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## Review of E-Learning Environment at the Kwame Nkrumah University of Science and Technology, Ghana

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# **Review of E-Learning Environment at the Kwame Nkrumah University of Science and Technology, Ghana**

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## **Abstract**

*This study explores the policies for e-learning and examines the awareness of teaching practices that incorporates e-learning among educational managers, librarians, teachers, IT experts and students of Kwame Nkrumah University of Science and Technology (KNUST) in Ghana. The study is based on a survey data extracted from the KNUST-based BSU Project. The results revealed that 84.1% of the educational managers and 87.1% of the teaching participants claimed the university has no policy for introducing e-learning, while 63.6% of the IT experts reported otherwise. The participants outlined a few teaching practices that involves e-learning, some of which are frequently and others rarely utilized by teachers and IT experts. Awareness of these practices was extremely high in the IT experts, teachers and student participants but low in the educational managers. The findings of this study draw attention to the strengths, weaknesses and gaps in the e-learning environment of the university.*

**Keywords:** e-learning, policy, strategy, teaching and learning, Library resources and university

## **Introduction**

The traditional teaching and learning method used in institutions of higher learning is characterized by face-to-face collaboration between the teacher and the learner with no or limited use of electronic devices which occurs in the on-campus/classroom setting. With the introduction of e-learning, many institutions are changing particularly with respect to how teaching and learning activities are carried out. Today, a wide variety of electronic devices and technologies have been incorporated into the traditional educational system, giving rise to the so called hybrid or blended mode of learning: where e-learning is employed in the traditional on-campus/classroom setting (Al-Shboul, et al., 2013). In some typical cases, e-learning has become a substitute, replacing the traditional system with distance or off-campus education. The devices commonly used in the blended and off-campus mode of education include laptops or personal computers, CD ROMs, MP3 players, mobile phones, televisions, data projectors, digital cameras, global positioning systems, personal digital assistants (PDAs) and interactive whiteboards. These are used alongside with a range of technologies such as internet, intranet, extranet, Local Area Network (LAN), Wide Area Network (WAN), and video and audio conferencing (Ministry of Education New Zealand, 2009; Oye, et al., 2011).

E-learning has been accepted in higher education primary due to the notable gains associated with its effective use. Applying e-learning efficiently provides the following benefits: widening access to education, improving quality of education (Andersson and Grönlund, 2009) and enhancing academic performance of students (Oye, et al., 2012; Rodgers, 2008). Additionally, e-learning is reported to create advantages such as greater information access, greater communication, synchronous and asynchronous learning, increased collaboration and pedagogical improvement (Sife, et al., 2007).

Presently, e-learning is an issue of concern in higher education in Ghana. The nation has it at heart to widen access to education and promote independent and lifelong learning through the use of e-learning (Addah, et al., 2012). A web based report indicates that the Kwame Nkrumah University of Science and Technology in Ghana is currently employing e-learning on distance learning mode; where students rarely or never meet face-to-face, nor access on-campus educational facilities (KNUST, e-learning center). Moreover, it has been reported by prior studies that KNUST has installed electronic devices and technologies to allow e-learning within the university (Marfo and Okine, 2011; Addah, et al., 2012; Agyekum, et al., 2014). However, none of these studies researched into how these devices and technologies are utilized to enrich the teaching environment of the university. In this paper, we investigate the available e-learning policies and assess the awareness of teaching practices that involves e-learning within the university.

## **Materials and Methods**

### **Study setting and method of data analysis**

Data used in this study is extracted from the KNUST-based Building Stronger University (BSU) phase two project. The project is a cross sectional survey of a section of workers and students of KNUST. The survey was conducted in the year 2017 with well-structured questionnaires built from a proposed matrix for mapping e-learning in universities under BSU. The working participants were educational managers, IT experts and teachers of the university. Among students the target population was those at level 200, 300 and postgraduate level. Students were sampled from College of Science, College of Agriculture, College of Architecture, College of Health and Allied Sciences, College of Arts and College of Engineering. They were engaged through focus group discussions in their various lecture halls. The educational managers were mainly provosts

