AVAILABILITY, ACCESSIBILITY AND USE OF ICTS BY NIGERIAN WOMEN ACADEMICS

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ABSTRACT
This study investigated the availability, accessibility and use of Information and Communication Technologies (ICTs) among women academics in six universities in South Western Nigeria. The study adopted a survey design approach and the questionnaire was administered on 246 women academics in the six universities. Findings revealed that the use of ICT facilities such as computers, printers, Internet, individual websites, photocopiers, telephones and mobile phones was relatively high among the respondents compared to the use of scanners, facsimiles, videoconferencing, and teleconferencing. Also, the women academics used the ICT facilities for various tasks notably for statistical analyses, word processing, Internet browsing and searching for information, electronic communications and preparation of course materials. Analyses also confirmed notable differences in women academics access to the ICT facilities compared with their male counterparts and some factors responsible for this were identified. The study argues that though increasing availability and access to ICT is very pertinent to making women academics avail themselves of the benefits of ICT, but other factors that would make them become a part of the decision-making process regarding ICT issues should equally be addressed. The study recommends some policy options and strategies that the government and the management of the surveyed institutions should adopt. They should not only increase the access of women academics to ICT, but also enable them participate in the decision-making and control of ICT deployment.

Keywords: Academics; Women in ICT; Digital Divide; Gender; Information and Communication Technology; ICT Policy; Nigeria

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INTRODUCTION

Knowledge is power and it is true that education is fundamental to the development of a dynamic labour force capable of accessing and integrating knowledge into social and economic activities and participating in today's global economy. With the evolution of Information Communication Technologies (ICTs), the delivery of education and training is changing. Rapidly, ICTs are affecting the way university education is delivered and research conducted. They are currently being used effectively in higher education for information access and delivery in libraries, for research and development, for communication, and for teaching and learning (Jacobsen, 1998). The drive for engendering the ICT environment dates back to the Beijing Declaration and Platform for Action (PfA), adopted by the Fourth World Conference on Women in 1995 (UNGASS, 2000). The PfA identified gender mainstreaming as a critical strategy for the advancement of women and the improvement of their quality of life. This process was expected to be applied to all arenas, including that of ICTs. The PfA drew attention to the emerging global communications network and its impact on public policies, and private attitudes and behaviour. It called for the empowerment of women through enhancing their skills, knowledge, access to and use of information technologies. The twenty-third special session of the General Assembly, held in June 2000 to review progress made in implementation of the Platform for Action, recognized the increased opportunities created by ICTs for women to contribute to knowledge sharing, networking and electronic commerce activities. It also noted that poverty, lack of access and opportunities, illiteracy, including computer illiteracy, and language barriers prevented some women from using ICT, including the Internet. Steps were proposed to ensure that women benefited fully from ICTs, including equal access to ICT-related education, training and entrepreneurship opportunities, and equal access as producers and consumers of ICT through public and private partnerships.

In Nigeria, the evidence for the growing importance of ICTs in modern university education is the increasing rate of acquisition of computers and other information technologies (including VSATs), for use by staff and students. Although much has been written and said about the value of ICTs in teaching, learning and research, studies have shown that successful integration of technology into the university system depends not only on access and availability but also on the extent to which staff and students embrace these technologies (Horgan, 1998). Academic staffs are a core user group who plays a vital role in the successful implementation of ICT projects and initiatives. While considering the use of ICTs by academics, a lot of studies (La Valle and Blake, 2001; Selwyn, 2003; Sorenson and Stewart, 2004) have noted that there is a disparity in the use of ICT between males and females. Writers such as Hafkin and Taggart (2001) have

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noted that factors which affect the use or non-use of ICTs by men may actually be different from those that affect use or non-use by women and that it is important to study gender differentials in ICT adoption and use because technology is not gender neutral. It is the general belief that women are lagging behind men when it comes to the accessibility, availability and use of ICTs. Hafkin and Taggart (2001) identified factors such as literacy and education, language, time, cost, and geographical location of facilities, social and cultural norms, as well as women's computer information and dissemination skills as constraints against women's access to information technology. The questions then are: Why are women affected by these factors? Do these factors also affect women academics considering their level of literacy? If it does, what can be done to improve their access, availability and use of ICT? This study seeks to assess the level of availability, accessibility and use of ICTs by Nigerian women academics with a view to recommending policies to increase their access to and usage of the ICT facilities. It also aims at investigating the effects that the use of ICT has on their activities. A study of this kind, it is believed, will no doubt identify policy options and strategies that would make ICT more relevant and beneficial to Nigerian women in general, and women academics in particular.

