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Women's Perceptions and Uses of Information and Communication Technologies in Nigeria and China: A Comparative Analysis

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Abstract: Nigeria and China were probably experiencing roughly similar economic fortunes only about two decades ago. Then, both had large populations and very low per capita incomes. But their socio-economic fortunes and growth rates have diverged dramatically since, with China now being a superpower and the second largest economy in the world, while Nigeria is still tottering along as one of the poorest countries in the world in terms of various global human development indices and rankings. The rapid economic transformations that China has experienced should normally be expected to be accompanied by equally dramatic socio-cultural changes, including the emancipation and greater participation of women in national economic activities. This study sought to investigate the extent to which women in China participate now in the ICT sector of their country compared to women in Nigeria. Data were collected through a questionnaire administered to cross sections of 123 and 151 women surveyed in purposively selected cities in Nigeria and China respectively. Women in both countries recognize the importance of ICT, but those in Nigeria were constrained from full utilization of ICT benefits due to electricity supply problems, financial constraints and inadequate training for ICT. The study found that improved levels of education of women promote the adoption and use of ICT by women in both countries, and that owning personal computers and the availability of time for women helped to increase participation of women in ICT. Some recommendations were made based on the findings.

Keywords: *Women, Participation, Information and Communication Technologies, Socio-economic transformation, China, Nigeria*

1. Introduction

Information Communications Technologies (ICTs) comprise a complex and heterogeneous set of goods, applications and services used to produce, distribute, process and transform information. They include the outputs of industries as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g. the Internet, electronic mail, electronic commerce and computer games)" (Marcelle, 2000). Information and Communication Technology (ICT) is a delivery mechanism and communication tool that is becoming more and more a part of our daily lives (Horie, 2003). It is the key resource of the information society. It provides a great development opportunity and a suite of indispensable tools used by all to deal with the limitations of time, cost, knowledge dissemination and distance problems among others. Access and use of ICT resources is not the end but the beginning of transformation of social, economic and political life. ICTs may reshape, re-organize and restructure working methods. They offer generic advantages of efficiency and productivity gains; information-sharing, storage and communication; faster knowledge-accumulation, dissemination and application; in support of the specific purposes in which they are used. ICTs also permit new collaborative work methods, enabling rapid and continuous transfer of commercial, financial and political information crucial to the development process (UNCTAD, 2003; Huyer and Sikoska, 2003). Gender equality has been the subject of many international efforts, starting as early as 1946 with the United Nations Commission on the Status of Women. The culmination of these efforts resulted in the adoption of the Convention on the Elimination of All Forms of Discrimination against Women in 1979. Article 14 of the Convention articulates the importance of technology in achieving its objectives. The Convention's focus is on fulfilling human rights and social justice for women. Access to science and technology by women has been emphasized at many international conferences, in particular in the Beijing Declaration released at the Fourth World Conference on Women in 1995 (Ainuddin

et al., 2005). With the advent of globalization, contemporary dealings with development can no longer ignore the increasing importance of Information and Communications Technology. Furthermore, given that women comprise over half of the world's population, development cannot be possible without their inclusion and support. In developing countries, the level and participation in Information and Communication Technology is generally low with less than 1% of these populations having access to the Internet (Ogunsola, 2005). Available figures show women users of internet comprise 22% in Asia, 38% in Latin America, 6% in the Middle East, and an unknown, but likely low, percentage in Africa (AED Study document).

