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Effects of Mobile Phones on Students' Academic Performance in Religious Education

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ABSTRACT

This study examined the effects of the mobile phones on high school students' academic performance in Religious Education. The aim of the study was to test the efficiency using of mobile phones against the lecture method. Seventy-two participants (31 females and 41 males), in the Kingdom of Eswatini, participated in this quasi-experimental study. Purposive sampling was used to select participants who were randomly assigned to two groups (control and experimental). The control group was taught the topics, "The birth of the church and its spread" using a lecture method, whereas the experimental group was taught the same topic using mobile phones. The independent t-test and the dependent t-test were used to analyse data. The independent variable used was "teaching method," with two levels: lecture versus mobile phones. The dependent variable was the participants' scores derived from the pre-test and post-test. The independent t-test and the dependent t-test were used to analyze data. The results revealed that there was a significant difference in favor of the experimental group. The study concluded that the use of mobile phones improved students' academic performance in Religious Education, and thus the integration use of mobile phones in the teaching of Religious Education is recommended in order to improve performance.

Keywords: Information and Communication Technology (ICT), lecture method, mobile phones, Religious Knowledge

INTRODUCTION

Teaching and learning environments of the 21st century are changing rapidly due to the incorporation of Information and Communication Technologies (ICT) in education. Mobile phones, in particular, have gained attention due to their applications in education. Smart phones, which can serve as a mini-computer, are efficient learning tools (Alsied, 2019). Research on the use of mobile phones in education shows that they can enhance students' academic interest (Squire & Dikkers, 2012). The purpose of the current study was to explore the effects of using mobile phones on high school students' academic performance in Religious Education (RE) in contrast to using the lecture method.

Information and Communication Technology in Education

The use of Information and Communication Technology (ICT) has resulted in tremendous progress in the field of education in developed and developing countries, and it has also brought a revolution in the teaching and learning process by changing the roles of teachers and learners (Kusi, 2017). The success of integrating mobile phones into the teaching and learning process depends on the degree of interaction and communication between teachers and learners (Woolfolk, 2014). Today, teachers have enormous opportunities to transmit knowledge and skills to students with the help of educational technology materials, many in the form of audiovisual materials.

Information and Communication Technology in Eswatini

In Eswatini, the government established a fully-fledged ICT Ministry in 2009 to promote economic growth and development. The government of Eswatini acknowledged the significant role which ICT plays as the country moves toward a knowledge-based society as stipulated in the Eswatini National Education and Training Sector Policy (2018). Moreover, one of the objectives stipulated in the policy is to integrate ICT in both primary and secondary schools. Since Eswatini is a developing country, certain technological developments are slow. A number of schools and tertiary institutions have begun to introduce e-learning through an initiative by the network service provider, Eswatini Mobile Telephone Network (MTN). The initiative has helped schools access curriculum content and other materials through mobile phones. A number of teachers have been introduced to e-learning through this initiative by the Ministry of Education and Training (MOET) with the assistance from MTN. Other schools have taken the route of not using ordinary textbooks and using e-books. Therefore, tablets and e-book readers have become a focal point

Statement of the Problem

The Eswatini General Certificate of Secondary Education (EGCSE) RE examination results show that learners' performance is poor in RE. The pass rate from 2012 to 2016 ranges between 36.65% and 42.06% achieved in 2013

and 2016 respectively (Examinations Council of Swaziland, 2016). Research attributes this problem to teaching methodology. According to Adunola (2011), poor academic performance among learners is fundamentally linked to application of ineffective teaching methods by teachers when imparting knowledge to learners. Indeed, studies such as Adeoti and Olufunke (2016), Ganyaupfu (2016) as well as Akinfe, Olofimiyi, and Fashiky (2012) found a significant relationship between teaching methodology and students' academic performance. Ganyaupfu (2016) also posited that the effectiveness of teaching methods is often reflected by the achievements of learners. Thus, it can be said that the teaching style is also a factor in student achievement as it determines success or failure. In light of the statistics above, there was a need to examine the effects of different teaching methods in RE. As Steel (2012) correctly observed, very few studies have investigated students' personal use of mobile applications for learning and the learning benefits. Therefore, this study compared the lecture method (traditional) which is the most prevalent in Eswatini (Shongwe, 2010) and mobile phone assisted learning (modern) to which no local studies have been found in the teaching of RE.

