

**ARE MINIMAL DIGITAL TECHNOLOGY-ENHANCED LEARNING DEVICES, A DEVIL OR MESSIAH TO PERENNIAL PROBLEMS IN THE LEARNING INSTITUTIONS? A SURVEY ON ZAMBIAN SECONDARY SCHOOLS**

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**ABSTRACT**

In 2014, the late Permanent Secretary in the Ministry of General Education in Zambia, Chishimba Nkosha pronounced that Information Communication and Technology (ICT) was a compulsory subject and examinable at Grade 9 although the subject was not going to be used for selection to Grade 10. This policy direction was pronounced in line with the revised curriculum. In November, 2015, several newspapers, mass media and the social media reported that thousands of children sitting for their Grade 9 ICT practical exams were forced to sit for their papers past midnight due to shortages of computers. The situation was further compounded by Zambia Electricity Supply Corporation Company's load shedding as some schools did not have power from as early as 12.00 hours and power was only restored around 22.30 hours.

Despite the pronouncement of making ICT as a compulsory subject at Grade 9, the presence and use of minimal technology enhanced-learning devices such as mobile phones in schools is a serious offence and that has led many learners to be expelled from school or being given force transfers. All public schools in Zambia debar the use of cell phones as they are perceived as distraction. Elsewhere, schools and universities are using these technologies to support learners and teachers.

In this paper, therefore, the theory of technology acceptance and various sub-themes have been discussed. The research is quantitative in nature and it is based on the understanding of the different approaches taken by different institutions on the topic of embracing technology-enhanced learning mobile devices in secondary schools. Literature of various studies which were undertaken, the benefits and challenges were investigated.

The research findings indicate that policy makers should consider introducing the use of mobile phones in secondary schools in order to enhance teacher-preparedness and learner-

performance; provide technical and pedagogical support, and embark on ICT orientation meetings in order to enhance the understanding of the full potential of the minimal digital technology-enhanced learning mobile devices in education as opposed to perceiving them as distractions. Further, the government and cooperating partners in the education sector should consider investing in mobile learning.

**Keywords:** *Learners, Teachers, teaching and Technology-enhanced learning.*

## **INTRODUCTION**

Education is dynamic as a result from time to time, individual, community, national and global needs change, knowledge expands and new technologies emerge. Considering that an effective curriculum should meet these changes, the Ministry of General Education in Zambia revised the curriculum.

Further, the concept of lifelong learning has been advocated for by many education stakeholders. Lifelong learning entails that learning takes not only in the classrooms but also in all kinds of contexts or anywhere. With e-learning, one online educator can teach a lot of learners and issues of shortage of staff, classroom space, teaching and learning materials do not arise.

One of the education goals is to produce a learner who is capable of, “Developing an analytical, innovative, creative and constructive mind” (Educating Our Future, 1996, p.5). In addition to that, in 2013 the Ministry of General in Zambia revised the curriculum. Information Communication and Technology (ICT) was made a compulsory subject (Zambia Education Curriculum Framework, 2013). The subject was introduced in order to equip learners with essential skills necessary for them to have basic knowledge of ICTs.

Despite making ICT as a compulsory subject, all public secondary schools in Zambia perceive some of these minimal digital technologies that can assist to address some of the challenges as distractions. Therefore, in the proceeding discussion, a number of sub-themes are put forward for discussions in relation to minimal digital technology enhanced-learning mobile devices, with specific reference to secondary schools in Petauke district, Eastern Province, Zambia.

## **STATEMENT OF THE PROBLEM**

The Ministry of General Education attaches great importance to the teaching of ICT as a curriculum subject. Nevertheless, ICT has been infuriated with inadequate computers. Other ICT minimal digital technology enhanced-learning devices such as mobile phones are not allowed to support teaching and learning. Some schools have inadequate teachers and shortage of classroom spaces especially urban day secondary and primary schools.

Therefore, this research seeks to find answers to the question, ‘Are minimal digital technology-enhanced learning devices, a devil or messiah to perennial problems in the learning institutions? A Survey on Zambian secondary schools’.

## **OBJECTIVES OF THE STUDY**

The objectives of the study are to:

- ❖ Find out if minimal digital technology-enhanced learning devices can support and enhance teaching and learning.
- ❖ Get the views on the reasons why secondary schools are prohibiting learners to have and use mobile phones in schools.
- ❖ Find out if the use of some kind of mobile phones or mobile learning software would improve overall success of learning in and away from school.
- ❖ Learn if mobile learning can address the annual challenges such as shortage of teachers, long distances learners walk, inadequate classroom spaces and shortage of teaching and learning materials in schools.
- ❖ Find out if mobile phones can strengthen collaboration, knowledge sharing and networking among learners themselves, learners and teachers or teachers themselves.

## **INTERVIEW QUESTIONS**

The study was guided by the following main questions:

1. Would you agree that having school materials such as lesson slides/teaching notes, open educational resources and practice quizzes available on learners’ and teachers’ mobile phones would be beneficial to their study, teaching and learning processes?
2. Would you invest public resources and personal time learning to use and installing software or best educational apps that can help learners to solve mathematical problems, learning languages, Sciences and those apps that could make educational resources

available on mobile phones in order to improve teacher preparedness and learner performance?

3. Do you agree that minimal digital devices such as mobile phones can address the shortage of staffing, inadequate classroom space and long distances learners usually cover if learning can move away from offline to online using mobile phones and other modern digital devices?
4. Do you agree that mobile phones can enhance collaboration, knowledge sharing and networking among learners or teachers?

## **SIGNIFICANCE OF THE STUDY**

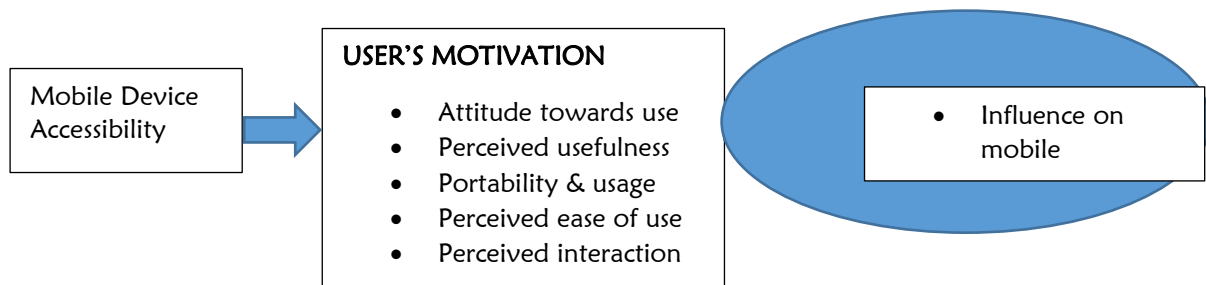
The significance of the study are as follows:

- ❖ Helps cooperating partners in education to consider embarking on projects in the area of Information Communication and Technology.
- ❖ Helps the investors to consider investing in minimal digital technology-enhanced learning devices especially in developing countries.
- ❖ Benefits people working in resource-impooverished environments and in backgrounds where education policies at the institution and political levels are not aligned.
- ❖ Informs teachers to consider mobile phones as potential teaching and learning aids in Information Communication and Technology.
- ❖ Helps the secondary school learners to have access to information in learning and acquisition of knowledge and skills at anytime and anywhere as it is the case of the developed world.
- ❖ Aids the school administrators and families to perceive mobile devices as tools that can enhance teaching and learning as opposed to seeing them as distractions.

