International Journal of Information and Communication Technology Education
Volume 15 • Issue 4 • October-December 2019

Electronic Textbooks in Gauteng Public Schools:
Pros and Cons

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ABSTRACT

The Gauteng Department of Education (GDE), a basic education department, is responsible for the management and administration of public educational institutions in the largest province in South Africa. The provision of learning and teaching support materials (LTSMs), including textbooks, is one of its core strategic obligations. GDE has introduced an information and communication technology (ICT) project through which schools are provided with LTSM in electronic format (e-LTSM). The first phase entailed the provision of smart-boards, laptops and tablets to grade 12 teachers and learners. This article addresses the research question on the envisaged advantages and disadvantages of electronic textbooks. A mixed method approach was utilised where 356 schools were selected to be given questionnaires and 35 schools would be interviewed. The theoretical framework applied was the technology acceptance model (TAM), with the focus on the perceived usefulness variable. The data analysis shows that the majority of schools regard the use of electronic textbooks as useful.

KEYWORDS

Core LTSM, Electronic-Textbooks, e-LTSM, ICT, Mixed Method, Online Textbooks, Smart-Bboards, Tablets, TAM

INTRODUCTION

Information and Communication Technology seems to have become a fundamental tool in the teaching and learning milieu across all levels at schools (Kihoza, Zlotnikova, Bada, & Kalegele, 2016). Due to the ongoing development of new ICTs, such as tablets and smart phones, many publishers are converting their traditional textbooks into a digital format. It is envisaged that electronic textbooks may soon replace printed teaching and learning materials (Aghaee, et al., 2016) for curriculum delivery in the classroom (Gakibayo, Ikoja-Odongo, & Okello-Obura, 2013).

Literature reports that the provision and use of electronic textbooks provide opportunities for schools to improve student achievement, and that exposure to the power of technology and digital

DOI: 10.4018/IJICTE.2019100104

text prepares students for the competitive world of work (Aghaee, 2015; Fan & Ho, 2012; Tran & Stoilescu, 2016). The introduction of electronic textbooks is, however, not without its challenges. This study attempts to assess the perceived advantages and disadvantages of using electronic textbooks in Gauteng public schools, as highlighted by school principals and teachers who take on the role of ICT coordinators in their schools.

BACKGROUND

South Africa, as one of the developing African countries, has nine provinces. Gauteng is the smallest of these, but the province is highly industrialised and urbanised. The study was conducted in the public schools of the Gauteng Department of Education (GDE) as the GDE has introduced several programmes to incorporate ICT in education over the past number of years (Gauteng Department of Education, 2014). For example, the ICT in Education (Paperless Classrooms) programme focused on the provisioning of digital classrooms in schools, and this initiative included a roll out of smart-boards, tablets, laptops, connectivity and training with regard to the use of the new infrastructure (Gauteng Department of Education, 2014). As such, it is to be expected that electronic textbooks would find their way into the Gauteng classroom. However, it seems as if, despite the availability of the hardware, software, connectivity and training, electronic textbooks are not yet an integral feature of teaching and learning in Gauteng. Davis' (1989) Technology Acceptance Model (TAM) explains that users come to accept and use a specific technology only if they believe that it can enhance their job performance and they perceive it as being easy to use (Davis, 1989). The question therefore arises whether teachers and school principals fully understand the advantages and disadvantages of electronic textbooks. This study therefore focuses on the perceptions of Gauteng school principals and teachers with regards to the advantages and disadvantages of electronic textbooks.

LITERATURE REVIEW

There are numerous global studies on the use of ICT in education. One of the ways in which the introduction of ICTs into education benefits schools is that it provides access to information using devices such as computers, the Internet, radio, and television (Aghaee, et al., 2016; Popovic, 2015).

These technological devices all have the potential to facilitate and promote teaching in the classroom (AlTammeemy, 2017; de Aldama & Pozo, 2016). In many cases, the unavailability of ICTs for teaching and learning is the main factor inhibiting their pedagogical use (Brun & Hinostroza, 2014; Chisalita & Cretu, 2015). However, when ICTs are rolled out in schools, the expectation is that teachers would want to take advantage of the affordances of these new technologies. Although teachers are often reckoned to be skilled in the use of ICTs in their classrooms, they still lag behind in realising its full potential by not optimally integrating these technologies into their teaching (Brun & Hinostroza, 2014).

The mandate of UNESCO is to collaborate with the educational community so that they benefit from the potential of using ICTs in education (United Nations Educational, Scientific and Cultural Organization [UNESCO] 2002). *ICT in Education* is a unit within UNESCO that supports education communities on the policies, strategies and activities associated with the use of digital devices in teaching and learning (UNESCO, 2002). Countries are, through the UNESCO policies, encouraged to integrate ICT in the classroom and particularly use electronic textbooks.

Carrim & Taruvinga (2015) reckon that the former minister of communications in South Africa, Dina Pule, at an international conference on ICTs in Cape Town, suggested that access to ICT should be declared a human right (Carrim & Taruvinga, 2015). She also emphasised the importance of ICT to provide access to good quality education and went so far as to argue that South Africa should lead other developing countries on the use of ICTs in education (Carrim & Taruvinga, 2015). This vision

is in line with the South African e-Skills Plan of 2010 that was aimed at enabling South African citizens to participate technologically in the global world (Gumbo, Jere & Terzoli, 2012).

The Department of Basic Education (DBE) in South Africa introduced e-Education White Paper 7 of 2004 that focused on the provision of ICTs to schools (Aghaee, et al., 2016; Carrim & Taruvinga, 2015). Due to various contextual factors, such as a backlog in the replacement of make-shift classrooms, and the lack of basic services, such as running water and electricity in some schools, the initiative was left to the provinces to manage (Gumbo, et al., 2012; Tran & Stoilscu, 2016).