ICT is one of the most promising developments of recent times that have immense potential in addressing many gaps in human socio-economic development. Harnessing this potential, however, is a challenge that requires thoughtful planning. ICT can address some of the shortcomings in women's development. The declaration made at the World Summit on the Information Society (WSIS, 2003) describes ICT as a tool in gender mainstreaming and equality. ICT can contribute to the political empowerment of women, improve their participation in the economy, and provide a better quality of life for women and their families. It is a gender-insensitive technology in the sense that both women and men can benefit from it and can contribute to its content. There are numerous benefits offered by the adoption and use of ICTs by women (Ainuddin et al., 2005). These include creation of public awareness of women's issues, access to information and services, provision of help in setting up new businesses and engaging in e-commerce and e-business, income generation, creation of new employment opportunities, improvement of access to formal and non-formal education, health services and other services that were formerly available only on site (Huyer, 2003). Other advantages outlined in Ojokoh (2010) are connectivity and access to information for livelihoods and enterprises, mobilization and education of women workers and advocacy for worker rights, linking of women producers to global markets, efficient communication for micro enterprises of poor women, opportunities for self-employment, and creation of data-repositories and data management. The broad impact of ICT on women has two perspectives: it serves as a tool in gender mainstreaming, but it also allows women to take a more active part in technology development, including the ICT itself. The way technologies develop is now changing: production of ideas alone is no longer sufficient for accomplishing innovation. The workforce of the future has to be multi-skilled, and must involve collaboration between workers at different levels of skills and with different perspectives. Women, through the connectivity provided by ICT, can take a proactive role in technology development: they can influence the direction of technology development by bringing their ideas and their consumer perspectives to bear in the shaping the direction of technology development (Babco, 2004).

Several researches have been conducted across the globe to evaluate the participation of women in ICT. Some focused on gender issues such as underrepresentation of women in ICT (Trauth et al., 2004), women empowerment and ICT (Buskins and Webb, 2009; Ojokoh, 2010), women and ICT career choice and other professional issues (Trauth et al., 2008; Olatokun, 2007), among others. The most common finding of such studies is that women participation in ICT activities is usually low and lower than the level for men. Considering all these related researches, some things were identified: None has addressed the participation of women in ICT in Nigeria as a country. Olatokun (2007) investigated the level of availability, accessibility and use only for women academics. These form just a minute percentage of the entire Nigerian women populace. Alutu and Audu (2008) only investigated for women in a single city. In addition, no research has carried out a cross national study, investigating the participation of women in ICT in Nigeria and China. It has been noted that technological advancements foster participation in ICT. Yet, there are wide disparities in the extent to which different developing countries, and different socio-economic groups within countries, benefit from ICT. Even in developing countries with relatively high net ICT uptake, ICT is still out of reach of many groups due to lack of appropriate products, cost constraints, inadequate education, language barriers, inadequate human resources and lack of robust regulatory framework for ICT (www.parliament.uk/parliamentary_offices/post/pubs2006.cfm). Low participation of women among the designers and creators of information technology has serious consequences, not only for women who are "missing the educational and economic opportunities that are falling into the laps of computer-savvy young men" (Margolis et al., 2002, p.2), but also for a society increasingly influenced by technology. Hence, this cross national and cultural study could help to identify some factors peculiar to women's participation. Barriers identified could be a stepping stone to improved participation when the government and ICT policy making take definite steps in addressing the issues raised. Therefore, in order to promote women's

participation in ICT in this rapidly changing global society, there is a need to identify current status of women in terms of their ICT use - where they stand, and how they take advantage of this new technology. This study therefore helps to find out the current level of female access and participation in ICT situation in Nigeria and China. It does a kind of comparative analysis of the situation in both countries and also provides advice on strategies to increase women's participation in ICT in the countries.

2. Literature Review

A number of researches have been conducted across the globe to evaluate the participation of women in ICT. Each of these works focus on diversified issues such as: underrepresentation of women in ICT, women empowerment and ICT, women and ICT career choice and other professional issues among others. The most common finding of such studies is that women participation in ICT activities is usually low and lower than the level for men. For instance, Reade-Fong and Gorman (2005) in their paper stated that "while new information technology has given women the opportunity to share information and interact on a scale that was hard to imagine…, in terms of political, economic and social participation, women's worldwide presence in… information technology remains low". Another related research was carried out by Georgiadou et al. (2009) while studying the under-representation of women in the field of ICT, and the lack of career progression for women, particularly in positions of senior responsibility from the UK, Greece, Malaysia and China. The survey respondents were mainly female students studying Computing/Information Technology at degree level. The authors identified the main reasons for the under-representation and lack of career progression, and studied the effect of national culture on the formation of strategy and practice in the four countries. Their findings reveal that gender and cultural issues cannot be ignored, while addressing participation in ICT. Sandys (2005) also found some disparities in some countries like China and Nigeria. The study found China as one of the few countries that collect gender-specific ICT statistics. It also discovered that in these countries, including Canada, Chile, Denmark, Finland, Hong Kong, Thailand and the United States, the percentage of female Internet users as a percentage of total Internet users is 45 per cent or more. On the other hand, in most African countries, like Nigeria, where such data is not collected by official statistics sources, estimates of female Internet use as a percentage of total use are 25 per cent or less.