REVIEW OF LITERATURE

Status of Women in Nigeria

According to Obayelu and Ogunlade (2006), findings from UNIFEM (2000) have revealed that in the formal sector in Nigeria, women constitute 30 per cent of professional posts, 17 per cent of administrative/managerial positions, and 30 per cent of clerical positions; 17 per cent are employed in other categories. They are disproportionately concentrated in low-paid jobs, particularly in agriculture and the informal sector. The Federal Office of Statistics has noted that 48 per cent of women are engaged in agricultural work, and 38 per cent are involved in petty trading at markets, although it is a common knowledge that most rural women conduct both roles. Women and young girls in Nigeria are burdened with an unfair workload inside and outside the home. Data suggest that 33 per cent of women work five or more days per week for very long hours to supplement the family income. In rural areas, aside from their reproductive and housekeeping roles, women fetch water and gather firewood, in addition to conducting much of the agricultural work in the fields such as planting, hoeing and weeding, harvesting, and transporting and storage of crops (Obayelu and Ogunlade, 2006).

Research has similarly revealed that 41 per cent of working mothers have to attend to their children while at work. Women in urban areas have little support from their extended family or community and so are forced to take their young children with them to work. Or the infants are left with older female siblings while their mothers are at work, which prevents the older girls from attending school, and partly explains the high levels of illiteracy among young girls. Men in Nigeria have much greater control over resources than women do. As a result of this, the Nigerian government has initiated series of programmes to assist women in obtaining micro-finance and credit, formation of co-operatives and self-help organisations such as Federation of Nigerian Women's Societies (FNWS) in 1953, formation of National Women's Commission was set up (later upgraded to the Ministry for Women's Affairs and Social Development), Family Support Programme (FSP) and Family Economic Advancement Programme (FEAP). However these programmes have not achieved the desired goal as the situation has not changed.

Results of a joint research by the Federal Government of Nigeria (FGN, 2001), in a joint venture with UNICEF (2002) showed that women and children in Nigeria were among the poorest in sub-Saharan Africa and the developing world. In response to UN initiatives, Nigeria recently formulated a National Policy on Women. The policy is an attempt to incorporate women fully into national development as 'equal partners, decision makers and beneficiaries' of Nigeria, through the removal of gender-based inequalities. The policy aspires to the inclusion of women in all spheres of national life, including education, science and technology, health care, employment, agriculture, industry, environment, legal justice, social services, and the media. It aspires to eliminate the negative aspects of Nigerian culture, which serve only to harm women, and it aspires to challenge the patriarchal status quo (Obayelu and Ogunlade, 2006).

Women and ICTs
According to Hafkin (2002), gender issues in ICT policy fall into two categories. In the first category, there are gender issues that affect nearly all aspects of access, in the broad sense, and use of ICTs. Secondly, there are gender issues in the topics that classically arise in ICT policy. The first category of gender issues that results in differential access and impact of the new technologies on men and women has been articulated in many places and with numerous variations, but the major among them are discussed below.

(a) Physical Access to Infrastructure
Technological infrastructure is a gender issue. At present, a huge gender gap exists in access to communications; infrastructure is concentrated in urban areas, and the bulk of women live in rural areas (Hafkin, 2002). In developing communications infrastructure,

many choices must be made that involve location of facilities, cost and choice of technologies. All of these affect the majority of women, who are poor and living in rural areas in most African countries, to access these facilities. Hafkin (2002) reported that Internet connectivity is frequently available only within capital and major secondary cities in many developing countries, while the majority of the population lives outside these cities. Access to communication facilities is a vital concern that affects women's lives. The infrastructural deficit of the rural areas coincides with gender demographics-more women live in rural areas than men. Simply by being the majority of the population in rural areas, women have a smaller chance than men to access new technologies. Women, with their special responsibilities for children and the elderly, find it less easy than men to migrate to towns and cities. The urban bias in connectivity thus deprives women, more than men, of the universal right to communicate (UNIFEM and UNU/TECH, 2000).

(b) Social and Cultural Issues
Hafkin (2002) also reported that women tend to have less access than men to those ICT facilities that do exist. Frequently, rural information centres or cybercafes are located in places that women may not be comfortable frequenting. Since most communications facilities in rural areas are shared public access, women also have problems of time. Given multiple roles and heavy domestic responsibilities, their leisure hours are few, and the centres may not be open when women can visit them. Or they may be open in the evenings, when it is problematic for women to visit them and return safely to their homes in the dark. Their mobility (both in the sense of access to transport and ability to leave the home) is also more limited than that of men. Some accommodations that may be needed to ensure gender equality in access and use of ICTs are adaptation of schedules to suit women's hours and availability of women support staff and trainers. In addition to this, Hafkin (2002) stated that another cultural aspect of gender and ICTs is gender bias in attitudes towards women studying or using information technology. The problem is worse in Africa than in any other regions. Many (predominantly male) math, science and technology teachers in Africa hold outmoded views that females cannot think or work scientifically and that science is too mechanical and technical for females, thus discouraging female students from enrolling in technical courses (Quaisie, 1996).