In many provinces, this drives to provide ICTs to schools included the supply of electronic textbooks. The electronic textbooks referred to here are printed textbooks available in digital format, and are typically digital texts used in the classroom for curriculum delivery (Gakibayo, et al., 2013) and for other academic purposes (Al-Mashaqbeth, & Shurman, 2015; Lee, Messom & Yan, 2013). In most cases, the introduction of electronic textbooks to the schools is regarded as a welcome change from the usual use of print textbooks (Maynard & Cheyne, 2005). It is, however, true that the adoption and use of electronic textbooks occur at a worrisome slow rate and thus the potential benefits of electronic textbooks are not yet fully realised (Dobler, 2015).

RESEARCH

Theoretical Framework

The theoretical framework used in the study was the Technology Acceptance Model or as it is colloquially known, the TAM (Davis, 1989). The model is intended to help researchers determine the readiness of users to accept, and actually use, a new technology (Al-Azawel & Lundqvist, 2016; Amornkitpinyo & Pirisurawong, 2015; Cheung & Vogel, 2013; Iqbal & Bhatti, 2016; Kelly, 2014). The Technology Acceptance Model, as indicated in Figure 1, has variables that can be categorised as both exogenous and endogenous factors (Gyamfi, 2016).

For this study, the GDE is regarded as one of the exogenous variables because they provide ICT resources to schools. The sampled schools, as endogenous variables, are tasked to implement the electronic textbooks in the classrooms. In this study, the perceived usefulness (PU) of the principals and the ICT coordinators in the sampled schools was determined. It is argued that only once school principals and teachers perceive electronic textbooks as a useful contribution to their schools and classrooms, will they be open to consider whether it is easy to use (perceived ease of use – PEOU), which in time may lead to a change in their attitudes towards these digital texts.

METHOD

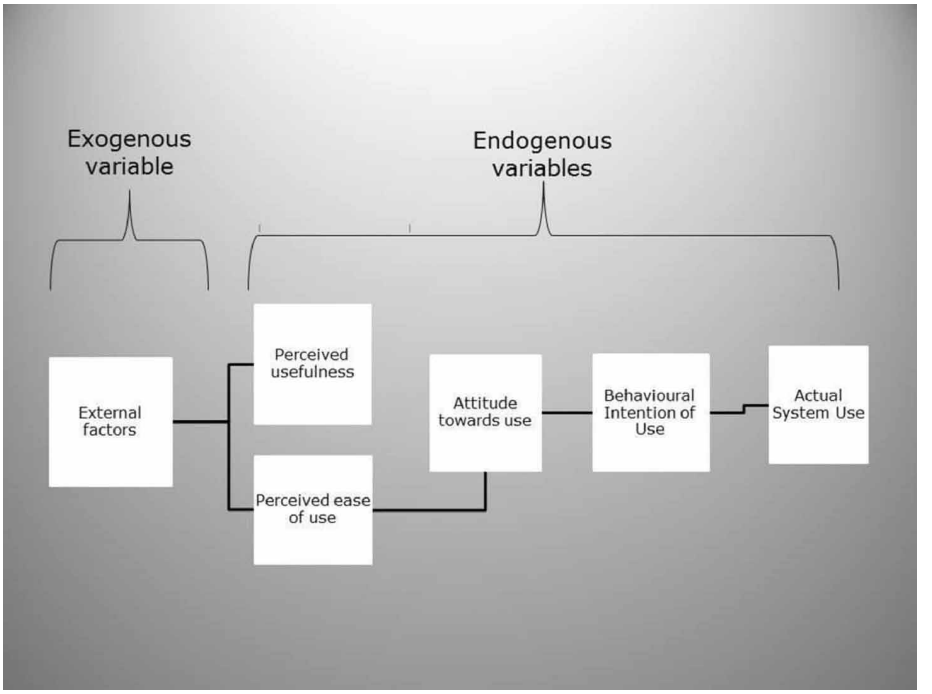
This study used a mixed method research design and the following section discusses the research population and the sampling techniques that were used. It also highlights the research instruments, and the way in which the data was collected and analysed.

Mixed method research is defined as a study where the researcher uses both qualitative and quantitative methods to collect, integrate and analyse data (Hadi Alldred, Closs, & Briggs, 2013). Mixed method research can, furthermore, either be described as concurrent or sequential by nature (Fetters, Curry, & Creswell, 2013; Hadi, Alldred, Closs, & Briggs, 2013; Johnson & Christensen, 2012). This study used a concurrent mixed method design, meaning that both quantitative and qualitative research designs are used simultaneously (Fetters, Curry, & Creswell, 2013; Hadi, et al., 2013).

Population and Sampling

The GDE's *ICT in Education* project was rolled out to 377 public schools in phases (Gauteng Department of Education, 2014). In 2015, ICTs were provisioned for the Grade 12 learners in the seven schools identified as a pilot. It is not clear why Grade 12 learners were selected as the target

Figure 1. Technology Acceptance Model (TAM) (Davies, 1989)



group. The ICTs that were provided included tablets for Grade 12 learners and laptops for their teachers. Also, interactive smartboards were installed, thus converting many traditional classes into so-called 'smart' classes.

In 2017 the GDE e-Learning directorate identified 377 schools that were to receive the ICTs and benefit from the ICT in education programme. However, the list contained only 356 schools. The online questionnaire was sent to the 356 schools on the ICT beneficiary schools list, as these schools' email addresses appeared on the beneficiary list provided by the e-Learning directorate.

During this study, the ICT in Education project was rolled out to the 377 secondary schools identified as a population. However, the actual number who received product from the e-Learning directorate at GDE were the 356 public schools. The schools were earmarked to receive the ICTs in 2017.

Data Collection Instruments

Two instruments were used to collect data, namely an online questionnaire and a semi-structured interview protocol. The online questionnaire focused on the advantages and disadvantages of electronic textbooks and was developed in Google Forms. The closed, multi-choice questions were aimed at gathering quantitative data while the open-ended questions were used to gather qualitative data.