## **CONCEPTUAL FRAMEWORK**

Notwithstanding the importance of the minimal digital technology enhanced-learning devices, quite little research has been done in Zambia to influence the acceptance of mobile devices by school authorities, learners, teachers and families. This research discusses the relationships

among all factors that influence mobile learning for secondary school learners as shown in the adopted and modified proposed Technology Acceptance Model (TAM Model) below:



## LITERATURE REVIEW

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) Policy Guidelines for Mobile Learning: Open Access (2013: 14) states, ‘**Mobile learning** involves the use of mobile technology, either alone or in combination with other information and communication technology (ICT), to enable learning anytime and anywhere. Learning can unfold in a variety of ways: people can use mobile devices to access educational resources, connect with others, or create content, both inside and outside classrooms. Mobile learning also encompasses efforts to support broad educational goals such as the effective administration of school systems and improved communication between schools and families.

**Mobile technologies** are constantly evolving: the diversity of devices on the market today is immense and includes, in broad strokes, mobile phones, tablet computers, e-readers, portable audio players and hand-held gaming consoles. Tomorrow the list will be different. To avoid the quicksand of semantic precision, UNESCO chooses to embrace a broad definition of mobile devices, recognizing simply that they are digital, easily portable, usually owned and controlled

by an individual rather than an institution, can access the internet, have multimedia capabilities, and can facilitate a large number of tasks, particularly those related to communication’.

Furthermore, ‘The policy goal of the technology literacy approach is to enable learners, citizens and the workforce to use ICT to support social development and improve economic productivity. Related policy goals include increasing enrolments, making high-quality resources available to all, and improving literacy skills’. (UNESCO 2011:9).

Moreover, ‘Some schools and universities, see these technologies as a distraction’ while ‘others like The Open University, are putting them to use to support learners and teachers’. (H880 TEL, 2019:5).

Moreover, in 1985, Davis proposed the first Technology Acceptance Model (TAM). He articulates ‘Users’ motivation can be affected by three main factors: Perceived Usefulness, Perceived Ease of Use, and Attitude towards Using. ‘Perceived Usefulness’ was defined as the extent to which a person believes that using a system would enhance his or her job performance and effectiveness. Perceived ease use means the extent to which a person believes that using a system would be free of mental effort and attitude towards using plays a critical effect on accepting or rejecting the system. (Ammar, 2014)

## **RESEARCH METHODOLOGY**

The primary research study was done in six (6) sampled secondary schools out of eleven secondary schools in Petauke district of Eastern Province in Zambia and data was collected using a quantitative data collection approach. The techniques which were used for data collection were one-on-one interviews and questionnaires for education administrators, teachers and the learners. Individual responses were then obtained, compiled, processed and analysed to arrive at the thoughts on several issues. The structured questionnaire was prepared to produce information on demographic aspects of the respondents. The demographic aspects included age, gender, grade, name of school, position and department/section bearing in mind research ethical issues.

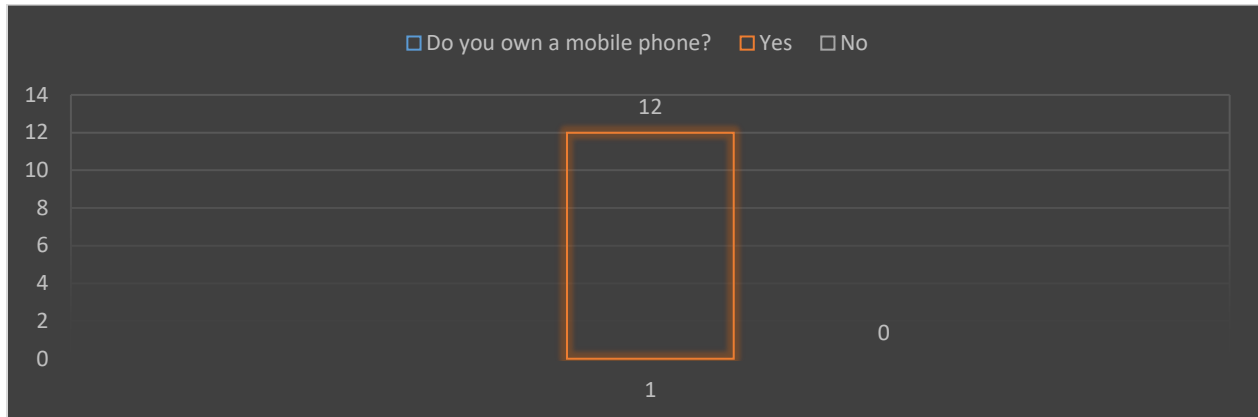
The sample of the survey respondents encompassed the learners in the age groups of 13-19 years across Grade 8-12 and 28 - 58 years in the case of education administrators and teachers. In all, they were twelve education administrators (6 females and 6 males), forty-eight teachers (24 males and 24 females) and ninety were learners that is, forty-five boys and forty-five girls. The respondents, were picked at random.

## **DATA ANALYSIS**

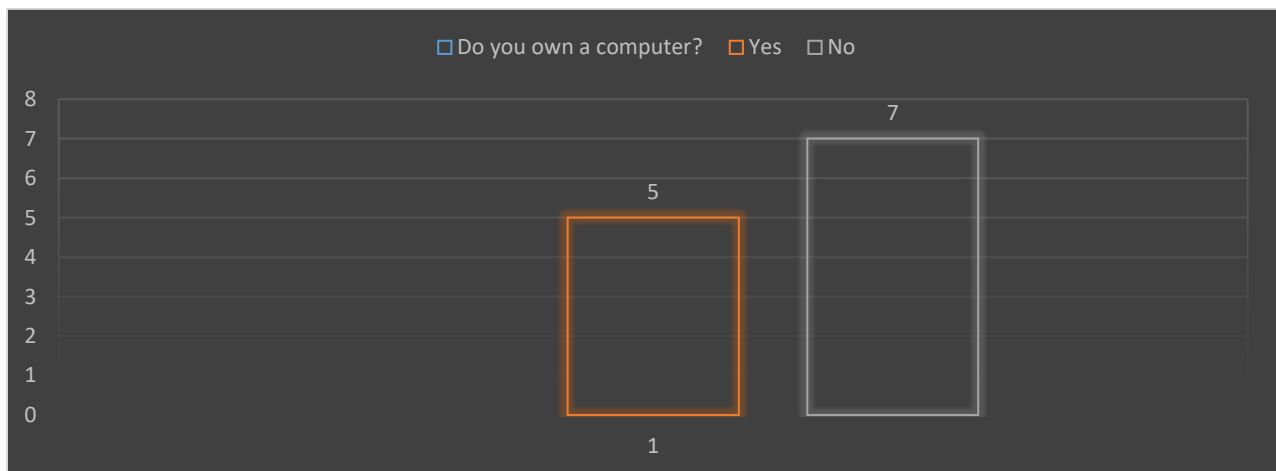
It is important to note that the data in this survey represent education administrators, teachers and learners' perspectives on the variables investigated. The data set was compiled and analysed using Microsoft excel and SPSS. The analysis was done according to the proposed variables that are influencing the use or rejection of minimal digital technology-enhanced learning mobile devices using graphs, tables and pie charts as illustrated below: The figures below show the twelve sampled education administrators at school and district level who responded to the interview questionnaire for administrators. Part one, shows the responses given by the 12 Education Administrators while part two, illustrates the responses of 48 teachers. Then, part three represents the responses of 90 learners.

