

MOBILE TECHNOLOGIES AND THEIR EFFECTS ON LEARNING OF BASIC SCIENCE IN SOME SELECTED SECONDARY SCHOOLS IN IBARAPA AREA OF OYO STATE

IGE Adeoye Oyetunde Ph.D

Department of Integrated Science, School of Science

Oyo State College of Education, Lanlate.

08033754243

igealexadeoye@gmail.com

Abstract

Based on the Federal Republic of Nigeria's (FRN) objectives of education, teaching and learning must be done to inculcate values to the learners so as to lay a sound and solid basic foundation for scientific and reflective thinking. Different teaching strategies had been employed among which are Jigsaw, cooperative instructional strategies but it seems most of them have been exhausted recently. Where applicable the expected results are not forthcoming. Hence, the reason for mobile technology as a learning tool in Basic Science. The negative effects of which were analysed and it was discovered that when properly guided with adequate regulatory policies and monitored, It is a better means of improving learning of Basic Science. All stakeholders and government especially are charged to be alert to their responsibilities on the usage. They should also provide an enabling environment for its effectiveness.

Keywords: -Mobile Learning, Basic Science, Effects, e-learning, Mobile Technology

Introduction

Science is an interdisciplinary field that works towards further scientific, humanistic and critical theoretical understanding of learning as well as to engage in the design and implementation of learning. Basic Science is an integral part of science education which deals with sharing science content and process with individuals learners. The field of science education mainly involves work in science content and process, analysis of science products and science pedagogy which leads the path and opens the gate to sustainable development (Ige, 2019). A child can get scientific facts or even knowledge from a book. However, they are fully immersed in the learning process when they do science. Getting hands on learning science also reinforces the highly beneficial inquiry process.

The art of teaching and learning of Science is to be learner-centred, participatory and activity-oriented. The central goal of Basic Science is to lay a sound foundation for scientific and reflective thinking. In pursuance of this, the National Policy on Education (FRN, 2013) states that government will

provide materials and manpower for practical, explorative and experimental teaching and learning besides ensuring teacher to pupils ratio. This implies that the children and teachers are to be actively involved in the teaching and learning processes.

There is a widespread ownership of mobile technology, including mobile/smartphones, tablets, chromebooks among school-aged youth (Ojebisi, 2018). Mobile technologies, especially, portable handheld devices such as smartphones and tablets allow students to carry out various activities such as listening to music, watching videos, using GPS, taking notes and playing games. The internet is accessed through browsers and many mobile applications (Apps) and mobile technologies which are considered as potential teaching and learning tools both with the classroom and beyond (Hwang & Lai, 2018).

Information and communication technology is an indispensable part of the contemporary world. In fact, culture and society have to be adjusted to meet the challenges of the knowledgeable age. The

perverseness of the information and communication technology has brought about rapid technological, social, political and economic transformation. Thus, a network of information society is organized around information and communication technology to cope with the worldwide information change and administration, most especially to foster effective teaching and learning in our educational system.

It is evident that the entire world has been turned to a global village with the advent of ICTs. This trend has also improved teaching and learning in the various sectors of education but the effect is yet to be pronounced in secondary schools. Nigeria is witnessing a tremendous growth in the number of secondary schools and students enrolment but disappointingly, the facilities for the teaching of the students are not available and where they provided, they have been exhausted. There is therefore the need to integrate information and communication technologies.

Ogunlade (2013) affirmed that E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems whether networked or not, serve as specific media to implement the learning process. The term will still most likely be utilized to refer to out-of-classroom and in-classroom educational experiences via technology, even as advances continue with regard to devices and curriculum. E-learning is essentially the computer and network enabled transfer of skills and knowledge. E-learning applications and processes include web-based learning, computer-based learning, virtual classroom opportunities and digital collaboration and mobile technology which is the focus of this paper. Content is delivered via the internet, intranet/extranet, audio or video tape, satellite TV and CD-ROM. Though the terms nowadays vary, they are still very relevant.