Attitudes that information technology is not for women are not limited to formal education. In an ICT project for farmers in Cajamarca, Peru, when women undertook information technology training with men, the men mocked them, saying that computers were for men, not women (Puican 2002). Sometimes collateral cultural factors and other cultural attitudes based in gender bias, and not the immediate gender identification of technology use, which prevent young girls and women from accessing and using ICTs.

In Uganda, girls did not get access to the limited number of computers installed in school because of the socio-cultural norm that "girls do not run" (Gadio, 2001). As a result, boys ran and got to the computers first and refused to give them up to girls. Additionally, the earlier curfew hours for girls at boarding schools further constrained their access to computers. In India, in the well-known "hole in the wall" experiment, the aggressiveness of boys pushing away girls prevented the girls from using the computers (Mitra, 2001).

(c) Education and Skills

These involve literacy, language, computer skills and information literacy. In each case, women in developing countries are less likely than men to have the requisite education and knowledge. Two-thirds of the world's 876 million illiterates are women, and the number of illiterates is not expected to decrease significantly in the next twenty years (UNIFEM, 2000).   Women are also less likely to know the international languages that dominate the World Wide Web. Until two years ago, the Internet was predominantly in English. But in 2002, the percentage fell rapidly to the point where English is no longer the primary language of the majority of Web users. After English, most Web pages are in Chinese, Japanese and German, languages that women in poor countries are unlikely to know. Given their limited access to schooling, women, especially those in rural areas, are also much less likely than men to have computer skills. Information literacy essentially involves using information contextually, a skill that women are less likely than men to have (Heeks, 1999). This generally results from the limited exposure and isolation of many women in developing countries, particularly those living in rural areas.

(d) Financial Resources

Almost all communication facilities cost money. Women are less likely than men to own radios and televisions, or to access them when they want to, in the case of household possession of the technology. When it involves paying for information access, such as at a rural information centre or a cyber cafe, women are either less likely to have the disposable income to do so, or hesitate to use family food, education and clothing resources for information. According to Hafkin (2002), there are gender issues in the way that ICTs are used in developing countries. To date, most women's use of ICTs has been confined to email and sometimes to listservs (email discussion lists), generally in connection with advocacy and networking activities. The main reasons for this concentration are cost of access and limitations of time, bandwidth and technical skills. To date, few women have used it for business, entertainment (the predominant use in the developed world) or education, including education in matters related to livelihood and well being of themselves and their families (e.g. health and nutrition education). A number of the factors above fall into the category of financial and educational deficits in accessing and using ICTs.

RESEARCH METHOD

The research design adopted was the survey. The research locations were the campuses of selected universities namely: University of Ibadan (UI), University of Agriculture, Abeokuta (UNAAB), Lagos State University (LASU), Covenant University, Ladoke Akintola University (LAUTECH), and BOWEN University. The population of the study comprised women academics in these six selected universities totalling six hundred and fifteen (615). Forty per cent of the study population (246) was selected as the sample size using simple random sampling. Data were collected in September 2006 using a self-constructed, structured questionnaire that was divided into three (3) sections as shown in Figure 1. Responses from the completed questionnaires were coded and analysed using frequencies and percentage distributions.

Section One: elicited information on the respondents' demographics.

Section Two: asked questions relating to availability, accessibility and use of ICT and

Section Three: elicited information on questions relating to digital divide, causative factors and possible solutions.

Figure 1: Structure of the Questionnaire

DATA ANALYSIS AND DISCUSSION

Demographic Information

Of the two hundred and forty-six (246) copies of the questionnaire administered, two hundred and eleven (211) were returned but only two hundred and five (205) of them were useful for analysis giving 83.3% return rate. Figure 2 shows the percentage distribution of the respondents in the selected universities. Respondents came from ten (10) faculties and the highest percentage of responses was from the Faculty of Science with forty-eight (48) (23.4%) of the total responses, followed by the Faculty of Medicine/Health Sciences with forty-six (46) (22.4%). The lowest percentage of responses was from ARCIS with only one (1) (0.5%), followed by Pharmacy and Law, having five (5) (2.4%) and seven (7) (3.4%) respectively. Figure 3 presents the details of the number of respondents from each faculty. On the academic designation of the respondents, the highest percentage was "Lecturer" (73, 35.6%) followed by "Senior Lecturer" with forty-three (43) (21.0%). The lowest percentage was "Professor" with nine (9) (6.3%) respondents.

