Digital influences on academic attainment: A case of one secondary school in a rural Education District

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ABSTRACT

This paper aims to investigate whether e-learning has any significant influence on academic attainment. From this time, little is noted by literature about training teachers towards attaining the necessary skills needed for digital e-learning applications. Investigation for this paper was conducted through a qualitative research methodology. Authors decided to use this method with a concern of understanding the behaviour of humans as per teacher perspectives, leading to obtaining better understanding of underlying motives. For this qualitative investigation, three conveniently selected secondary school teachers from a rural school in the Eastern Cape Province of South Africa were interviewed. Engaging with the participants through administration of the interview schedule assisted authors in obtaining reach data due to contained questions that had a specific element of being open-ended. A fundamental finding revealed that teachers across all subjects have since embarked at focusing on (i) learner-centred practical approaches to allow determined e-learning engagements, thus having an impact on (ii) learner turnout. On noting this perspective from the teacher participants, it is recommended that as citizens held up in the technological revolution, there seems to be a need for teaching-learning approaches to be altered. This study, therefore, concludes that as a means to enable enhanced learner attainment, rural versus urban digital variations be addressed.

Introduction

The emergent introduction of digital learning systems in schools has resulted in infused learning approaches encompassed by selection of technologies for instruction in a schooling environment. It has become an international phenomenon that learners and teachers in schools versed with the use of information computer technology (ICT) in order to be accommodated in the current trends of information exchange. For this enhanced pedagogical rationale of using computers in learning, as argued by Du Plessis and Mestry (2019), both teachers and learners need to have capacitiation towards the use of such digital technologies. This also suffixes in a research recommendation that teachers and students must be aware and critically engaged with the use of internet of things to sustain the current pedagogical shift in education system, even in the health care sectors (Fauzi & Khusuma, 2020; Nasajpour et al., 2020). On the same view in relation to learning through internet usage, research proclaims that even prior COVID 19 eruption, there were some investigations conducted to identify whether learning through digitals had any significant outcome with regards to the expected academic throughput. Findings to this survey indicated that learners who engaged in e-learning as compared to those who still embarked on traditional engagement methods, were observed to have performed efficiently in their studies, this emanating from the sense of connectedness with their corresponding learners (Duncan & Barczyk, 2016; Irina, Novikova, Polina, Bychkova & Novikov, 2022).

However, it has been a decade since schools in the rural environments of South Africa have been reported to experience some glitches hence the relegated perspective including infrastructure and underprivileged access to services like electricity and internet connectivity. Adukaite et al (2017) are of a similar view as they designate those new-fangled challenges have emanated in rural South
African schools with regards to digital expansions resulting from digital variations that remain unaddressed, yet, on the other side, for an enhanced academic attainment in the current learning and teaching philosophy such e-learning resources need to be equally available and accessible for all cohorts of learners. In the same vein, Dube (2020), Madimabe and Omodan (2021) also confirm that rural schools, including higher colleges and their learners suffered during the hit of COVID-19 lockdown because they were neither exposed to technologically infused learning, not have access to technological materials such as computers, phones, and internet.

Despite the scanty practices of the technological space in schools, Khoo (2019) still argues that teaching and learning administered using digital has been noted for its element towards improved quality learning, thereby exposing learners as recipients of learning to e-learning embedded practices. Such practices are believed to be augmentative in the country’s economy. Although learners in the same schooling environment emanate from diverse backgrounds, they need to access in learning material, thereby exchanging ideas for varying exercises. Schwab (2016) believes that in the current learning environment, there can be no viable learning without embedding computer competency in learners. In this line as claimed by Schwab, COVID-19 has made it practical that teaching and learning may no longer be achieved without the use of technology. This implies that learning as a process should infuse e-learning approaches on daily basis, further than that, learners to have full exposure such that they are able to access e-learning gadgets at any given point throughout the duration of their learning across all levels of studying (Omodan, 2020; Omodan & Ige, 2021). Such an approach would cater for the transformed digital learning environment. Therefore, there is a need for teachers across all subjects to instil approaches that would equip life-long learning with the necessary knowledge and computer skills.