The ten questions that focused on the participants' perceptions with regards to the advantages of electronic textbooks were based on a four-point Likert scale. Respondents were asked to indicate whether the statements were not valuable at all, somewhat valuable, valuable or very valuable. The items that focused on the disadvantages of electronic textbooks used a five-point Likert scale and respondents were asked to choose whether they totally disagreed, disagreed, neither agreed nor disagreed, agreed or totally agreed with the statements provided. Both the sections on advantages and disadvantages concluded with a short open-ended paragraph style question that allowed for the collection of qualitative data.

A semi-structured interview protocol also focused on the advantages and disadvantages of electronic textbooks and was used to obtain additional qualitative data. In a semi-structured interview, the researcher, using a prepared interview schedule, allows for guided flexibility from the interviewees and is not confined to the chronology of questions on the schedule (Punch & Oancea, 2014; Thomas, 2013). The interview protocol that was used in this study guided the discussion between the researcher and the interviewees, but also provided the opportunity for further exploration wherever the need arose.

Data Collection

The data collection was done using the online questionnaire and the semi-structured interview protocol.

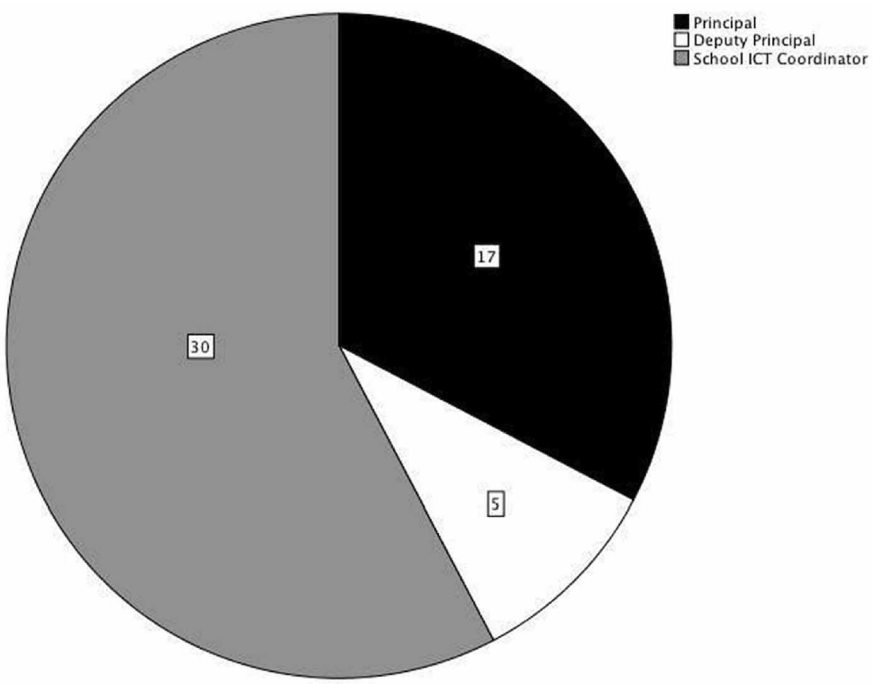
Online Questionnaire

The online questionnaire was sent to 356 public schools in Gauteng to be administered by the principals or deputy principals and the ICT coordinators. However, quite a few challenges were experienced during the data collection process. Some of the schools did not receive the online questionnaire because of incorrect email addresses, or because some principals were no longer associated with the schools due to retirement and promotion. In some instances, emails were simply not opened even though it was successfully delivered.

Of the 356 questionnaires emailed to schools, only 55 schools responded. Of these 55 responses, 52 could be used in the data analysis process. Data gathered from two school interns and one district official was omitted because the sample explicitly required input from the school ICT coordinator and the principal/ deputy principal.

The responses per designation were as follows: 17 Principals, 5 Deputy Principals and 30 School ICT Coordinators, as highlighted in Figure 2. The responses from Deputy Principals were accepted because these participants were either acting on behalf of the Principal, or were in fact the ICT Coordinators of their schools.

Figure 2. Designation of participants



The interview protocol, targeting the principal, or the deputy principal if the principal was not available, and the school's ICT coordinator, was developed for 35 sampled schools in the Tshwane West education district. These 35 schools were sampled conveniently from the list of 356 schools because of their proximity to the researcher and being in the same education district, Tshwane West.

Semi-Structured Interview Protocol

Out of the 35 sampled schools for interviews, only 20 were interviewed. The other schools could not be reached within the period that the GDE allowed for data collection. From the 20 interviewees, one was subsequently omitted because he was identified as an intern and a technician at his school. The responses from the 19 valid interviewees were coded as 6 principals and /or deputy principals and 13 school ICT coordinators.

Data Analysis

Processing of quantitative and qualitative data was done separately because the method of analysing the two is different. In quantitative research, for a large sample the findings (from the sample) can be generalized to the population; this is referred to as statistical inference. The question of what sample size constitutes as a 'large' sample has been examined throughout the decades by many researchers. The consensus is that a sample size of 30 is seen a sufficiently large, due to the central limit theorem. For more details on the central limit theorem and sample sizes, the reader is referred to Field (2014, p. 54). In conclusion, the sample size used in this research is large enough to be seen as a representative sample of the population and the findings can, therefore, be generalized to the population.

Online Questionnaire

Data collected from the Likert scale questions in the online questionnaire was processed as quantitative data, using the Statistical Package for Social Sciences (SPSS) to perform the statistical analysis.

To measure the scale reliability of the set of questions, a Cronbach alpha measure of internal consistency was calculated based on the quantitative data available. Most of the Cronbach alpha values were above 0.5, which indicated that the questionnaire was valid and reliable (Goforth, 2015), then the histograms were developed.

Using the quantitative data, the responses that related to the perceived advantages of electronic textbooks were all grouped together. These responses were categorised into five factors, as depicted in Table 2. The factors were: searchable nature, ease and immediacy of access, online collaboration, cost effectiveness and portability of electronic textbooks. All these five factors were computed on SPSS as variables and their frequencies calculated.

