

Women in ICT: An Essential Strategy for Sustainable Women Empowerment, Productivity, and Economic Development in Nigeria

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Abstract

Women constitute half of the world's human capital and yet have lower wages than men, with a 22% pay gap. Nigeria is not an exception with 43% agricultural women labour force. Evidence has also shown that resources in women's hand, when empowered by ICT, result in household expenditure that benefits the entire family, and especially children. Despite these important virtues in women, poor adoption of ICT has undermined their chances to various productive resources and information. Sustainable economic development in Nigeria at all levels depends on women's full adoption of ICT to leverage their empowerment for increased national productivity and development. This study highlights the strategy to leverage women productive resources and economic empowerment through ICT usage. In this study, the authors explored a narrative review of prior research that focused on the theoretical foundations on vast works of literature that revealed significant information on strategies for sustainable women resources through ICT adoption. The authors also conjointly extracted peer-reviewed articles among the last five years from electronic databases, engaging some keywords like "women in ICT", "leveraging women resources via ICT", "female gender productivity and trends for ICT", etc. Results show that women in ICT may (a) advance women's well-being for sustainable goals. (b) tackle the gender deficit in access to national resources in public and private governance. (c) result in positive social change that may positively close the gap in gender discrepancy in access to productive resources.

Keyword: *Economic development, Gender gap, Human capital, ICT adoption, ICT innovation, Usability, Women in ICT*

1. Introduction

ICT is increasingly recognized as enablers of modern technology-dependent innovations to improve the lives of people everywhere (Cotter, 2018), reduce gender productivity inequality, and strengthen the position of women for sustainable empowerment, productivity, and economic development in any society. However, a significant gender gap exists, as evident in women's low level of access and use of ICT as compared to men. But far greater divides exist due the fact that the female genders do not perceive ICT system interfaces as usefulness and ease-of-use, among others (Park & Kim, 2014). According to ITU (2016), there are over 250 million fewer women online than men, and the gap is widening. Globally, 53 per cent of the world's population (equivalent to some 3.9 billion people) is not connected or use ICT. The 2016 global internet user gender gap is given as 12% distributed as follows: America 1.8%, Europe 6.9%, CIS (Commonwealth of Independent States) 5.1%, Asia and the Pacific 16.9%, Arab States 20%, and Africa 23% (ITU, 2016).

In Nigeria, as in most African countries, girls make up over half of those out of school, while sub-Saharan Africa accounts for as much as 80% of the 65 million girls of school age globally that are denied an education. The gender disparity in science and technology is not peculiar to Nigerian. Globally just 27% of the world's science researchers are women (ITU, 2016), though large disparities exist especially in Nigeria. The low presence of women in ICT has hindered them to the highest academic and decision-making positions in scientific institutions and

universities, and the positions of responsibility for sustainable empowerment, productivity, and economic development in Nigeria. United Nations Educational, Scientific, and Cultural Organization (UNESCO) 2015 Statistic Report placed the Nigeria society literacy rate for adults aged 15 years and older at 59.67%. According to United Nations World Population Prospects the 2015 Revision, about 62% of Nigeria populations are aged 15 years or older (United Nations World Population Prospects, 2015). The implications of the above statements are: 62% Nigerians are aged 15 years or older, 40.33% of Nigerians aged 15 years or older are illiterate or semiliterate. The literacy rate for adult males and females are 51.4% and 48.6% respectively (UNESCO, 2015), meaning that unlike the male gender, the female gender has more of illiterate folks than literate. In Nigeria, 16% fewer women than men use ICT (Nwokocha, 2016). Therefore, the ICT gender divide goes beyond simple adoption issues. It is also inextricably linked to factors such as cultural backgrounds, literacy levels of users, design strategy and usability of ICT interfaces, technical know-how, and awareness about the benefits of ICT.