Moreover, interests came from informal observations made by the researchers as lecturers that when first year university students were instructed to log onto computers for their first time in the university, they struggle to display the least skills they had on the use of digital learning devices. Henceforth, it could be noted that a lesser number of students who could operate computers were those who had a luxury to have such gadgets in their homes. Nonetheless, there were some noted hinderances as that cohort of students were given limited chances to explore devices on their own without close monitoring by their parents. Lippman (2015) is of the same view by noting that computers should be regarded as practice electronic equipment for upgrading skills, yet without being connected to the actual world. On the same notion, Rundel and Salemink (2021) assert that learning through digital approaches play key roles in learning as learners acquire computer mastery thus improving their academic attainment across their years of schooling. In addition to that, Al-Samarraie & Saeed (2018) and Crawford (2021) affirm that disregarding e-learning practises in this digital era is tantamount to a decline in learner academic attainment hence emergent changes had led to teaching remotely, thus embedding a digitalised curriculum. Further than that, for efficient and effective digital learning, it then becomes vital to note that online teaching and learning has since become a revitalised practical process that bears outcomes when availability of such resources are readily available, thus enhancing the scholarship of learning and research (Hoadley, 2018; Hew et al., 2019; Giannikas, 2020).

As this manuscript aimed to investigate if e-learning and teaching approaches used by teachers have any significant influence towards academic attainment, this is reinforced by Khan (2020) who contends that for teachers to produce learners with well-equipped abilities on the use of digital learning devices, they as well need to have the necessary skills for enhanced diversity in their teaching approaches. This paper is organised as follows: following the introduction is literature review as the second part, with indications of theoretical and empirical studies as a way of linking theory and practice. The third part introduces research and methodology. Following this section is where authors have analysed and discussed findings, with implications. Finally, key points, recommendations, future research directions and limitations have been outlined.

Based on the above problems, and the objective of the study, the following research question was raised to pilot the study:

i. What is the significant influence of e-learning and teaching approaches used by teachers on academic attainment?

**Literature Review**

In this section the authors embarked on reviewing literature for purposes of attaining some indulgence of prevailing research with adherence to arguments by other scholars in the same field of study, yet in relation to the problem under examination. On that note, Work (2022) attests that underpinning ones’ research with literature review helps at providing grounded knowledge on the investigated problem, leading to recognition of areas previously researched, thus avoiding replication, thereby identifying a need for additional research.

Blank et al (2018) note that for efficiency and effectiveness, there is a dire need for teachers to acquaint themselves with aspects of technology yet comprehending with both compensations and constrictions for diversity in the teaching approaches used. Khan (2020) observed that learning through digital technology is a highly complicated practice as one has to incorporate some knowledge that allows flexibility in the use technological devices. As teaching and learning occurs in dynamic and complex settings, there is a crucial need for upgraded skills for the subjects offered. Moreover, Khoo (2019) reasons that teachers and psychologists have to ensure that learning is not merely acquired through passive perceptions, but rather by actively engaging by interrogating the e-learning gadgets. By so doing, teaching and learning as a process would become real and relevant, with specific focus on solving real life situations through using convincing approaches necessary for this digital world environment (Voogt & McKinney, 2017).

Brueer (2015) conducted a study that investigated how learners were capacitated to be conversant with e-learning skills. On the other side, Beames and Brown (2016) conducted a survey to also discover approaches and methods used by teachers to plough love of e-
learning engagements among learners. Both the above researchers are of the same view as they found out that learners who have access to computers at least twice a week were observed to have acquired better skills as compared to those who had limited access to such e-learning devices. The primary learning outcome achieved by learners who have obtained a firm foundation on digital learning is a developed computing skill that makes them to effectively use computers in future careers as they further their studies. Such an outcome, with the help of engaging in various appropriate topics that develop expertise in the use of computers, is accomplished (Zimmerman, 2015). For learners to master engaging through e-learning, there is curriculum that needs to be followed. Learners require to be taught through the use of different computer programs to capacitate them at being relevant users towards employability (Fung, 2018). In congruency of the previous studies, another strategy to be adopted by those teachers offering information technology as a subject is to teach learners on how to obtain and manage information that is obtainable from the internet. When learners are trained in this important skill, they would be able to analyse information relevantly.