A research was carried out in Nigeria by Olatokun (2007) who investigated the availability, accessibility and use of ICTs among women academics in six universities in South Western Nigeria. The findings of the study 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 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 argued 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. Also, Alutu and Audu (2009) delved into the level of participation of women in the technological development of the country as an implication for early career guidance. Data analysis showed that quite a large number of women (80%) were interested in ICT but only 60.67% had access to it. The constraints identified by their study were time, gender roles, work-life imbalance and inadequate training and empowerment. Ojokoh (2010) proposed practical steps that can be taken to empower women, especially using ICT. The paper highlighted such issues as using ICT as lever to reduce reduction and gender inequality, promoting women's participation in IT at the community level, educating women and girls for IT, and roles for governments and the civil society in improving and increasing women's participation in IT.

Women in some of developing countries are taking advantages of ICT and entering the new workforce it creates. In India, for example, there is a high intensity of women involved in ICT: it is estimated that women constitute 21 per cent of the total ICT workforce, which is higher than their participation rate in the national economy as a whole, now at 13 per cent (NASSCOM, 2005). Women's entry in the ICT industry has had some socio-economic impact. Studies of village pay phones in rural Bangladesh (Richardson et al., 2000) and computer-aided technologies and teleworking in Malaysia and India (Gothoskar, 2000; Kelkar, 2002; Mitter and Sen, 2000; Ng, 2001) have shown that household income has increased, and women have more mobility

and more say in domestic matters. But it is also pointed that women's work has multiplied as gender-based division of labour at home has been maintained. Due to the limited data from developing countries, the full picture of the extent to which women make use of the potential of ICT is not clear. Concurrent and competing priorities in developing countries make progress in fully benefiting from ICT slow and difficult. Poor infrastructure, the high cost of getting online, the low number of female entrants into ICT-related education and fewer female entrepreneurs in ICT-related businesses, make the realization of the promise of ICT for women in developing countries a distant prospect (Ainnudin et al., 2005). Therefore, the need for a study like this cannot be overemphasized.

3. Methodology

Sample and Data Collection: The survey for this study was carried out to address several questions related to the participation of women in ICT in Nigeria, compared to China. The study involves a total of 274 women respondents from selected cities in Nigeria and China (as in Georgiadou et al. (2009)'s multicultural studies). Table 1 reports the cities from which data were collected. Convenience Sampling was used to select the four cities, in terms of accessibility. In addition, they are capital cities of the states; hence they are likely to show a true reflection of what happens in the respective states. In addition, Lagos, one of the selected cities is also known to accommodate many migrants. Moreover, the western part of the country that forms a larger portion of the entire selected sample is known to be made up of a sizeable number of educated folks. The questionnaires sent to the northern part (Kaduna) were fewer in number due to the fact that it was a bit difficult to reach that part of the country. The population of women in Nigeria as at 2011 was 76,101,436 (wikipedia.com). The women respondents in Nigeria, though few, cut across different sectors and age groups, hence the justification of the adequacy of the data to represent the whole of Nigerian women. Statistics reveal that China has a total population of 1.34 billion people, out of which 48.73% are female and 51.27% are male, therefore the number of women are approximately 0.65 billion. In Beijing Municipality, the total population is 19, 612,368. It is approximated from statistics that the number of women is 9.56 million. In addition to convenience sampling, Beijing Municipality was selected, because it is the capital city, and the city with the highest number of migrants from virtually every other province in China. It was the only city selected in China because there was no easy accessibility to other provinces. In fact, report shows that mmigrants who have come from other provinces to the city are the main contributors to Beijing's population growth, and moreover, one in three Beijing is a migrant (Juan, 2011). Therefore, the responses from the Chinese women respondents will be a true reflection of China as a country.