Ogunsola (2015) described information technology as electronic based system of information transmission, reception, processing and retrieval which has drastically changed the way we think, the way we live and the environment in which we live. It is a global phenomenon of great importance and concern in all aspects of human endeavor, spanning across education,

governance, labour, business market place, agriculture, commerce and others. Bamidele, (2018) described its impact on nearly every aspects of our life from working to socializing, learning and playing. It is now an inevitable part of the core of education as it has become one of the fundamental building blocks of modern society.

Mobile Technology is technology that goes where the user goes. It consists of portable two-way communication device computing devices and the networking technology that connects them. Currently, mobile technology is typified by internet – enabled devices like smart phones, tablets and watches. It is exactly what the name implies-technology that is portable.

Mobile devices are relatively new and evolving the extensive use of the internet via mobile devices/phones and development of new features and functions. Mobile learning continues to spread, thus further research regarding mobile technology supported learning. This will invariably help science educators to expand their knowledge and skills on how to embrace these technologies. In parallel, different factors may impact on students' learning in the mobile technology-supported environment.

Abanikanda (2018) defined e-learning as the digital support of adaptive, investigative, communicative, collaborative and productive learning activities in remote locations; proposes wide ways that people learn or stay connected with their learning environments including their classmates, instructors and instructional resources while going mobile. He affirmed that e-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked or not serve as specific media to implement the learning process.

A deeper insight into theory-based research is required to better understand the underlying motivations that lead academics to adopting mobile learning elements and characteristics. It is necessary that, the elements of mobile learning are organized correctly and the interactions between the various elements are combined in an efficient and optimum way so that the mobile learning is successful and the implementation is efficient. In addition, the characteristics of

mobile learning should be organized and the way they are applied to mobile learning activities and the application time should be planned well in advance. These reasons have motivated and necessitated this paper.

Impact of Mobile Technology in Learning of Basic Science

Ojoye et al (2013) affirmed that we are in the era of gadgets and smart phones and communication has never been easy with social media, we are always connected to our friends and millions of other people, no matter where we are. There is need for the integration of mobile learning into the mainstream of the curriculum so that the citadel of learning will be better equipped. All that is needed is a smartphone with internet connection. Besides communications, there are available vast variety of apps that can make daily life lot busier. With mobile devices, we can read books, listen to music, take pictures, watch videos, play games, create and edit documents and much more. In the recent time, notes can be sent through mobile phone and even lectures presented.

Mobile technology has given a voice to those otherwise cut off from the world during cataclysmic events. That voice can reach out for help when local trading strikes. They can share their plight using mobile communications through text, voice and most importantly, images and bring about real change.

More information can still be stored through mobile technology. It has become second nature to quickly look up helpful resources for whatever activity to do. Gadgets can even anticipate what information needed and present when most useful.

Brown (2005) described mobile learning (m-learning) as a kind of learning model allowing learners to obtain learning materials anywhere and anytime using mobile technologies and the internet. Brown as Ojoye said found that mobile learning resources inspired employees to suggest new ideas for the incorporation of technology in the workplace, including education and interpretation programs. Rahamon and Ogundipe (2018) submitted that m-learning is generally considered to increase the performance of learners by making learning accessible. Mobile learning technologies

eliminates geographic boundaries and provides collaborating learning environment between foreign groups. It's learning be used to enhance practical investigation and also a virtual alternative to real practical work where simulation supports exploration of the investigation model through a computerized representation.

Furthermore, advances in handheld devices have facilitated the use of multimedia in mobile applications, which allow mobile learners to have access to a wide variety of richly diversified learning resources.

The wireless handheld devices such as personal digital assistant (PDA) mobile phone, wireless laptop, tablet, and personal computer (PC) which are always on and always with the learners, allow learners to get information about courses. Learners can attend exams, download notes, share information and also these process are tracked to the system. They also facilitate "Just-in-time" learners to take advantage of unexpected free time as they frequently have their devices with them.

Smartphones notification can impair concentration. Through short in duration, they cause enough of a distraction to affect one's ability to focus on a given task, decrease one's performance by prompting table-irrelevant thoughts and mind-wandering. This can be very dangerous in some specific situations like loss of concentration of students for some minutes and distraction which consumes one's time and makes one less productive person.