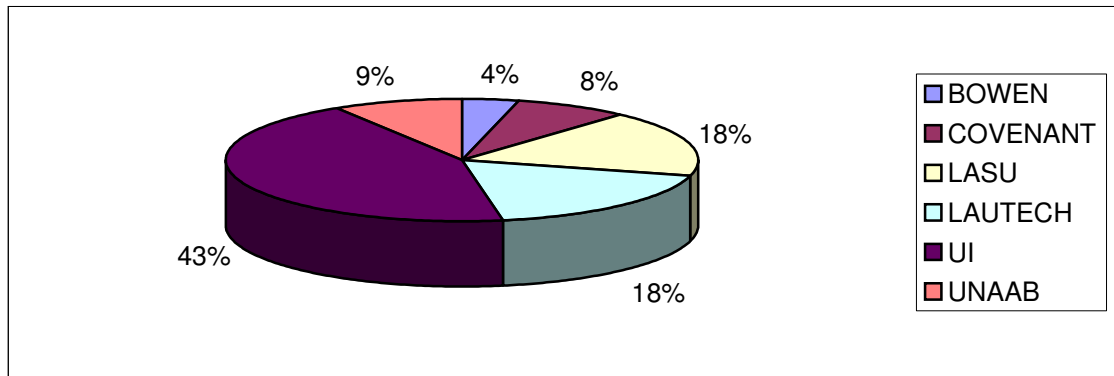Figure 2: Percentage of Responses from Each University

faculty

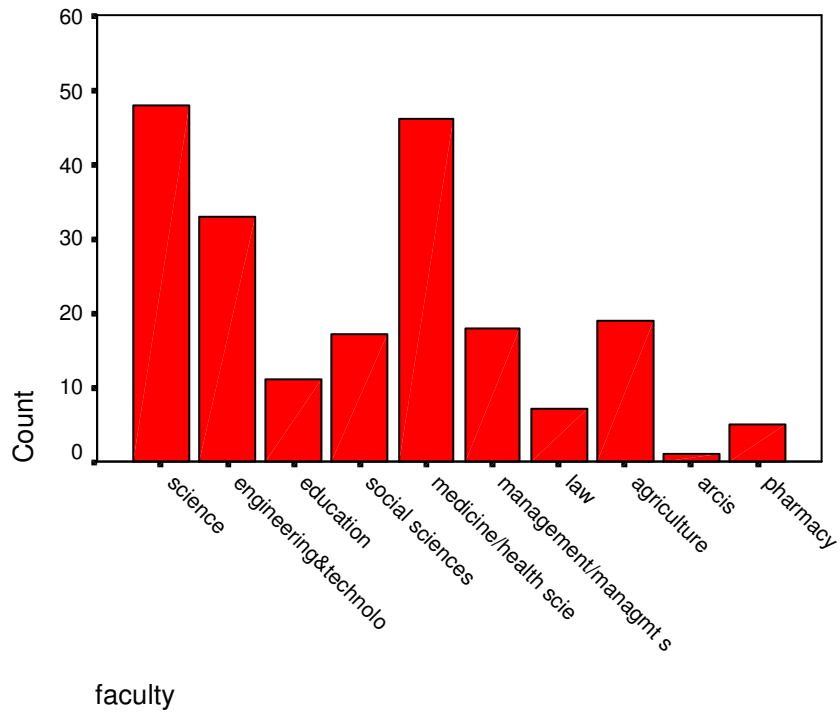Figure 3: Responses from Each Faculty in the Selected Universities

Availability, Accessibility and Patterns of Use of ICTs by Women Academics
All the two hundred and five (205) (100%) respondents were computer literate. This shows that all the respondents in one way or another know how to operate the computer and use it for diverse data processing tasks. Those who had been using ICT facilities for between 6 and 10 years had the highest percentage (113, 55.1%), while the lowest percentage came from the category of those who had been using ICT facilities for between 16 and 20 years with four (4) (2.0%) respondents.

All respondents indicated that computers, printers, Internet, scanners, facsimile, telephones, mobile phones, and photocopiers were available in their institutions. One hundred and eighty two (182) (88.8%) indicated that they had individual websites. Twenty-four (24) (11.7%) respondents attested to the fact that videoconferencing facilities were available in their institution, while only fourteen (14) (6.8%) indicated that teleconferencing facilities were available. Table 1 presents these findings.

