

Impediments to ICT-led Development in Nigeria: the Case of ICT ‘Illiteracy’ in Universities

Chinelo O. Duze¹

© Uganda Martyrs University

Abstract · Information and Communication Technologies (ICTs) can play a major role in development. Accordingly, nations and institutions are making enormous efforts to promote their utilisation. In many of these efforts, it is taken for granted that once ICT facilities are acquired, they will be put to uses that are crucially relevant to development. This paper reports the findings of a study that brought this presumption to question, taking the case of knowledge and use of these technologies among 5118 students and 1509 academic staff of 97 universities in Nigeria. It reports that majority of the respondents and, by inference, people in Nigeria do not have the ICT competence required to harness the benefits that the technologies offer. Therefore, it is recommended that ICT and development policy makers at all levels in the country put the development of ICT competence at the centre of efforts to promote ICT-led development.

Keywords · ICT4D · Digital divide · Total Cost of Owning ICT (TCO)

Obstacles au Développement lié aux Technologies du Génie Informatique (TGI) au Nigéria: Cas de l’‘ignorance’ de TGI dans les Universités · Résumé · Les Technologies du Génie Informatique (TGI) peuvent jouer un rôle majeur dans le développement. Conséquemment, nombreuses nations et institutions fournissent d’énormes efforts pour en promouvoir l’utilisation. Dans plusieurs de ces efforts, il a toujours été négligé qu’une fois les biens de TGI sont acquis, ces derniers seront utilisés de manière crucialement importante au développement. Cet article reporte les résultats d’une étude qui questionne cette supposition, prenant le cas de connaissance et d’usage de ces technologies parmi 5118 étudiants et 1509 employés académiques de 97 universités au Nigéria. Cet article reporte que la majorité de répondeurs, et par inférence le peuple Nigérian, n’a pas des compétences concernant TGI requises afin d’assembler les bénéfices que TGI offrent. Par conséquent, il est recommandé que les décideurs pour le développement du pays, à tous les niveaux, puissent mettre les compétences liées aux TGI au cœur des efforts afin de promouvoir un développement lié aux TGI.
Mots clé · Développement lié aux TGI- Partition digitale · Coût Total d’appartenance de TGI (CTA)

Introduction

The role of ICT in development has been emphasized in the literature (see, for example, Changeiywo, 2005; Danish Ministry of Education, 2001; FAO, 1998; Gates, 1995; GoU & NCST, 2002; Kasigwa et al., 2006; Museveni, 2006; NRM, 2006; Roudrigues & Wafula, 2006; Thom-Otuya & Ubolum, 2007). ICT media are evolving rapidly—bringing unique advantages to the dissemination of information; innovating production processes; and transforming the ways in which

¹ Delta State University, E-mail: chineloduze@yahoo.com



individuals and societies do business (Oliverio & Pasewark, 1988; Boritz, 2000). Production and competition are influenced by synergies enabled by ICTs, leading to fundamental changes in the way governments, transnational organizations and economies work. ICT has become so central to organizations' success that it is nearly impossible to succeed in today's market without a working knowledge of these technologies (Boritz, 2000; Cheta, 2003; Duze, 2009b; Saint et al, 2004; Otuya-Thom & Ubulom, 2007).

However, the ICT revolution also presents unprecedented challenges for those that are excluded from the advantages that it offers. ICT exposes those that are excluded from its advantages to predatory competition from firms in the more developed world and widens the gap between its haves and have-nots, thus perpetuating the underdevelopment of the have-nots (Akudolu & Olibie, 2007). Akudolu & Olibie (2007) note that lack of access to ICTs pushes nations off the information superhighway, makes it impossible for them to change to knowledge-driven economies, hurts their competitiveness and reduces their citizens' quality of life. In education, for example, the textbook, the teacher, and the student inevitably become purveyors of obsolete knowledge so long as they are not trained to acquire new knowledge and skills resulting from these innovations. The big irony is that the obsolete not only perpetuates itself in the content of education but also in the context traversing methodology and the very architect of the school, comprising a vicious cycle of ICT exclusion, underdevelopment and further ICT exclusion (Coombs, 1968; Duze, 1997; Heyneman, 1983).

The world over, therefore, nations and institutions are making enormous efforts to invest in the promotion of ICT, to harness the benefits that the technologies offer. In various parts of the less developed world, efforts are being made to increase the availability of ICT facilities. Notwithstanding the usefulness of such acquisition of ICT facilities, however, a well established position in ICT for development is that access is not synonymous to inclusion. Those accessing ICTs must also possess the knowledge and skills that they need to make the best of the advantages that the technologies offer. In the less developed world, this knowledge and skills are usually developed through educational institutions, so there has been notable affirmative action in favour of the promotion of ICTs in educational institutions (see, for example, Adam, 2003; Czerniewicz & Carr, 2005; Damonse, 2003; Farrell and Isaacs, 2007; Loing, 2005; Lwakabamba, 2005; Murenzi & Hughes, 2006; Muzaki & Mugisa, 2006; Rodrigo, 2005).

