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IMPLICATIONS OF THE ABSENCE OF QUALIFIED TECHNICIANS IN COLLEGES OF EDUCATION IN GHANA TO SUPPORT PRE-SERVICE TEACHERS' TECHNOLOGY TRAINING

Bernard Wiafe Akaadom (PhD), Email: bernard.akaadom@ucc.edu.gh Tel: +233 20 234 1500 University of Cape Coast, Cape Coast, Ghana.

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Abstract

Efforts have been made by governments and educational stakeholders to inject funds in procuring and expanding technology infrastructure for teacher training institutions and equipping teacher educators through various intervention programmes to ensure that teacher educators are able to deliver technology integrated lessons and teach teacher trainees to be able to use technology to deliver instruction yet there have been challenges with using technology to teach by pre-service teachers. This study aimed at investigating into the presence or otherwise of qualified technicians in colleges of education in Ghana and how this is affecting the training of pre-service teachers to integrate technology into teaching and learning. A qualitative approach was adopted to gather data from teacher educators and pre-service teachers in order to verify the availability of qualified technicians in colleges to aid in teacher trainees' professional development to integrate technology into teaching and learning. Four student focus groups consisting of not less than ten students in each group together with a purposive sample of four tutors teaching technology related courses and other courses participated in the study. The qualitative data were analyzed using a thematic approach. The study adopted a qualitative approach because it aimed at digging deep into the problem in order to know more about how the presence or otherwise of qualified technicians in the colleges and how this is affecting both trainee teachers and teacher educators to develop their technical competencies in handling and using technology for instructional purposes. It was revealed that most colleges were without technicians as the government failed to provide qualified technicians for the colleges. Colleges are therefore calling on the government and

stakeholders to provide them with qualified technicians to enable them fix their technical problems, lend a helping hand to their tutors and support to develop pre-service teachers' technical expertise to overcome their technical fears to be able to use technology for instruction. It is therefore being recommended that stakeholders and as well as the government help provide colleges with qualified technicians to help equip pre-service teachers with technical abilities to teach effectively with technology in the classroom.

Key words: technology, integration, technicians, instruction.

Introduction

An important aspect of instruction that pre-service teachers could be enlightened on through technology integration is via a process to craft the use of technology in learning environments. Throughout the world, technology is fast becoming a tool that impacts both teachers and learners to such an extent that gradually, there is a change that is starting to manifest in the teaching profession. This paradigm shift is repositioning teachers for a shift from the customary "stand and deliver" instructor role, which usually makes students mere passive recipients of information and notes takers, to one of a facilitator, guide and coach (Kabadayi, 2016). Scholars observe that pre-service teachers are pivots to integrating technology into learning (Elton-Chalcraft et al., 2017; Šimandl & Vaníček, 2015; Wang et al., 2010; Lucas et al., 2012). For several decades now, efforts have been made to assist in-service teachers and pre-service teachers to develop their competencies and skills to accept technology as an educational instrument to enhance and facilitate their jobs. As the benefits of technology use in the classroom continue to grow for learners and teachers alike, much still needs to be done to ensure that teachers use or incorporate technology into their set of courses. It is the view of the researcher that technology use does not benefit only the learner, but the teacher as well. The successful implementation of technology integration in classroom practice depends very much on pre-service teachers as most of the already trained teachers may have missed essential technology related courses during their training in college. If pre-service teachers are trained very well to integrate technology in teaching and develop confidence in their training, they may take up the mantle to mentor the already trained teachers working in schools to take to technology integration in lessons in their respective schools. It has been noticed that a teacher's knowledge with technology affects whether technology will be taken seriously and made use of in the classroom (Biswas, 2017).