Table 1: ICT Facilities Available in the Selected Universities

ICTs	Available	Not Available	No response
Computers	205 (100%)	-	-
Printers	205 (100%)	-	-
Internet	205 (100%)	-	-
Individual website	182(88.8 %)	18 (8.8%)	5 (2.4%)
Scanner	205 (100%)	-	-
Facsimile	205 (100%)	-	-
Telephone	205 (100%)	-	-
Mobile Phone	205 (100%)	-	-
Photocopiers	205 (100%)	-	-
Videoconferencing	24 (11.7%)	146 (71.2%)	35 (17.1%)
Teleconference	14 (6.8%)	170 (82.9%)	21 (10.2%)

Extent of Use of ICTs
Analyses showed that 71.7% (147) of the respondents indicated that they make a very great extent use of computers while only 9.8% (20) respondents make little use of it. A total of 6.3% (13) of them made a little extent use of printers while 89.3% (183) use printers moderately. Internet was used greatly in the selected universities as 63.4% (130) respondents stated that they used it to a very great extent and only 11.2% (23) used it

moderately. The use of scanner was not very common among the respondents as majority of them (68.5%, 140) said they made little use of it. The same went for facsimile as 45.4% (93) of them indicated that they made no use of it while only 4.90% (10) indicated using it moderately. The respondents made frequent use of the telephone as 91.7% (188) of them indicated using it. The use of mobile phone was common in the selected universities as 15.6% (32) respondents made a frequent use of it. The use of videoconferencing and teleconferencing facilities was not popular among the women academics as 71.2% (146) and 82.9% (170) respondents indicated not using them respectively.

Table 2 shows the extent to which ICTs were used to perform various tasks among the women academics in this study. A total of 26.6% (54) of them reported using ICTs always for data collection while 53.7% (110) occasionally used it for the same purpose. A total of 45.9% (94) made occasional use of ICTs for statistical analysis; 70.7% (145) used ICTs very often for word processing; 98.5% (202) indicated not using ICT for games at all. A total of 84.9% (174) respondents used ICT very often for Internet browsing; 80.0% (164) respondents used it very often to search for information; 60% (123) reported not using ICTs at all for writing computer programmes while 23.4% (48) respondents used it occasionally for the same purpose. A high percentage of 77.6% (159) always used ICTs for storage and retrieval of materials while 14.1% (29) used ICT facilities very often for the same purpose. In terms of using ICTs for electronic communications, 58.0% (121) reported always used it, while 6.8% (14) occasionally used it for the same purpose. A total of 31.2% (64) used ICTs very often for research while 48.3% (99) used it occasionally for that purpose. The majority of respondents either always or occasionally used ICTs for preparing their course materials (39.5% (81) and 51.7% (106) respectively). A total of 69.3% (142) reported rarely used the scanner and 58.0% (119) rarely used the facsimile. A high majority (84.4%, 173) did not use ICTs for ecommerce, only 7.8% (16) of the respondents reported occasionally used ICT for this purpose.

Access Issues
On whether there was equality of access between the women academics and their male counterparts, 199 (97.1%) answered in the negative while only 6 (2.9%) respondents confirmed that there was equality of access (Table 3). Thus, it was evident that the women academics perceived that there was an unequal access to the use of ICT facilities between the women and their male counterparts in the selected universities. This study therefore established that there was indeed gender imbalance in the use of ICTs in the surveyed universities.

Table 2: Tasks ICTs Were Used for

Tasks	Not at all	Rarely	Occasionally	Always	Very Often	No Response
Data Collection	1 (0.5%)	20 (9.8%)	110 (53.7%)	54 (26.3%)	20 (9.8%)	-
Statistical Analysis	51 (24.9%)	47 (22.9%)	94 (45.9%)	9 (4.4)	4 (2.0)	-
Word Processing	4 (2.0%)	1 (0.5%)	2 (1.0%)	145 (70.7%)	53 (25.9%)	-
Games	202 (98.5%)	3 (1.5%)	-	-	-	-
Internet Browsing	-	-	-	31 (15.1%)	174 (84.9%)	-
Searching for information		3 (1.5%)	5 (4.4%)	29 (14.1%0	164 (80.0)	-
Writing computer programmes	123 (60.0%)	48 (23.4%)	4 (2.0%)	5 (2.4%)	3 (1.5%)	22 (10.7%)
Storage and retrieval of materials	-	3 (1.5%)	10 (4.9%)	159 (77.6%)	29 (14.1%)	4 (2.0%)
Electronic communication	-	11 (5.4%)	14 (6.8%)	121 (59.0%)	57 (27.8%)	2 (1.0%)
Research	3 (1.5%)	19 (9.3%)	99 (48.3%)	13 (6.3%)	64 (31.2%)	7 (3.4%)
Preparation of lecture materials	-	-	106 (51.7%)	81 (39.5%)	18 (8.8%)	-
Scanning documents	2 (1.0)	142 (69.3%)	53 (25.9%)	5 (2.4%)	2 (1.0%)	1 (0.5%)
Faxing documents	77 (37.6)	119 (58.0%)	9 (4.4%)	-	-	-
E-commerce	173 (84.4%)	12 (5.9%)	16 (7.8%)	3 (1.5%)	1 (0.5%)	-

