Access to Information Communication Technology and School Engagement of Girls in Rural Areas

Sabina N. Obi, PhD
Lead City University, Ibadan
Sabinaobi27@gmail.com
+2348036047243
&
Ayo-Ogunlusi Veronica Abiola
College of Education, Ikere Ekiti
ogunlusiabiola@yahoo.com
+2348166490138

Abstract

Women in the world over, in their quest for empowerment and societal recognition have adopted and accepted Information Communication Technology (ICT) as an instrument for their personal and professional advancement, and empowerment. Despite the much emphasis placed on the use of ICT in Nigeria, women are often under-represented in terms of access and use. It is against this background that this paper examines the challenges and prospects of ICT utilization among women in Nigeria, and relationship between access to ICT and school engagement. The researchers adopted survey research design for the study. The sample for the study comprised 179 female senior students in Ikere Local Government area who have been using ICT gadgets in their classroom learning. A Questionnaire containing Access to ICT Scale ($\alpha=0.83$) and the School Engagement Scale ($\alpha=0.77$) was used for data collection. The results revealed that ICT access is related to school engagement among girls in rural areas and that there was significant relationship between students' access to ICT and learning improvement. The study concludes that to address these gender gaps in ICT in Nigeria, all hands must be on deck to change women's attitudes towards ICT use by overcoming technophobia. The Girl child should be provided with educational and economic empowerment; government ICT policies and programmes must address the needs of women in the rural areas.

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Introduction

In contemporary civilized Nigeria, the Information Communication Technologies (ICTs) have become a household name used in offices and at homes to access, receive and retrieve information. Many innovations in the world today are as a result of the exposure and access to the world of the ICTs, and people all over the world can access any other parts of the world to receive information about anything that borders on their interest in life.

The marginalized situation of women cuts across all aspects of life, and information, and communications technology (ICT) is no exception. Experience in some countries showed that women are very important when it comes to the development of any nation. If they are held

back it will be as holding back the potential for the economic growth of such nation.ICTs are known to be powerful and capable of serving both men and women and can serve as important tools for girls that are seeking to promote e-learning and to empower them. ICT links young people with the future, and girls are not exempted. However, socio-economic factors that hinder girls, affect their full access to education and utilization of ICT facilities. Many of the realities of life are more different for girls than they are for boys. Research showed that in some societies girls do not enjoy the same opportunities as boys. The world over, most women are poorer than men, not as well educated, and have higher levels of illiteracy (Abdulkafi, 2008; Hafkin, 2013). This article is set within the context that much as the socio-cultural situation of girls affects their full access to ICT, conscious effort to enable them to make the best use of ICT will facilitate their journey to empowerment through technology-mediated learning.

It is an established fact that major sectors of the institutions within our society are already utilizing the capacity of information technology to improve life generally, the health, economic, among others. Educational institution is not left out in this trend of development. It is common knowledge that globalization brought about by Information and Communication Technology (ICT) has reduced the whole World to a village without boundaries. ICT has been acknowledged as a powerful hub of development in the 21st century. The massive economic benefits real and potentials of ICT are not in doubt, especially in the industrialized economies where the revolution is rooted (Rayport & Jaworski, 2002). The 21st century, started with the awareness that the new revolution variously called information revolution and IT revolution has come to stay. Increasingly, it is also being realized that the revolution is presenting frightening challenges which must be frontally tackled in order to maximize both potential and real benefits emanating from it (Olatokun, 2009). The challenges are at personal, societal and global levels. The new ICT revolution has now broadened the horizon of the opportunities among nations, organization, institutions and individuals giving hopes to compete with their counterparts all over the world as observed by Collins (2002). It has been seen as an important vehicle to push individuals to bigger heights as the world moves further into the 21st century. Education is perhaps the primary enabler of women's ability to participate in the development and growth of nations. Information and Communication Technologies (ICTs) have proved to be increasingly fundamental to the socio-economic development of any nation. They are important tools that can provide girls access to lifelong learning, education and training. Neglecting to give girls access to these tools not only deprives them and their families of income but reduces the skill levels of the nation, limits productivity and bars a country from being competitive in the global market (Denton & Vloeberghs, 2000).

Women are significant actors in the socio-economic development of any nation. To this end, ways of enhancing female access to ICT in rural areas include: women sharing ICT experiences, facilitating ICT access for women, creating an enabling environment for ICT in education, and increasing ICT careers for women (Dlodlo, 2009).