## PART 1: EDUCATION ADMINISTRATORS

**Figure 1.1**

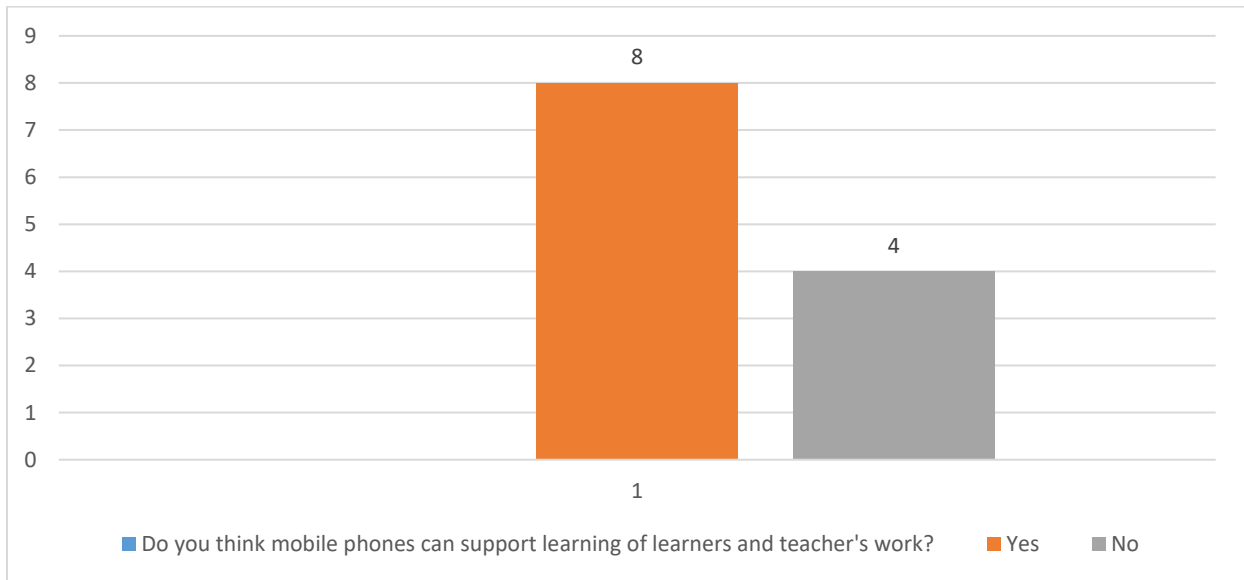


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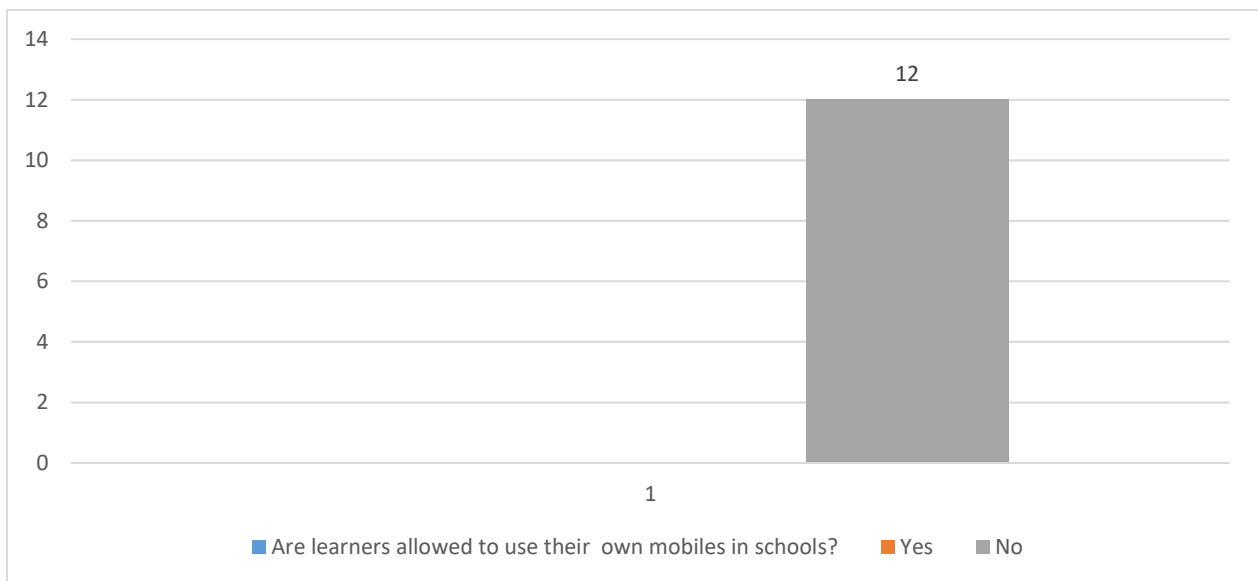