Table 3: Equality of Access to ICTs in the Selected Universities

Equality	Frequency	Percentage %
Yes	6	2.9
No	199	97.1
Total	205	100

The women academics were asked to identify the various possible reasons for gender digital divide (Table 4). This was due to their affirmation that there was unequal access to ICT facilities between them and their male counterparts. The respondents were somewhat unanimous in their response to the extent to which the possible reasons might have accounted for the gender digital divide as 203 (99%) of them identified "inadequacy of ICT facilities", "women having less time to spend learning new programmes", "undue discrimination against the women folk", "most women are ICT-phobic", "lack of institutional ICT policies to encourage women to use ICT facilities", "women academics seem more reluctant than men to use ICT", and "women having less access to electronic communications and less ownership of the necessary equipment" as reasons that greatly cause gender digital divide. Two respondents each identified: "lack of ICT skills" and women being less focussed on the technical side" to be the factors responsible for the gender digital divide while 203 (99%) identified the same reasons as being responsible to a very large extent. The unanimity of the respondents on the factors responsible for the gender digital divide shows the gravity of the problem among the women academics and reveals the level of ICT development and extent to which ICT is made to negatively impact on the activities of women, and in this case, women academics, in Nigeria.

As revealed in Table 5, all respondents were unianimous on the following possible solutions that could be adopted to bridge gender digital divide: provision of ICT facilities to women academics; training them to acquire ICT skills; providing loan to purchase ICT equipment and incorporating them into formulating ICT policies. Other possible measures include: ensuring that educational and academic curricula are gender fair; including gender sensitivity in school curricula & ICT training modules to correct existing cultural and social gender biases and stereotypes; as well as giving of scholarships to women academics in ICT related courses will bridge gender digital divide. Also, 204 (99.5%) indicated that getting institutional and national ICT policies, initiatives and laws to redress gender digital divide is a probable solution and 195 (95.1%) of them indicated creating and improving women academics' access to the Internet could be a solution.

Table 4: Possible Reasons for the Gender Digital Divide

Reasons	No extent	Little extent	Moderate extent	Very Great Extent
No enough ICT facilities	-	-	2 (1.0%)	203 (99%)
Women have less time to spend learning new programmes	-	-	2 (1.0%)	203 (99%)
Undue discrimination against the women folk	-	-	2 (1.0%)	203 (99%)
Most women are ICT-phobic			2 (1.0%)	203 (99%)
No institutional ICT policies to encourage women to use ICT	-	-	2 (1.0%)	203 (99%)
Lack of ICT skills	-	2(1.0%)	-	203 (99%)
Women academics seem more reluctant than men to use ICT	-	-	2 (1.0%)	203 (99%)
Women have less access to e-communications and less ownership of the necessary equipment	-	-	2 (1.0%)	203 (99%)
Women are less focused on the technical side	-	2(1.0%)	-	203 (99%)

Table 5: Possible Solutions to Bridge Gender Digital Divide

Opinions	Agree	Undecided	Disagree
Provision of ICT facilities to women academics	205 (100.0%)	-	-
Training of women academics to acquire ICT skills	205 (100.0%)	-	-
Provision of loan to women academics to purchase ICT facilities	205 (100.0%)	-	-
Incorporating women academics into formulating ICT policies	205 (100.0%)	-	-
Create and improve women academics' access to the Internet	195 (95.1%)	10 (4.9%)	-
Guides equality and women's empowerment	162 (59.0%)	20 (9.7%)	23 (11.2%)
Getting institutional and national ICT policies, initiatives and laws redress gender digital divide	204 (99.5%)		1 (0.5%)
Gender sensitivity in school curricula & ICT training modules to correct existing cultural and social gender biases and stereotypes	205 (100.0%)	-	-
Ensure that educational and academic curricula are gender fair	205 (100.0%)	-	-
Giving scholarship to women academics in ICT related courses	205 (100.0%)	-	-

DISCUSSION

The majority of the women academics in the selected universities were ICT literate. Computers, Internet, individual websites, telephones, mobile phones, and photocopiers were the most commonly used ICT facilities, while ICT facilities such as scanners, facsimiles, videoconferencing and teleconferencing were not commonly used and thereby these facilities had little significance in the academics' activities. Findings also revealed that the respondents mainly used ICT to perform data collection, statistical analysis, word processing, information search, storage and retrieval of materials, electronic communication, research, and preparation of course materials. They make little or no significant use of the ICT facilities for writing computer programmes, playing games, scanning documents and e-commerce. This might be due to the fact that they had little or no skills for these activities or that in terms of using ICT to play computer games, the women were rather too busy with more important activities. This corroborates the Gender Advisory Board to the Commission on Science and Technology Development 2006 report that women's double and triple workloads of domestic, income-generation and community management activities mean that they often do not have the free time to travel, to learn about and use ICT.