Using ICT to enhance learning
Learners demonstrate this capability by purposefully applying technology to solve problems, analyse and exchange information, develop ideas, create models and control devices. ICT capability is much broader than a set of technical competences in software applications although, clearly, these are important. ICT capability involves the appropriate selection, use and evaluation of ICT. In essence, students need to know what aspects of ICT are available to them,

when to use it and why it is appropriate for the task. For example, when creating a presentation, ICT capability involves the selection of appropriate software, consideration of fitness for purpose ICT capability is about having the technical and cognitive proficiency to access appropriately, to use, develop, create and communicate information using technological tools and matching content and style to a given audience. It is important that lessons are not software or technology driven but focused on clear teaching and learning objectives where ICT is used as a vehicle to support achievement of those objectives. (Gnanadevan & Babu, 2011)

Rufai (2004), is of the opinion that

> *"With the various summits all over the world, it is increasingly clear that development cannot be achieved where the needs and contribution of women are downgraded, marginalized or completely ignored". (Pg 44-51)*

The proposition of this statement is that for any country to succeed and develop, the girlchild education should be a focus for policy formulation and implementation as far as democracy in concerned. Nigeria as a member nation of the United Nations agreed to the obligation for achieving the goal of education for all. Research and experience showed that education of the girl-child remains the same as there has not been any drastic measure or plan by the government to address this challenge. It is on this premise that the problem of this study is posed in this question form; how can ICT application to learning improve the girl-child education in Ikere Local Government Area of Ekiti State, Nigeria.

Infrastructure for ICT

To provide quality service using ICT a strong infrastructure backbone is required. Infrastructure backbone includes workstation, high speed network, projection/display technology, interactive devices, video conferencing equipment, printer etc. For mobile workstation devices like laptop, tablets, notebooks are essential. In hill area or island where setting up wire network is costly, wireless network infrastructure may be the best choice. The workstations must have a focused coverage and be assessed by the public. It aims to provide free service or service at low cost. Those must be set up in some convenient locations, accessible in walking distance. Selection of proper application software and Graphical User Interface (GUI) are important for smooth operation using ICT. Today's Cloud computing are becoming popular to provide support to a large number of users without buying individual software copy. The services provided by Cloud computing may be thought as `whenever and whatever needed'. It reduces the implementation and maintenance cost. Software as a service, platform as a service and infrastructure as a service are various cloud computing models as per the user requirement. Technical support is also a part of the infrastructure to keep the backbone in proper health. Knowledgeable technicians in the field of IT community must be staffed to provide the technical support. They can be grouped into problem solver and problem preventer. Technical Support acts as a liaison with vendors on technical matters (Firdhous, Mohamed, Osman & Suhaidi, 2013).

ICT in Education

Education is the backbone of the nation. In many developing countries bringing a large percentage of students to education system is a great challenge. The reasons may be the geographical location, socio-economic condition, among others. Poor transport facility discourages the rural students to come to school regularly. Scarcity of efficient teacher in the

rural schools and a large student teacher ratio to the student side is also a reason for dropout of a large percentage of girls in the midway of their education. Thus a great mismatch of education quality is observed when comparison is made with rural and urban students. Adoption of ICT in education can minimize the gap. Role of a teacher is shifted from leader to facilitator in ICT based education system. Adoption of ICT in teaching system enables and supports the move from traditional `teacher-centric' teaching styles to more `learner-centric' methods. A diverse group of students can learn simultaneously even in the absence of teacher. An online repository must be maintained for accessing the study materials. There must be facility for teleconferencing, video conferencing with experts and for this a certain pre-defined time span must be broadcasted to the target learners. A pre-assigned interactive session may provide the opportunity to the geographically diverse learners'interact with each other. Internet and World Wide Web open the door of wealth of learning materials in variety of subjects. Achieving higher education from rural areas is a great challenge. Most of the male has to contribute to their family income in their pre-youth and the girls are got married. ICT in learning can help a lot in providing higher education to the rural students. Not only in primary or higher education, anytime anywhere. Feature of ICT helps to provide adult education in the rural area. Online vocation training in engineering fields like civil, electrical, computer, mechanical, etc., prepares experts in rural areas who can easily handle the rural needs in peoples' daily life activities (Kirk, 2008;& Choike, 2004).

