

# A Preliminary Framework for the Adoption of Mobile Learning Technology in Namibian High Schools: A Case of the Erongo Region

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**Abstract:** *The popularity and acceptance of mobile devices is growing. It has reached a stage where various models and frameworks are now being developed to guide its adoption and implementation in the educational sector. This paper focuses on the development of a preliminary mobile learning framework for Namibian High Schools. The usage patterns of mobile devices were analyzed and a preliminary framework was developed to guide the development of a sustainable educational framework for mobile learning in Namibian high schools.*

**Keywords:** Framework, Mobile Learning, ICT, Models, Mobile devices

## 1. Introduction

ICT is one of the innovative potentials required to improve effective and meaningful interaction and collaboration between teachers and learners in high schools. It is a powerful tool that can facilitate easy teaching and learning. ICT, as a pedagogical tool, can improve the quality of high school student's education and support teachers' work within and outside the classroom. It is worthy of note that the application of ICT in high schools will aid effective teaching and learning and the acquisition of necessary skills that will facilitate learners academic progress, enhancement and growth of the nation socially and economically.

The application of ICTs in the form of mobile learning is already playing a great role in the transformation of teaching and learning processes. Many educational and socio-economic benefits can be derived from the adoption of mobile learning in education, particularly in high schools. These include enhanced access to information; better communication through electronic media; facilitation of collaboration. It will also enhance pedagogy through virtual learning and other potentially innovative electronic means. Teachers and learners will have the novelty of choosing more suitable applications which are flexible in time, in place, personalized, reusable and more cost-efficient (Fisser, 2011; Pelliccione, 2013).

Furthermore, mobile technologies have significant interconnection potentialities together with portability, Internet connectivity, and strong computing power (Hsu & Ching, 2013). Together, these innovativeness allow mobile technologies to create great prospects for flexibility and everywhere and anywhere learning (Hwang, Tsai, & Yang, 2008; Looi & Toh, 2014). There is presently, an upsurge in the educational use of mobile devices/technologies (Rushby, 2012) and significant increase in mobile learning research (Kukulka-Hulme & Traxler, 2007).

Coupled with the increasing volume of studies, efforts have been made to develop models and frameworks that will guide the use of mobile learning in the education sector

(e.g., Barker et al., 2005; Laurillard 2002; Park, 2011; Koole, 2006, 2009; Ng and Nicholas, 2012; Vavoula & Sharples, 2009). These frameworks delineate the conceptual relationships among components and hypotheses based on analysis of empirical evidence. In their research, Hsu, Ching, and Snelson (2014) reported some areas of research in mobile learning that should receive attention and have high priority in the next five years, based on the consensus of a panel of international experts of mobile learning. These experts indicated that while there are increasing models and frameworks in mobile learning, more research effort is needed because conceptual and theoretical guidance can help support design and research in mobile learning. In as much as there are varieties of mobile learning frameworks guiding different learning experiences, none has been developed to guide the adoption of mobile learning in Namibian High Schools. The purpose of this current paper is to develop a preliminary framework to will act as a guide towards developing a sustainable framework for the adoption of mobile learning in Namibian High schools.