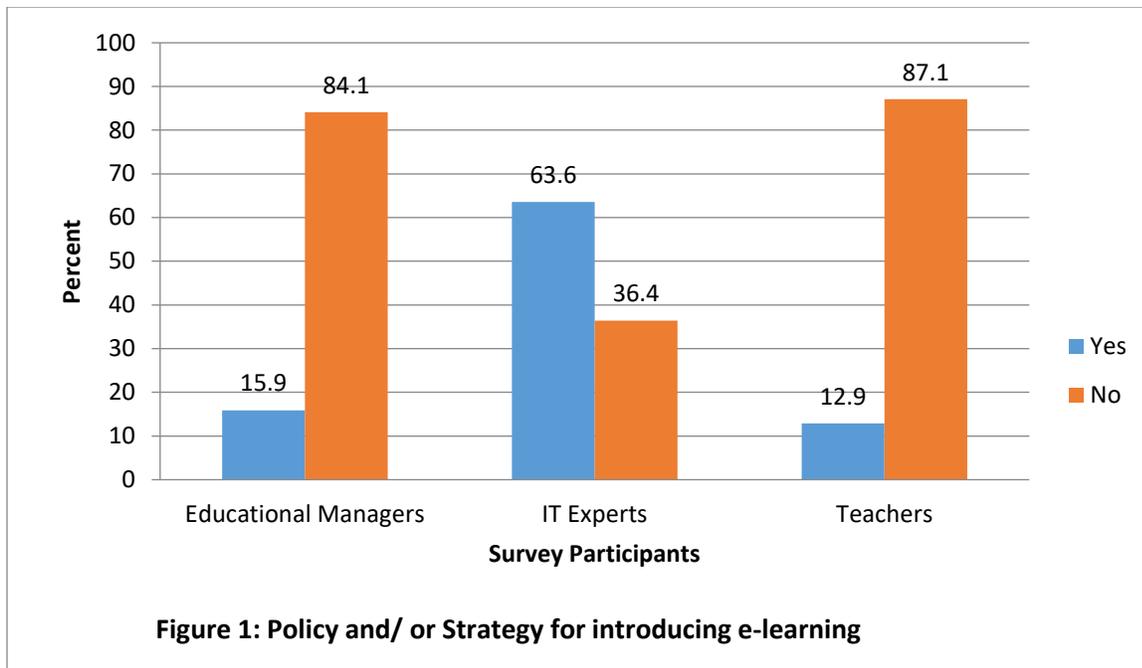
and head of departments of the university. Educational managers, teachers and IT experts were engaged individually in their offices. The key research questions been analyzed include the following:

1. Does the university/college/department (u/c/d; to be adapted to relevant level of mapping throughout) have a policy and/ or strategy for introducing e-learning? If yes, please elaborate - if possible provide a written copy of the policy/ strategy. If no, do you think there is a need to get one?
2. Are you aware of any teaching practices including e-learning within the u/c/d? If yes, please elaborate- if possible provide names of teachers working with e-learning.

The study is a descriptive type with data analyses performed using graphical procedures, charts and a test of proportion. Data preparation and graphical procedures were computationally implemented in Ms Excel. Also, the test of proportions was performed with MINITAB.

## **Results**

The study is based on responses from educational managers (3.8%), teachers (6.1%), IT experts (1.0%) and students (89.1%) in the KNUST-based BSU survey. These survey participants were asked if the university has any policy and/ or strategy for introducing e-learning. This question was meant for the educational managers, IT experts and teaching participants. The responses given by the survey participants differed from one participating group to another. While few of the educational managers (15.9%) and the teaching participants (12.9%) indicated that the university has policy and/ or strategy for introducing e-learning, those of the same view among the IT experts (63.6%) were the majority (Figure 1).



However, these participants, educational managers, teachers and IT experts neither stated nor provided a written copy of the policy. When subjected to a statistical test of significance, the proportion of IT experts who indicated that the university has policy and/ or strategy for introducing e-learning did not differ significantly from 50.0% (Table 1). The participants who reported that the university has no policy and/ or strategy for e-learning expressed their concerns regarding the need for such policies.

Moreover, the survey participants were asked if they are aware of any teaching practices that include e-learning within the university. A predominant proportion of the IT experts, teaching and student participants reported that they are aware of colleagues and teachers who have integrated e-learning into their teaching activities. At exactly 81.8% of the IT experts indicated that they were aware of teaching practices within the university that involves e-learning (Figure 2).