Mobile technologies have huge impact on students' social lives. They tend to be more disconnected to the real world, put their phone ahead of human interaction, they are always too busy with mobile devices checking notifications, sending message or just sharing a new video. It is like an addition and a kind of turning students attention from their academics.

The technology that drives mobile device has improved a lot since those days and especially in the last ten years. Mobile gadgets have got smaller, more powerful and very useful. They are everywhere and play increasingly greater role in the lives of most people.

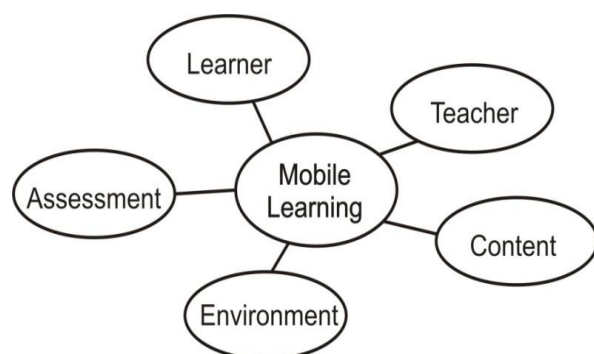
Besides the dark part of mobile technology, in the form of phones, tables and

notebooks, is making our lives better than ever before. It does this in many ways not the least of which is making communications routine. Mobile technology has also assisted in the areas of sharing information. This greatly help in participation in social networking. Sharing seemingly trivial information.

In terms of healthcare of students which invariably affect their learning, mobile technology has profound raised the quality of life. Healthcare is an area that has embraced mobile technology and while it is still in the infancy of adoption great benefit of it has been upon the students' learning. Healthcare providers can review home medical tests from anywhere and make crucial changes to the patients' care. Medical staff members can receive pacemakers tests remotely using a phone and change the programming of the device to address changes in the patients condition. Doctors can see intricate diagnostic images on phones and find conditions that need immediate treatment, all while the patient is comfortable at home. This will limit the students' time of visiting hospital and ensure easy accessibility to medical care. This invariably will ensure total concentration of students to their academics.

Basic Elements of M-Learning

Basic Elements of mobile learning are learner, teacher, environment, content and assessment



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- ✓ **Learner:** Learners are at the centre in all teaching and learning activities, according to new education approaches. All the other elements serve the learner. Mobile learning

builds on the learner's interests, experiences and needs. Nikololopou and Kausloglou (2019) claimed that as the mobile learning concept implies, the pedagogical approach places the student at the center of the learning process. The learner plays an active role from determination of the goals until the evaluation stage. Learner's roles stated include the following among others: access information when they need, responsible for their own learning, learning with their learning speed, discover and use their learning style, create and share new information or products, Study with their peers collaborations, evaluate themselves and other groups.

1. **Teacher** – Books and other media elements store information and teachers convey it to students in traditional learning environments. On the other hand, teachers are recently using technology to store information for students.

Teachers Role

Expert→Presenter→Moderator→Consultant
With the mobile technologies changed role and responsibility of the learners, the role of the teacher changes slowly towards that of a consultant. In this role, teachers need to be able to identify the students' interests, relate these interests to topic related learning goals and offer opportunities to reach these goals that are related to the specific conditions a learner is in. Teacher's roles in mobile learning also include the following: qualified to use required mobile tools and technologies; determine the strength and weakness of used methods and study to resolves different methods; facilitator guide; advisory; high levels of self-confident about courses; learn with their students; eliminates the barriers; increase motivation of learners; arrange activities to support interactive interaction between collaborative groups and arrange activities for evaluation of process.