Responses to the disadvantages of electronic textbooks were also grouped together into four factors. The factors identified were Limitations, Availability, Interactivity and Health effects. Those responses that listed additional disadvantages of electronic textbooks are shown as individual items in Table 3.

There were two questions on the questionnaire that required respondents to provide any additional advantages and disadvantages relating to electronic textbooks. These responses were mentioned individually either as advantages or disadvantages.

Table 1. Sampled schools and respondents/participants

Instrument	Sampled Schools	Respondents/ Participants
Online questionnaire	356	55
Semi-structured interview	35	20

Table 2. Factors on the advantages of electronic textbooks

Factors	Related Statement/ Question
Searchable nature	Electronic textbooks make it easy to search for a specific phrase it is easy to search for a specific word in electronic-textbooks
Ease and immediacy of updates	Electronic textbooks are easy to update e-Textbooks allow for immediate access of reviews and editions
Online collaboration using electronic textbooks	Electronic textbooks allow for online collaboration Electronic textbooks allow learners to do projects as groups remotely
Cost effectiveness of electronic textbooks	Unlike printed textbooks, electronic textbooks have no delivery costs and Electronic textbooks are affordable
Portability of electronic textbooks	Electronic textbooks are portable Electronic textbooks are not heavy to carry
Additional Advantages of Electronic Textbooks Identified	
User friendly (or use it everywhere) E-books do not require storage or a book storeroom. They do not tear like hard copies do With electronic textbooks, there are no damages, no loss and no retrieval costs Use it everywhere Enhance learners' interest Can be loaded in one device They have text to speak to readers Save space in the storage room Environmentally friendly E-Textbooks are easily kept on one device.	

Table 3. Factors on the disadvantages of electronic textbooks

Factor	Related Statement/ Questions
Limitations	ICT Hardware requires regular maintenance For using electronic textbooks, ICT hardware is costly
Availability	There is a limited number of e-textbook titles available Some e-textbooks may not be readily available at suppliers
Interactivity	e-Textbooks have interface limitations Some of the e-textbooks are in pdf, thus do not have interactivity
Health effects	Prolonged use of a keyboard may hamper normal development of fine motor skills Screen readers cause eye strain
Additional Disadvantages of Electronic Textbooks Mentioned	
No Wi-Fi (cannot use or connect internet) Bad effect to the eyes For just using e-Textbooks, ICT hardware is costly	

Interviews

The principals and ICT coordinators shared their perceptions with regards to the advantages and disadvantages of electronic textbooks in a semi-structured interview with the researcher. Using a smartphone, interviewees were recorded, then recordings were transcribed as MS Word documents. For analysis purposes, the transcribed responses were then copied to MS OneNote for manual coding. In MS OneNote, recurring themes were identified for both the data associated with the advantages and the disadvantages of electronic textbooks. The codes identified were then matched to the factors on the advantages and disadvantages of electronic textbooks.

RESULTS AND FINDINGS

For the quantitative data, histograms were created to show the level agreement as well as the normality of the standard deviation while on the qualitative data, factors identified were discussed in relation to the quantitative data.

Advantages of Electronic Textbooks

The analysis of quantitative data that relates to the advantages of using electronic textbooks in the classroom is outlined as per the factors developed during the data preparation phase. On Figure 3, the majority of responses are on the right side of the histogram thus indicating that the majority of participants regard searchability in electronic textbooks as valuable or very valuable.

Also, when investigating the histogram on Access to electronic textbooks (see Figure 4) it can be seen that the majority of responses fall on the right side of the histogram which indicates a significant number of participants indicated that access and review of electronic textbooks is valuable or very valuable. Interview responses on the advantages electronic textbooks also confirmed that the interviewees regarded electronic textbooks are easily accessible and easy to review. One of the interviewees stated:

…if they [textbooks] are in an electronic format, then everybody is having a textbook every day, always available. [INTPRINC3])

The questionnaire data that is qualitative also acknowledged that electronic textbooks, once downloaded, can be accessed off-line and used everywhere, that the electronic textbooks are portable and can be reviewed easily.

According to literature, other electronic textbooks advantages are that they are easy to update and reprint as well as easily searchable. (Bossaller & Kammer, 2014; Capita & Capita, 2016; Waller, 2013). By using electronic textbooks, one can easily access the text as well as make notes for use as future reference (Al-Ali & Ahmed, 2015; Carrim & Taruvinga, 2015; Ishtaiwa, 2014).