## 2. Methodology

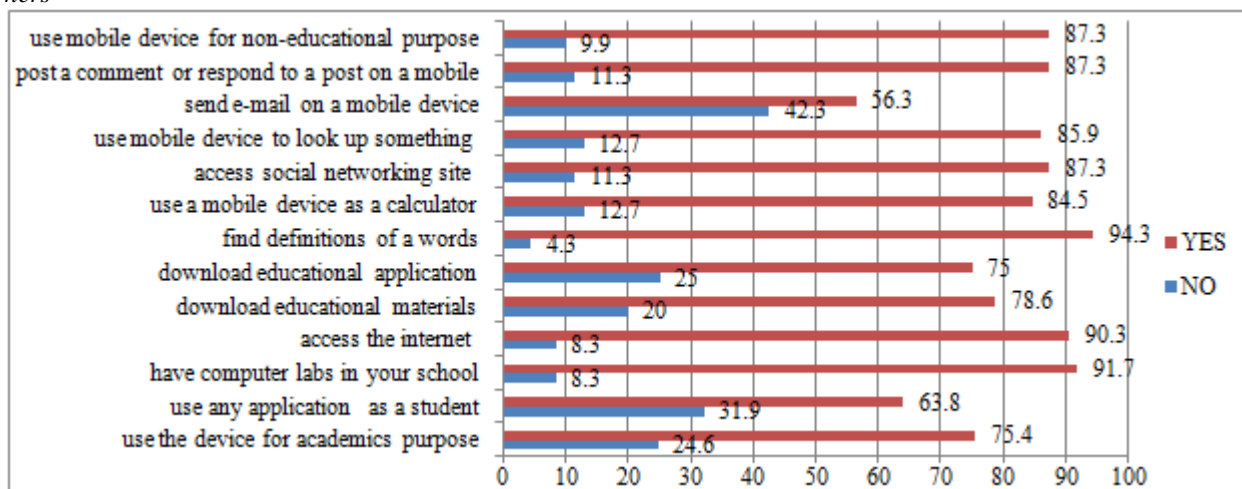
Descriptive survey design was adopted for this study and questionnaires were used to obtain relevant information from respondents to describe the existence conditions and other phenomena. According to O'Leary (2010) information about people's lifestyles, attitudes, beliefs, behaviours and feeling can be collected through the use of questionnaire. This design was found most suitable for this study due to the fact that the study got information from the respondents relative to their attitudes and behaviour. The survey instrument was modified so as to make the questions suitable to the context of mobile learning and the participating population. For instance the words "mobile learning" replaces the word "system". The sample of the study is participants from three (3) high schools in Erongo region. A sample of high school teachers and learners was drawn from the 3 schools. The students were selected primarily from grades (11) and twelve (12). Forty (40) learners were randomly drawn from each school giving a total of one hundred and twenty (120) learners from the high

school. Also eight (8) teachers were randomly selected from each school making a total of twenty four (24) from the three schools. SPSS was used to analyse the data collected.

The purpose of this study is to develop a preliminary framework for the adoption of mobile learning in Namibian high schools. An overview of the analysis and results will be reviewed in this section.