Pre-service teachers with a strong technology applications background tend to experience greater success with technology integration (Neiss, 2006). A real concern for training institutions in considering using technology tools in their instruction is the breakdown of equipment and the attendant problems it creates. The lack of technical support emanating from lack of regular or no maintenance of equipment often leads to frequent breakdowns. This leads to a barrier for both tutors and pre-service teachers to use technology tools both for training purposes and even after completion of their studies. Jacobs (2016) backs this by asserting that schools that cannot afford the services of technicians often experience software malfunctions and servers that thump, making lessons hard to teach. In the event of equipment breaking down, the absence of technicians to lend that technical support may mean the tools go out of service for a long time unrepaired. Yolcu and Kartal (2017) highlight this phenomenon by citing an example where a burnt out projector bulb took three weeks to be replaced. DiPetro et al. (2008) indicate that breakdown of technology tools prevents its use in schools. It tends to discourage the use of technology tools in teaching by pre-service teachers. Pre-service teachers who attempted to integrate technology into instruction by using a computer or any other technology device but were not successful due to technical glitches refrain from the use of technology because of the potential technical problems they might encounter (Raza et al., 2016). All this calls for the need for adequate technical support in schools which the researcher intended to investigate. Literature reveals that in some instances, there is need to provide some sort of technical assistance and support for pre-service teachers to effectively integrate technology into their instruction (Burton, 2016; Wang et al., 2010; Scales et al., 2018). For this reason, the study collected qualitative data about whether or not pre-service teachers were given any technical support from qualified technicians to deal with technical problems as they emerged in their training.

Objectives of the study

The objective of this study was to investigate into whether or not there were qualified technicians in the colleges of education in Ghana and the technical abilities of pre-service teachers with regards to the use of technology in teaching and learning and how it affects their instructional delivery. It is believed that most teachers shun the use of technology for instruction for fear of hitting a technical glitch which might go unresolved as a result of their poor technical knowledge to fix technical problems themselves as and when they occur.

Research Methodology

To Morse and Richards (2002), qualitative expressive methods are helpful. This is because evidence of familiarity and knowledge can simply fail to be noticed when quantitative approaches are used. This study utilized semi-structured interviews because the researcher believes that open-ended questions would be an effective manner to collect data from participants on whether or not the absence of technicians is affecting the training of pre-service teachers in incorporating technology into instruction. This permitted participants, time and possibility to deliberate their perceptions and understanding (Morse & Richards, 2002) on the issue at stake. The qualitative research approach centred on the views, self-analysis and theory construction of the participants where a small sample size and in-depth study of solitary incidences were employed.

Participants

Four tutors of technology-related course(s) and/or tutors handling teaching methods in various subject areas as well as heads of departments of ICT with not less than three years teaching experience were drawn for the sample through a purposive sampling procedure for the semi-structured interview. Also, four student focus groups consisting of not less than ten final year students were randomly selected and interviewed using the semi-structured interview guide. Since the aim was to obtain in-depth information from a small sample for the qualitative study, this study employed purposive sampling of teacher educators to provide comprehensive information on technology integration using the TPACK model in the colleges concerned. The tutors have a part to play in the pre-service teachers' preparedness for technology integration and TPACK modelling, in addition to observation of these institutional approaches. They thus, offered valuable information on their day-to-day practices. These tutors provided factual data regarding the attainment and difficulties of technology integration presently available in their individual institutions. McMillan and Schumacher (2014) assert that in-depth interviews prolong and validate discussion and are seen as a dialogue with an objective which enabled quality data to be collected for this study.

Data and analysis

The in-depth interviews (IDIs) were analyzed manually. The data from the IDIs were transcribed, categorized under specific themes and used for the analysis. The researcher carried out all interviews to ensure that the required data were collected to help answer the research questions in the study. First and foremost, the audios recorded during the interviews

were checked to ensure that they were duly recorded with both the focus groups and the interviewees selected for the interviews. Then to generate the initial codes, all features of the data were coded in a systematic fashion across each interview data set. The researcher collated and organized data relevant to each code manually. Thereafter, as many as possible, codes were generated to identify potential themes. It must be emphasized that codes were generated for minority and contradictory features whiles trying to establish patterns from the generated codes. The codes were generated into themes and sub-themes in order to align them to the research questions. The themes were then reviewed in order to merge or separate them or remove certain themes where necessary. This ensured internal coherence in a theme and clear distinctions between various themes. After all this was done, the themes were described in a way to capture the essence of each theme. Where necessary, sub-themes were named again.