Figure 3. Histogram on the searchability of electronic textbooks

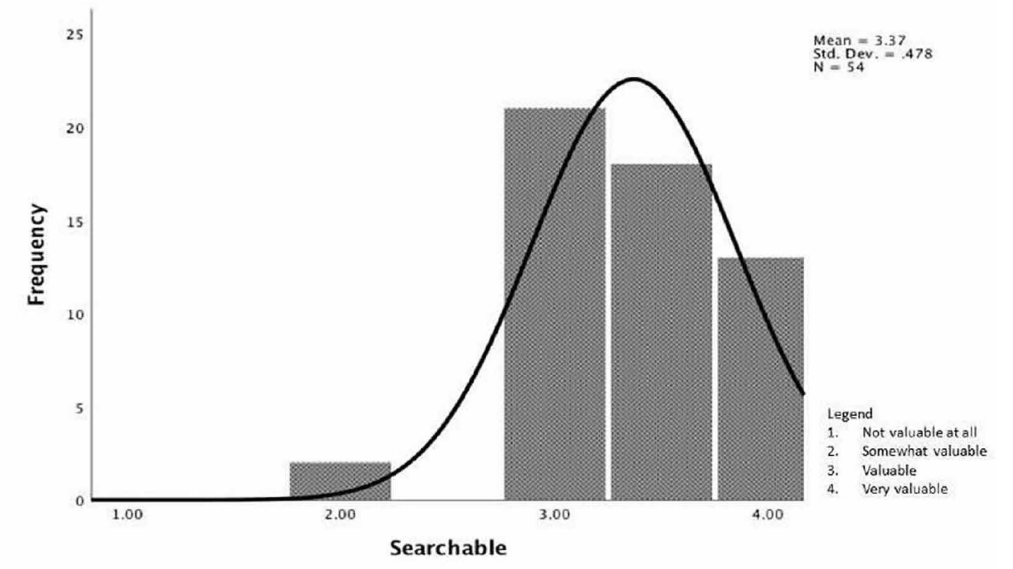


Figure 4. Histogram on the immediacy of access of electronic textbooks

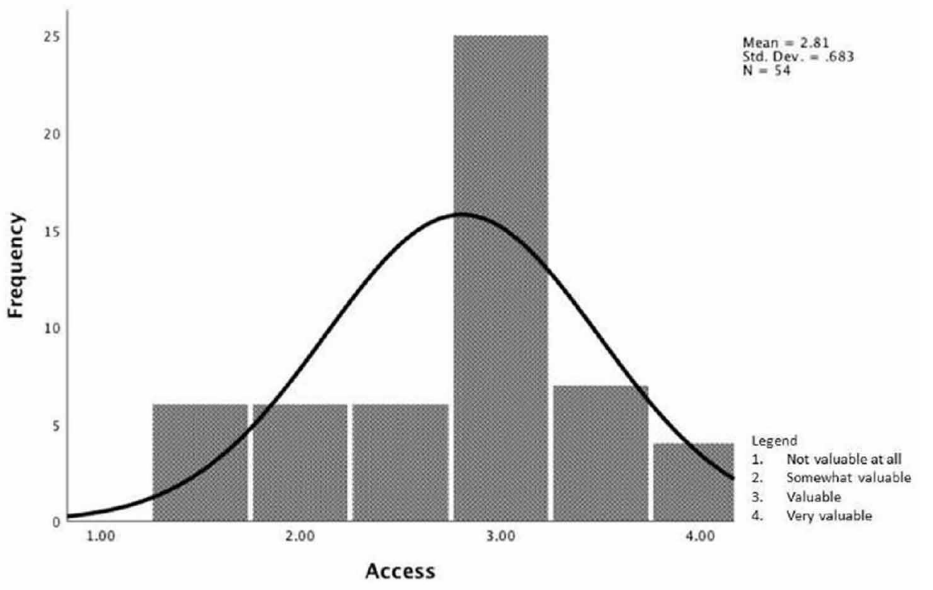
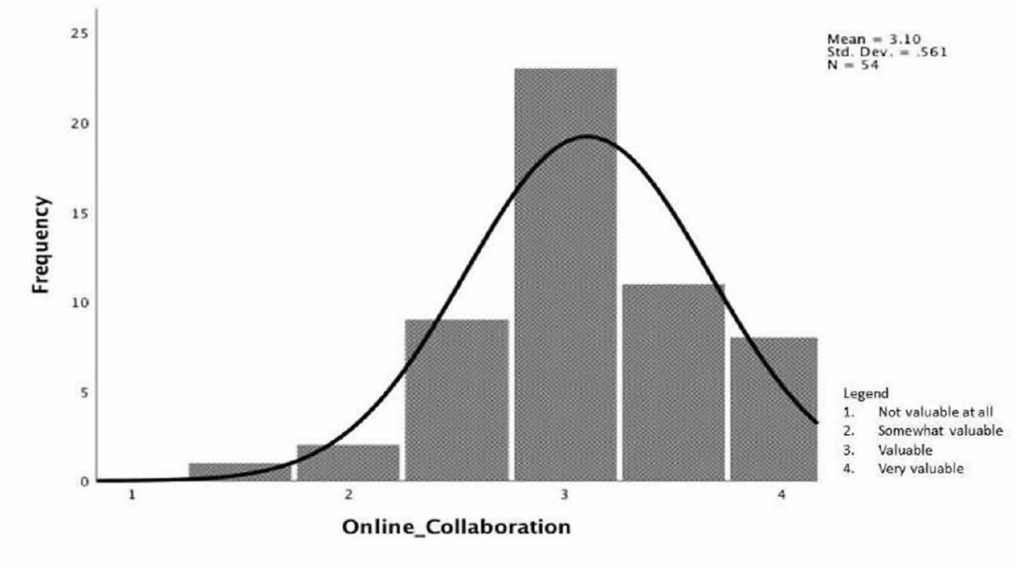


Figure 5 shows a histogram on the advantage of online collaboration of electronic textbooks. The histogram shows that the mean of the online collaboration is 3.10 highlighting that the participants regard the online collaboration as valuable or very valuable. Electronic textbooks thus encourage and allow collaborative learning for a group of learners (Dubey, 2016; Zhonggen, 2015).

Another factor that is related to the advantages of using electronic textbooks in the classroom is cost effectiveness. Since the majority of the responses on the histogram fall on the right side of

Figure 5. Histogram on the online collaboration of electronic textbooks



the histogram this illustrates that most of the participants indicated that the cost effectiveness of the electronic textbooks are valuable or very valuable (see Figure 6).

One interviewee supported the notion that the electronic textbooks are cost effective by stating that:

… it's cheaper than the printed textbook, it's cost effective… [INTCOORD13]

The low cost of electronic textbooks is possibly caused by lower costs incurred to develop it, as well as the fact that delivery costs are significantly cheaper than that of the printed textbook (Bossaller & Kammer, 2014; Carrim & Taruvinga, 2015; Falc, 2013; Gerhart, Peak, & Prybutok, 2015).

Lastly, Portability was identified as a factor relating to the advantages of electronic textbooks. The confirmations were that e-textbooks can be uploaded on different devices. It is also easy to carry all the electronic textbooks of the grade on one device, thus reducing the heavy load that teachers and learners may carry when using printed electronic textbooks (Brown, David, & Monaco, 2016; Ishtaiwa, 2014). Interviewee participants, with concerns about the weight of printed textbooks, their usage at school and home, confirmed that it is only viable when electronic textbooks users carry all their electronic textbooks on one device to enhance access. The concern also helps to address the negative effects of the heavy load of printed textbooks such as physical fatigue (Al-Ali & Ahmed, 2015).