Girls' Attitude towards Science-related Subjects
The fact that the dominant cultural understanding of technology is as a masculine activity, means that women have often chosen not to engage with it – not because they are excluded but because it does not fit with their self-image of what it is to be a woman. Traditionally, anything that is difficult to perform is considered a preserve of the male species. Therefore, girl children would psychologically have a barrier to taking up science subjects, including ICT education. There is a shortage of role models who have succeeded in ICT careers and can be emulated among the womenfolk in this small community. Boys have more access to technology at home than girls from a young age even in this rural community. Therefore, girls have less experience in technology than boys even before they reach schools. In this light, boys are encouraged and have more positive attitudes towards ICTs than girls.

Levels of Literacy, Awareness, Finance and the Language Barrier among Women
There is a substantial number of girls interviewed that could not speak English, meaning that they were illiterate. Ironically, much of the knowledge present in the global pool is in English language that is not understood by the poorest rural/tribal communities. There is very little content in the vernacular language for the non-English speaking. Therefore since the language of teaching in educational institutions is English, it would be difficult to impart ICT knowledge to the members. The best alternative is to enable traininginlocal languages. But there is the task of providing content in these languages. The new technology comes at a financial cost, which hinders its penetration to the individual and sometimes to the community. The problem is compounded by the fact that women in developing countries have little control over the household income and do not have decision-making power to invest in these technologies. With high unemployment level only a privileged few women can access paid training. Therefore financial costs hinder penetration of ICTs. Very few women in this community are aware of the

benefit of taking up ICT training let alone the benefit of utilizing ICT because they have not been exposed to it.

School Engagement

School engagement, a complex and multidimensional construct (Skinner, Kindermann & Furrer, 2009) has been described as involving three components: behavioural, emotional and cognitive components. The first component, (a) behavioural engagement, involves active participation in curricular and extracurricular school activities (Skinner & Belmont, 1993; Engels, Colpin, Van Leeuwen, Bijttebier, Van Den Noortgate, Claes, Goossens, & Verschueren, 2016) as well as norm-conformant behaviour or disobedience of school rules (Finn, 1993). The second component, (b) emotional engagement, denotes a student's emotions and feelings toward teachers, peers and school in general (Skinner *et al*., 2009). This type of engagement especially supports students' identification with their schools (Finn, 1989; Skinner & Belmont, 1993). The third component which is more recent, (c) cognitive engagement, might be defined as the "psychological investment" (Fredricks Blumenfeld & Paris, 2004) a student makes in his or her own learning process, thus possessing motivational properties (Fredricks *et al*., 2004).

Behavioural engagement often refers to involvement in school-based activities or to the absence of disruptive behaviours (Fredricks *et al*., 2004). Emotional engagement entails positive emotional reactions to the school, the teacher, and schoolmates (Nor & Hanida, 2009). These two concepts of school engagement are likely to be predictive of different outcomes and to be influenced by different variables. For instance, active participation in school activities leads to positive academic outcomes because a students feel more capable and confident, and more involved in his/her learning. ICT facilitates learning and make learning more interesting, thereby encouraging active participation in the classroom. When students are active learners, they are more attentive, confident and, they comprehend more. Learning becomes more personal and this improves long term learning (lifelong learning). Emotional bonds with school prevent negative developmental outcomes among adolescents, such as delinquency (Carbonaro, 2005). When students have access to ICT in the school, and they are able to interact with these facilities, there develops a sense of personal touch to learning and commitment to learning grows from there. Their emotions are positive leading to a sense of school attachment. Also, Cognitive engagement involves internal indicators such as becoming a self-regulated learner (Fredricks *et al*., 2004). ICT develops in students a capacity to be self-directed learners making them being capable of taking charge of their learning. Finn (1989) postulated that active participation (behaviour) leads to an increased sense of belongingness and to a commitment to learning in students. However, as suggested by (Fredricks *et al*., 2004), it is also possible that emotional engagement leads to increases in behavioural engagement, or in other words, when students feel more attached to school, they are more likely to be involved in school-based activities. Although the direction of the relationships between behavioural and emotional engagement are yet to be determined, it is hypothesized that adolescents, as experienced students, need to experience positive feelings toward school to, at least, maintain effort (Valehzaghard, Khodaei & Chegini, 2013). According to Valehzaghard *etal*.,(2013), positive emotional engagement may lead to increased behavioural involvement. The feeling states of students determine greatly what positive or negative behaviour students emit in the school that leads to good academic outcome. Thus, a positive achievement emotion is required for high academic achievement and goal-oriented behaviours in the school.

Research question

What is the level of ICT access of girls in rural areas?

