Towards The Development of an Android Based Offline Mobile Learning Application Open Learning

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ABSTRACT

With increasing demands for access to education on the go, the need to promote mobile learning for Open and Distance Education cannot be over-emphasized. This paper propose a research agenda for the development of a mobile-based application for students of the National Open University of Nigeria. The proposed android system will provides offline access to MSc Information Technology courseware on the National Open University website and will incorporated hyperlinks to other extra study material. This app will be developed with Java which is the official language of Android development while XML mark-up language was used to design the graphical user interface of the various activities displayed in the app. Logical sequence of activities from the welcome screen to the final courseware content screen for the various courses will also be provided . In addition, we intend to include Ebooks displayed by the app. We conclude this paper with the provision of operational definition of terms to guide readers in providing inputs on the research agenda.

Keywords: Android, Online, Offline Mobile Learning Application, Open Learning, Students

1. INTRODUCTION

All countries, regardless of their national wealth, stand to gain from more and better "formal" education (Børge, 2015). Countries that have advanced economically, technologically and in areas that show real promise and hope for future generations have been countries that paid close attention to formal education. Studies show, that education is a means to progress and a means to improving a society and a country as a whole (Siddiqui, 2012). Education has been one of the ways a society develops itself, improves itself, and prepares the next generation for leadership and progress. It plays a vital role in national development (Rashid and Rashid, 2012). A well-developed educational system is directly related to a country's improvement and advancement in so many areas. It is therefore important to study the systems of learning and examine on a regular basis how helpful they are. It is also essential to occasionally review the current status and look for ways to improve.

With the current explosion in information technology, and its relationship to educational systems, it is necessary to explore the many options available for the interaction between education and information technology. Several studies have been carried out in this field of research. Learning theories that have been the basis of much educational reform through the years emphasize the importance of starting early with very young pupils (Lever-Duffy and McDonald, 2011). It is disheartening to note how much of the research done in core areas of the primary and secondary level educational curricula have been in other countries. With the advent of technology and the Third Industrial Revolution computers have replaced many jobs previously done by humans, but have also provided other jobs requiring necessary skills. In education computers have advanced the learning process in astronomical ways.

2. RELATED ISSUES/WORKS

The Internet alone has made possible all kinds of learning, from free courseware to educational apps. Looking for the Fourth Industrial Revolution and the narrowing gap between man and machine, Klaus Schwab of the World Economic Forum (2016) famously wrote of the effects of this astronomical change on people. He is convinced that we are at the beginning of a revolution that is fundamentally changing the way we live, work and relate to one another. One may go on to foresee incredible leaps even in the way formal education is carried out. Indeed, at the World Economic Forum one of the CEOs was reported as stressing the importance of focusing on education and entrepreneurship (Sikka, 2017). Mukesh D. Ambani at the same forum observed that "... the fastest way to transmit education in a big country... is through technology" (Ambani, 2017). The general consensus is that the world is getting ever smaller on the one hand, but on the other hand the digital gap is increasing day by day. The need to let education mold the generations to come in a way that is relevant, timely, functional and progressive cannot be overstated. Using technology in education does that.

In recent times, the application of technology in virtually every human endeavor is becoming more and more significant and to some extent indispensable for relevance in developmental programmes. Industries make use of computerized equipment for quality control and efficiency among others. Isman, A. Baytekin, C. Balkan, F. Horzum, M.B. and Kiyici, M. (2002) suggested that the use of technology in education will provide students with a more suitable environment to learn, serve to create interest and will help increase students' motivation. Using technological equipment in order to aid learning is becoming a common method in the educational sector around the world, including Nigeria.