In the Nigerian education system, however, efforts to promote the availability of ICT facilities have not been complemented by checks on the capacity of learners and their teachers to make the best use of these facilities. This is despite the fact that, as noted above, access to ICTs is not synonymous to inclusion in sharing the benefits that the technologies offer (CoSN, 2001). It is also despite the fact that it is essential to understand the uses to which ICTs are put and the best way to use them to enhance individual's and organization's performance (Saint et al, 2004). Apparently, it is taken for granted that, once available, ICT facilities will be put to the best use.

Since a host of authors (e.g. Akinbola, 2006; Ebenebe, 2007; Duze, 2009a; Ssempebwa et al. 2007; Ouma & Ssempebwa, 2009; Bakkabulindi et al., 2008; 2009) had presented data discrediting this presumption in various parts of the world, however, this study delved into knowledge and use of ICT systems in Nigeria, taking the case of Universities—because universities' use of ICTs deserves special attention, given their need for the technologies (Loing, 2005; Zhao, 2003) and role as promoters of ICT usage among their staff and learners (Ouma & Ssempebwa, 2009; Duze, 2009b); and because education is a mirror of society and educational institutions are society in miniature (Winston, 1994; Duze, 2009b; Aggarwal, 1985), the inference being that conclusions derived from these institutions may validly make an indication of the situation in the society as a whole.

Methods

The study followed an ex-post facto design because it sought to establish the extent to which the subjects were knowledgeable about and used ICT systems and there was no need to manipulate the

variables. Data were collected from the 97 universities in Nigeria and focus was on knowledge about and use of ICT systems. Specific attention was paid to: 1) knowledge of the PC and ICT peripheries; software; communication facilities; and ICT services, with regard to knowledge of ICT systems; and 2) frequency and nature of use of ICTs, with regard to utilization of ICTs. A sample of 5,118 students and 1,509 academic staff were involved in the study—because students and academic staff are the major actors in universities. These were drawn from a cross-section of the departments of the universities. However, students and faculty of computer science departments were purposely left out, because their ICT competence was likely to be atypical of the norm given their specialization in the study of ICTs. Data collection took cognizance of the fact that ICTs include the full range of computer and telecommunications equipment relevant to the capture, storage, processing and dissemination of data so the data collection instrument was constructed as a 99-item questionnaire ($r=.87$) touching on each of these constituent components of ICTs and their utilization. The questionnaire was close-ended and self-administered, because the respondents were literate and self-administration would enable the researcher to survey a big number of subjects in a short period of time. The validity of the instrument was ascertained by a team of computer and measurement experts. The instruments were delivered by data collection assistants, under the supervision of the Principal Investigator. The data collected on each of the attributes of knowledge and use of ICT systems were analyzed using frequency counts and percentages.

Findings and Discussion

The findings on knowledge of ICT systems among the respondents are summarized in Table 1.

Table 1: Distribution of Respondents by Knowledge of ICT System (%)

Component		Students (n=5118)	Staff (n=1509)
PC & Peripherals	Know that ICT refers to computers, ancillary equipment, microelectronics & telecommunications	37	39
	Can identify the basic parts of a PC	25	9
	Know hardware & software components of PC	22	11
	Know the functions of basic parts of a PC	21	11
	Know the use of ROM and RAM	11	6
Software	Can connect scanner, modem, & phone to PC	20	2
	Know that ICT includes spreadsheet software	30	21
	Can follow display instructions to install software	6	2
Communication facilities	Can follow display instructions to troubleshoot software errors	1	1
	Appreciate telephony as part of ICT	39	40
	Understand what the Internet is about	23	23
ICT Services	Understand LAN & WAN	30	12
	Know that ICT involves acquisition, manipulation, transmission, reception, management, control, storage, retrieval, interchange, movement, display, data analysis.	36	36

The findings in Table 1 indicate that less than 50% of both the students and academic staff affirmed knowledge of all the aspects of ICT systems. This suggests that majority of the respondents were ICT illiterate. It may be noted that the ignorance of components of ICT systems these results indicate could lead to underutilization of the technologies—even in instances where they are available—since ICT literacy goes beyond the provision of computer access to students to include deep changes in the content, design and delivery of education to sharpen the students' competencies (Bakia, 2002; CoSN, 2001; Cristina & Sandra, 2003). The findings on the respondents' utilization of ICT facilities are summarized in Table 2.