From the histogram (see Figure 7) it can be seen that the majority of responses fall on the right side of the histogram which indicates that the majority of the respondents expressed portability as valuable or very valuable. As a result, it becomes easy and convenient to use and store electronic textbooks (Waller, 2013).

Disadvantages of Electronic Textbooks

Data for the analysis on whether the use of electronic textbooks in the classroom has disadvantages was also categorised using codes. Factors identified were Limitations, Availability, Interactivity and Health effects. From the histogram (see Figure 8) it can be seen that the majority of responses fall on the right side of the histogram indicating that the participants are mostly in agreement that the limitation of irregular maintenance and costly ICT hardware is a major disadvantage.

Figure 6. Histogram on cost effectiveness electronic textbooks

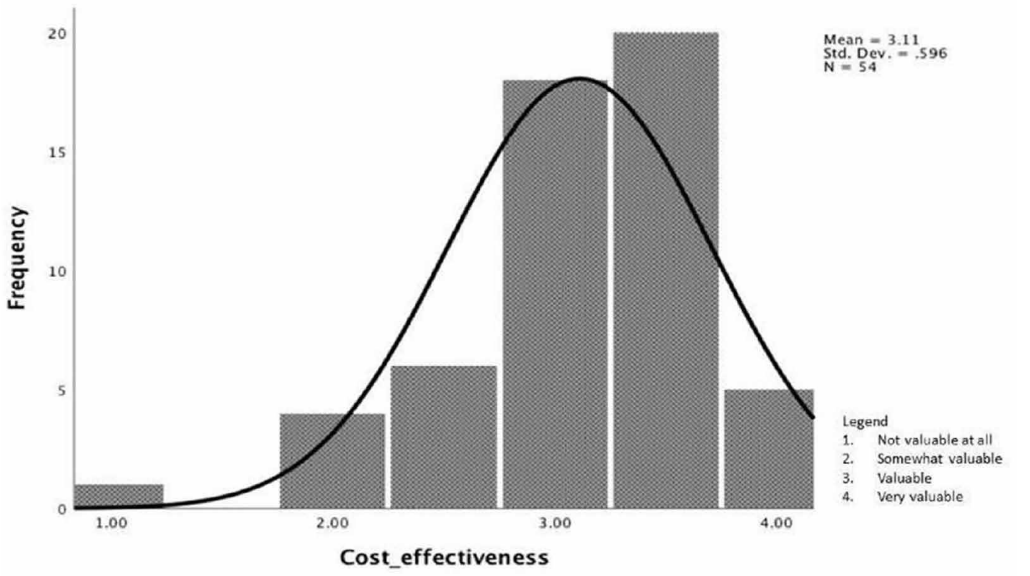


Figure 7. Histogram on portability of electronic textbooks

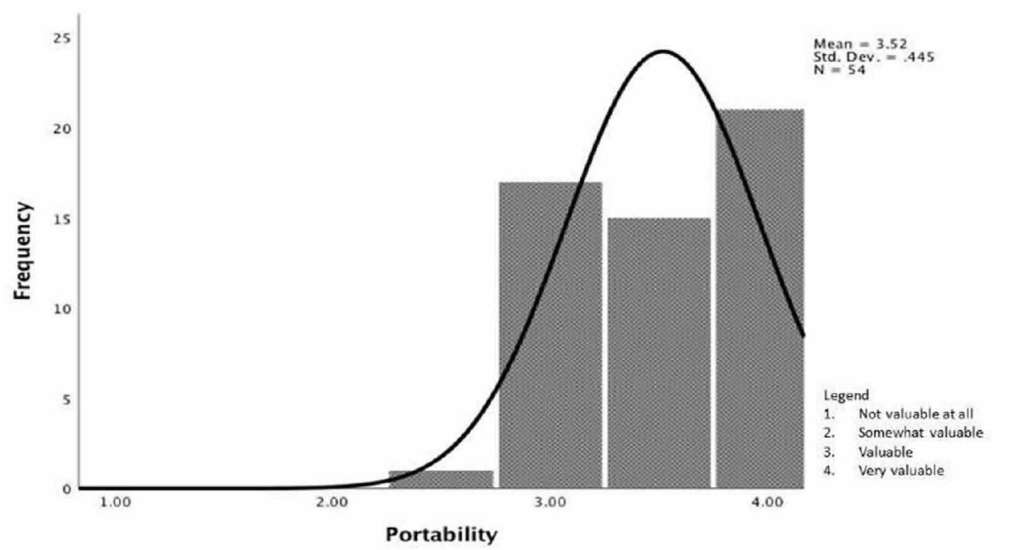
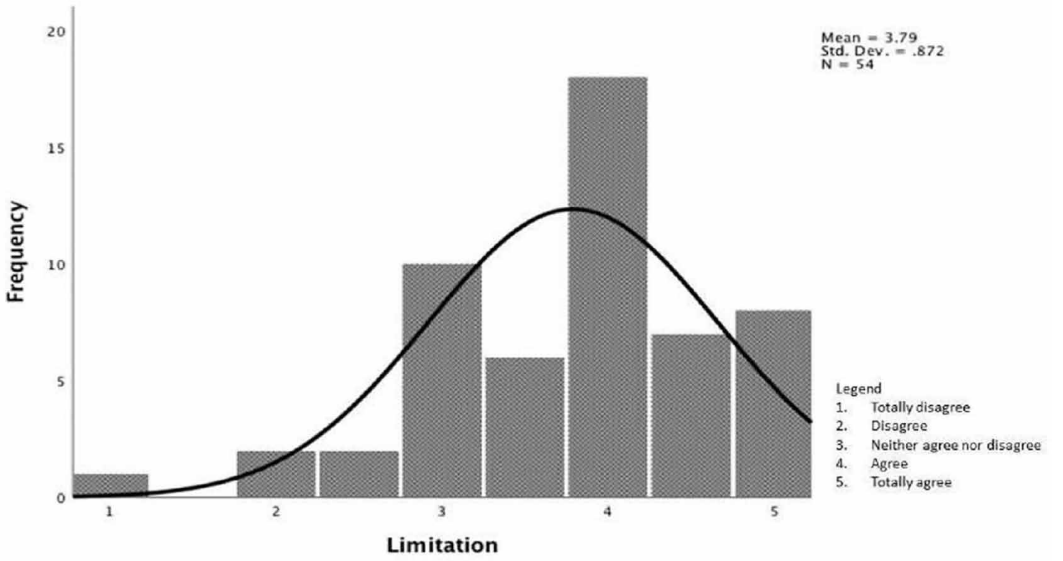