### 3. Results and Analysis

#### Learners

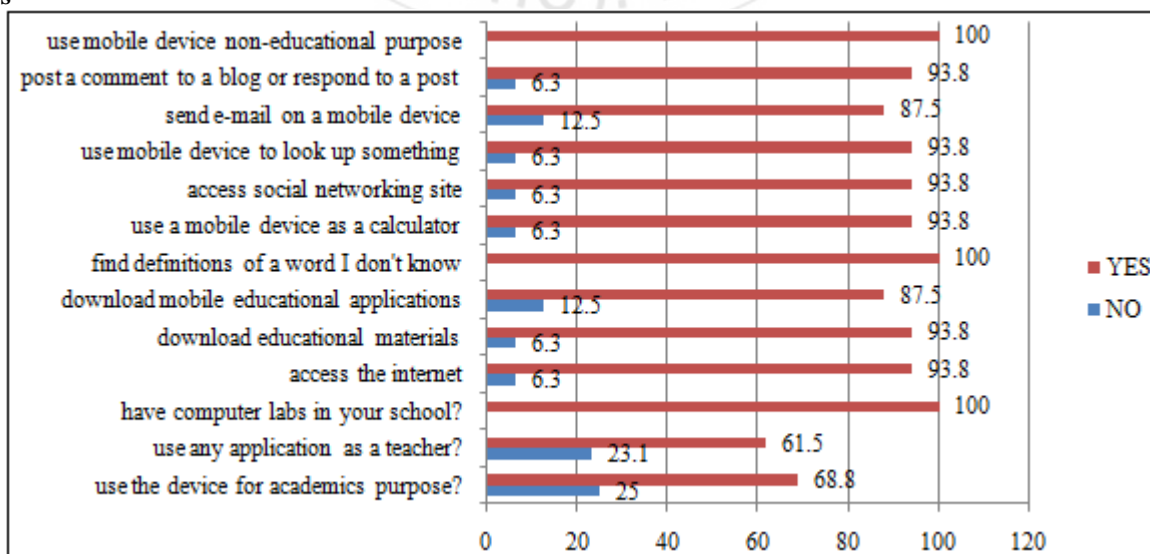


**Figure 1:** Usage Pattern of mobile devices by learners in Erongo region

From figure one, it is very glaring that majority of the learners are mobile literate. 90% of the learners agree that they can access the internet on a mobile device. Secondly for the learners to know how to post comments and respond to post, it means that they can be involved in collaborative learning where they can share information. This can be seen from the percentage (87.3%) of the learners that agreed that they can post comments and respond to posts. Furthermore, 56.3% of the learners affirmed that they can send emails on a mobile device. Even though the percentage is smaller compared to the percentage of learners that can access social networking sites (87.3%) due to the fact that learners are more at home with the social media, the 56.3% is still on the high side. One very important area in education is research. Majority of the learners can use mobile devices to find definition of words (94.3%), use mobile devices to look up something they do not understand (85.9%), use mobile

devices to download educational materials ((78.6%), use mobile devices to download educational applications (75%) and use mobile devices as calculators (84.5). Therefore, for learner to be able to use mobile devices to perform these functions, it opens up a variety of possibilities for the adoption of mobile learning in Namibian high schools. Another high point is the availability of computer labs which are available in these schools as affirmed by 91.7% of the learners. Doyle (1994) noted that the learner of the 21<sup>st</sup> century must have the ability to access information, evaluate and use information from a variety of source. These sources include the computer and internet. This enables learners to increasingly utilize the internet to do research on their own initiative, and satisfy their other forms of information needs (Smith and Philips, 1999).

#### Teachers



**Figure 2:** Usage Pattern of mobile devices by teachers in Erongo region

Unlike the learners, all the teachers affirmed that they can use mobile devices for non academic purposes. They also noted that they have computer labs in their schools and that they can use mobile devices to find definition of words they do not know. The percentage of the teachers (87.5%) that can use mobile devices to send emails are more than the learners (56.3%). This is understandable due to the fact that the learners are more at home with using the social media such as blogs, Facebook, twitter, instagram and many others for their social interaction while most of the teachers tend to use e mails basically for official purposes.

The various ways of using mobile devices by teachers is positively overwhelming. 98.8% the teachers can access the internet on a mobile, download educational materials using a mobile device, use mobile device as a calculator, post comment and respond to posts, use mobile device for social networking and also to look up something they do not understand while 87.5% can use mobile devices to download educational applications. Also, 61.5% of the teachers can use mobile devices in their fields as teachers while 68.8% of the teachers can use mobile devices for academic purposes.

The results above show that teachers and learners in Namibian high schools are already used to using mobile devices for various purposes, both academic and non-academic. This makes it easy for the adoption of mobile learning in the schools. Brown and Metcalf (2008) noted that handheld devices have the potential to effectively “push” and “pull” information and deliver learning whenever/wherever employee/student needs arise. In as much as there are signs of mobile readiness on the part of teachers and learners judging from the above results, it is important that a guideline in form of a framework be put in place the assist stakeholders in the education sector map out strategies that will facilitate the adoption and implementation of mobile learning in Namibian high schools. For this to be possible, it is essential to develop a preliminary framework that will facilitate the adoption of mobile learning in Namibian High Schools.