Table 2: Distribution of Respondents by Utilization of ICTs (%)

Attribute of Utilization of ICTs		Students (n=5118)	Staff (n=1509)
Frequency of use	Work with PC at least once a week	4	5
	Use computer in course of work	1	2
	Can browse the internet using a PC	20	3
	Can browse the internet using GSM	6	1
	Browse the internet at least once a week	2	3
Nature of use	Blogs, chat rooms, & social networking	46	1
	Desktop publishing	4	1
	Editing and review	11	9
	Email	49	4
	Music downloads	49	2
	Office software	3	1
	Research	30	11
	Spreadsheets	3	1
	Utilities	6	3

Table 2 shows that less than 50% of the respondents indicated that they used the components of ICT facilities outlined. It may be noted that in the academic staff category, the percentage of respondents who indicated use of these components was less than 15%. In almost all the items investigated, the students recorded higher percentages of ICT use than academic staff—probably because the students were younger than the academic staff yet there is an inverse relationship between age and adoption of ICTs (Bakkabulindi et al., 2009). Regardless, the students' use of ICTs was mainly in the area of recreational and leisure aspects of ICT use (such as chatting (46%), exchanging e-mails (49%) and downloading music (49%).

Conversely, in areas that have been reported to have achieved ICT-led development, millions of youths are online whether at school, at home, or at a neighbour's or friend's house. If they have Internet access on their cell phones or a handheld device, then they are online almost anytime, anywhere. For example, statistics show that in Canada nearly half of all youths with cell phones can access the Internet with them; in India the sharp rise in the number of Internet users (54% annually) is largely attributed to youths; in the United Kingdom nearly 1 in 5 youths between the ages of 9 and 19 had Internet access in their bedroom; and in the United States 93% of youths between 12 and 17 use the Internet. Even if Nigerian youths may not be expected to be as ICT savvy as their peers in these more developed settings, and despite the fact that many of the youth in these settings also use the internet for leisurely activities, the finding that over 50% of the Nigerian youths hardly appreciate modern communication facilities as constituent components of ICTs (Table 1) indicates that the country is still far from achieving ICT-led development. This is especially the case when it is taken into account that young people are expected to be the leaders of the ICT revolution, given the inverse relationship that has been confirmed between age and adoption of these technologies (Bakkabulindi, et al. 2009).

Specifically notable, is the indication that a very low percentage of both the students and academic staff indicated that they use ICTs to execute core aspects of their work (e.g. research). It is also notable that less than 10% of the respondents indicated ability to follow display instructions to install software and troubleshoot software errors. This is especially so when it is taken into account that a lot of frustration could result from inability to follow display instructions to correct minor errors and adjustments and that incompetent ICT users may refuse the technologies. This could explain why individuals cannot work alone and must require computer assistants who are themselves often not available at the time they are needed. Besides, the low levels of ICT competence established raise fears that doing the wrong things and punching the wrong keys could damage the ICT facilities, since ICT end-user operations and dependence on peers for support has

been characterized as detrimental to the promotion of ICT use in educational settings (see CoSN, 2001, for example).

These findings are disquieting since academic staff are expected to carry out researches (and, therefore, use these technologies to retrieve, organize, analyze, and report data); and investment in the acquisition of ICT facilities is motivated by desires to promote students academic, rather than recreational, experiences. Nonetheless, these findings rhyme well with those in Table 1 (indicating that most of the students were not aptly knowledgeable about different aspects of ICTs). Specifically, when interpreted in terms of the findings in Table 1, the findings (in Table 2) that ICTs were not put to *good* use point to the fact that the technologies could not be well used when those that are expected to use them are not aptly knowledgeable about them and their use. A more disturbing dilemma is that these data were elicited from an ICT niche category (i.e. university students and academic staff), who are expected to be above society averages with regard to knowledge and use of ICTs. Simply put, the study indicates that Nigeria is ill prepared for ICTs for development, considering that those that are hoped to be the champions of the ICT revolution in the country are themselves ICT *illiterate*.

In fact, when interpreted in terms of Akinbola (2006), Ebenebe (2007) and Duze (2009a)'s observation that many of the higher education institutions in Nigeria are still using manual typewriters, have obsolete ICT ware and primarily deploy their ICT facilities to secretarial chores, the findings of the study suggest that if Nigerian universities do not have the requisite competence to tap the benefits that ICTs offer, then the Nigerian community cannot be reasonably expected to deploy ICT for development. Though Nigeria is aware of the importance of ICT in its social, political, economic, and cultural development, therefore, this study suggests that she cannot realize these benefits because she does not have competent people to harness these technologies. Accordingly, a key implication of the study is that ICT human resource competence development should be at the centre of efforts to promote ICT-led development in the country, since any ICT resources acquired in the country should be operated and maintained by competent people (Duze, 2009b).

Conclusion and Recommendation

The main conclusion deducible from this study is that Nigeria is not ready for ICT-led development because majority of the subjects and, by inference people in Nigeria, do not have the ICT competence required to harness the development-related benefits that ICTs offer. Therefore, it is recommended that ICT and development policy makers at all levels in the country put the development of ICT competence at the centre of efforts to promote ICT for development.

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Author Biography

Doctor C. O. Duze is a senior lecturer and staff adviser in the Department of Educational Administration and Policy Studies, Delta State University (DELSU), Abraka, Nigeria. She is also the course adviser/coordinator of Music Education, DELSU, and the public relations officer, National Association of Women Academics, DELSU Chapter.