**Table 1: Test of Proportion for available Policy and/ or Strategy for introducing e-learning**

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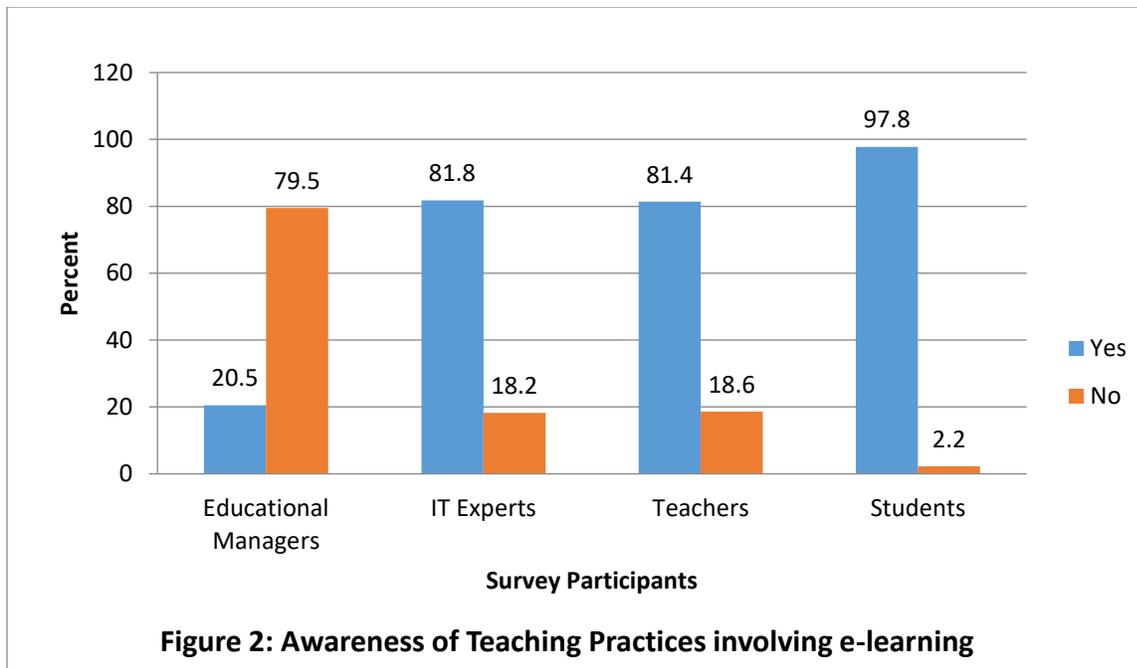
**QUESTION: Does the u/c/d have a policy and/ or a strategy for introducing e-learning?**

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<b>Survey</b>	<b>Sample Proportion</b>	<b>95% Confidence Interval</b>		<b>P-Value</b>
<b>Participants</b>	<b>(%)</b>			
Educational Managers	15.9	6.6	30.1	0.000
IT Experts	63.6	30.8	89.1	0.549
Teachers	12.9	6.1	23.0	0.000

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From Table 2, the corresponding p-value of 0.000 suggests that this proportion is significantly higher than 50.0%. Among the teaching participants, more than half (thus, 81.4%) indicated that they know colleagues who utilize e-learning in their teaching activities. On the contrary, only 20.5% of the educational managers reported that they are aware of teachers who have embedded e-learning with teaching activities. The participants outlined the specific e-learning practices employed by their colleagues and teachers (Figure 3). The use of computer and projectors in presenting lessons, public address (PA) systems for lecture presentation, and delivery of course materials and assignments through emails are reported to be the frequent e-learning activities engaged by teachers.