Procedure: The questionnaires administered consist of two sections. The first section, comprising ten questions requires respondents to provide answers to questions related to female use, participation and knowledge of ICT. Alutu and Audu (2009) adopted a related method. Section II consists of fifteen questions asking respondents about reasons for participating in ICT or otherwise and especially finding out about their opinions on women participation in ICT. These questions were grouped under the themes : Belief (or view) about ICT use, time availability for ICT use, culture related factors and gender related factors affecting use, infrastructure and economy, training and job requirements, (as shown in Table 10) thus identifying factors influencing their participation in ICT. The section requires respondents to provide answers using Likert Scale responses – 5 (totally agree), 4 (partially agree), 3 (neither agree nor disagree), 2 (partially disagree) and 1 (totally agree) as used in Georgiadou et al. (2009). Such questions would also help to analyze the differences and relationship in the participation of women between the two countries. The data was coded and analyzed using SPSS 15.0.

Table 1: Nigerian Cities of Study

Nigerian Cities	Administered	Returned	Analyzed
Ado-Ekiti	50	48	
Akure	41	40	
Lagos	25	25	
Kaduna	10	10	
Subtotal	126	123	123
Chinese City			
Beijing Municipality	151	151	151
Total			274

4. Results

The findings will analyse the level of participation of women in the two countries, identify barriers, and find the relationship and differences in the level of participation between the two countries with the intention of removing the barriers, thus increasing the level of participation through recommendations.
The statistical analyses from Section I of the questionnaire are shown in Tables 2 to 8.

Table 2: Age distribution of respondents

Age	Countries			
	China		Nigeria	
	Freq.	%	Freq.	%
15-21	29	19.2	10	8.4
22-29	43	28.5	32	26.9
30-37	17	10.6	40	33.6
38-45	42	27.8	17	14.3
Above 45	21	13.9	20	16.8
Total	151	100	119	100

Table 2 displays the age distribution of the respondents from the two countries.

General Use of ICTs

Table 3: Respondents Owning Personal Computers

Responses	Countries			
	China		Nigeria	
	Freq.	%	Freq.	%
No response	-	0.0	1	9.8
Yes	137	90.7	52	43.7
No	14	9.3	66	55.5
Total	151	100	119	100

Table 3 indicates the responses of the Chinese and Nigerian women about owning personal computers. Most of the Chinese women respondents (90.7%) own their personal computers while only 43.7% of the Nigerian women respondents do.

Table 4: Means of learning to use Computers

Responses	Countries			
	China		Nigeria	
	Freq.	%	Freq.	%
Not Applicable and no response	10	6.6	21	17.7
Demand of Employer	19	12.6	9	7.6
Personal Interest	51	33.8	32	26.9
Formal training courses	51	33.8	54	45.4

Formal training & Demand of employer	5	3.3	1	0.8
Formal training & personal interest employer	8	5.3	2	1.7
Demand of employer & personal interest	4	2.6	0	0
Formal training and others	3	2.0	0	0
Total	151	100	119	100

It can be seen from table 4 that a good number of the women in both countries got to learn to use computers through formal training courses (33.8% of Chinese women respondents, and 45.4% of nigerian respondents). Personal interest assumes the same position for the Chinese women (33.8%) while it takes the second position in Nigeria (26.9%). This shows the importance of good Computer training irrespective of the location and level of development. There is no remarkable difference in the other ways of learning to use computers, except that in China, some of the respondents combine different means, such as personal interest together, formal training and demand of employer.

Table 5: Respondents' abilities to operate Computers without assistance

Responses	**Countries**			
	China		**Nigeria**	
	Freq.	**%**	**Freq.**	**%**
No response	-	0.0	2	1.7
Yes	140	92.7	77	64.7
No	11	7.3	40	33.6
Total	151	100	119	100

Table 5 shows that almost all the respondents from China (92.7%) have the ability to operate computers without assistance while the situation is a bit different with the Nigerian respondents with only 64.7% being able to operate computers without assistance. Personal interest in the use of computers could contribute a great deal to operating it without assistance, because this creates an inner motivation towards its use.

Table 6: Respondents' access to Internet at home

Response	**Countries**			
	China		**Nigeria**	
	Freq.	**%**	**Freq.**	**%**
No response	-	0.0	-	0.0
Yes	135	89.4	30	25.2
No	16	10.6	89	74.8
Total	151	100	119	100

As revealed in table 6 there is a great disparity in the percentage of women who had access to the Internet at home in the two countries. 89.4% of the Chinese women respondents had access to the Internet at home while only 25.2% of their Nigerian counterparts did. This could be as a result of the more technological advancement leading to cheaper and more affordable access in China than Nigeria.