### **1) Component of a Preliminary mobile learning framework for the adoption of Mobile Learning in Namibian high Schools**

The components of the preliminary framework for the adoption of mobile learning in Namibian high school were derived based on inputs from stakeholders in the education industry, reviews of literature and data analysis. The components are as follows;

#### **2) Administrative support for mobile learning in Namibian High Schools.**

It is normal to experience resistance to change when mobile learning is introduced. Consequently it is expedient for school administrators to show the support for the project particularly in the area of resource allocation. There is need for administrators to adopt a strategy design for mobile learning (West and schofield, 2012). In the same vein, Naismith and Corlett (2006) opined that for mobile learning adoption to be successful, some factors must be considered. These factors are: institutional support and provision of technical support.

#### **3) Cost/Budget**

Some fundamental issues are needed to be tackled before any mobile system is deployed. One of them is the need to have mobile devices that are associated with infrastructure, arrangements for the payment for connectivity, training costs for teachers and learners and the development of mobile learning content suitable for all mobile devices (Naismith and Corlett, 2006). This shows the need for the provision of cost effective implementation solutions so as to reduce budgets when investing in mobile learning deployment.

#### **4) Awareness and motivation of teachers and learners.**

Awareness of the benefits and uses of mobile learning applications should be made known to the teachers and learners before they embark on the usage of the applications. The teachers and learners must be sufficiently motivated. This is because “if the mobile learning environment motivates the learners to engage in their learning and gives support to teachers in the area of developing innovative ways of device usage to act as a complement to the traditional techniques, there will be great enthusiasm on their part for technology adoption” (Barker et al., 2005).

#### **5) Compatibility of mobile learning applications.**

Due to the fact that mobile devices come with different operating systems, (i.e. Android, BlackBerry, Symbian and iPhone), it is essential to develop applications that are compatible with all available devices. Looi et al. (2010) pointed out that it is vital for mobile devices to have compatible software when accessing general education resources.

#### **6) Ease of use**

Learners might have different cultures and different educational capabilities (Basham, Meyer and Perry, 2010). This exposes the need for a mobile system to be designed so that the different needs of all users can be met. Another angle is that learners and teachers will need pedagogical or technical support. Learners’ and teachers’ needs have to be taken into account when determining requirements (Marshall and Mitchell 2002). Consequently, it will be a success factor to examine the needs of the users in the preliminary phase of mobile learning deployment.

#### **7) Usability Issues**

Usability according to Hawarth, Smith-Jackson and Hartson (2009) is the effectiveness, efficiency and satisfaction with which users of a certain application are capable of achieving specific goals.

#### **8) Training.**

In any organization, when a new technology is introduced training for all users is required. Thus, for mobile learning to be adopted in a high school environment there is a need to provide constant training for learners and teachers. This will enhance their ease of use with mobile technology and also support new instructional activities (Naismith et al., 2004).

#### **9) Issues of Mobile Learning Content**

Designing and developing mobile learning contents that will be suitable for mobile devices may present some challenges to researchers and educators (Alvarez, et al., 2011). There is a variety of mobile devices and platforms; hence

instructional design for mobile content requires specific modifications to suit learning environments and experiences (Güler et al., 2014). These must be put into consideration for one to have an appropriate mobile learning content that will be suitable for high schools.