**Table 2: Test of proportion for awareness of teaching Practices including e-Learning**

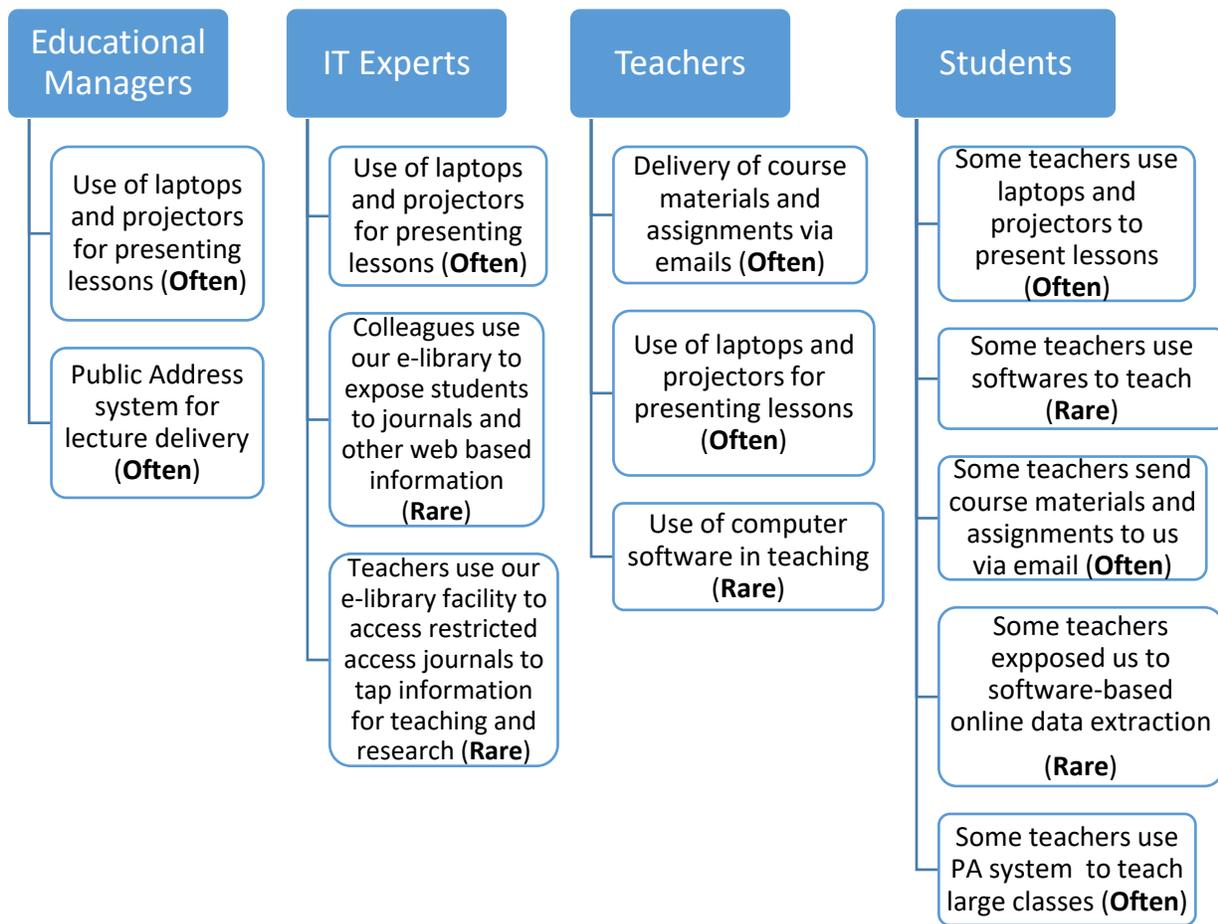
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**QUESTION: Are you aware of any teaching practices including e-learning within the u/c/d?**

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Survey Participants	Sample Proportion (%)	95% Confidence Interval		P-Value
Educational Managers	20.5	9.8	35.3	0.000
IT Experts	81.8	48.2	97.7	0.000
Teachers	81.4	70.3	89.7	0.000
Students	97.8	96.6	98.6	0.000

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**Figure 3: Teaching practices that incorporate e-learning based on participants awareness**

However, other practices such as the use of computer software for teaching, software-based online data extraction among others rarely occurs (Figure 3). These practices, particular the tools employed by teachers correspond to the devices and technologies used in e-learning, but largely there is a wide range of tools and technologies such as interactive white boards, video and audio conferencing, instant messaging among others that could be utilized by the teachers but are completely not in use. These are the gaps in the e-learning environment of the university. Moreover, the teaching activities incorporated with e-learning that are utilized in rare cases are the weaknesses and those that are repeatedly practiced are the strengths in the e-learning environment of the university.

## Conclusion

In this paper the policies and/ strategies for e-learning and awareness of teaching practices integrated with e-learning in the context of KNUST are investigated. The study is based on responses gathered from educational managers, teachers, IT experts and students of the university. In our results, 63.6% (not significantly higher than 50.0%) of the IT experts reported that the university has a policy and/ or strategy for introducing e-learning, while a significant proportion of the educational managers (84.1%) and teaching participants (87.1%) disagreed. For those who indicated that the university has policy for e-learning, no written copies were provided. However, among the participants who reported otherwise, they emphasized the need for such a policy and/ or strategy. Awareness of teaching practices that incorporate e-learning was extremely high among the IT experts, teachers and students but low in the educational managers. The participants outlined the specific teaching practices that includes e-learning. The use of laptops and projectors in presenting lessons, public address systems for lecture presentation, and delivery of course materials and assignments via emails are reported to be the frequent e-learning activities engaged by teachers. On the other hand, activities such as the use of computer software for teaching, online data extraction and others rarely occur. These practices occur in the on-campus/classroom setting, therefore suggesting that KNUST is applying the hybrid mode of learning. The e-learning practices that infrequently occur and those that are completely not in use represent weaknesses and gaps respectively. These might result from teachers' poor proficiency and inabilities in ICT as well as the absence or limited number of infrastructural resources. Our findings emphasize the importance of adopting policies and strategies that are capable of turning the weakness into strength and bridging the gaps in order to improve the e-learning environment of the university.

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