Table 7: Number of hours of Internet access in a week

Response	Countries China		Nigeria	
	Freq.	%	Freq.	%
No response	-	0.0	1	0.8
Not at all	7	4.6	54	45.4
Less than 2 hours	9	6.0	26	21.8
2-5 hours	21	13.9	26	21.8
6-9 hours	21	13.9	7	5.9
10-13 hours	22	14.6	3	2.5
Above 13 hours	71	47.0	2	1.7
Total	151	100	119	100

Table 7 shows the number of hours the respondents have access to the Internet in a week. 45.4% of the Nigerian respondents do not have access to the Internet at all, while 43.6% of them had access for less than 5 hours in a week. The situation is very different for the Chinese women. A good number of them (47.0%) have access to the Internet for over 13 hours in a week. 14.6% have access from 10 to 13 hours, 13.9% have access from 2 to 5 hours, the same percentage also have access from 6 to 9 hours, while only 4.6% do not have access to the Internet at all. A more viable economy and technological advancement in China than in Nigeria would have contributed to these remarkable differences.

Table 8: Various uses of Computers

Response	Countries China		Nigeria	
	Freq.	%	Freq.	%
No response	0	0	4	3.4
Not Applicable	3	2.0	10	8.4
Only Playing Games	5	3.3	6	5.0
Only Looking up information	8	5.3	23	19.3
Only Programming	10	6.6	10	8.4
Only Communication	1	0.7	4	3.4
Only Obtaining learning materials	16	10.6	16	13.4
Only Wordprocessing	5	3.3	9	7.6
Only For professional work	9	6.0	18	15.1
Two combined uses	9	6.0	18	15.1
Three combined uses	18	12.0	1	0.8
Four combined uses	30	19.8	0	0
Five combined uses	32	21.2	0	0
More than Five combined uses	31	20.5	0	0
Total	151	100	119	100

Table 8 analyses the various uses of computers by Nigerian and Chinese women. From the responses, about 12% of Nigerian women either did not make any response or chose that they did not use computers for anything. About 86% of the women used the computer for a single purpose -- of playing games (5%), looking up information (19.3%), programming (8.4%), communication (3.4%), obtaining learning materials (13.4%), word processing (7.6%) and professional work (15.1%). The highest number of respondents use the

computer for the major process of looking up information. Information can be provided through dictionaries, thesaurus and research facilities in the computer; with internet connection, a vast amount of information can be obtained. Nevertheless, most Nigerian women use the computers for single purpose, only 15.1% use it for two combined uses, while 0.8% use it for there combined uses. The case is different in China. A good number of the women use the computer for more than five combined purposes (31%). 32% and 30% use it for five and four combined purposes respectively. However, communication seems to find the most use by many of the respondents (over 60%), in addition to other uses.

Table 9: Participation in ICT related activities

Response	Countries			
	China		Nigeria	
	Freq.	%	Freq.	%
No response	-	-	1	0.8
Mobile Phoning	4	2.6	58	48.7
Facsimile Services	-	-	2	1.7
Electronic Mailing	-	-	7	5.9
Internet Browsing	2	1.3	24	20.2
Internet Telephony	-	-	1	0.8
Internet Chatting	5	3.3	1	0.8
Internet Banking	-	-	2	1.7
Electronic Commerce	-	-	0	0
Online learning	-	-	5	4.2
Two combined uses	9	6.3	17	14.3
Three combined uses	20	13.2	1	0.8
Four Combined uses	42	29.4	-	-
Five Combined uses	23	16.1	-	-
Six Combined uses	28	19.6	-	-
Seven Combined uses	13	8.6	-	-
Total	151	100	119	100