The Lecture Method

The lecture method is a common teaching method. Lecturing is when an instructor is the central focus of information transfer (Kelly & Brandes, 2001). Typically, an instructor will stand before a class and present information for the students. The main criticism against the lecture method is that very little exchange occurs between the instructor and the students during a lecture. That is, when the lecture method is used, the learners become passive recipients of information with little participation in their own learning. It can be noted that the success of the lecture method, being a teacher-centered technique, is largely dependent on the teacher's skill in delivering content. In other words, success is typically driven by an instructor's ability to present information effectively. Therefore, less effective "presenters" tend to see less transfer of knowledge and skill. This is the major weakness of the lecture method. Because the teacher controls the transmission and sharing of knowledge, the lecturer may attempt to maximize the delivery of information while minimizing time and effort. Therefore, both interest and understanding of students may get lost. As such, students taught using the lecturer method have little opportunities to engage with the subject being taught (Boud & Feletti,

1999). The approach is more theoretical and less practical. It does not apply activity-based learning to encourage students to learn real-life problems based on applied knowledge. Coincidentally, in the context of Eswatini, Shongwe (2010) also observed that Religious Education lessons in the local high schools are dominated by traditional teaching methods such as lecturing, note giving, question and answer as well as too much reliance on textbooks. This is a cause for concern as the Examinations Council of Swaziland (2016) reported poor performance of students in Religious Education in EGCSE in the past 5 years.

Mobile Phone Assisted Learning

Mobile phone assisted learning is a quite new field in research. It offers a way of gaining new knowledge to improve the mastery of skills. This creates a method of learning very different from conventional methods commonly used in teaching and learning. Research shows that mobile phones can be used to leverage instruction (Roschelle, & Pea, 2002), empower place-based learning (Squire, Jan, & Matthews, 2007), and amplify learning (Squire & Dikkers, 2012). Mobile phone assisted learning allows RE teachers to offer access to authentic content, communicative religious practice, and task completion (Chinnery, 2006).

Integrating Mobile Phones in Religious Education

Mobile phones fit well with the multisource nature of RE because they give a "total picture" of the subject matter (Hennessey, 2003). That is, mobile phones not only facilitate understanding, but also promote interest, analytical research, critical thinking and enjoyment among students (Hesson & Shad, 2005). In contrast to the lecture method, mobile phones are inclined toward discovery learning, which is a learner-centered approach (Greitzer, 2002). Slavin (1996) submitted that a learner-centered approach also motivates goal-oriented behavior among students and is very effective in improving student achievement. Unlike the lecture method, mobile phone assisted learning is considered more effective since it does not centralize the flow of knowledge from the lecturer to the student (Lindquist, 1995). Since learning is a process that involves multi-level cognitive tasks, such investigating, formulating, reasoning, and using appropriate strategies to solve problems, it can be argued that it becomes more effective if the students are tasked to perform rather than just asked to remember some information as is the case with the lecture method. Ganyaupfu

(2016) asserted that a typical learning environment with a presentation from the course teacher accompanied by a lecture neither promotes learners' participation nor builds the required level of reasoning among students. Students build a better understanding of the main concepts more effectively when they are actively involved in their own learning. That is to say, when they are active participants rather than passive recipients of information. Furthermore, mobile phones promote collaboration between pupils and could contribute to the development of religious thinking. Mobile phones eliminate the limitations posed by the lecture method by encouraging reflection, analysis, and understanding (Hennessey, 2003). Therefore, mobile phones can be incorporated in the teaching of RE as an alternative to the lecture method. Ababneh (2017) maintained that mobile phones have a variety of learning opportunities such as peer collaboration where learners can share information among themselves and engage in discussion regardless of time and space.

Hypotheses

The following hypotheses were formulated for this study:

H_0: There was no significant difference between the pre-test and post-test for control group when taught the birth of the church and its spread using the lecture method;

H_0: There was no significant difference between the pre-test and post-test for experimental group when taught the birth of the church and its spread using the mobile phones;

H_0: There was no significant difference between the post-tests of students taught the birth of the church and its spread using the lecture method and students taught using mobile phones

Significance of the Study

The significance of the study is that it contributes immensely to the various educational stakeholders. First, it will be useful to students in determining the many opportunities the mobile phone technology can provide in their academic pursuits. The study will guide Religious Education teachers on how integrating mobile phone technology makes a difference in RE as it creates a richer environment for teaching and learning. Moreover, curriculum planners and

policy makers will be aware of the numerous possibilities of using mobile phone technologies in learning, so as to assist in implementing and designing activities to support the various learning styles. In addition, the findings of this study will also complement other studies and provide appropriate information for content developers on mobile learning. This research will further contribute to the body of educational research in that it explored students' academic performance with multiple indicators of learning, which are satisfaction, learning style, and performance.