1. **Content:** Issues that are expected to be learnt by students. Content should be decided in consultation with all stakeholders, such as learners, teachers, parents etc. Otherwise

- teaching can not get the desired results. Learning content must enable a user to quickly zone into needed information. In addition, the content can be presented with interactive games or quizzes. Content should support with graphics video and other multimedia elements.
2. **Environment:-** Environment must be designed properly to obtain positive learning experiences. Environment is that place where students reach information. Students studying entirely online must have access to all of the unit contents including the learning outcomes, assignment requirements and relevant resources. Students attending face-to-face classes receive the content in class and additional content on online with mobile technologies. Students can access course content, while traveling on the train or in a coffee shop. Environment must increase interaction between students – students and students – teachers.
 3. **Assessment:** Shaples (2009) concluded that assessment is matched to the ability of the learners offering diagnosis and formative guidance that building on success. Assessments, is a critical component of the complete m-learning. Mobile technologies can access, record and report learner's performance to the instructor. So student evaluation should make via database logs, software, packages, online exams, chat room, discussion board, online quizzes, or project evaluation. Also, students should evaluate themselves and others. It provides the pieces needed to accurately evaluate a learner's knowledge, skills, creativeness etc.

Basic Characteristics of M-Learning

Mobile learning has different characteristics. The core characteristics of mobile learning are ubiquitously, portable size of modules tools, blended, private, interactive, collaborative and instant information. The core characteristics of mobile-learning enables learners to be in the right place at the right time, that is to where they are able to experience the authentic joy of learning.

Mobile technology is the technology used for cellular communication. It has evolved rapidly over the past few years. Since the start of this millennium, a standard mobile device has gone from being no more than a simple two-way pager to being a mobile phone, GPS navigation device, and embedded web browser and instant messaging client and a hand held gaming console. Many experts believe that the future of computer technology rests in mobile computing with wireless networking. Mobile computer is a way of tablet computers which has become more popular. Tablets are available on the 3G and 4G networks. Mobile technology has different meanings in different aspects, mainly mobile technology, mainly based on the wireless technology of wireless devices including, laptops, tablets, mobile phones etc. equipment information and technology integration.

Mobile Phone Features

The features of mobile phones are the set of capabilities, services and application that they offer to their users. Mobile phones are often referred to as feature. Handsets with more advanced computing ability through the use of native code try to differentiate their own products by implementing additional functions to make them more attractive to consumers. This had led to great innovation in mobile phone development over the past 20 years. The common components found on all phones are:

1. A number of metal-oxide-semiconductor (MOS) Integrated Circuit (IC) chips.
2. A battery (typically a lithium-ion battery) providing the power source for the phone functions.
3. An input mechanisms to all the user to interact with the phone. The most common input mechanism is a keypad, but touch input mechanism is a keypad, but touch screens are also found in smartphones.
4. Basic mobile phone services to allow users to make calls and send text messages.
5. All GSM phones use a SIM card to allow or accounts to be swapped among devices. Some CDMA devices also have a similar called call a R-UIM

6. Individual GSM, WCDMA, IDEN and some satellite phone devices are uniquely identified by an International Mobile Equipment Identity (IMEI) number. All mobile phones are designed to work on cellular networks and contain a standard set of services that allow phones of different types and in different countries to communicate with each other. However, they can also support other features added by various manufacturers over the years.
7. Roaming which permits the same phone to be used in multiple countries, providing that the operators of both countries have a roaming agreement.
8. Send and receive data (if a computer is attached) access WAP service and provide full internet access using technologies such as GPRS.
9. Applications like a clock, alarm, calendar, contacts and calculator and a few games. Sending and receiving pictures and video (by without internet) through MMS, and for short distances with e.g. Bluetooth.
10. GPS receivers integrated or connected (i.e. using Bluetooth) to cell phones, primarily to aid in dispatching emergency responders and road lowtruck services.
11. Flush to talk, available on some mobile phones, is a feature that allows the user to be heard only while the talk bottom is held, similar to a walkie talkie

Conclusion and Recommendations

The impart of technologies and its effects on learning cannot be overemphasized. The government as well as the society must embrace this technology for effective teaching and learning. It must also be encouraged with government parastatals matters and among policies to cater for effective learning in the secondary school. Though, the negative effects goes by sides, proper streamlines to reduce or eradicate the excesses must be put in place.

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