Underpinning this inquiry is the Activity Theory by Clemmensen et al (2016). An activity, in this instance, is regarded as a system aiming at acquiring an anticipated product. The principles of the Activity Theory are practical exercises and approaches on teaching and learning necessary for the design of a learning environment, coupled with knowledge construction that entails complexity in a learning situation. Activity Theory has an educational implication as it relays that with e-learning capabilities learners can easily solve problems precisely. As such, application of technology skills in learning would enable learners for preparedness towards a huge range of possible life-long careers. This theory also provides a useful framework for the design and evaluation of educational technology applications (Cliff et al., 2022) which can help to ensure that learning goals are met and that technologies are used effectively to support learning. Though activity theory is not a panacea for all educational ills, but it is one of the tools that can be used in the design and evaluation of educational technology applications and in practices (Engeström & Pyörälä, 2021). We also argue that it projects the need to consider the context in which learning takes place and the specific needs of the learners as a valuable for understanding and designing effective educational technology applications.

This theory is relevant to this study, not only because of the expediency in technology skills that are critical in today’s world, but many jobs, including school system are now require at least some level of technological literacy, and the trend is only increasing. As such, it is important for teachers and students to develop these skills so they can use technology effectively to support their teaching and learning activities.

Above all, there are some valuable implications affecting learners’ lives that can be planted by information technology teachers. For better living nowadays, knowing how to interact with technology has proven to be a very important aspect on everyone’s lives. When infused digital learning approaches have been fully implanted in learners, there are great possibilities for them to have obtained the necessary skills needed for lifelong learning. Such skills include problem solving skills, thinking skills and some sense of creativity. Hence, during the COVID 19 pandemic era drastic changes in schooling systems led to planting an essential wake up call for application of the expected digital knowledge in teaching-learning processes, thus leading to improved learner academic attainment (Pillay, 2021).

**Research and Methodology**

For the purposes of this investigation authors used a qualitative research methodology. This method helped to discover and understand the underlying meaning with regards to the transformed teaching methodologies as perceived by individual participants (Creswell, 2015). Authors adhered to a qualitative research process to explore teaching and learning approaches used by teachers towards enhanced e-learning to suit emergent changes roaming the digital world. A case study design embedded in this research approach was followed using the phenomenological method to explore whether approaches used have any significant influence to empower e-learning towards academic attainment (Mckenney & Reeves, 2018). As opined by Duckworth and Yeager (2015) and Freedmam (2014), purposive sampling was used for this inquiry as it focused on particular characteristics of a population identified to be of interest. Study participants in the investigated school from the Amatole Education District comprised three teachers who offered computer applications technology (CAT).

Authors adopted semi-structured interviews because of its relevancy in this exploration as they allowed for more robust discussions (Flick, 2014) as interviews contained open ended questions relating to the subject under investigation. Furthermore, semi-structured interviews gave authors an opportunity to probe deeper into what was perceived by the teachers. Using this data collection instrument allowed authors greater scope leading to obtaining rich data. Interviewing and understanding responses was conducted by listening to participant responses whereby authors repeatedly interpreted recorded responses. This procedure was done by listening to audiotapes to gain a feel of the overall facts. The entire process led to formation of themes as findings for this investigation (Galletta, 2013). Thematic analysis was employed to make sense of the data. According to Braun & Clarke (2021) thematic analysis enables researcher to categorise data into themes for meaning making.

As a way of observing ethical considerations, as the investigation involved human participants, it was therefore necessary that some ethical principles be adhered to, as argued by Flick (2014). The participants voluntarily granted authors permission to be included as part of the sample population as no single individual was forced to take part in the investigation. They were also given freedom to withdraw from the study at any time should they feel uncomfortable with the research process. Their identities were protected and
no statements in the discussion section that could be linked to them. Henceforth, authors acknowledged not to identify any given response and ensured protection of participants from any kind of exploitation.

**Presentation of Results**

In this investigation data was analysed such that all similar responses were grouped together, later put in common categories that formed up themes. Themes that emerged are discussed as findings in the preceding paragraphs (Flick, 2014); as learner turnout and approaches for technology infused learning.