**Figure 1.3:**



**Figure 1.4:**



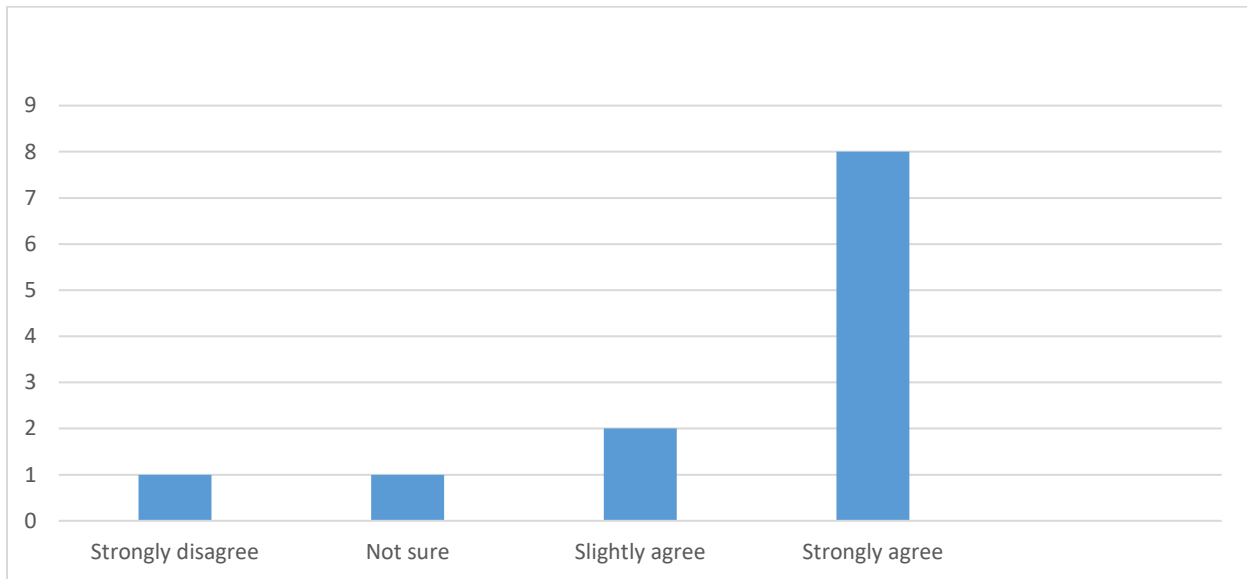
During the face-to-face interview, the following reasons were given as to why school authorities do not allow learners to use mobile phones in schools:

- i. Learners may not concentrate on studies.

- ii. Mobile phones promotes immoral behaviour among learners.
- iii. Learners may be exposed to pornographic materials.
- iv. It is the education policy.

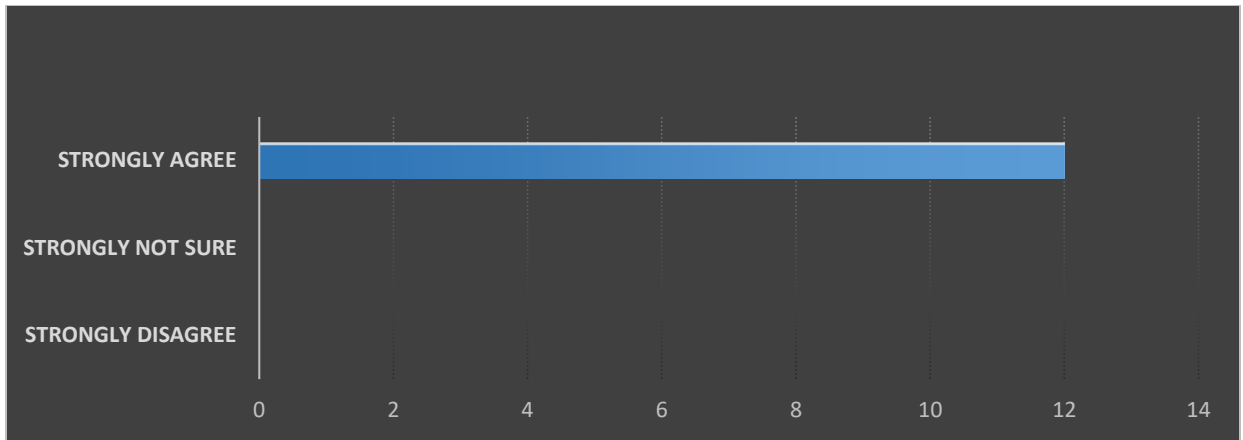
**Figure 1.5**

Would you agree that having school materials such as lesson slides, teaching notes, open educational resources and practice quizzes available on learners' and teachers' mobile phones would be beneficial to their study, teaching and learning processes?



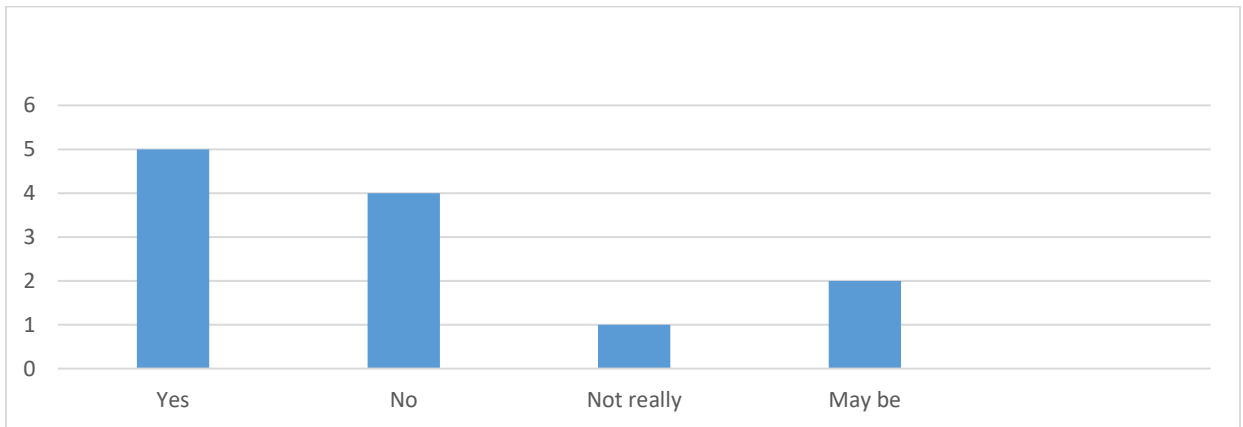
**Figure 1.6**

Would you invest public resources and personal time learning to use and installing software or downloading best educational apps that can help learners to solve mathematical problems, learn languages, Sciences and those that could make educational resources available on a mobile in order to improve teacher preparedness and learner performance?



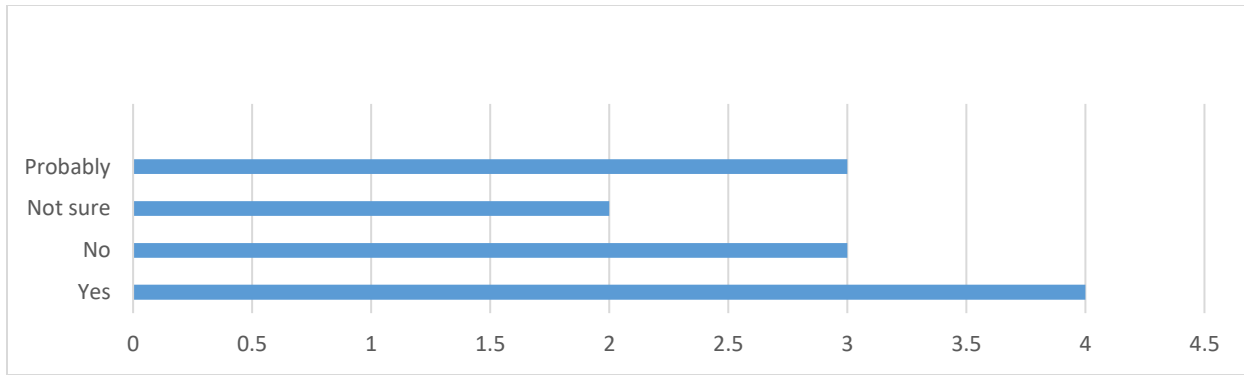
**Figure 1.7**

Are you willing to or able to allow learners or parents to purchase modern minimal digital devices such as mobile phones if you thought it would improve teacher preparedness and enhance learning and learner performance in your school or in the ministry?