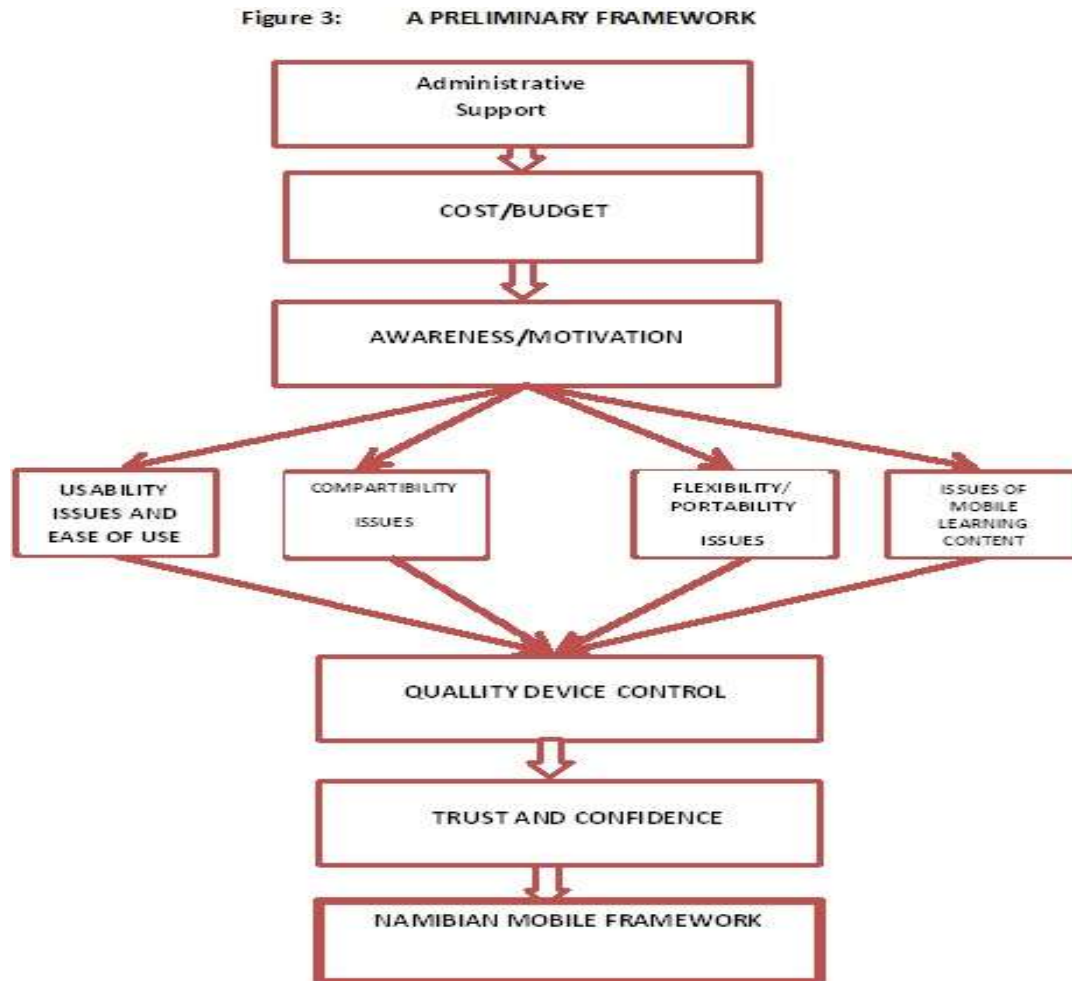
**10) Quality of device control.**

There is every need to assess the pedagogical and technical aspect of mobile learning service so as to keep in check the quality and nature of the devices because it affects the users. Since there could be different mobile learning platforms, it is important to assess the compatibility of mobile learning content across the different types of these mobile platforms.

Also, the mobile learning service must be interactive and must be able to furnish users with up to date contents (Parsons and Ryu 2006).

**11) Trust and confidence.**

To make the system sustainable, there must be trust and confidence among all stakeholders ranging from the parents to the supervising ministry, school management to teachers and then teachers to learners. When there is trust, communication between stakeholders is activated thereby increasing their willingness to share ideas which on the long run allow learners to participate in effective formal learning (Ng and Nicolas, 2012).



**4. Conclusion and Future Research**

This study focuses a preliminary framework that can help guide the development of a sustainable mobile learning framework for the adoption of mobile learning in Namibian High Schools. The Erongo region was used as a case study. The adoption and implementation of mobile learning in high schools is very important as it facilitates flexibility and also allows for ubiquitous learning. With 98.8% of the teachers and 90.3% of the learners responding that they can access the internet on a mobile device, it makes it easier for collaborative learning and interaction to take place.

Future research can consider expanding the scope of study so as to include other regions in order get a more holistic

result. Considering the fast development of mobile technologies and mobile learning, constant reviews and research is suggested. This will open up a various ways mobile technology can be used in education.

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