Figure 8. Histogram on the limitations of electronic textbooks



On Figure 9, the majority of responses are on the right side of the histogram showing that a significant number of participants agree or totally agree that some electronic textbook titles are not available. Publishers and developers need to make a variety of electronic textbooks available.

Qualitative data from the online questionnaire also highlighted that the availability of electronic textbooks in certain subjects is a major challenge and power outages make the ICTs unusable, and while the theft of the ICT devices and the associated health effects were also reported as challenges.

Some participants in the interview raised the following concerns regarding the electronic textbooks:

Figure 9. Histogram on the non-availability of electronic textbooks

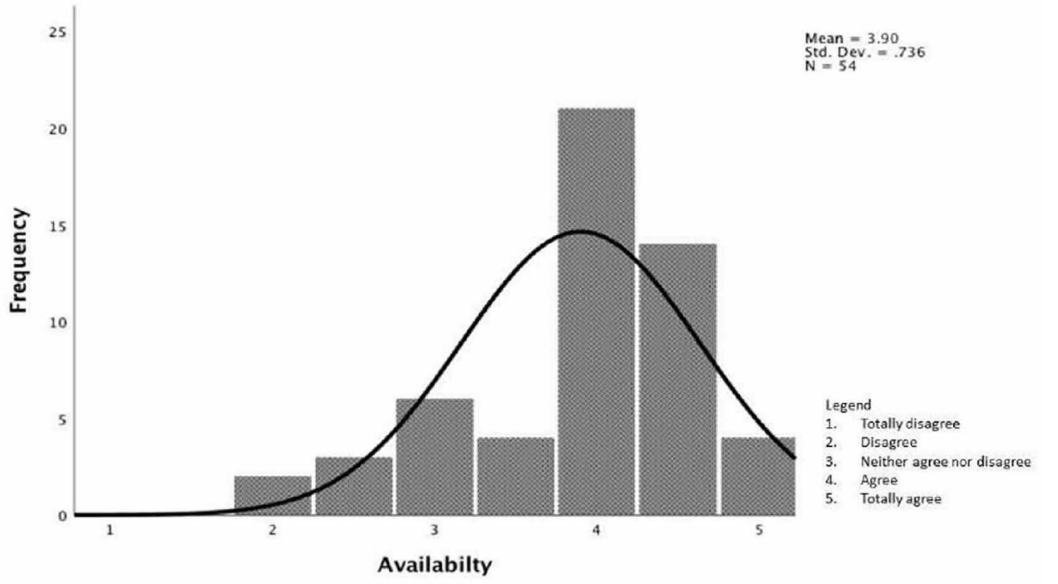
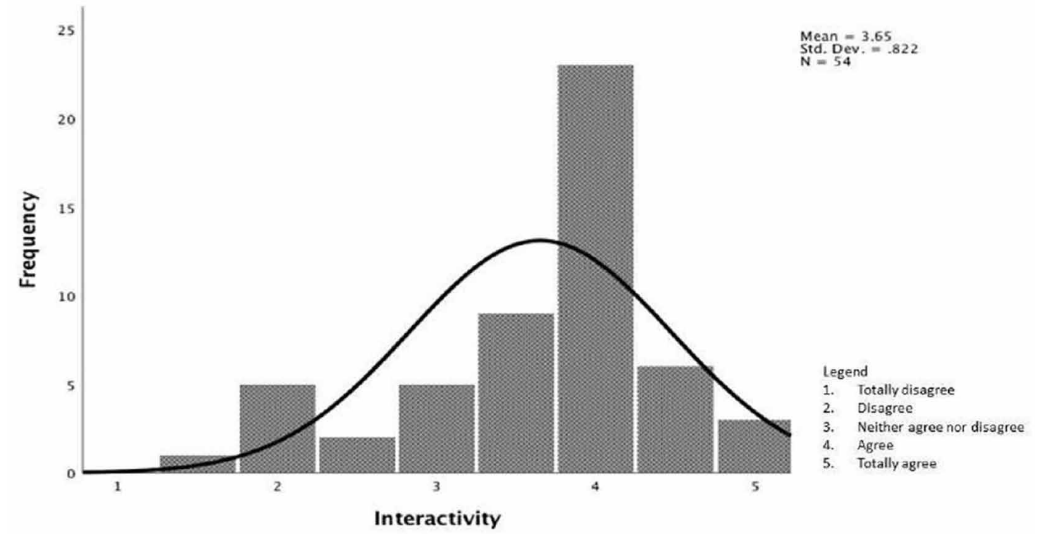


Figure 10. Histogram on the limited interactivity of electronic textbooks



… sometimes people from Head Office (find) it difficult, they are working with many people, (so) they come (for support) after two weeks [INTPRINC1]

…and then there is a delay, you will complain, raise up your voice, cry loud and it becomes difficult for (them), maybe the queue is too long [INTCOORD7])

Data collected suggests that there are health effects relating to the use of electronic textbooks in the classroom. On the Health effects histogram, the majority of responses fall on the right indicating

that the participants agree or totally agree that the use of electronic textbooks may cause eye strain, fatigue and under-development of fine motor skills (see Figure 11).