Table 9 shows the results of the participation of the Chinese and Nigerian Women in ICT related activities. Many Nigerian respondents (48.7%) do not go beyond the use of Mobile phones. A good number of them (20.2%) do Internet Browsing. The results agrees with Olatokun (2007). About 14% combine Internet Browsing with other activities like electronic mailing, internet chatting and online banking, while only 1 respondent involve in three ICT related activities. Electronic commerce is not used at all by any of the Nigerian respondents. Where as, at the Chinese end, 29.4% of the women participate in up to four activities, with the most in mobile phoning, electronic mailing, internet browsing and chatting. Facsimile seemed to be the least used by the Chinese women. 8.6% of the women are involved in the seven activities outlined in the questionnaire. A high percentage of the women also do mobile phoning. These results show that Chinese women are more active in communication, hence probably more sociable than Nigerian women. Nigerian women tend to seek for knowledge more than other activities. Generally, ICT have found its use more in China than in Nigeria. The factors responsible for this are likely to be more advanced technological development and enabling environment for ICT use in China than in Nigeria.

Factors influencing Women's participation in ICT: Section II of the questionnaire contains questions relating to the perceptions and attitudes of the women to the use of ICT. The fifteen assertions were grouped into seven themes.

Table 10: Perceptions and attitudes to Use of ICT

Theme	Questions	Countries	
		China	Nigeria
Belief/View	Operating a computer is quite complicated	13.2%	52.1%
	I need to receive special training to use ICT	43.7%	71.4%
	It is easy to get trained to use ICT	61.6%	83.2%
	I should be able to use the computer some basic things without assistance	93.2%	81.5%
	I should be able to access my email box without assistance	79.8%	93.4%
Time	It is time consuming using computer and other ICT tools	25.2%	37.0%
	I have interest in ICT but time is a constraint	50.3%	56.3%
Culture	Culture related factors affect my interest in the use of ICTs	39.1%	17.6%
Gender	A woman does not need to be computer literate	6.6%	11.7%
	My family commitment does not give me the time to use ICT	10.6%	36.1%
Infrastructure and Economy	Electricity problems are a major constraint to my use of ICT	9.3%	76.5%
	I don't have the financial means to get trained to use ICT	10.6%	25.2%
	My environment is not conducive for the use of ICT	17.9%	47.0%
Access to Training	I don't have access to adequate ICT training	59.6%	47.9%
Job requirement	My job demands the use of ICT	80.8%	68.9%

Table 10 presents the results. In terms of belief and view about women's participation in ICT, the women in the two countries seem to differ in opinion about the first assertion that "Operating a computer is quite complicated". Only 13.2% of the Chinese women agree and 76.5% disagree to this fact, while 52.1% of the Nigerian respondents agree. To some extent, the respondents from the two countries appear to agree on the other three assertions on belief. They accept that it is easy to get trained to use ICT, and some basic things can be done with the computer without much assistance. Nevertheless, many believe that they need to receive special training to use the computer. Only that more Nigerian women (71.4%) than Chinese (43.7%) believe this fact. The women in the two countries seem to agree on the issues of time. This is to show that time is a major barrier to full participation of women in ICT in the two countries. Culture seems to be a barrier to the participation of women in China irrespective of the technological advancement, as only 23.2% totally disagree that they are not affected by culture related factors. In Nigeria, culture seems not to be a barrier. The results on gender related issues reveal that women from both countries seem to agree that gender should not be a barrier to participation in ICT related activities. Only a few Chinese women (6.6%) and Nigerian women (11.7%) agree that "A woman does not need to be Computer literate". However, there seems to be a difference in their lack of access due to family commitment. The one family- one child rule in China may be a contributing factor to this. It used to be a saying in Nigeria that "the place of the woman is in the kitchen". The results show that only 36.1% agree to family commitment constituting a barrier. This shows that many of the women are embracing ICT, inspite of being women. The greatest disparity in the opinions of the women

of the two countries lies in the issues of infrastructure and economy. Electricty problems are a major obstacle to the participation of the Nigerian women. This is an issue of concern that the government needs to address. Among the Chinese women, only 9.3% agree to this fact. The opinions of the women seem to be almost the same on the conduciveness of the environment for ICT use, showing the environment is not really a barrier. Finanical constraints seem to be more intense with Nigerian women (49%) than Chinese women (17.9%). These might be as a result of the economic base of each of the countries. Access to adequate training seems to be an essential factor for the women in both countries, as they agree to a similar degree, that they do not have adequate access to training in ICT. This is an isssue that the government in both countries need to put into consideration. In both countries, many of the women's jobs require the knowledge of ICT. This is to show that technological advancements leading to the paramount utilization of ICT in all sectors have reached far into several countries, inspite of the economy or infrastructural development.

