as giving birth to two other methods of teaching which are; Andragogy and Mobigogy. The former regarded as a pedagogy for adult learners, while the latter is regarded as mobile learning; education of the future. The findings are in agreement with [25] and [26] who opine that E-learning studies have shown that the main elements of success in e-learning are as followed: access to computers and the Internet, search skills, classification and data analysis, effective use of the tools, familiarity with communication methods, planning skills and learning methods. To a large extent, if tutors have poor skills in doing virtual learning/eLearning, the performances of students would be poor. It is gainsaying that to make better use of the e-learning resources, learners must identify their learning needs and information and classify, analyze and interpret data to use accessible data in e-learning resources to improve their knowledge and skills. So, e-learning participants should benefit from scientific thinking skills and application of the scientific method to classify information and analysis, and then by interpreting data, provide new solutions to problems [27].

Objective 3: To determine the factors influencing students' virtual learning in the colleges of education in Ghana

It has been revealed that there is a significant relationship between factors that influence students' virtual learning and students' academic achievement. The null hypothesis ($H0_3$) proved that there are myriad factors that influence students' academic achievement and virtual learning is just but one of such. It has been concluded that factors that influence students' virtual learning have a positive relationship with students' academic achievement. The purpose of the study was to identify factors influencing digital natives (students) face in the transition from teaching in traditional classroom environments to online learning environments and to identify and understand any paradigm shifts required to learn online. The tectonic shift in learning and teaching in the colleges of education has brought a lot of structural changes in the way we learn. The study identified gaps in research related to how tutors' experience in virtual learning would affect learner's academic achievement. The results revealed that majority of the students had a preference for face-to-face or blended mode of delivery compared to virtual learning mode, though some were undecided. The findings are in agreement with [28] study conducted to determine how students perceived the introduction of eLearning into teaching and learning in Ghanaian universities using SAMR as the theoretical model. The results of the study revealed that the majority of students preferred mixed or blended mode compared to fully online. The results could be attributed to the fact that a single delivery mode certainly limits the reach of a learning programme or critical knowledge transfer in some form or fashion [29]. cited in [30]. Learner access to resources for eLearning and preference for eLearning delivery mode in distance education programmes in Ghana. International Journal of Educational Technology, 6(2), 1-8. and [31] argues that the use of VLETs to support learning and teaching in Africa is still young and needs to be developed.

8. Conclusions

The purpose of this study was to investigate the virtual Learning and Readiness of tutors of Colleges of Education in Ghana. The result of $H0_1$ indicated that there is a significant difference between tutor readiness and virtual learning delivery in the colleges of education. $H0_2$ revealed that tutors' pedagogical skills in delivering virtual lessons have a positive relationship on students' achievement. $H0_3$ revealed that there is a significant relationship between factors that influence students' virtual learning and their academic achievement. The study found out that tutors who were taught with good skills in navigating around the many ICTs tools and learning platforms felt okay as opposed to the majority who had had no formal training in teaching with technology. The creation of virtual learning environments requires the establishment of some changes in the pedagogical methods [32]. Therefore, along with the technological issues, identifying the substructures of pedagogy of this environment seems necessary; otherwise, employing traditional methods in modern one's cause problems in the success of this program. Using the Web as a main Media in education requires developing new structures, modern paradigms, support mechanisms of learning sources, new teaching, and pedagogic skills and methods.

In conclusion, all Colleges of education and stakeholders of training institutions must promote instructional technology and built a robust learning management system which would help in the future.

9. Recommendations

Based on the findings, study recommended the following:

1. tutors should be adequately trained on how to use virtual learning platforms.
2. all colleges of education should have a robust LMS that would curb future occurrences and policies on LMS should be implemented.

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