Also, the majority of the women academics affirmed that they had unequal access to the use of ICTs in their institutions in comparison with their male counterparts. This finding confirms previous studies that had reported continued gender differences of access. Selwyn (2003) noted that a higher proportions of males than females report access to ICT such as the Internet. In the UK, La Valle and Blake (2001) found that women were less likely to have access to computers. Even in a developed country like the Netherlands, Sorenson and Stewart (2004) noted that although gender differences in terms of access were small, they still exist and to buttress this, the United Nations Secretary General, Kofi Annan in the year 2000 stated that there is a gender divide, with women and girls enjoying less access to information technology than men and boys. The gender divide within the digital divide could be seen in the lower numbers of women users of ICT compared to men. One illustration of this is the number of women Internet users and the majority of the world's women do not use the Internet (UNDP, 2002). However, these findings were at variance with others which report no gender differences with regard to access. For instance, in the US school-sector, a 2001 study (Miller, Schweingruber and Brandenburg, 2001) found no gender difference in home computer ownership, and an extensive and recent study of UK youth commented, "interestingly, gender makes little difference to access in any location" (Livingstone, Bober and Helsper, 2005). Also, Atan et al. (2002) found no gender differences in the availability of computers, either at home or at work for distance education learners. Even in Africa, a

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study of 200 academics at 10 universities in Nigeria and Kenya found no gender differences in the use of the Internet, with female and male staff using it equally (Oyelaran-Oyeyinka and Adeya, 2004).

According to the Gender Advisory Board to the Commission on Science and Technology for Development (2006) report, gender divide continues to exist in most countries, particularly in the poor countries of the world. However, even in countries with high Internet penetration rates, women often have a lower rate of access. In general, women use computers and other ICTs less than men, access the Internet less and for shorter periods, do not have the same levels of access at work, and use community access points less. The report and the data collected by the International Telecommunications Union (ITU, 2002) indicate that, contrary to what might be expected, gender patterns in Internet use do not vary equally with Internet penetration, that is, women's rates of use of the Internet will not automatically rise with national rates of Internet penetration. For example, while the gender gap has vanished in some countries which have high Internet penetration, others, such as Norway, Luxembourg, the UK, the Netherlands, Germany and France have not seen women's rates of access approach or become equal to that of men's. In fact, in Germany, the UK, France and Norway, for the years for which we have data women make up less than 40% of Internet users. On the other hand, the rate of 40% female Internet users in the Netherlands is similar to that of Brazil, Mexico, and Zimbabwe, countries where the overall internet penetration rate is less than 5% (Huyer et al, 2005).

These imbalances in females' versus males' use of ICT were found to be due to some factors as revealed in further analyses of the data collected in this study. The cited factors include: inadequate ICT facilities, women having less time to spend learning new programmes, undue discrimination against the women folk, and the fact that most women are ICT-phobic. Other reasons include no institutional ICT policies to encourage women to use ICT facilities, lack of ICT skills, women academics seem more reluctant than men to use ICT, women having less access to electronic communications and less ownership of the necessary equipment, and that women are less focused on the technical side. Women's inadequate access to ICT facilities, social and cultural barriers and financial resources (less ownership of the necessary equipment) were reported by Hafkin (2002) as some of the inhibitors against women's taking advantage and opportunities offered by ICT. In addition, women's "less ownership of technological equipment" agrees with Gurumurthy (2004) who stated that women have relatively little ownership and control of ICT facilities. Gurumurthy (2004) submitted that although data was lacking, it was clear that women are underrepresented on the boards and senior management of IT companies, policy and regulatory organisations, technical standard-

setting organisations, industry and professional organisations and within government bodies working in the area of ICTs. This buttresses the fact that women are under represented in the ICT policy arena since men are more "technically-inclined" and possess ICT qualifications which make them occupy top positions in organisations and thus make policies regarding ICTs at the expense of their female counterparts.

