

# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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**NOMADIC COMPUTING: AN IMPERATIVE TO HIGHER EDUCATION SECURITY IN NIGERIA**

**ALADE, O. A.**  
**PRINCIPAL LECTURER**  
**COMPUTER SCIENCE DEPARTMENT**  
**FEDERAL POLYTECHNIC**  
**BIDA**

**RAJI F. I.**  
**ALUMNI**  
**COMPUTER SCIENCE DEPARTMENT**  
**FEDERAL POLYTECHNIC**  
**BIDA**

**ABSTRACT**

*Various tools have been used over the ages in learning and research. A deficiency in one always leads to the discovery of another. The new technologies always emerge to refine or modify the existing ones. Printing of publications in various forms is what is common at every level of formal education. This makes the learning to be sedentary and/or restricted to the forewall of a building – classrooms, laboratory or library. The emergence of computer has, over the years, revolutionized literacy in printing and providing learning tools. Computers have helped the production of better publications, analysis of experimental data, and presentation of papers and reports of all kinds. Also it has served as wonderful complement of many research equipment, yet almost all these usages tend to be restricted to classrooms, laboratories, offices, houses and conference halls. This paper discusses nomadic computing technology and then surveys the prevalence of mobile computing devices and their suitability for nomadic computing among students, then proposes the use of these handheld computing devices to promote nomadic education in our institutions of learning to secure qualitative and quantitative learning habits among staff and students. It also advocates the provision of nomadic computation infrastructures in schools to achieving a secured qualitative education, research and social networking.*

**KEYWORDS**

Nomadic computing, mobile learning, handheld devices, social networking.

**INTRODUCTION**

Johnstone (2006) opines that higher education as an agent of change, national growth and instrument for the realization of collective aspiration. This should contribute to the development of the entire education system through teacher education, curriculum development and educational research thereby providing the crucial mass skills and educated populace needed by any country to ensure genuine indigenous sustainable development.

According to the Education Digest Global (2009), the number of students pursuing tertiary education has skyrocketed over the past 37 years, growing five-fold from 28.6 million in 1970 to 152.5 million in 2007. This translates into an average annual increase of 4.6 million. The Sub-Saharan Africa has experienced the highest average regional growth rate with students' enrolment that have risen by an average of 8.6 percent each year. Yet, in spite of this achievement, the region still lags behind other regions in terms of total tertiary students' enrolment. Today, there are 20 times more students than in 1970, with an additional 3.9 million enrolment. Shu'ara (2010) in his presentation reports the enrollment statistics of higher institutions in Nigeria from 2005 -2009 with the highest percentage of 18.9% in 2009 and the least in 2006 with only 8.4%. He equally shows the percentage distribution of academic staff by categories, 20% Professors and Readers; 23.6% Senior lectures and 56.4% Lecturer I and below. This show that only few applicants get admitted for intended higher education and the few admitted lacks adequate hands for their trainings. Akinyemi & Bassey (2012), in their survey observed that there has been a downward trend in the number of university teachers from 2003/2004 to 2005/2006. They attributed this to possible departure of some university teachers to other countries in search of greener pastures due to poor condition of service and facilities (physical and financial) which are inadequate compared to the rising increase in enrolments in the Nigerian higher education institutions.

Over the years, education has suffered a lot of setback in Nigeria. There appears to be no standard or standard tools to work with despite fine curriculums that have been designed in various forms and versions at different levels of education in the nation. A number of standards were explored in (Orji, Akinwumi, & Odii, 2008). Different methodologies have been taught in our colleges of education and Universities. But the attitude of students to use of the available electronics have not been included in the training of teachers nor implemented in educational practices of the nation.

Given the current situation in Nigeria, it is no coincidence that the main preoccupation of the Federal Government through its Federal Ministry of Education momentarily is the need to reach every nook and cranny of the country in order to take education to the citizens no matter where they may be located (Jegade, 2002). This can only be achieved by the use of fascinating technology that will draw the attention of people to 'studying anyhow and everywhere'

**LEARNING THEORY AND LEARNING STYLE**

In educational psychology, learning theory is an attempt to describe how people learn, thereby helping in understanding the inherently complex process of learning (Agbonifo & Adewale, 2009). This approach emphasis the fact that individuals perceives and processes information in different ways.