Limitations of the study

This study is limited by the sample size. Usually experimental studies are more decisive with a large sample. Also, this study was conducted in one school and that could not preclude participants' interaction during the experimental stages. Furthermore, other topics in RE were not explored as they were beyond the scope of this study. The study focused only on Form Five RE students in the Manzini Region of Eswatini, and other regions were not included in the study. Thus, the results are not generalizable to other regions of the country.

REVIEW OF LITERATURE

The study is underpinned by the Social Constructivism by Vygotsky (1978). Social constructivism is a theory of knowledge in sociology and communication that examines the knowledge and understandings of the world that are developed jointly by individuals (Amineh, 2015). Vygotsky (1978) stated that a learner has to undergo three stages, for example, current ability, zone of proximal development, and extended zone due to favorable conditions. From these three tenets or stages, the current study draws from the zone of proximal development (ZPD). The ZPD implies that cognitive development stems from social interactions from guided learning as children and their partners co-construct knowledge. This principle is particularly relevant to the current study because it relates to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a skilled partner. Vygotsky (1978) considered the ZPD as the area where the most sensitive instruction or guidance should be given - allowing the child (learner) to develop skills they will then use on their own - developing higher mental functions. This theory, therefore, brings together teacher-centered and learner-centered teaching approaches. For instance, the

lecture method aligns with sensitive instruction or guidance from skilled partners (teachers) while mobile phones correspond to what can be achieved independently by the learner. This is not to say mobile-assisted learning requires no guidance. Rather, it means there is minimal supervision and learning; students learn mainly through discovery.

Studies That Have Shown No Significance When Lecture Method Was Employed

A number of studies support the view that the lecture method as a way of teaching is more beneficial to more learners. For instance, Arquero-Montano (2004) studied the use of two teaching methods in different cases fostering the development of competencies and skills, such as communication skills and accounting problem solving. The results showed no significant differences. Clinton and Kohlmeyer (2005) designed an experimental study on the effects of a lecture method on the performance of the students in general and the subject taught, in particular. The results revealed no significant difference between the two groups. Hwang, Lui, and Tong (2005) used a study on the effects of collaborative teaching versus lectures. Despite all the evidence that collaborative teaching had better results than traditional lecturing, there was no compelling evidence in support of one method over the other. A study by Hosal-Akman and Sigma-Mugan (2010) considered the performance of students taught by two different methods. Again, no significant difference was found between the two groups and teaching practices.

Studies That Have Shown Significance When Mobile Phones Were Employed

Some studies have supported the integrating of mobile phones in their learning to boost academic performance. Cubelic and Larwin (2014) examined the impact of the use of selected iPad applications for the remediation and reinforcement of early literacy skills on levels of student achievement. Findings from their study were in favor of the experimental group. Cooke (2010) conducted a cross-sectional survey design and found that students' performance increased with an integration of mobile phones. In Iran, Saedi and Ahmadi (2016) carried out a study on the effects of watching videos in mobile phones in pre-reading on English as a Foreign Language (EFL) learners' reading comprehension and

attitudes. The results also showed that the experimental group outperformed the control group during the post-test. In Nigeria, Arinze and Okonkwo (2012) conducted a study on mobile phones in secondary schools and students' academic performance in Social Studies. The findings of the study revealed that mobile phones raised the interest and performance of students in Social Studies. Shabangu (2017) examined the impact of iPads on History learners' academic performance in schools in the Eswatini. Shabangu (2017) reported that the results showed a significant difference in favor of the experimental group. The study concluded that the use of mobile phones improved students' academic performance in History.

From the aforementioned studies, it can be said different conclusions have always been reached on the use of mobile phones in education. These disparities are due to various subjects and teaching items used as treatments; for instance, communication skills and accounting (Arquero-Montano, 2004); literacy skills (Cubelic & Larwin, 2014); reading comprehension (Saedi & Ahmadi, 2016); Social Studies (Arinze & Okonkwo, 2012); and History (Shabangu, 2017). Furthermore, the studies were conducted in different contexts and learner characteristics could have been a factor. As previously stated, lecture effectiveness could have been impacted by specific instructors as well. This is another dimension worth investigating which was, unfortunately, beyond the scope of the current study.