Discussion: This study reveals that only few Nigerian women own personal computers. This is not only true of women alone as The New Nigerian (2009) stated that "The uptake of personal computers in Nigeria is low, and has been put at just under 2% as compared to other developing nations such as the Philippines with 8.9% and Vietnam with 7.8%". Olatokun (2007) also discovered some gender divide in this area. Meanwhile, the availability of personal computers has been central to the growth of the Internet in recent years. The relative high cost of purchase has been identified as one of the major barriers to owning a PC. The Nigerian government has in place some programs to help boost the uptake of personal computers. These include Computer for All Nigerian initiative (CANi), Government Assisted Purchase Program (GAPP) and One Child per Laptop (OLPC) project designed to help Nigerians acquire computers at affordable and discounted prices. GAPP was primarily targeted at civil servants in the employment of the government alone; hence it limits the access of the ordinary Nigerian to these computers. In addition, the CANi initiative was generally not locally driven (The New Nigerian, 2009). As a result of the large population, it will be extremely difficult for all these programs to make sufficient impact. Some more radical and broad reaching schemes like zero tax policies for local computer manufacturers, provision of loans to purchase computers and reduced duties for import of personal computers could be adopted to improve PC uptake. On the other hand, China, in recent times has been found to be the world's second-largest economy (http://www.therichest.org/world/worlds-largest-economies). In spite of the large population, it is still easy for many of the populace to own their own PCs.

This study also confirms the results of previous studies on the fact that only very few Nigerian women have access to the Internet at home. Maritz (2008) stated that most Nigerians still only have access to the internet through internet cafes. It was revealed in Maritz (2008) that the main problem with internet access in Nigeria is the high cost of access. If only the stakeholders can ensure the reduction in the cost of bandwidth and if Internet Service Providers build on their existing infrastructure, broadband in Nigeria would be at affordable to all and internet access would be much more enhanced. As more operators build infrastructure, local content will become affordable, leading to further reduction in prices. Nevertheless, Melhem and Tandon (2009) attributed a gender-based reason to the problem of financial constraint as a barrier to ICT access. They stated that because women and girls often do not control the finances of the home or do not have sufficient personal income, they may lack the financial resources to purchase radios, televisions, or computers or to pay Internet service providers (ISPs) for monthly access to the Internet. Many Chinese women have access to the Internet at home. In fact, Tao and Crabtree (2010) discovered a rising access to information technology in China, and thus stated that the percentage of Chinese who report that they have computers at home doubled in the past several years, while home Internet access nearly tripled. It has recorded steady increases in computer ownership and Internet access, with the biggest increase seen between 2007 and 2009. These increases are more dramatic in light of the population numbers they represent -- the nine percentage-point rise in reported Internet access between 2007 and 2009 means about 90 million more Chinese adults have Internet access in their homes. Nevertheless, while there have been increases in home Internet access among urban and rural Chinese, the gap between them grew between 2008 and 2009. In 2009, 42% of Chinese living in urban areas said they had access to the Internet in their homes, up 14 points since 2008. The study reveals a disparity in the variety of things the computer is used for by the women in the two countries. However, many of the women in both countries utilized Computers to look up information. 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 (Olatokun, 2007). Communication is more prominent by Nigerian women. According to Olatokun (2007), electronic communication is one of the major things ICT is used for. In developing countries, especially, electronic communication is finding its use more than ever before (Donner, 2008).