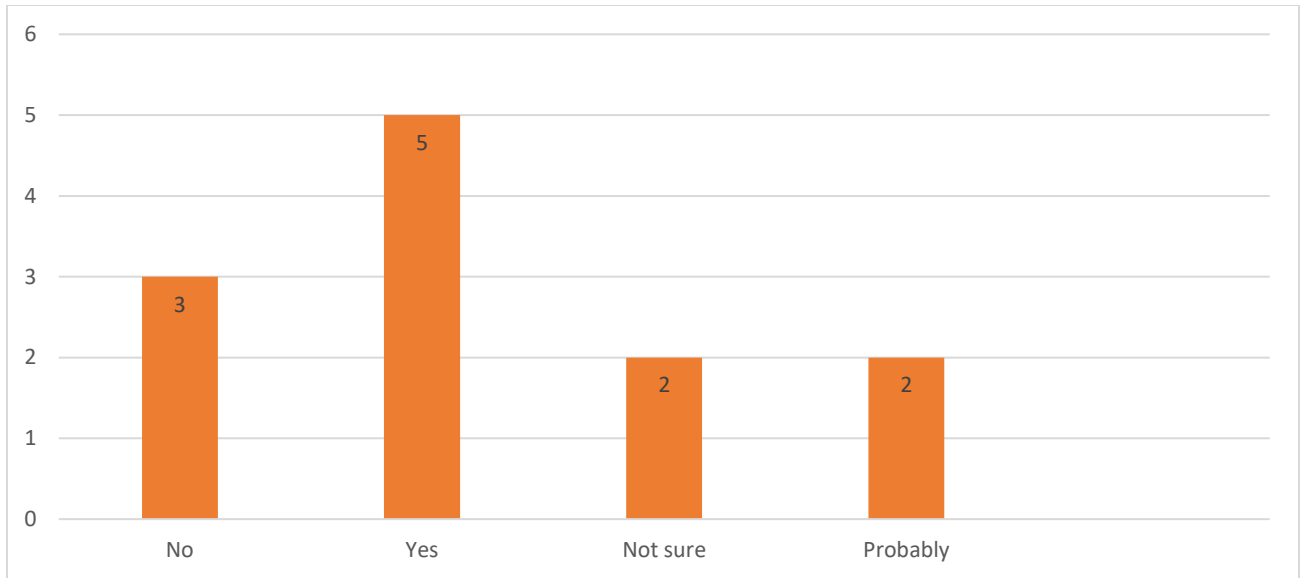
**Figure 1.8**

Do you feel that the use of some kind of mobile phones or mobile learning software would improve overall success of learning in your school or ministry?



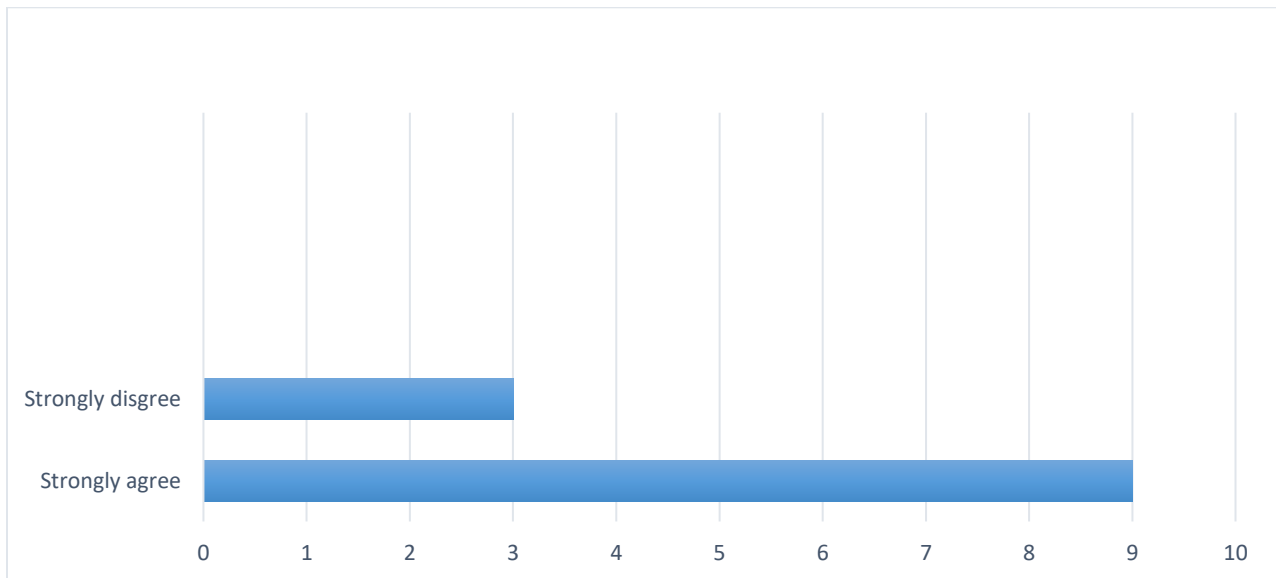
**Figure 1.10**

Do you agree that that online learning using mobile devices can address the challenges of inadequate classroom space, shortage of teaching staff and long distances which learners cover to go to school?



**Figure 1.11**

Do you agree that mobile phones can enhance collaboration, knowledge sharing and networking among learners themselves, with teachers or among teachers themselves?



When the respondents were asked to state the anticipated challenges of introducing mobile learning in the school and suggest a solution to each challenge, the following responses came out strongly among the respondents:

## CHALLENGES

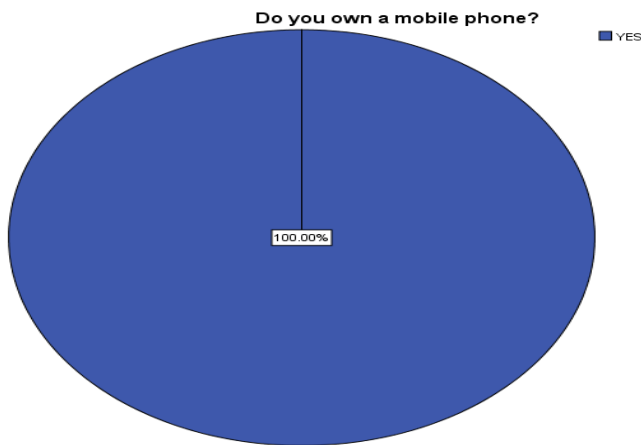
1. Poor internet connectivity.
2. Lack of resources to procure mobile devices.
3. Load shedding and lack of electricity.
4. Loss of jobs.