In learning style theory, the degree to which an individual has learned is measured by how much his/her education experience is geared towards particular learning style rather than how smart he/she is. Skinner (1976) in Agbonifo & Adewale (2009) classified the basic perspectives in learning theory as Behaviourism, cognitivism and constructivism. These theories are interconnected in this phrase 'information pictured (cognitivism) becomes information coded (constructivism) which is translated to attitudinal change (behaviourism)'. The prevalence of ICT tools and handheld mobile devices have brought about mental coding style in an average Nigerian (students and youth having higher percentage) making many electronics beings

**ROLES OF IT IN HIGHER EDUCATION**

Perhaps the most striking attributes of IT progress have been its pervasiveness, convergence, integration, and migration. Today, not only servers, networks, and end-user devices are interconnected and interdependent, but the network components are literarily seamless. Even organizations provide or operate more than one networks in carrying out their tasks. Network switches are essentially servers. Servers often comprise internal networks plus vast arrays of the some processors that drive the end-user devices, and the end-user devices readily tackle tasks — voice recognition, for example — that once required massive servers. The locus of technology has shifted dramatically from the institution — be it home, workplace, school, or campus — to the mobile individual. The locus of control and responsibility is shifting accordingly: connectivity, content, services, even identification come from providers external to one's immediate location or affiliation — from the "cloud" — in a sharp departure from past practice.

Through what applications might information technology help higher education evolve? Jackson (2012) stressed the need to distinguish two different but overlapping roles that information technology might play. In the *evolutionary* category are four overlapping educational functions. Information technology can

- streamline administration,
- amplify and extend traditional pedagogies, mechanisms, and resources,
- make educational events and materials available outside the original context, and/or
- enable experience-based learning.

In the *transformational* category are two more-radical functions. Information technology can

- renew and redefine the social environment and/or
- replace the didactic classroom experience.

## NOMADIC COMPUTING

Several terms are currently being used to refer to cyber learning environment. Some of these are Ubiquitous computing (Weiss & Craiger, 2002), calm computing (Edware & Grinter, 2001), pervasive computing (Teredesai & Hu, 2006), nomadic computing (Alexander, 2004), ambient intelligence (Ducatel & Bagdanowicz, 2010), Mobile computing (Cobroft, Tower, Smith, & Bruns, 2006). Alexander (2004) was of the view that wireless is perhaps the leading label, for several reasons, including its sense of the unwiring of connectivity and the implicit un-tethering of hardware from local cabling. Mobile learning, or m-learning, covers this point better, but this term doesn't imply wirelessness. The combination of wireless technology and mobile computing is resulting in escalating transformations of the educational world.

Nomadic computing is made possible by portable hardware, software and communication systems that interact with non-mobile organizational information system while away from the normal fixed work place (Obiniyi, 2008). This mobile system of computing is becoming more and more prevalent in our society. Rapid developments in wireless technologies and Sensor-network-based smart spaces are creating an urgent need for well trained Pervasive Computing Engineers (Hu & Teredesai, 2006) However, with the coming of pervasive computing, an ever-increasing degree of information is collected by use of distributed networks.

In April 2010, Apple released the iPad, selling more than 3 million units in less than 90 days (Apple press release, 2010). Suddenly e-content readers were ubiquitous, with iPads appearing on campuses within hours of the release by Apple. For 2012, Gartner estimates that nearly 120 million media tablet devices will be sold worldwide. (Gartner press release, 2012). Today the e-reader platforms are improving at a rapid rate, prices for devices are plummeting, the e-content is becoming richer and more interactive, and the content publishers are developing capitalistic business models to respond to this disruptive technology. Yet despite years of discussion, many higher education institutions have found that they are ill equipped to respond to this latest technology change. Compounding this problem is the fact that what started as an interesting idea has now become a priority for the higher education community. The imperative to lower the cost of education and create a viable means to influence the costs of textbooks (one of the largest non-tuition and non-housing costs for any student) has arrived. Although institutional leaders are still discussing e-content plans, in reality the debate is over: students are asking for digital now. (Waggener, 2012)

Since Nigeria has therefore decided to embrace the open education system, which will afford the greater majority of the citizens, especially those hitherto unreached or denied access, to be educated as and when they so wish. (Jegade, 2002), inculcating cyberculture in our education system will be the best alternative to improve and secure quality education terrain both amidst the students and the teacher with more obvious growth among the students' folk.

## MATERIALS AND METHOD

As a precursor to further studies in nomadic computing, a survey was conducted using structured questionnaire. The questionnaire was designed to sample the opinion of students in various schools (faculties) in the Federal Polytechnic. Bida Niger state Nigeria. The respondents were randomly selected among students in five schools in their age and sex distributions. The questionnaire contained sufficient information to look at the technology awareness of nomadic computing devices among the students. The questionnaire looks at the internet access configuration of the students' mobile phones, acquisition of other mobile computing devices aside mobile phones and the availability and accessibility of the Internet facilities provided by the institution.