Some of these reasons for gender digital divide were further identified and buttressed in the Gender Advisory Board to the Commission on Science and Technology for Development (2006) which further stated that although the reasons for trends in gender digital divide have not yet been determined, a range of variables affecting access and use of Internet and other ICTs include sex, socioeconomic level, ethno-cultural group, rural/urban location; level of education, and age. Also, women have lower levels of literacy worldwide, making up two thirds of the illiterate population, and women and girls in general have lower levels of education (with the exceptions of girls' enrolment in primary schools in some countries) and are less prone to reach higher education levels in many countries. In addition, women make up the majority of the population in rural areas in many developing regions, the result of male migration to urban areas for employment. Socio-cultural and religious customs such as restrictions on travel by women and girls, restrictions on interactions with members of the opposite sex, and preconceptions about the ability of females to understand and manipulate technology all contribute to reducing women's use of ICT (Gender Advisory Board to the Commission on Science and Technology for Development, 2006; Hafkin, 2002). Even where women are present in public access centres and the workplace, gendered patterns of behavior and interaction such as harassment, belittlement of women's abilities, and the prevalence of pornography at cyber-cafés will mitigate against use by women. Finally, ICT and their content are overwhelmingly designed by men, in the English language, and do not often reflect the interests, concerns, perspectives and information needs of women in the developing world (Gender Advisory Board to the Commission on Science and Technology for Development, 2006).

On how the gender digital divide could be bridged, the respondents submitted that heads of institutions and other stakeholders need to evolve gender-sensitive policies aimed at providing ICT facilities to women academics, train them to acquire requisite ICT skills, provide loan to them to purchase ICT facilities, and incorporate them into formulating ICT policies. Other possible solutions include creating and improving women academics' access to the Internet, getting institutional and national ICT policies, initiatives and laws redress gender digital divide, ensuring that educational and academic curricula have no gender biases but are fair; including gender sensitivity in school curricula and ICT training modules to correct existing cultural and social gender biases

and stereotypes; as well as giving scholarships to women academics in ICT-related courses. All these were summed up in the submission of Hafkin and Taggart (2001), that in order to retain and build upon the employment gains associated with globalization and information technology, women need to move into more technical or higher-level, better-paying jobs. For this, they need access to the educational and training opportunities necessary to equip them for the rapidly changing skill requirements. Policy should encourage girls and women to use ICT early in education, and pursue higher studies in ICT as well as technical careers – as scientists, researchers, administrators and educators.

CONCLUSIONS AND POLICY IMPLICATIONS

This study revealed ICT use pattern by women academics in six Nigerian universities and identified there was a gender digital divide in the use of ICT in these institutions. It is imperative that the gender dimension of the digital divide be considered early in the process of ICT diffusion, rather than as a corrective measure after the fact. The early stage of ICT development is a critical time to advocate on behalf of universal access, low-cost extension of services to underserved rural areas, and an enabling regulatory environment. Women's access to technology and training is a basic requirement for their participation in the global information economy. A focused and timely effort to provide Nigerian women academics with ICT education and skills can enable them to compete successfully in the global information economy and play a leadership role in its development.

Therefore, judging from the findings of this study, it is very essential that the Nigerian government, and the management of each institution surveyed in this study encourage the spread of ICT and increase its availability, accessibility and usage by the women academics. However, whilst it is well recognised that access to ICT resources is important, addressing access alone is insufficient to avoid a gender gap in ICT engagement. The importance of the involvement of women in making decisions about the development of the new technologies is recognised by the United Nations (2005) and others (Gadio 2001; Tshukundu 2002; Hafkin and Taggart, 2001). As Morgan, Heeks and Arun (2004) put it, participation in the decision-making and control of ICT deployment are as important as access. There is therefore the need to evolve policies that will ensure gender equity along the following areas:

- the design and use of the hardware and software components: effective deployment of the technology by all requires that women be active in the design of the technology.

- the design and form of the information content: many recognise the need to develop 'local content' based especially on the local cultural legacy rather than depending on western-designed content (Chapman and Slaymaker, 2002; NEPAD, 2001). Thus, women need to be involved in the design of the type and form of the content.

- the training and education programmes available for technology users and designers: to be part of the ICT professions, women need to move into more technically and cognitively oriented, better-paying jobs which rely heavily on an educational background in science and technology (Hafkin and Taggart, 2001).

- the employment conditions and opportunities available in the ICT profession: since the poor participation of women in the ICT professions both in the developed world and the developing world has been identified, efforts should be geared towards increasing access to ICT education, removing socio-cultural norms that discourage women from studying science and technology, and removing stereotypes that women have towards ICT jobs (Hafkin and Taggart, 2001).

If adequate strategies could be put in place to achieve the stated policy options, the tremendous potential that ICT holds for improving the lives of Nigerian women in general and women academics in particular, would become a reality.

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