## SUGGESTED SOLUTIONS

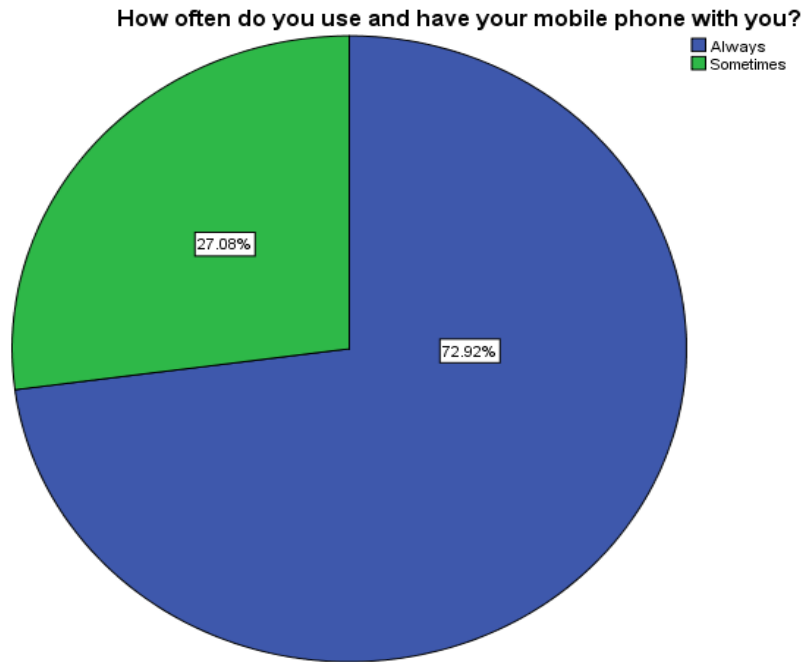
- Companies with strong and reliable internet need to come on board.
- Schools need to be installed with clean and reliable electricity.
- The concerned ministry and cooperating partners need to increase funding.

## PART 2: TEACHERS' QUESTIONNAIRE

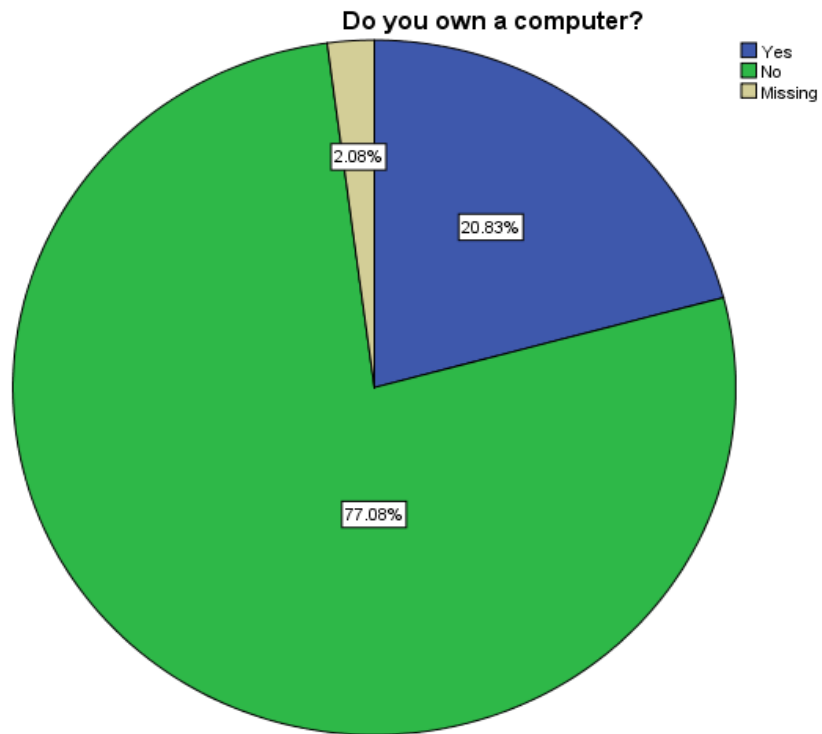
**Figure 2.1:** One hundred percent of the respondents own a mobile phone.



**Figure 2.2:** 72.92% of the respondents always use their mobile phones whereas 27.08% sometimes they use it.



**Figure 2.3:** 20.83% of the respondents own a computer while 77.08% do not.



**Figure 2.4**

Would you agree that school materials such as lesson slides, teaching notes, open educational resources and practice quizzes available on learners and teachers' mobile phones would be beneficial to their study, teaching and learning process?

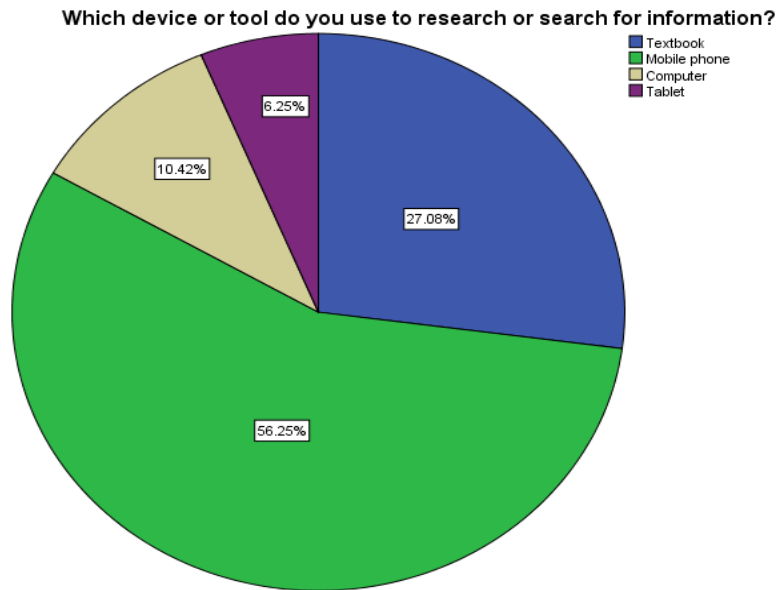
Responses	Frequency	Percent	Valid %	Cumulative %
Valid Strongly Disagree	5	10.4	10.4	10.4
Valid Not sure	3	6.3	6.3	16.7
Valid Slightly agree	9	18.8	18.8	35.4
Valid Strongly Agree	31	64.6	64.6	100.0
Total	48	100.0	100.0	

**Figure 2.3**

Would you invest public resources and personal time learning to use and installing software or best educational apps that can help learners to solve mathematical problems, learning languages, sciences and those apps that could make educational resources available on mobile phone in order to improve teacher preparedness and learners performance?

