COMPUTER APPLICATIONS TECHNOLOGY LEARNING IN SECONDARY SCHOOLING: CHALLENGING OR RESOURCEFUL

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ABSTRACT

This paper aimed to investigate whether computer applications technology learning in secondary schooling are challenging or resourceful. In this study qualitative approach was used as it assisted in eliciting the essential meaning from participants, yet, best suited for small samples. As the case study was embedded in this investigation, participants were three purposively selected from one school located in an Eastern Cape Education District. Semi-structured interviews were used to collect data, which led to the development of themes. Findings divulged that infrastructure challenges with limited learning resources together with teacher workload were the main hinderances to learning of Computer Application Technology (CAT). It is concluded by this paper that revamping of computer laboratories and purchasing enough computers for all learners for improved access and functionality is a real necessity. This study suggests that it seems imperative that donors have to supply adequate new computers to schools to support the development of computer literacy skills to allow for functional e-learning in this digital world.

Keywords: Computer Applications, Technology, Computer Skills, Digital, Learning.

INTRODUCTION

In recent decades, computers have become an integral part of daily life. Currently we are faced with Covid 19 pandemic logistics, the most overwhelming threat to our education system (Mhlanga & Moloi, 2020; World Bank, 2020). This pandemic forced education to use digital tools during studying process. The crisis has brought to light numerous challenges encountered by Computer Application Technology (CAT) teachers while administering subject (Adukaite, Van Zyl, Er & Cantoni, 2017). Consequently, studying CAT in a conducive environment could benefit both teachers and learners by training them how technology works. Moreover, they need to adapt new pedagogical concepts and modes of delivery of studying for which they may not have been trained. In particular, learners have been noted to be the most disadvantaged cohort, as they do not have access to digital learning resources or lack the resilience and engagement to learn on their own, are at risk of falling behind (Ministry of Education, 2020). Studying CAT helps learners to develop computer skills that meet global current crises. These computer skills allow them to develop problem-solving, critical thinking, and compound analytical skills, which are all necessary in today's world (Cristobal-Fransi, Montegut-Salla, Ferrer-Rosell & Daries, 2020). CAT is a hand-on skills-based subject that helps learners in the schooling environment, preceding to workplace

(Birt, Scott, Cavers, Campbell & Walter, 2016). Hence, the studying process in secondary schools need the dynamic environment to meet learner needs for improved academic attainment when at tertiary level of schooling. Therefore, studying CAT while in secondary school would be advantageous, henceforth, authors of this manuscript developed an interest to investigate whether computer applications technology learning in secondary schooling are challenging or resourceful.

LITERATURE REVIEW

In this digital world immersed in the Fourth Industrial Revolution (4IR) e-learning skills can be obtained by attending workshops and trainings offered by the Department of Education (DoE) or any other organization (Blank, Graham & Calvino, 2018). If teachers improve their skills, they will be more empowered to impart more information to learners as others emanate from privileged backgrounds and have easier access to computers as against those from disadvantaged backgrounds. If CAT teachers do not collaborate as a team and share responsibilities among themselves, learning of the subject may result in non-enhanced upgrading in learners, leading to underperformance even during examination time (Blankley & Booyens, 2010).

Fambaza (2012) affirms that the incorporation of CAT into the learning process has the potential to change the role of learners as well as the way schools are run and administered, because the subject is designed to provide learners with new technological skills that are required in today's world. Nonetheless, the main challenge is obtaining funding for this subject. It was discovered in a school where this study was conducted that parents are expected to pay funds toward CAT teaching (Trilling & Fadel, 2012). Findings by Killin (2013) are in line as this author confirms challenges regarding lack of knowledge and skills in teaching CAT. Lack of adequate training opportunities is one of the most significant challenges that teachers face. Teachers need to receive pre-service training to keep up with the rapidly changing world of work and technology. Even though CAT is one of the subjects underpinning the curriculum, it may be difficult for learners to gain access to it (Oloruntegbe & Collins, 2011).

In addition to that, when some learners progress to tertiary levels of education, they may experience some problems because of a lack of exposure during their previous years of study. Rijuan (2009) speculates that as remedy to limited exposure, a few CAT teachers in one province received CAT training to capacitate both themselves and learners enrolled for the CAT subject. On the other hand, information obtained from that training acted as eye-openers at the effective use of information and communication technologies to solve problem and access information. This is harmonised by Barnett (2012) who specifies that CAT is one of the most important subjects with all the necessary computer skills obtained. However, some challenging factors have been noting to disturb computer learning. These include poor internet access, shortage of computers and infrastructure encounters (Howell & O'Donnell, 2017).

Underpinning this inquiry is the Activity Theory by Clemnensen and Katelynn (2016). An activity is seen as a system of human doing whereby a subject works on an object to obtain a desired outcome. In order to do this, the subject employs tools, which may be external (e.g. a computer) or internal (e.g. a plan). The principles of the Activity Theory are the practical exercise, approaches

on teaching and learning, design of learning environment, teacher, and computer, providing multiple presentations of content contextual dependent knowledge and knowledge construction and supporting complexity in a learning situation. Activity Theory has an interesting approach to the difficult problems of learning. This therefore has an educational implication that with computers learners can easily solve problems precisely. Learning CAT would enable learners to understand the principles of computing and how these apply to their daily lives, to the world of work and to their communities (Du Plessis & Mestry, 2019). Using computers in schools for teaching and learning can help learners prepare a number of possible careers.