## ANALYSIS

Out of about 60 questionnaires administered, 53 were duly filled and returned. The frequency and percentage distribution of responses were analyzed using Statistical Package for Social Sciences (SPSS). The analyses of various devices are shown below.

### MOBILE PHONE

The analysis show that the 53 (100%) respondents has mobile phones. 44 (83.0%) of the phones are camera ready, while only 8 (15.1%) are not; 1 (1.9%) was indifference. 44 (83.0%) of the phones have Bluetooth/infra red for file transfer, 9 (17%) have no Bluetooth. 45 (84.9%) of the phone are configurable to browse while 8 (15.1%) are not. With the mobile phone 20 (37.7%) visit the Net between 1-5hrs a week; 2 (3.8%) between 5-10hrs/wk; 1 (1.9%), between 10-20hrs/wk; 16 (30.2%), visits the Net always while 14 (26.4) do not visit the Net at all with there phones.

### MOBILE COMPUTER (LAPTOP)

From the analysis, 23 (43.4%) of the respondent have laptop while 30 (56.6%) have not. 36 (67.9%) have access to the Internet, 17 (32.1%) do not have. 48 (90.6%) have email account, 4 (7.5%) have not whole 1 (1.9%) is indifferent. 9 (17.0%) claimed to have personal website while 44 (83.0%) did not. 21 (39.6%) visit the Internet 1-5hrs/wk; 4 (7.5%) 5-10hrs/week, 7 (13.2%) always, 18 (34.0%) not at all and 3 (5.7%) indifference.

### INSTITUTION'S FACILITY

51 (96.2%) are aware of the schools internet facility while 2 (3.8%) are not. 40 (75.5%) admitted having access to the school internet facility, 12 (22.6%) disagreed while 1 (1.9%) is indifference. 5 (9.4%) access the Internet facility 1-5hrs/wk, 14 (26.4%) 6-10hrs/wk, 2 (3.8%) 11-20hrs/wk, 19 (35.8%) access it always, 11 (20.8%) do not access it at all while 2 (3.8%) are indifference. 35 (66.0%) agreed that the facility is always available while 18 (34.0%) disagree that the facility is available to them. For those who claim it non-availability ranked the thus in the possible reason for its non availability: power failure 6 (11.3%), congestion 9 (17.0%), administrative problem 1 (1.9) and logistic problem 2 (3.8%).

## DISCUSSION OF THE RESULTS

It may be inferred that virtually all the phones that are camera ready have Bluetooth and are configurable to browse the Net. More so, the analysis reveals that some of the respondents that have the facility for internet connection on their phones do not use it for the purpose at all.

The fact that 43.4% of the respondents see the necessity of laptop and secure it without been forced shows that a greater ground still needs to be covered before nomadic computing is introduced. With 57.9% internet access, 90.6% e-mail account and even 17.0% personal website is an indication that the environment is poised for nomadic computing. 96.2% of the respondents are aware of the existence of internet facility in the school. This is remarkable. Also the 75.5% affirmative of having access to the facility proves that a good ground had been prepared. The 35.8% of respondents' regular visit to the center is a sign of good omen, although respondents remarked that they have no access to wireless technology of the school facility. This is great impendance to true nomadic computing.

## CONCLUSION

In this paper, various literature have been reviewed that show astronomical increase in demand for tertiary education. The roles of IT in facilitating easy access to tertiary education have been discussed. Nomadic education has been proffered to be an alternative learning style to eradicated unrest among students in tertiary institution due to highly deficient infrastructural facilities require for teaching and learning. The level of awareness, and usage of nomadic education



devices are expressed in percentages. The high rate of awareness and usage of these devices is an indication that with slight motivation on the side of lecturers, parents and government, students will embrace this technology as a means of learning than regimented classroom learning system.

In most cases, one of the causes of students' unrest in higher institution of learning is the conglomeration of students of various background, philosophies and learning style in classrooms. One of the means that have been adopted over the years to diffuse the tension is to disperse the students by closing down the school. Changing the mode of learning from sedentary classroom assembly to nomadic system will reduce the tension on our campuses. More students will be accommodated, and quality knowledge will be impacted. Security threat will be drastically reduced.

## RECOMMENDATIONS

It is a known fact that most of our tertiary institutions have become the training ground for political, religion and sectional thugry. Quality study is ebbing away because of academic unrest that always leads to the closure of schools. It therefore recommended that:

- the educational policy makers should include nomadic computing in the curriculum our tertiary education;
- the various institutions should provide wireless service that will adequately cover the geographical locations of campuses;
- students should be encourage to secure the technology;
- lecturers should be courageous enough enforce the usage of available mobile device in learning among the students.

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