Responses	Frequency	Percent	Valid %	Cumulative %
Valid Probably Not	2	4.2	4.2	4.2
Valid Probably	8	16.7	16.7	20.8
Valid Yes	38	79.2	79.2	100.0
Total	48	100.0	100.0	





**Figure 2.4** Above shows 56.25% of respondents who use mobile phones, 27.08% use textbooks phones to research, 10.42% use computers and 6.25% use tablets.

**Figure 2.5:** Enhancement

Do you think your Mobile phone can support learning of learners and the teacher's work?

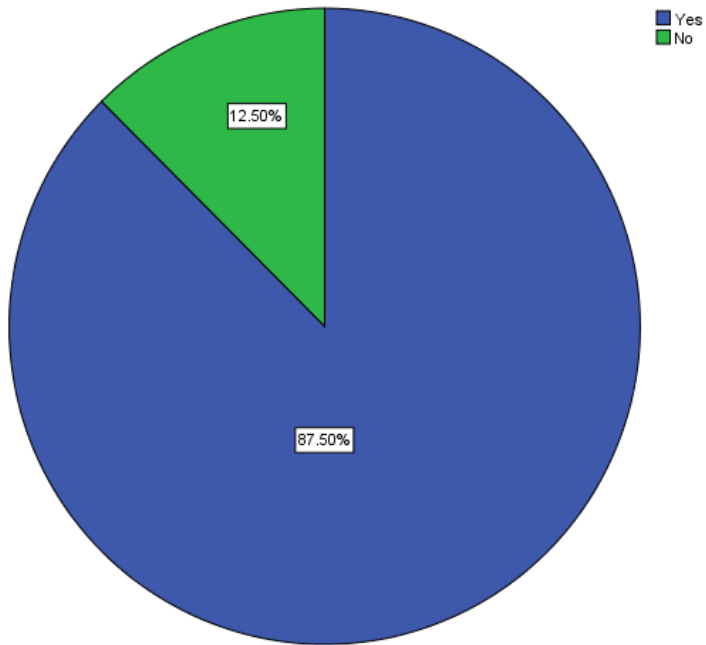
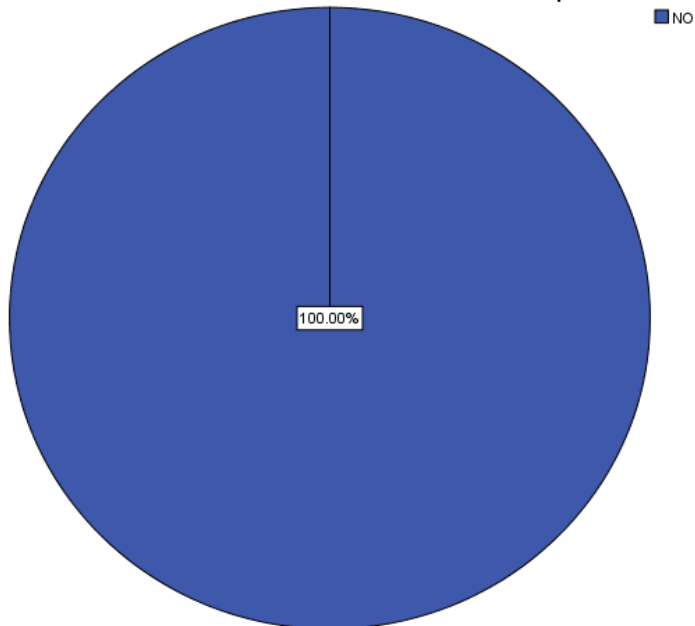


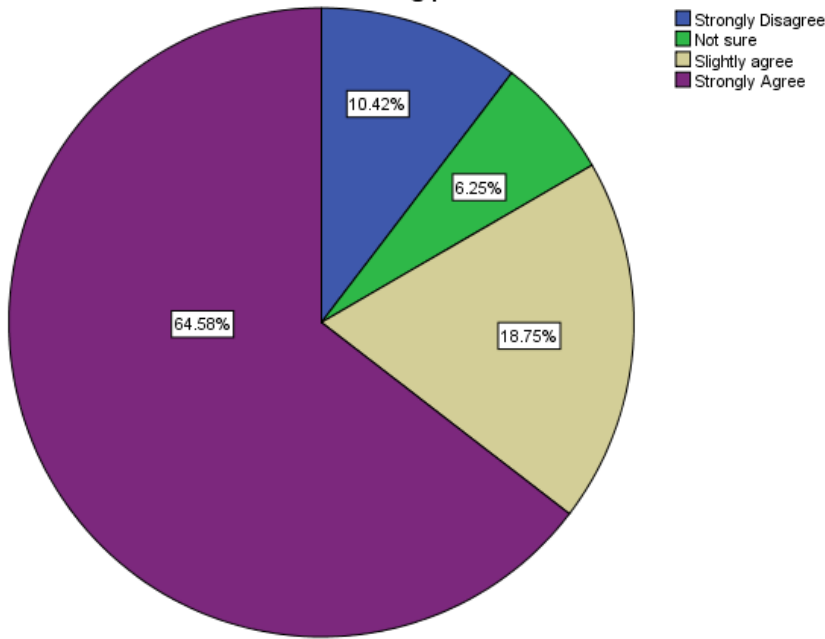
Figure 2.6: Ban

Are learners allowed to use their own mobile phones in school (s)?



**Figure 2.7:** Usefulness

Would you agree that school materials such as lesson slides, teaching notes, open educational resources and practice quizzes available on learners and teachers' mobile phones would be beneficial to their study, teachings and learning process?



### PART 3: LEARNERS' QUESTIONNAIRE

The tables and pie charts below show the responses of learners:

**Figure 3.1**

Do you own a mobile phone?

Responses	Frequency	Percent	Valid %	Cumulative %
YES	44	48.9	48.9	48.9
Valid NO	46	51.1	51.1	100.0
Total	90	100.0	100.0	

**Figure 3.2:**

Are you allowed to come with a mobile phone in school?

Reponses	Frequency	Percent	Valid %	Cumulative %
Valid No	90	100.0	100.0	100.0

**Figure 3.3**

Is there any specific time that you are allowed to use your mobile phone in school?

	Frequency	Percent	Valid %	Cumulative %
Valid Not at all	90	100.0	100.0	100.0

**Figure 3.4**

What happens if you are found in possession of a mobile phone illegally in school?

Responses	Frequency	Percent	Valid %	Cumulative %
Valid Automatic force transfer	9	10.0	10.0	10.0
Warned and punished severely	22	24.4	24.4	34.4
Phone is confiscated and destroyed	7	7.8	7.8	42.2
Charged with a penalty fee	3	3.3	3.3	45.6
Given a call parents letter (CP)	49	54.4	54.4	100.0
Total	<b>90</b>	<b>100.0</b>	<b>100.0</b>	

**Figure 3.6**

Which activity do you mostly engage in on your mobile phone?