RESEARCH METHODOLOGY

Authors employed a qualitative research approach for this investigation as this method assisted in discovering and comprehending meaning of the underlying problem from individual participants (Creswell, 2015). This approach helped a lot at providing realities of the challenges faced by teachers in the studying of CAT. Embedded in this qualitative study was a case study design which followed a phenomenological method to explore whether computer applications technology learning in secondary schooling are challenging or resourceful (Mckenney & Reeves, 2018). The study sample consisted of three purposefully selected participants because of their specific characteristics that were of interest, further enabling them to respond to interview questions as they demonstrated their knowledge regarding the investigated problem. Authors deeply engaged and interacted with teacher participants as semi-structured interviews were conducted and yet allowing for in-depth discussions as open-ended questions were administered (Brown & Elias, 2016; Freedman, 2014).

FINDINGS AND DISCUSSIONS

For this investigation, data were analysed. Similar responses were grouped together and as a result, some themes emerged. Results have been discussed in relation to the themes. Themes that emerged as findings discussed below are infrastructure limitations and teacher overload.

Infrastructure Limitations

One of the major findings concerns challenges centred around infrastructure. Participants complained that they were faced with poor infrastructure. For example, Teacher 1 reported that: *There is a lack of resources; the workstation for grade 12 is not at all adequate, with limited space to accommodate only a few learners*. This statement is supported by Teacher 2 who coincides: *The computer lab for the grade that I teach is not in the best condition to support large numbers of learners at the same time. As such, classes take turns to attend the lab and use the same computers, which make them wear out quickly. Furthermore, there needs to be some improvements on the available infrastructure. The school management has to make sure that all the computers in our school are in good working condition*. Teacher 3 is of the same view with the statements by the previous participants: *Learners cannot practice computer literacy skills due to lack of computers at homes as they mostly come from rural communities with limited access in most learning resources.*

As articulated by Beames and Brown (2016), there are suggestions of numerous and unsatisfactory factors that may influence the degree to which teachers implement and persist in the implementation of educational innovations. These include the extent to which administrative and curricular support of resources is made available to schools, as well as the quality of teacher access to computer resources. With regards to non-working equipment as part of infrastructure challenges in the school where research was conducted, it emerged that there are problems of old computers. This was evident as teachers complained that they are left with no choice but to only teach theory, thereby depriving learners of the necessary skill to practice on computers. Such predicaments are likely to lead to mis-informed learners hence expected to use outdated and old computers. On the other side, there are connectivity glitches due to network challenges. Therefore, internet unavailability seems to worsen the problem.

From these findings, authors could denote that teachers face a number of constraints that make the educational shift not to be fully computer technologically driven classroom engagement. As these mentioned problems of inefficient computers continue unattended, the ultimate results might rotate around time limitation, pressure to cover the curriculum, lack of funds to purchase and upgrade hard and software, as well as limited number of internet connections (Lippman, 2015).

Teacher Overload
For this finding, all the participants who had undergone the interview process has a unanimous comment: *Teacher learner ratio is high such that one-on-one tutorship is challenging as a result most learners focus to other things during lesson times*. Teacher 2 also proclaimed: *The greatest challenge in my class is overload. I am unable to attend to all learners at the same time. Even before the period ends, I am already worried of the other subjects still waiting for me*.
For teachers to be overloaded and to be expected to offer other computer lessons in varied many groups is really time consuming. This could lead to CAT teachers being unable to reach at the intended outcomes in due course. Such a finding also compromises other subjects to be taught as CAT teachers find themselves overwhelmed by exceeding to other periods not meant for the teaching and learning of CAT. For conducive learning environments, CAT teachers need to devise some means that would be functional towards motivation and positive attitudes to learning. Khoo (2019) is of the same opinion as he suggests that friendliness is a prime feature and an essential requirement for what teachers are all about. In the context of CAT, teaching with friendliness refers to the ability of the teacher to provide a nurturing and conducive learning environment irrespective of time constraints or any other factors that might negatively affect learning processes (Gordon, 2014). However, regarding time obstacle, Khan (2020) suggests that long–term solution would be to put computers in each classroom and provide teachers with laptops so that learners do not need to wait for weeks to go to the computer laboratory to have computer lessons. Such a strategy can help teachers to use their laptops anywhere and at any time to prepare lessons.

CONCLUSION AND RECOMMENDATIONS
The aim of the study was to investigate whether computer applications technology learning in secondary schooling are challenging or resourceful. Findings above are in line with Activity Theory by Clemnensen and Katelynn (2016) as it advocates for educational implications that with

computer information, learners have an added advantage to solve problems precisely, additionally, learners begin to understand the principles of computing and application to real life situations. Considering the findings above, it is concluded that there is a need for improvements and expansion on the available infrastructures, with sufficient computer laboratories that would accommodate all enrolled learners. The school management has to make sure that all the computers at schools are in good working order. There is a need for computers to be connected on internet to help learners find information for their school projects and assignments. This study suggests that it seems imperative that donors have to supply adequate new computers to schools to support the development of computer literacy skills in this digital world (Voogt & McKinney, 2017.).

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