

ICT Access and the Nigerian Teacher: A Literature Review

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Abstract: Nigeria's National Policy on ICT's main objective is to create a conducive environment for rapid expansion of ICT networks and services that are accessible to all at reasonable costs while its policy statement is to ensure the country's effective participation in regional and international ICT to promote ICT development. Given the emphasis on ICT by the Nigerian government in schools, this study seeks to examine related literature on the state of ICT access currently available to teachers for teaching and learning where focus is given to the Nigerian context.

Key words: ICT Access • Nigerian Teacher • Facilities • Education reforms

INTRODUCTION

The development and deployment of ICT have brought about phenomenal improvements and great opportunities for developing countries like Nigeria to participate meaningfully in the global digital economy. Over 70% of Nigerians reside in the rural areas and most do not have access to advanced ICT services, others reside in the urban areas that are unserved or underserved [1]. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing countries, especially in Africa, are still low in ICT application and usage [2]. Research studies conducted in Nigeria have found that computers and other ICT facilities have become major tools of communication and exchange of information among individuals, organizations, governments, corporate bodies among others [3-6].

Access can be defined in terms of physical access to an ICT device. According to [7], access can be quantified at different levels: the individual, the household and the community. Measures in terms of individuals include indicators such as ICTs per 100 inhabitants and the percentage of the population that uses an ICT. It can also be used to measure availability of ICTs in homes to

determine the level of universal service. According to [8], access means an individual could utilize an ICT because it is available, but may not necessarily be doing so. Real opportunities for using ICTs are dependent on the infrastructure and means of access that are available in the communities they belong to [7].

Purpose of the Study: The purpose of this study is to identify the extent of secondary school teacher's access to ICT for teaching and learning. In doing so, the authors will review the current situation teachers face in gaining access to ICT facilities.

Study Framework: The framework for this study is one of the conditions of change developed by [9]. [10] points to conditions of successful change and was the first to emphasize the environmental conditions that promote change. In his pioneering study of change libraries, he uses the term conditions of change to refer to a set of factors to describe the environment. [9] study has been refined over the years and broadened to cover the implementation of educational technology in a variety of education-related context. Ely's approach recognizes that the characteristics of the innovation are not the only factor influencing its adoption, his research suggests that the environment in which the innovation is to be

introduced can play an equally important role in determining a change effort success. Ely's studies have identified eight of these conditions and validated them across various educational and cultural settings—one of his eight conditions of change states that the things that are needed to make the innovation work should be easily accessible. [9] advocates these guidelines as suggestions for successful implementation but not 'formula or rules' and they cannot all be realistically achieved for all innovations in all environments. Ely identifies the things that are needed to make the innovation work and should be easily accessible as resources. Resources are broadly defined as those tools and other relevant materials that are accessible to assist learners to acquire learning objectives [9]. Innovations are less likely to succeed if adequate resources are not provided such as computers, classroom remodeling, personnel salaries and teacher training. If resources are unavailable, acquisition of learning objectives will be impeded.

Literature Review: It has been argued that ICT is a principal driver of economic development and social change worldwide [11-12]. In Nigeria as in many countries, the need for economic and social development is used to justify investments in educational reform and in educational ICT. Considerable resources have been invested to justify the place of technology in education and many research studies have revealed the benefits and gains that can be achieved by students, teachers and administrators [13]. Although ICT is now at the center of education reform efforts, not all countries are currently able to benefit from the developments and advances that technology can offer. Much research in the area of technology integration in education has been conducted in technologically advanced countries, but little in the developing countries. For this reason, few statistics are available from developing countries [13]. This might imply that the former countries now possess a wealth of knowledge, skills, expertise and the competitive edge that most of the latter countries do not possess. Developing countries have become anxious about the widening gap between their reality and the aggressive ICT policies of some developed countries. Consequently, there is a more urgent need to improve the quality and equity of education to bridge the gap between developed and developing nations and ICTs are perceived as necessary tools for this purpose. [14] observes that despite the recognized role of ICTs in improving education, ICTs remain a low financial priority in most educational systems in Africa. He further observes that most countries in the region lack resources for a sustainable integration of ICTs

in education and that African countries face numerous competing development priorities.

According to [15] the acquisition and use of ICT must be placed in an appropriate context. An increased reliance on ICT can only benefit those who have access to it. Access to technology is a necessary ingredient to technology use in schools [16]. Nigeria is a developing country and whose educational system shares many of the same problems and limitations as those of its fellow developing nations. As facilitating technologies, the Internet and the World Wide Web (WWW) facilitate people in communicating and accessing remote information from worldwide sources and hence remove the constraints of time and distance. In order to make effective use of it, educational institutions need to understand their capabilities. ICT can assist an institution with its data storage and processing, with the flows of information in and around the institutions, in the control and management of the institution and in establishing internal links between different departments in the institution and external links with other institutions. In other words, there is a real danger that exclusion (for whatever reasons such as economic, physical and social) will constitute a handicap. Furthermore, it is likely that many of those who will be excluded will be the same people who are already disadvantaged. Education in developing countries takes place under circumstances that are substantially different from those in developed countries. The poorest countries spend the least – absolutely and proportionately – on non-salary related educational expenditures [17]. In the early 1980s, while African countries allocated only 3.6% of their education budgets to classroom materials and developing countries in Asia spent 8.8%, industrialized countries spent 14.4% on books and learning aids. [18] estimated that, while the richest countries spend as much as US\$430 per child on non-salary educational expenditures, the poorest countries disburse approximately US\$5 per child, of which US\$1 or less goes to ICT. It is, therefore, no surprise that in developing countries, school buildings commonly do not have concrete flooring, furniture, electricity and water and there is virtually no equipment for science, art and other practical subjects.