ICT innovations as enablers of empowerment and enhancement of women capabilities can only be meaningful when driven by ICT system interfaces that are perceived as useful and easy-to-use, and aligned with women's cultural values, literacy level, effort expectancy, social influence, facilitating conditions, ICT policies, rules, goals, and values in a sustainable manner. The general IT problem is the poor adoption of ICT innovations due to lack of easy-to-use ICT system interfaces, low literacy level, poor ICT practices and policies. The specific IT problem is that some ICT system

interfaces, policies, laws, guidelines, and value system on the adoption and sustainability of ICT coupled with formulation and communication of same, do not favor female usability platforms. Our purpose in this narrative study was to identify ICT usability challenges that negatively impact its adoption by the female gender for productivity, empowerment and enhancement of capabilities, and to identify strategies to close the gender gap created by these challenges.

2. Conceptual Framework

The Unified Theory of Acceptance and Use of Technology (UTAUT), proposed by Venkatesh, Morris, Davis, & Davis (2003) was adopted as the conceptual framework for this study. UTAUT model claims that the benefits of using technology and the factors that drive users' decision to use it, is what determines users' acceptance behavior. The theory considers factors: user adoption behaviour toward intention to use ICT, and users' usage behaviour of ICT. Both user adoption and usage of ICT are affected by four constructs: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC), and four moderators: literacy level, gender, age, experience and voluntariness of use. UTAUT model in recent times has been widely adopted (Oye, Alahad, & Abraham, 2014). UTAUT was adopted as our theoretical foundation to study how to create sustainable ICT adoption strategies among women for sustainable empowerment, productivity, and economic development in Nigeria

3. Literature Review

There are only 59.67% of literate Nigerians adults aged 15years and older (UNESCO, 2015). The latest world organization estimate of current Federal Republic of Nigeria population as at March nine, 2017 was put at 190,279,273 with a median age of 18 years (Worldometers, 2017). According to United Nations World Population Prospects the 2015 Revision, about 62% of Nigeria populations are aged 15 years or older (United Nations World Population Prospects, 2015). The implications of the above statements are: 62% Nigerians are aged 15 years or older, 40.33% of Nigerians aged 15 years or older are illiterate or semiliterate, and 48.6% of adult Nigerian women are illiterates or semi-literates. The ICT gender divide goes beyond simple adoption issues. It is also inextricably connected to factors such as cultural backgrounds, literacy levels of users, design strategy and usability of ICT interfaces, technical know-how, and awareness about the benefits of ICT.

One of the ICT adoption challenges among women in ICT is that the existing ICT system interfaces in Nigeria have failed to provide easy-to-use system interfaces for a good population of women with varying abilities and literacy levels. An ICT interface that fails to incorporate the user, and "compromise" the users' varying abilities and capabilities that determines whether or not the product will

be easy-to-use, has failed (Hyysalo & Johnson, 2014). This study intends to suggest strategies to close this interface gap which may, in turn, close the ICT gender discrepancy gap. Usability design should reflect culture in practice in order to improve user experience in the aspect of human interface design (Hoehle, Zhang, & Venkatesh, 2015). Culture does indeed influence interface acceptance, especially interface issues like colors, graphics, signs and placement of voice prompts which are elements that may have different connotations for people with different cultural backgrounds. Pictorial images and voice prompts provide effective communication platform that is understood by all literacy levels, better perception of learnability, self-efficacy, enjoyment and excitement than text-based interfaces, especially among illiterate and semi-literate users. Perceived learnability, self-efficacy, enjoyment and excitement were found in literature to be significant drivers of ICT usability among illiterate female gender (Aguboshim, & Udobi, 2019).