Results

For effective teaching and learning with technology to go on, there is the need for qualified technicians as supporting staff to assist teacher educators in colleges to deliver instruction successfully and get pre-service teachers to learn to teach with technology. Participants were therefore, asked whether or not their colleges had qualified supporting staff (technicians) for their laboratories. From both the tutors and students' points of view, no such staff was provided and that made the work of tutors even more difficult. It is either the college had to call on suppliers of the equipment to service damaged or faulty equipment, or tutors had to sacrifice to do fix damaged or faulty equipment themselves. In some instances, some colleges had to employ their own technicians to assist them to deal with problems affecting technology equipment in the college.

> *Our college has employed few technicians and pays them from the college coffers to service the computers and other tech devices in the laboratory and offices for us. They are also to ensure that tools and equipment are always in proper working conditions. We are privileged to have had our college paying them from the college coffers unlike other colleges. Government doesn't provide us with technicians.* (T2)

> *We always have to call on those who supplied us with the equipment for all maintenance works and they sometimes delay in responding to our calls. Some tutors also learned hardware and software either on our own or as part of our training so sometimes, we solve our own problems if it's not beyond us. (*T1)

> *……anytime there is a problem, they get fixed by the same ICT tutors in the college. There are no technicians provided by government. (*T3)

Pre-service teachers agreed that there were no technicians in their colleges, so anytime there was a problem, it was their tutors who got them fixed. They felt sometimes it puts pressure on their tutors and noted instances where tutors did not possess the needed skills to solve such problems because they were not necessarily trained as technicians. They felt all these were hindrances to the teaching and learning of technology in college. This is affirmed in the comment:

> *There are no technicians in our college. Anytime there are problems, it's our tutors who fix them. Sometimes I wonder if they got trained with stuffs like that to fix problems. What if they didn't receive that kind of training like technicians usually do? You see, all these go a long way to affect our training to integrate technology in our lessons. (*SFG4 PS18)

> *Our tutors struggle sometimes for fix problems whenever we encounter one in the computer lab. On some occasions, they do not try at all because they simply have no idea of how to fix such problems. (*SFG1, PS3)

> *The services of trained technicians are non-existent in colleges so our broken down technology tools usually don't get fixed. Some of us are good at that so what happens is that when tutors identify any student good at fixing computers, they always call on him for assistance anytime the need arises. What then happens when that student completes school?* (SFG3, PS12)

Pre-service teacher participants felt that, although their college administrations were doing the best to make provisions for the needed resources to facilitate their technology training, there was need to do more. This is evident in the comment:

> *ICT tutors are only two in the college. We wish they brought in more tutors and/or technicians to work on the computers instead of relying on the few tutors to service the broken down computers. Due to this, it takes a very long time to fix broken down equipment anytime they occurred.* (SFG1 PS2)

Pre-service teachers believed there was so much pressure on their tutors to act as both tutors and technicians. They feared that in a situation where a tutor was incapable of fixing problems, most of the computers in their laboratories would breakdown and never get fixed to ensure their smooth training and render laboratory attendance meaningless, which could be detrimental to their professional training.