According to [19] access can be defined in terms of physical access to an ICT device. The simplest, though most limited, way of thinking about ICT access is in terms of ownership of a device [20]. Ownership, however, is not the only way people gain access to ICTs. Even if a person does not own a particular ICT device, sometimes they can access one through another member of the household, a friend or a neighbour, through the work place, or in public

places. Hence, it is important to investigate accessibility of ICTs through these alternative means. [7] reveals that access can be quantified at different levels: the individual, the household and the community. Measures in terms of individuals include indicators such as ICTs per 100 inhabitants and the percentage of the population that uses an ICT. It can also be used to measure availability of ICTs in homes to determine the level of universal service. Community indicators measure the availability of service in population centres, such as the number of municipalities or villages with telephone service [8] A different criterion was necessary in evaluating a policy from the client perspective. Furthermore [7] posits that universal access cannot be collected in national statistics; therefore, she conducted a separate household survey at the community level. According to [8] "ownership/subscription" means an individual possesses an ICT device. "Access" means an individual could utilize an ICT because it is available, but may not necessarily be doing so, while "use" means a person is actually utilizing an ICT facility. Also [21] study states that, ICT infrastructure measures the perceived availability and suitability of the ICT tools such as hardware, software and peripheral equipment provided in the school. [22] report that with the ICT infrastructure provided, the teachers were able to access school network, the Internet and laptop accessories (printer, digital camera, data projector, large TV screen, scanner and video camera). Hence, the educators have more prospects to utilize instructional technology when the ICT infrastructures are provided in a well manner. Earlier research studies have shown clearly that ICT infrastructure can be one of the factors that influence the technology use among the teachers [22, 23].

In a study carried out by [24] to investigate the application of ICT in Nigerian secondary schools, they found out that several factors were associated with low ICT application in Nigerian secondary schools. The participants were selected through purposive sampling and 176 teachers were involved from two states in Nigeria. Results of the study revealed that limited/poor information infrastructure ranked highest with 112 respondents (64 percent). This research confirms that ICT development and application are not well established in Nigeria because of poor information infrastructure. This is supported by an earlier study conducted by [25] that more than 40 percent of the population of Africa is in areas not covered by telecom services. Schools located in such areas will experience ICT connectivity problems. Lack of/inadequate ICT facilities in schools ranks second with 108 respondents (61 percent). Similarly, [26]

discovered that unavailability of some ICT components in the schools hampered teachers' use of ICTs. This problem may be due to underfunding [27] [28] carried out an investigation of ICT availability in schools in Onitsha on 100 nursery school teachers which revealed that the media availability average was less than 20% over 50%. It also found out that the degree of utilization in instructional delivery was that teachers used mostly books and over 60% did not use ICT resources at all. In addition, [29] investigated the challenges of ICT for teaching/learning as perceived by agricultural science teachers in 210 secondary schools from the three educational zones in Kogi State also found that ICT facilities were not available in secondary schools.

Similarly, [30] also investigated English language teachers' knowledge and use of ICT in Ibadan Southwest LGA of Oyo State and found that availability of computers and their connectivity to the internet was non-existent in virtually all the schools studied, the study found out that utilization was dependent on availability and because availability was poor, thus, usability was also found to be poor. Similar studies have revealed that lack of computer, computer hardware and software facilities have been a major barrier to the integration of ICT in the classroom [31]. Computer access has always been an important factor for successful adoption of technology [32]. [33] claimed that lack of access to computer labs or the inconvenient location of computers inhibited the teachers' use of ICT in their teaching. Access to computers also had a significant impact on their competency and this in turn affected the use of computers in their classrooms [33].

An earlier study by [34] reported on a survey of 26 countries on the obstacles perceived by teachers to impede computer use in the classroom. The study showed insufficient number of computers as one of the top obstacles which affected the realization of ICT in the schools. In line with a recent study by [35] who also found out that Syrian teachers surveyed in his study reported a high access to computers at home (owned computers at home) but only a few had access to computers at school. This indicated that insufficient computers at school posed a major challenge to ICT integration in schools. Computer software was also mentioned as another challenge to teachers. With the lack of appropriate software, teachers faced with the problem of matching the software to the curriculum of the school and they also faced the lack of guidance on how to make use of it. According to [35] this was made even more difficult with the lack of country version of educational

software. He indicated that although there were computers available, appropriate computer software could be a major challenge for teachers to integrate ICT. Even when teachers have received training in the use of ICT, on-site technical support was not available at schools. When faced with technical problems teachers seem to lose confidence in using technology [32]. Human resources are necessary to provide technical support for equipment maintenance and repair and to provide help with the design, implementation and evaluation of an innovation [10]. [36] study of high school English teachers in Taiwan revealed that the lack of support and poor management of hardware were seen as barriers to ICT use in teaching. Support and help from school coordinators in classroom management were seen to be vital in encouraging teachers to use ICT and the teachers acknowledged that both gave them confidence and a sense of security [37].

CONCLUSION

In line with [38] condition of change, the review of literature in this paper suggests that availability of resources is crucial for change to take place. Resources being anything that are required for implementation of the innovation, including hardware, software, supplies, funding, technical support and teaching materials. According to [39], technological innovations and their implementation often require supportive infrastructures to be established. Similarly [40], states that most factors contributing to the advancement of innovation is the availability of infrastructure resources such as hardware, quality and functional equipment, as well as availability of general educational software. In fact infrastructure can promote or inhibit change, but the apparent presence of adequate infrastructure does not ensure change. This suggests that access is important only when other conditions are met in the process of technology implementation in schools. Nigerian teachers must have the funding, technical support, teaching materials, ICT facilities for effective teaching and learning in line with the nation's education reform policy. As posited by [41] a successful educational system refers to a system, which is able to apply new ICT's and employ trained experts.

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