Computer-based learning (CBL) is the term used for any kind of learning with the help of computers. Computer-based learning makes use of the interactive elements of the computer applications and software and the ability to present any type of media to the users. Computer-based learning has many benefits including the advantage of users learning at their own pace and also learning without the need for an instructor to be physically present (Techopedia, 2019). Some of the more well-known forms of CBL include computer assisted learning (CAL) which, as the name implies, is the use of electronic devices/computers to provide educational instruction and to learn. Computer assisted learning can be used in virtually all fields of education, ranging from TV/DVD play-learn program for kindergarten kids to teaching quadruple bypass surgery techniques in medicine (Intense School, 2016), Computer Assisted Instruction (CAI) and Computer-Based Training (CBT). The broad all-inclusive term eLearning (or E-learning) covers the general idea of computer-based learning methods. A learning system based on formalised teaching but with the help of electronic resources is known as E-learning.

While teaching can be based in or out of the classrooms, the use of computers and the Internet forms the major component of E-learning (The Economic Times, 2019). At National Open University of Nigeria - NOUN - where the open and distance learning method is used, nearly all the aspects of eLearning are exhibited including the fact that learning can take place at great distances and students and "tutors" may never meet, and tests are conducted "on-line". This trend is widely practiced in many countries and has made higher education more readily accessible for more people from various backgrounds. Although ongoing research, shows that there is still a need to measure the actual effects and benefits of eLearning when compared to the traditional methods of teaching (Cochrane, 2012), Alasoluyi (2015) discovered that the use of CAI in teaching of Economics in senior secondary schools enhances students' performances and they tend to score higher in tests administered to them using CAI teaching method than those students taught using traditional method of teaching Economics.

This explains why students with access to online forums tend to be better informed and better prepared to tackle the coursework required in Open and Distant Learning methods. Hence, there is a need to integrate technology-based learning such as the use of mobile devices into all aspects of education. Mobile devices which include mobile phones, tablets, e-book readers and various other handheld technologies have become quite common all over the world. In this country mobile devices are even more widely used than computers, specifically mobile phones, and especially among young people.

A 2012 Nigerian Bureau of Statistics survey revealed that over 95% of Nigerians lack access to a Personal Computer while conversely the Nigerian Communications Commission (NCC) shows that of the over 100 million active phone connections in Nigeria, over 90% of them have mobile phones. Mobile phones are used to 'make phone calls, send text messages, check email and browse the Internet. Moreover, they are readily available and more affordable now than over a decade ago when they first appeared in this country. It is not uncommon to find people of different age groups with heads bowed while they browse, chat or text. It may well be that, coupled with our dwindling educational system which needs to be revived as well as reformed - injecting new learning styles could encourage learners and teachers alike. The ability to explore some of the available options in mobile applications for educational purposes may just be part of the transformation needed for the falling standards of education.

Research has shown over and over that there are advantages to the world of learning with technology. Jacob and Issac (2008) stated that the flexibility, instant connectivity, mobility associated with mobile learning has given rise to new delivery platforms for teaching and learning. Their studies led to the confirmation that there are improvements to be seen in the learning environment including the widespread, universal access to learning, the access students have when using the same kind of devices and software that faculty members use, the huge cost savings in having wireless networks and laptop computers instead of desktops.

This is an inspiring idea for a mobile application (app) for National Open University of Nigeria, (NOUN) students. Presently, materials for all the courses are available online for download, and hard copies are also supplied when students register (subject to availability). Students are generally encouraged to study hard, attend tutorials where possible, form discussion groups, complete their Tutor-Marked Assessments (TMAs) and prepare for exams. Since most students of NOUN are part-time students, civil servants, business owners, or employees (who make good NOUN's motto Work and Learn) finding ways to utilize the precious hours of study can be a hurdle. For those with regular online Internet access, the task is made easier. However, with the increasing number of students owning smart phones but the sadly relatively slow and expensive internet facilities presently available in Nigeria it is very advantageous to explore options in promoting the use of offline mobile phone devices in E-learning solutions for NOUN students. The app developed in this case gives an initial stage to the thought by providing offline access on the phone to materials made available online by NOUN for Masters Students in Information technology. Students can thus have fully mobile access to course materials.