More variety is found in the Chinese women. China has shown consistent growth in ICT goods with a focus on computer and communication equipment. It is by far the largest producer and exporter of ICT goods today, while India is the largest exporter of computer and information services. While China has primarily invested in the engineering and manufacturing aspects of the ICT industry and the creation of technological clusters to increase the number of highly qualified ICT graduates significantly, the bulk of developing countries are yet to put in place national ICT action plans (Tandon, 2012). The assertion that Computers are relatively complicated to use by Nigerian women is not new. Alutu and Audu (2007) recorded something close in a Nigerian study, as almost half of their women respondents reported that it is quite complicated using computers. The level of technological advancement might be a contributing factor to the sharp difference between the views of the Nigerian and Chinese women. On other factors related to belief, women in both countries seem to agree. Women generally agree that it is easy to get trained to use ICT. They also agree that computers can be operated without much assistance. This confirms that the perception of women about ICT training and operation is positive. On the other hand, the importance of formal Computer training (irrespective of the country) has been shown in the study. It confirms the assertions in some existing Nigerian studies (Olatokun, 2007; Alutu and Audu, 2009). According to a study carried out by Melhem and Tandon (2009), training in ICT skills is rarely gender sensitive or tailored to women's needs and is sometimes delivered by a male trainer who has embedded perceptions about women's capabilities inconsistent with a research-based understanding of women's competencies and contributions in these fields. Therefore to increase the involvement of women and women's groups in ICT deployment, policy and planning and monitoring and evaluation will require gender sensitive training on ICT to increase the potential for their full participation. According to an International study (Sandys, 2005); training is needed at national, regional and local levels. Government bodies could support the development of, and fully utilize the training capacity of, NGOs or civil society organizations involved in ICT.

Time has been found to be a major constraint to the full participation of women in ICT in the two countries. This supports the claims of some related gender studies (Hafkin, 2002; Olatokun, 2007; Alutu and Audu, 2009). Women seem to be occupied with additional household chores that occupy their time. Culture seems to be a barrier to the participation of women in China irrespective of the technological advancement. This supports the claim that social and cultural factors limit women's access to shared ICT facilities such as cybercafés, or tele centres which often become meeting places for young men, and hence deter women's absorption and adoption of ICTs to access information and knowledge (Melhem and Tandon, 2009). The study also reveals the perception of women as regards the embrace of ICT in terms of gender is positive. They do not believe that they should not embrace or use ICT because they are women. Nevertheless, other studies have shown that women are somehow technophobic. As a result of this, young women have a lower self-concept of their competence in mathematical and technological domains than young men (Sáinz, 2007), which also discourages them from pursuing mathematics and technology–related studies (Sáinz, 2007). Therefore, there might be some gender bias when ICT is taken beyond just mere use. Electricty problems are a major obstacle to the participation of the Nigerian women. Years back, UNDP (2001) asserted that in huge investments are required to extend telecommunications infrastructure; provide an electrical infrastructure to power the technology; and, upgrade and retain a skills infrastructure to keep the technology working. Newer forms of ICTs like the Internet require even greater investments in equipment, training, maintenance, outreach and network access. The story remains unchanged today. Therefore, the importance of this physical infrastructure cannot be overemphasized. In spite of this, power outage, server breakdown repairs and congestions are critical challenges that not only females but also males contend with in Nigeria. According to Gowon (2010), the challenge is worse for women because most of them use facilities in government organizations and offices and cheaper business centers, due to lack of funds and cost of procurement of personal materials. When this happens, the males can usually afford to go to expensive cyber cafes or wait to go to these cafes at night, a time when most 'dutiful wives are supposed to be at home. Most of the women respondents require the use of ICTs in their jobs. The reason is not far-fetched. Technological advancements

in different countries of the world have made ICT very useful in different spheres of life; so its knowledge helps the professionals to function in the modern society and increases social status.

5. Conclusion and Recommendations

This study aimed at evaluating the participation of women from China and Nigeria in ICT. Questionnaires were administered, and analysis was carried out on the data from the respondents. It was deduced generally from the study that Chinese women participate more in ICT than Nigerian women. Nevertheless, it was discovered that in spite of more participation by Chinese women, the women agreed on some factors influencing their participation. Some of those factors are requirements for special ICT training; and time constraints acting as a barrier to effective utilization of ICT. Many of the women respondents require ICT on their jobs. Women from both countries agreed on the fact that gender is not a barrier to participation in ICT. Culture related factors have influence on the Chinese women participation, while electricity is a major barrier to the full participation of Nigerian women in ICT. Based on the study, the following recommendations are made: The governments of the two countries should endeavour to organise more specialized ICT training for women especially. It is also necessary for women to learn more about proper time management in order to manage their time wisely and conveniently combine other things they do with ICT use. Campaigns can be made on awareness of the need for more participation in ICT especially to women. It is also recommended that the Nigerian government should work on bringing solution to the power supply related problems in the country.

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