Some studies were conducted in Europe (Cubelic & Larwin, 2014; Kutluk, Donmez, Gulmez & Terzioglu, 2015) while others were conducted in Middle East (Aloraini, 2012; Badri, Nuaimi, Guang & Rashedi, 2017; Saedi & Ahmadi, 2016). Another gap observed was on the participants used in the studies. Few studies used students at the secondary level (Arinze & Okonkwo, 2012; Rabiu, Muhammed, Umaru, & Ahmed, 2016; Umar, Dauda & Mutah, 2016), whereas others used participants at the university level (Allen, 2014; Ali, Yaacob, Endut & Langove, 2017; Aloraini, 2012; Roux & Parry, 2017).

Present Study

The present study examined the effects of the lecture method and mobile phones on high school students' academic performance in Religious Education in Eswatini where no similar studies have been found.

METHODOLOGY

This quasi-experimental study was conducted at one high school, located in the western part of Manzini region. Following all research ethics, 72 participants were selected for the study using convenient sampling. But the assignment of treatment to each group was conducted randomly. There were 41 males and 31 females, all studying Religious Education as a core subject. Most of the participants were between the ages of 15 and 20 years old and were day scholars.

Table 1 below shows the demographic information of students sampled for the experimental and control group. It could be seen that out of the 36 participants for the experimental group, 21 were males and 15 were females. Their ages ranged from 15 – 20, and there were 3 repeaters. It could be seen that out of the 36 participants for the control group, 20 were males and 16 were females. Their ages ranged from 15 – 20, and there were 6 repeaters

Procedures

Following all research ethics, data was collected using pre-tests and post-tests. These were identical for both groups and were given on the first day of meeting before any teaching began. The pre-test consisted of 50 objective questions each with four alternative answers per question. The participants completed sentences by circling correct responses from a given set of four alternatives, (i.e., a, b, c and d). The purpose of the pre-test was to determine the baseline knowledge of the students on the birth of the church and its spread, for the purpose of selection. One mark was allocated for each question making a total of fifty marks each. Each group took approximately one hour to complete pre-test. For the pre-test, the book of Acts which had nine topics was selected and given to the participants to check whether or not they were familiar with events done by Apostles. Participants who got all answers correct in the pre-test were not included in the study as they were not considered as "real learners" in the sense that they already had good knowledge of the subject matter, and their post-test performance could not be directly linked to the treatment.

Treatment 1
(Control group - lecture)

The materials that were used in the teaching of control group were the RE textbook V, chalkboard, blue and red board markers, and exercise books. Instructions were given to the students through traditional method, which was by delivering the lesson from the textbook and frequently using the chalkboard. The students solved the exercises given in the textbook in their notebooks. After solving a few of them on the chalkboard, they were involved in drill and practice activity. Daily assignments were assigned to students to be done at home twice a week for the duration of three weeks and these were checked regularly by the researcher. The control group was given guided practice and independent practice throughout the one hour period allocated for the experiment to control the variable of time and to comprehend the main objective of the study.

Treatment 2
(Experimental group – mobile phones)

The experimental group received the treatment of use of mobile phones. This group consisted of one mobile phone for two students. The mobile phones were connected to the internet and loaded with RE software which had different programs related to the topics under study through the main server. For the convenience of the students, information and videos about birth of the church, the spread of the church in Judea, Samaria, and Damascus related to the unit were downloaded from the internet. In addition, for further practice, the websites were given to the students. Websites were chosen according to how closely they matched textbook material in terms of presentation, depth, and breadth of the information. In other words, the textbook was the yardstick or benchmark for the selection of websites for the experimental group. The purpose was to ensure a close match of content between the two groups so that no group was at a disadvantage. That way, the author could have confidence that the outcomes were due to the treatment (teaching method) rather than other

Table 1. Participants (*N* = 72)

Group	Gender	Number of participants	Repeaters	Age Range
Experimental	F	15	2	16 – 18
	M	21	1	15 – 20
Control	F	16	4	15 – 20
	M	20	2	15 – 18

variables. Students were helped to create e-mail addresses, and these were used to chat, to share and to solve their problems related to their study with their researcher and other students or persons who were inclined regarding Religious Education.