Responses	Frequency	Percent	Valid %	Cumulative %
Valid SMS/MMS	14	15.6	15.6	15.6
Phone calls	25	27.8	27.8	43.3
Entertainment	3	3.3	3.3	46.7
Social media	48	53.3	53.3	100.0
Total	90	100.0	100.0	

**Figure 3.7:** Do you research?

Responses	Frequency	Percent	Valid %	Cumulative %
Yes	89	98.9	98.9	98.9
Valid No	1	1.1	1.1	100.0
Total	90	100.0	100.0	

**Figure 3.8:** Which device or tool do you use to research or search for information?

Responses	Frequency	Percent	Valid %	Cumulative %
Textbooks	52	57.8	57.8	57.8
Mobile phone	34	37.8	37.8	95.6
Valid Laptop	1	1.1	1.1	96.7
Desktop	3	3.3	3.3	100.0
Total	90	100.0	100.0	

**Figure 3.9:** Which one do you find interesting between researching using a mobile phone and a textbook?

Responses	Frequency	Percent	Valid %	Cumulative %
Valid Mobile phone	81	90.0	90.0	90.0
Books	9	10.0	10.0	100.0
Total	90	100.0	100.0	

**Figure 3.10:** Do you think your mobile phone can support your learning?

Responses	Frequency	Percent	Valid %	Cumulative %
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Yes	55	61.1	61.1	61.1
Valid No	35	38.9	38.9	100.0
Total	90	100.0	100.0	

**Figure 3.11:** Would you agree that school materials such as lesson slides, teaching notes, videos, audios, e-books, e-libraries and practice quizzes if made available on your phone would be beneficial to your study and learning process?

Responses	Frequency	Percent	Valid %	Cumulative %
Not sure	1	1.1	1.1	1.1
Slightly agree	4	4.4	4.4	5.6
Valid Completely Agree	85	94.4	94.4	100.0
Total	90	100.0	100.0	

**Figure 3.12:** Would you invest personal time learning to use and installing software or best educational apps that can help you to solve mathematical problems, learning languages, Sciences and those apps that could make educational resources available on your mobile phone

Responses	Frequency	Percent	Valid %	Cumulative %
Probably	9	10.0	10.0	10.0
Valid Yes	81	90.0	90.0	100.0
Total	90	100.0	100.0	

**Figure 3.13:** Would you love your teacher sending you take away assignments, remedial work, homework and feedback on your mobile phone?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	80	88.9	88.9	88.9

No	10	11.1	11.1	100.0
Total	90	100.0	100.0	

**Figure 3.14:** Do you feel that the use of some kind of phones or mobile learning software would improve overall success in your learning?

	Frequency	Percent	Valid Percent	Cumulative Percent
No	1	1.1	1.1	1.1
Yes	54	60.0	60.0	61.1
Valid Not sure	24	26.7	26.7	87.8
Probably	11	12.2	12.2	100.0
Total	90	100.0	100.0	

## DISCUSSION OF FINDINGS

In the continually connected world, professionals rely on minimal digital technology-enhanced learning devices to carry out activities. The study findings therefore, clearly indicates that respondents believe that mobile learning can be beneficial in teaching and learning. It also

investigated the potential and usefulness of mobile devices in education and from data collected and analysed it is clear that all administrators, teachers and some learners own the mobile phones but very few have computers. This also reveals the serious shortage computers in schools and among the staff.

Furthermore, the research revealed that it is true that learners are not allowed to use mobile phones in schools. This was evidenced by the following questions: ‘Are you allowed to come with a mobile phone in school?’ and ‘Are learners allowed to use their own mobile phones in school?’ All the respondents indicated that learners are not allowed to own or use a mobile phone in school. However, when the respondents were interviewed to give reasons for not allowing learners to own mobile phones, their responses were that learners were: being distracted from studying; may be exposed to pornographic materials and promote immoral behaviour. However, learners are not allowed to use mobile phones using individual school local policies without backing of the education policy.

In addition to that, the study also revealed that mobile learning can enhance teaching and learning and that it can also address some of the annual challenges such as inadequate teaching and learning materials through open educational resources that can be installed in mobile devices, shortage of teaching staff, classroom space and long distances that learners cover to access education. It was further uncovered that the use of some kind of mobile phones and mobile learning software would improve overall success of learning. Moreover, the research unveiled that mobile devices can strengthen collaboration, knowledge sharing and networking among learners and teachers.

The study also exposed that some teachers, administrators and learners lack knowledge on third party software, educational apps and other educational resources available online which technology can offer to them to maximise efficiency in administration, teaching and learning through their responses like ‘not sure’, ‘slightly agree’, ‘slightly comfortable’ and ‘probably or maybe’.

It also discloses a mix of feelings about the perceived distractions as the respondents agreed that mobile phones can support teaching and learning while on the other hand others disagreed to some



questions. In other words, the study suggests the tensions or contradictions that can arise in situations where policy is well-meant but it is not easily implemented.

## **CONCLUSION**

Based on the findings, it was concluded that minimal digital technology-enhanced learning mobile devices should not be perceived as a devil (distraction) but as a messiah (saviour). It was also vivid that mobile phones are convenient. As educationists, we need to understand the adage that ‘change is inevitable and it is the only constant’. Therefore, we need to embrace the rich, smart and attractive learning possibilities that mobile learning is offering. It is also important that before we change the learner, we must change ourselves as coaches and teachers. This entails that teachers need to be equipped with the relevant ICT skills and tools if they are to facilitate the teaching and learning effectively in the light of the dynamic world.

## **RECOMMENDATIONS**

Therefore, the researcher recommends as follows:

- ❖ Governments should consider aligning well-meant education policies for easy implementation.
- ❖ A significant finding is that there is no overwhelming support for the idea of using mobile phones to access learning and teaching materials amongst administrators and teachers. Work needs to be done in order to enhance the understanding of the full potential of the minimal digital technology-enhanced learning mobile devices and online learning in education as opposed to perceiving them as distractions
- ❖ Policy makers should consider pushing the agenda to introduce the use of mobile phones in schools in order to enhance teacher-preparedness and learner-performance.
- ❖ Computer labs need to be stocked with computers as the current ratio of 1:150 learners clearly show that there is no effective teaching and learning of ICT and access to lifelong learning is compromised.
- ❖ The governments and cooperating partners should also consider setting up industries that shall manufacture computers and other minimal digital mobile technology-enhanced learning devices to improve access to education and lower the prices of buying these technologies as a long term measure.

- ❖ Investors to also consider investing in the clean energy in order to reduce power outages as computer lessons are usually interrupted.
- ❖ It might effective for Governments to invest in providing connectivity so that teachers and learners can be using their own mobile devices.

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