Hypothesis

HO$_1$: There will be no significant relationship between access to ICT and school engagement of girls in rural areas.

Methodology

The researchers adopted survey research design for the study. The initial sample for the study comprised 200 female students in African Church Comprehensive High School and Irepodun High School, from the senior category in Ikere Local Government who have been using ICT gadgets in their classroom learning. The respondents rated the relevance of ICT to their educational progress in the questionnaire item. Questionnaires containing self-constructed Access to ICT Scale (α=0.83) and the adopted School Engagement Scale by Fredericks, Blumenfeld, Friedel and Paris (2005) (α=0.77) were administered to the respondents with the help of the teachers in the selected schools. The researchers collected, collated and sorted the 179 usable questionnaires and analyses were done using percentages, mean, standard deviation and Chi square analysis at 0.05 level of significance.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
I have access to ICT tools for learning	179	1.00	4.00	2.9553	1.02673
ICT has improved my interest in learning	179	1.00	4.00	3.1061	.95689
ICT has motivated me to learn	179	1.00	4.00	2.8659	1.05677
ICT has improved my academic engagement	179	1.00	4.00	2.9106	1.05620
I am aware of search engines such as google that I can use to access any website	179	1.00	4.00	2.9330	1.02550
I am aware that internet can enhance my knowledge in any area of my choice	179	1.00	4.00	3.1061	.98009
I have a personal computer	179	1.00	4.00	2.1173	.97881
There is internet connection in my school	179	1.00	4.00	2.8380	1.05015
Teachers in my school are versatile in the usage of ICT in teaching	179	1.00	4.00	2.8045	1.06570
Teachers in my school use ICT to facilitate teaching-learning process.	179	1.00	4.00	2.8045	1.06570
Poor power supply affect the use of electronic devices for teaching	179	1.00	4.00	2.8883	1.04335
High cost of airtime affects the use of internet services	179	1.00	4.00	2.6872	1.06655
Use of electronic devices encourages laziness in students	179	1.00	4.00	2.2346	1.01158

HO$_1$: There is no significant relationship between students' access to ICT and school engagement

Table 5: Chi-Square Tests relationship between student access to ICT and school engagement

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	96.737[a]	9	.000
Likelihood Ratio	96.800	9	.000
Linear-by-Linear Association	63.492	1	.000
1N of Valid Cases	179		

P<0.05 (Sig.)

The result presented in table 4 revealed chi-square calculated (96.737) was greater than chi-square table (16.919), Df = (1.9) and P-value (0.000) < 0.05 level of significant. Thus the null hypothesis is rejected. This means that there was significant relationship between students' access to ICT and school engagement.

Discussion

The result of the hypothesis tested in this study revealed that ICT access is related to school engagement among girls in rural areas. This connotes that when girls have access to ICT, their level of school engagement tend to be high. These students become more interested in learning and identify with their schools. School engagement with all its components develops more in students who can gain access to ICT facilities both at home and in the school. This could be because for learning to be optimal and lifelong, the cognitive, affective and psycho-motor domains must be fully achieved for an individual student. Researchers, educationists, school administrators, teachers and even students themselves have attested to the fact that ICT is the future, and for any student to be part of the knowledge-driven present and future world, such a student must key into technological innovations in education. It is particularly expedient for girls to be carried along in the digitalized world if there will be empowerment, education, independence and quality of life for them especially in the rural areas where development has not taken its full stand in Nigeria. According to Fraillon, Ainley, Schulz, Friedman and Gebhardt (2014), students generally expressed high levels of interest and enjoyment in using computer technology, however, female students express relatively lower levels of interest and enjoyment than male students. There is obviously need for more researches in the area of girls and ICT use, as there is a dearth of empirical studies in this young line of research inquiry.

Conclusion

For girls to compete and have access to ICT in this information age, they must overcome some attitudes that seems to pose some barriers. Today girls believe that science and disciplines are meant for male counterpart, thus girls find it difficult and tasking. Therefore they see themselves as inferior or as a second citizen in the ICT sector. Girls also assume that technology and its production, application and maintenance are areas that fall more easily into the male domain. The result also indicated that girls even when they have access to ICT tools are still not interested, therefore should try and overcome this technophobia; there should be serious efforts to change/tackle such attitudes that act as set back to their participation in the ICT sector and be

encouraged to take up the challenges of the new information and communication technology in order to perform brilliantly in ICT sector as they are doing in other fields of study.

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