After the completion of the session treatment, a post-test, which contained the subtopics under main topic, the birth of the church and its spread but different from the set of questions in the pre-test, was given to the participants. These were high-order questions based on the Bloom's Taxonomy Order Skills. Comparing results of the pre- and post-tests of the participants in both groups was done to see if there were significant differences between these two groups. The tests were marked by the teachers and the scores were recorded.

Validity of the Research Instrument
Brown (2014) described validity as the extent to which a measurement instrument is measuring the concept it is intended to measure and content validity as the level to which the contents of a measurement instrument accurately and fully reflect the concept the instrument is intended to measure. In this study, content validity for the pre-test and post-test were face validated by two experts from the University of Eswatini. These experts validated the instruments on the basis of relevance of the content of achievement tests to the study. The experts corrected the purpose of the study and research questions to suit the study. The content validity of the instrument was ascertained using a table of specification by questions, time of the test, line of questioning, and the allocation of marks. To ensure internal validity the pre-tests / post-tests, were identical for both groups and were written in close succession to avoid any collaboration among the two groups. The researcher made arrangements with other teachers to shift lessons to facilitate this exercise. That is, instead of having one test written in the morning and another in the afternoon, the researcher negotiated with other teachers to swap teaching times to avoid possible collaboration between groups during breaks.

Reliability of the Test
The reliability of the post-test scores obtained by the sample students was tested by using Cronbach alpha method. Correlation coefficient formula was applied to find out co-efficient of reliability from the comparable value of the post-test at 0.05 levels of significance, was found to be 0.95 which was excellent.

Data Analysis
Data was analysed using inferential statistics, mainly an independent and dependent t-test. For instance, a paired sample t-test was used to determine if there was a significant difference between the pre-test and post-test of the control group. The same question had to be answered in respect to the experimental group. Zimmerman (2011) explained that a paired sample t-test compares means from the same group at different times. A paired sample t-test was appropriate in the study because it provided answers to research question 1 and 2. A dependent t-test, on the other hand, compares the means of two independent groups in order to determine whether there was statistical evidence that the associated population means were significantly different (Shulman, 2004). To ensure validity and reliability, all the assumptions of a t-test were observed in the study. They were that the observations were independent; the dependent variable was normally distributed for each of the groups in the population, and the variances of each of the population were equal in the population (Yockey, 2008).

FINDINGS
RQ1: Was there a significant difference between the pre-test and post-test for control group when taught the birth of the church and its spread using the lecture method?

Fifty items were used to capture participants' responses on this question. The results are presented in Table 2.

Table 2. A Comparison of the pre-test and post-test within the control group (*N* = 36)

Control Group	*N*	*df*	Mean	*SD*	*t*-value	*p* (2-tailed)
Pre-test	36	35	28.11	6.315	-0.940	0.354
Post-test	36	35	28.39	7.287		

Significance level: 0.05

Table 2 shows that the mean score for the control group taught using the lecture method in the pre-test (M = 28.11, SD = 6.315) was significantly lesser than the mean score of the post-test (M = 28.39, SD = 7.287), t (35)= -0.94, $p < .05$, d = -0.20. Therefore, there was no significant difference between the pre-test and post-test scores of control groups for high school students' academic performance in Religious Education who had learned through the lecture method.

RQ2: Was there a significant difference between the pre-test and post-test for experimental group when taught the birth of the church and its spread using the mobile telephones?

Fifty items were used to capture participants' responses on this question. The results are presented in Table 3

Table 3 shows that the mean score of the experimental group in the pre-test was (M = 29.50, SD = 4.657) was lower than the mean score for the post-test (M = 35.75, SD = 8.323) t (35)= 4.517, p = 0.001, d = 0.99. The effect size for this analysis (d = 0.99) was found to be bigger than Cohen's (1988) convention for a large effect (d = 0.80). The value of t (4.517) was higher than the table value of t (2.49) at 0.05 levels. Thus, null hypothesis 2 was rejected.

RQ3: Was there a significant difference between the post-tests of students taught the birth of the church and its spread using the lecture method and students taught using mobile phones?

The results are presented in Table 4.

In Table 4, the results indicate that the mean score of the control group in the post-test was (M = 28.39, SD = 7.287) lower than the mean score of the experimental group in the post-test (M = 35.75, SD = 8.323) t (70) = -4.517, p = 0.01, d = 0.99. This test was found to be statistically significant. The effect size for this analysis (d = 0.99) was bigger than Cohen's (1988) convention for a large effect (d = 0.80). The findings indicated that the value of t (calculated) of independent sample t-test was 4.517, which was significant (p <0.05) based on the fact that it was larger than the tabulated t at alpha 0.05. Thus, null hypothesis 3 was rejected. Descriptive and inferential statistics explicitly displayed that there was a substantial dissimilarity between the performance of control (M = 28.39, SD = 7.287) and experimental (M = 35.75, SD = 8.323) groups on post-test. The students of experimental group performed better when compared with the students of control group.