3. RESEARCH STATEMENT AND SIGNIFICANCE

3.1 Research Statement
Students generally encounter difficulties in the course of studying such as lack of sufficient reading materials, inadequate facilities such as libraries for studying and insufficient levels of facilitation including regular access to supplementary audio and video courses and ubiquitous power outages. These various limitations are a major deterrent to proper performance. The extent to which students have opportunities to study beyond the bare minimum is the extent to which they will be able to properly comprehend the content of courses being studied. One obvious remedy is the convenient interaction made possible by the Internet. Sadly, frequent and sporadic power outages mean that even when students have access to printed study material or Laptop/Desktop computers, they cannot study.

The proposed app will readily provide an avenue for interaction and learning by building a knowledge base that enables NOUN students (and other students) to access available course materials and, thereby, harness ideas and promote academic excellence. The app to be developed will also be a means of supporting existing NOUN online platforms and encouraging independence and accountability so that users are able to diligently apply themselves to learning. It is hoped that this will greatly improve the educational competence of students in NOUN.

3.2 Research Significance

The significant position accorded technology as a key factor in the development of any nation made the researcher to investigate this tool for motivating students' interest and improving their academic achievements. An android application which is indigenously developed and used for E-learning is of obvious importance to students, researchers, parents, etc. One of the benefits of the "Work and Learn" scheme in NOUN is the opportunity afforded to working class people to advance their education without detriment to their employment status. This mobile application will benefit other student groups besides the target group of Msc Infotech students as the course materials can be easily substituted with alternative course materials thus making the app useful to students of other academic disciplines. NOUN Students obviously have the advantage of being frontline beneficiaries, because the application is tailored around the study materials and methods used primarily by the University. Students from other backgrounds and other institutions may also benefit. Those taking similar courses can use the materials available.

4. RESEARCH DIRECTION

The aim of this study is to promote mobile and online learning through the use of an android app. The app will allow Msc IT students in any location to easily access course material and study on any Android platform such as a Mobile phone or Tablet even without Internet coverage. The research work aims at achieving the following specific objectives:
1. To develop an android application package to encourage mobile learning.
2. To provide offline access to digital course materials and other helpful resources through the use of the android app.
3. To promote the use of mobile devices for study and collaborative learning among students.

4.1 Research Purpose and Direction for Future Works

The purpose of this research project is to provide an android based E-learning tool for students of Msc Info-tech in the National Open University of Nigeria. Mobile technologies have come a long way and the use of mobile devices based on their size, connectivity and ability to enhance learning makes this option significant. As mobile devices become more widely available, and affordable to the student society, the development of such a resource is inevitable. Android-based mobile devices are the most popular and the most widely established of the three major mobile operating systems: Google Android, Apple IOS and Microsoft Windows Mobile (GlobalStats, 2018). Our future work will estavblish the programming and etchnical components for the work, design, develop and implement the artefact

5. OPERATIONAL DEFiNITION OF TERMS

Information and Communications Technology (ICT): Refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions. ICT has more recently been used to describe the convergence of several technologies and the use of common transmission lines carrying very diverse data and communication types and formats (Technopedia, 2018).

Mobile Apps (mobile applications): Software that are specially designed to run on mobile devices. Hardware configurations for mobile devices are much lower than for personal computers and laptops and as such the software designed for them are also configured to match their size. They are also easily adaptable and can be loaded on a variety of platforms depending on their specifications.

E-Learning (or eLearning): The use of electronic media and information and communication technologies (ICT) in education. E-learning is broadly inclusive of all forms of educational technology in learning and teaching.

Synchronous learning: This has to do with the "exchange of ideas and information with one or more participants during the same period of time. A face-to-face discussion is an example of synchronous communications." Examples include Skype conversations (which are online and real-time), chat rooms, virtual classrooms where everyone works together at the same time.

Asynchronous learning: This is a form of learning which includes "technologies such as email, blogs, wikis, and discussion boards, as well as web-supported textbooks, hypertext documents, audio video courses, and social networking using web 2.0" The interaction is not real-time.

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