> *Sometimes in the lab, most of us get stuck and ask for assistance from our ICT tutor. Imagine a class of over thirty students where almost every student solicits the assistance of the tutor at one point in time. This tells you that tutors would always need the support of technicians not only in fixing problems but also, assist tutors in the labs especially to ensure our smooth training.* (SFG3 PS16)

> *We are hard pressed for time and so anytime there is a problem at the lab, we ignore them. We believe that if there were technicians around, they could quickly come to our aid and help fix these problems. Besides, they can be employed to assist us in teaching and learning the practicals of ICT which would go a long way to help our students.* (T4)

> *There have been issues most of the times regarding internet connectivity, printer failures, faulty computers, etc as a result of the absence of technicians in the college.* (T1)

Both teacher educators and pre-service teachers were not happy about the absence of qualified technicians and called for the services of technicians which they felt would go a long way to aid in their training to ensure the proper maintenance and support for teaching and learning of technology in the colleges.

Discussion

Pre-service teachers who attempt to integrate technology into instruction but are unsuccessful due to technical problems tend to refrain from the use of technology because of the potential technical problems they might encounter (Yolcu & Kartal, 2017). A major finding of this study was that there were no qualified staff to provide technical support to assist tutors in lesson delivery and maintaining the laboratories and technical equipment in the colleges. To teacher educators and pre-service teachers, this was one of the major challenges facing colleges for implementing the technology syllabus to aid pre-service teachers to integrate technology into instruction. The lack of staff to provide technical support to ensure regular maintenance often leads to software glitches and servers that crash making lessons difficult to teach. In the event of an equipment breaking down, the absence of technicians led to tools and equipment going out of service for a long time. This supports the findings of DiPetro et al. (2008) that in schools where they cannot afford the services of technicians, they repeatedly encounter software and server problems which eventually lead to difficulties in using technology for instruction. Without suitable technical support, pre-service teachers cannot be projected to rise above difficulties hindering them from using technology (Burton, 2016). The lack of technical assistance to both teacher educators and pre-service teachers in the

classroom and school resources was a big challenge to pre-service teachers' technology training for integration. Some of the major technical difficulties related to failing to connect to the internet because of server problems, printers' failure to print, faulty computers, and ICT tutors having to work on faulty computers. To Šimandl and Vaníček (2015, p.43), "technical barriers impeded the smooth delivery of a lesson or the natural flow of classroom activity." The availability of technical support in colleges helps tutors to make use of technology in instruction without losing precious instructional time through the instances of fixing software and hardware problems. This agrees with Becta (2004, p.16) report that "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly resulting in a higher risk of technical breakdowns". In Turkey, Yolcu and Kartal (2017) identified that lack of technical support was a major obstacle to technology integration in education in schools. In some countries such as the Netherlands, Latvia, the Czeck Republic and the UK, schools have acknowledged the essence of technical support to assist teachers to use technology in the classroom (Korte & Husing, 2007). This goes a long way to show the importance of technical support for teachers if they are to teach with technology without any fear of equipment breaking down. Apparently, technical problems dissuaded pre-service teachers and teacher educators, who are not technically good at fixing problems, from using technology in their teaching for the mere fact that equipment may break down in the course of a lesson.

Conclusion and Recommendations

The findings of this study indicate an immense necessity to re-examine the way in which teacher education is preparing pre-service teachers in college for technology integration into instruction. This calls for both policy and practical considerations. With regards to policy, the college education curriculum and the various stakeholders such as the Ministry of Education, National Council for Tertiary Education, the Curriculum Research and Development Division of the Ghana Education Service would need to develop policy guidelines for the proper implementation of technology aspects of teacher training programmes in colleges. These changes in policy would enable the procedures for the recruitment of technicians as well as make the training of pre-service teachers to integrate technology into instruction more practical. This would help mitigate the challenges colleges face in their attempt to help train pre-service teachers for technology integration into instruction. Practically, the findings should help stakeholders address the problems which are preventing pre-service teachers

from incorporating technology into instruction and enable them to make the necessary modifications to established practices required for successful implementation of the technology curriculum in colleges. The teaching profession stands to become the principal beneficiary of the findings of this study if the preparation of pre-service teachers for technology integration for the 21st century is effectively implemented. This will invariably result in a remarkable reduction in pre-service teachers failing to integrate technology into instruction to realize the set objectives of the teacher education programme.

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