**Learner turnout**

Improved school attendance by learners was divulged as one of the findings for this inquiry. In classes where teachers had embarked on fully tapping into application of the use of digital technologies, it was revealed that learners from such classes have improved attendance in an alarming way. For this finding one participant reported: *Learners for the subject I offer are no longer absent from school. What troubles me is the lack of computers used, as such, quarrels of running to be seated in a computer desk have since caused some havoc in my class. This emanated from the groupings I formed; some would complain that time allocated was not sufficient as they had interest to play around with these e-learning gadgets. This finding is supported by the second participant who reported that: Even when time comes for learners to be outside for play time, I would observe that they seem to be hooked in enjoying computer learning.*

**Technology Infused Learning Approaches**

In relation to teaching and learning approaches it emerged from the findings that participants used dissimilar approaches to teach during CAT learning. Two participants used learner- centred approaches as teacher one said: *I use learner-centred approaches when I teach CAT because I observed that this approach accommodates them all, as yet ensuring that at the end of the lesson all learners have acquired the necessary expertise in using computers.* Teacher two was of the same idea although with a totally different strategy: *As soon as I observed that learners in my class become so inquisitive and excited as soon as I instruct them to log on to computers, I have since developed a strategy to allow open and free access, without myself intervening as an instructor. What surprised me when I expected them to report back is to find out that they had gone far beyond to an extent of discovering how functions not yet been outlined are operated. In the same disposition, another participant reported: I use more practical engagements to help improve e-learning skills in my learners as such activities are a necessity not only for computer lessons, but across all subjects hence the emergence of teaching through application of digital technologies.*

**Discussion**

In relation to influences of learning through digital technologies for improved academic attainment, discussion below is focused on technology infused learning approaches and learner attendance. Khan (2020) notes that if learning practice is structured in a manner of infusing blended learning tools, learners could be motivated to improve on learning computer applications, thus leading to reduced overall declining performance in CAT as a subject. On the other side, learners who have attained skills on the use of e-learning devices stand better chances of self-employment in this fourth industrial era. For transformed teaching methods, professional development and sustenance needs to be fostered on teachers, infusion of digital learning is likely to result in some positive effects on improved learner computer mastery skills. These findings are in line with Lippman (2015) who recommended that learners should have access and exposure to e-learning devices more often, therefore, they need to be assisted by their teachers for best practises. Duma et al (2021) argue that teachers are expected to exercise meaningful learning by infusing realistic approaches liable to tackle existing life problems. This is supported by Lozano & Solé-Pla (2017) who maintain that functional learning should be put into existence for learners to acquire the necessary expertise needed to interrogate technological devices. Henceforth, Pereira and Sithole (2020) claim that explorative learning produces inquisitive learners capable to experiment and explore. As delineated by Piaget (1954), learners who can explore and discover information by themselves are applauded for their investigative zeal to bring new concepts and theories into existence.

Further than that, these findings denote that schools as learning environments need to rethink ways of improving learner attendance. Learners who frequently attend classes, yet fully engaging in whatever form of learning have been noted for their improved academic performance, not in the study of CAT only, but across all the subjects offered. Learners’ interest in such expertise needs therefore to be nurtured because a learned, yet, skillful nation results to a wealthy country. All these findings are in line with the Activity Theory as it supports embedding of e-learning skills in learners for betterment in the near future (Clemmensen et al, 2016). However, some schools situated in disadvantaged rural areas in South Africa experience internet connectivity. This discovery is also in line with the finding by Blank et al. (2018) who reported that there is still a huge role in rural–urban differences with regards to demographic variables. Hence the aim of this investigation to closely look at the intensity of strategies used by teachers in embracing digital literateness in the rural environments.

**Conclusions**

Arguments effected in this paper have been in congruency with Activity Theory (Clemmensen et al, 2016), as it lay the basis of this inquiry. This investigation aimed to examine if digital influences used during the teaching and learning processes have any significant
influence towards academic attainment. Through the revealed findings, it emanated that there is necessity for teachers across diverse subjects offered to allow for environments that would instil motivated learning through digital applications. For learners to acquire computer literacy skills they need to engage in consistent practical work. Although this investigation was only conducted in one education district this then becomes a limitation to the findings of this study, nonetheless, for future research as a way of closing the gap in lack of skills development, this manuscript therefore suggests that as citizens across societies are all held up in technological revolution, there seems to be a dire need for teaching-learning approaches to be altered. With educational implications outlining the decline in learner academic throughput, it is therefore recommended that as a means to enable an enhanced learner attainment, rural versus urban digital variations be addressed.

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References


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