Rejecting or failing to reject null hypotheses constructed for the study determined the effectiveness of mobile phones as compared to the lecture method of teaching Religious Education at the high school level. The findings of the study were observed from the calculated t-value and F recorded in tables tabulated against three null hypotheses to achieve the objectives of the study. The following were the findings of the study:

Objective One was aimed at determining the significant difference of the pre-test and post-test for the students taught the birth of the church and its spread using the lecture method. The study revealed that there was no significant difference

Table 3. A Comparison of the pre-test and post-tests within experimental groups (N = 36)

Experimental Group	N	df	Mean	SD	t-value	p (2-tailed)
Post-test	36	35	35.75	8.323		
					-4.517	0.001
Pret-test	36	35	29.50	4.657		

Significance levels: 0.05

Table 4. A comparison of the post-tests between the control and experimental group (N = 72)

	N	df	Mean	SD	t-value	p (2-tailed)
Post-test - EG	36	35	35.75	8.323		
					-4.517	0.001
Pret-test _ CG	36	35	28.39	7.287		

Significance levels: 0.05

between the pre-test and post-test of the control group when Religious Education learning used the lecture method on high school students.

Objective Two sought to determine if there was a significant difference between the pre-test and post-test of students taught the birth of the church and its spread using the mobile phones. The results revealed that the experimental group that used mobile phones was more effective than the group that used the lecture method in learning Religious Education with high school students in the Manzini Region in the post-test. This might be due to the availability of mobile phone facilities at school or home and students who had knowledge and interest in using the mobile phones.

Objective Three compared the difference between the post-tests of students taught the birth of the church and its spread using the lecture method and students taught using mobile phones. The study found that mobile phones were more effective than the lecture method in high school students' academic performance in Religious Education in the Manzini Region. This might be because sufficient mobile phones were made available to them by the researcher and at home.

DISCUSSIONS

The focus of this study to examine the effectiveness of teaching RE to high school learners through mobile phones as compared to the lecture method. The calculated t-value for the control group was not statistically significant, which showed that the application of lecture method in the teaching and learning process did not show any improvement in the academic achievements of students of control group in RE at high school. This outcome corroborates the findings of Hassan (1991) and Moore (1996). The significant results for the calculated t-value of for experimental group indicated the improvement of the experimental group over the control group in academic achievement in RE. These findings were in line with studies by Shabangu (2017) and Kutluk, et al. (2015) where the group taught using mobile phones scored significantly higher in the post-test. There, null hypothesis 3 was rejected because there was a statistically significant difference between the post-tests of both the control and experimental groups.

The results of this study suggested that there was a positive and significant relationship between the use of mobile phones in RE and the students' academic performance. This might be because students with mobile phones were learner-centered involved learners; at the same time the mobile phones were interesting and enjoyable to the learners. Mobile phones offered a large amount of information as opposed to textbooks. With mobile phones, teaching was improved through enhancing an already practiced knowledge; they also introduced new ways of teaching and learning. The mobile phones encouraged independent and active learning. Indeed, using mobile phones in the study encouraged students to process information better and thus enhanced understanding and improved students' memory (Cubelic & Larwin, 2014).

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that the performance of the control group taught via the lecture method during pre-test and post-test was similar. The performance of the experimental group before treatment in the pre-test and after using mobile phones in the post-test was effective. The performance of the experimental group during post-test improved more than the control group performance. The study concluded that the students in the experimental group that were taught using mobile phones performed better than the control group that were taught using the lecture method. It was worth noting that access to mobile phones and actual levels of access and use of iPad by students in the class could have a positive effect of future productivity levels (Arzal, 2013).

Based on the discussion of findings and the above conclusion, it is recommended that students must be trained in Information and Technology (IT) from grass roots to the high school level. Computer laboratories at high schools should be equipped with a sufficient number of mobile phones connected to the Internet. In addition, the Ministry of Education and Training in collaboration with the Ministry of Information and Technology should be develop online tutoring for all subjects at the high school level to meet the demand of Eswatini curricula and students.

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