The use of ICT devices such as the screen influences the health of the user. Small screens and fonts are known to cause eye strain and fatigue (Al-Ali & Ahmed, 2015; Chapman, Wright, Glenn, & Adams, 2016; Stone & Baker-Eveleth, 2013).

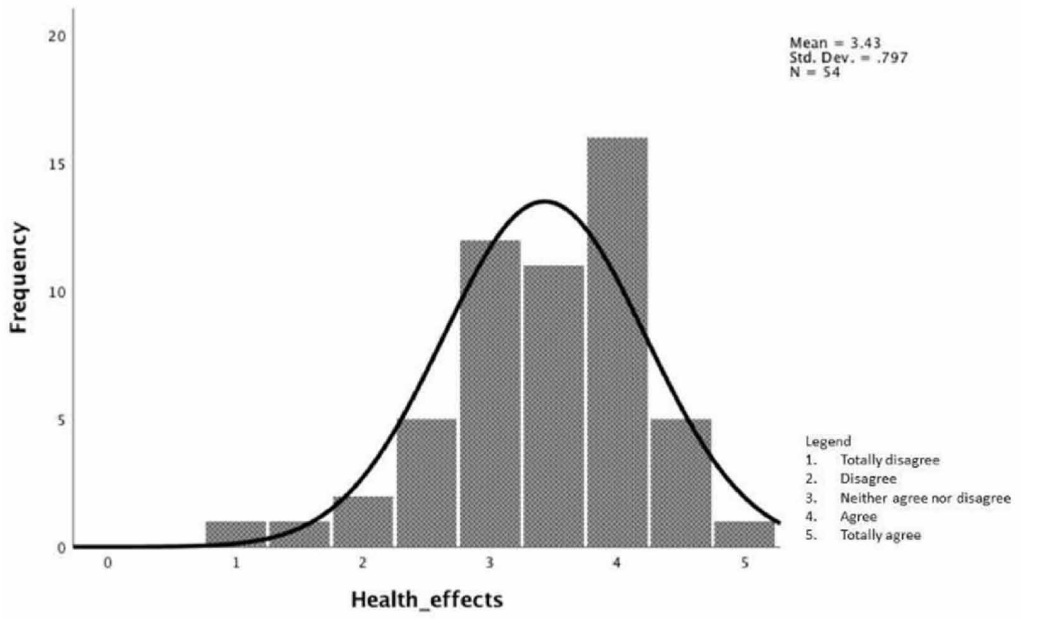
In the data analysed, there were some items that could not be grouped or categorised because they did not relate to each other. Other items mentioned as disadvantages of using electronic textbooks included lack of connectivity to read some of the electronic textbooks. Interviewees also mentioned that at times the smartboards freeze, and as result teaching and learning are disturbed [INTCOORD2]. Regular supply of electricity is an external factor beyond the control of GDE and the schools. During power outages, the ICT devices cannot function thus hampering teaching and learning [INTCOORD2 & INTPRINC1].

Another obstacle is that for some users, it is difficult to read from an electronic device; therefore, the electronic textbooks cannot be read (Al-Ali & Ahmed, 2015). In other studies, students found that the extra features and the layout of certain electronic textbooks make them very difficult to use (Al-Ali & Ahmed, 2015; Bossaller & Kammer, 2014; Sloan, 2012). Thus, the use of electronic textbooks in these instances contributes to slower reading and reading comprehension (Al-Ali & Ahmed, 2015; Falc, 2013).

CONCLUSION

The electronic textbooks are becoming popular in schools. Since the adoption of smartphones, most schools appear to be aware of the advantages of using electronic textbooks specifically and ICTs in general. Most interviewees are excited and appreciate the provisioning of ICT devices by the department of education. They acknowledge that they use the available electronic textbooks and are optimistic that in future more electronic textbooks than printed textbooks will be used in the classroom. Teachers, in their eagerness to embrace technology in the classroom, acknowledged

Figure 11. Histogram on Health effects of electronic textbooks



the support provided by the department of education and wished that it should not be stopped, but rather extended to other subjects and grades. Both the questionnaire respondents and the interview participants acknowledged that the use of electronic textbooks in the classroom could have positive effects on the education system.

The cost of electronic textbooks is much cheaper than the printed textbooks. The use of electronic textbooks may enhance the effectiveness of teaching and learning because most electronic textbooks are multimedia rich and allow for annotation and remote access. Most schools are anxious to embrace the roll-out of the ICT project in all the grades.

The electronic textbooks used presently do not have full annotative functions and rich multimedia. The electronic textbooks developers have not developed electronic textbooks for all the subjects. The subjects targeted are Mathematics, Sciences and Languages. The lack of electronic textbooks in other subjects discourages other teachers from engaging in ICT use in the classroom. Also, the challenge regarding the availability of electricity poses a serious challenge for the ICT in education project.

The issue of licensing is another challenge raised that may militate against the cost effectiveness of electronic textbooks. Another challenge is the unavailability of connectivity to access other online resources. Despite the challenges experienced in schools that use ICT in the classroom, there is a positive response to accepting and using the available ICTs and electronic textbooks.

Gauteng provincial schools provided with ICTs (including electronic textbooks) are eager to use them in the classroom. Not all the schools in Gauteng province are provided with ICTs. Only a few schools are fully ICT capable, meaning that all the grades in the secondary school are provided with ICTs. The school principals and the ICT coordinators (including teachers) are aware of the perceived usefulness of electronic textbooks. Despite the limited experience in using ICTs in the classroom, most teachers are implementing and using the knowledge and skills acquired during the training sessions provided by the department of education. Therefore, most schools are eagerly waiting for the department of education to continue providing ICTs and specifically the wide variety of electronic textbooks.

Further study needs to be considered on whether the support mechanisms provided by government and private stakeholders are sufficient to realise the full potential of integrating ICTs in the classrooms.

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