The world of ICT is majorly male-dominated (O'Donnell & Sweetman, 2018). This is because developers of ICT interfaces are dominated by men who are often employed by organizations who disproportionately prefer men rather than women (Ashcraft, Brad, & Elizabeth, 2016). As a result, ICT interfaces, content, and applications are often more likely to be tailored to men's interests and needs, and accessed by male users. The challenges are heightened by the low literacy rate among women in Nigeria representing about 48.6%, coupled with the written language level used by ICT software developers in the design of ICT system interfaces. Consequently, ICT innovations that might potentially play a significant beneficial role in the empowerment and enhancement of women's capabilities failed because the ICT system interfaces are not perceived as useful or easy-to-use by the female genders, which are majorly illiterate or semiliterate.

ICT innovations are seen as beneficial or advantageous only when they are perceived as useful or ease-of-use (Consoli, 2012). Benefits such as these will depend majorly women perceive ICTs as useful or ease-of-use. Perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Perceived ease-of-use is "the degree that someone believes that employing a specific system would be freed from effort" (Davis, 1989, p. 320). It is the primary precursor that determines the behavioural aim to use an ICT system (Venkatesh & Davis, 2000). Also, ICT innovations reflect the societies that create them, and such technologies are affected by overlapping varieties of variables such as literacy, culture, embedded interfaces, gender, ethnicity, age, social class, geography, and disability, among others.

A number of gender studies (Soundari, 2016; Park & Kim, 2014) have shown that the main users of ICT

innovations are young males, and that women are marginal users, suggesting a gap between discourse and the reality of women's empowerment through ICT. Women through ICT can be leveraged for personal security, better access to education and jobs, financial inclusion or to access basic healthcare information. However, these are not accomplishable except women have important access to ICT which might be expedited or prevented by many factors, as well as affordability, relevant content, skills and security. The authors aimed to investigate these militating factors to ICT usability by the female gender and how to leverage the resultant ICT gender usability gap for women empowerment, productivity, and economic development in Nigeria.

3.1 ICT Standards and Policies for Sustainable ICT adoption for Women.

Women in ICT are further discouraged by corrupt policies and practices, ignorance, illiteracy, and the bad economy which have persistently hindered women empowerment and enhancement through ICT. It is not enough to have ICT system interfaces that are acceptable by all. It is necessary and sufficient to run ICT innovations in Nigeria on acceptable ICT international standards and policies. Policy measures, laws, and infrastructures required to handle ICT sustainability for economic empowerment are rather relegated to the background. Implementation and adherence to policies control over policy enforcement, and enterprise definitions are no longer reliable or efficient in sustaining ICT innovations due to corrupt practices in Nigeria. Technological innovations in Nigeria have been made to be attitudinal, thereby rendering its sustainability impotent. Human adherence to required principles and policies for the adoption of ICTs has been claimed by a significant number of empirical researches as the major links the ICT sustainability, while the negligence of same constitutes a great risk to the ICT sustainability (Oladimeji & Foltyn, 2018).

When ICT policies and safeguards are violated or not valued by users especially by some of our so-called honorable men and stakeholders in our society, sustainable ICT for women empowerment becomes unrealistic. The need for ICT initiatives is essential to establish women's dignity and rights. These initiatives include: adequate attention on basic education, technical skills, and tailored training for women; employment of women in content creation; offering easier access and optimum use, and implementation of good ICT policies. The present reality is a wakeup call for a policy change in order to close the ICT gender gap, especially from the perspective of women at the grassroots level. Their active participation in designing and delivering content is the need of the hour for their own emancipation and for the development of the country. 'ICT initiatives need to be pro-poor, pro-rural and above all pro-

women'. Equal rights and full participation of women in all spheres of ICT usability is required for full and complete development of any modern civilized nation (Yila & Azeez, 2018). To this end, certain policy measures must be put in place to address gender discrimination in ICT adoption especially for the female gender that are predominantly illiterates.

4. Methodology

The authors reviewed significant information based on the study conceptual framework, existing challenges that plagued ICT usability among the women in Nigeria. We also reviewed, analyzed and synthesized prior research findings. A narrative review methodology is adopted where analysis and synthesis of different and related research findings are required to draw holistic interpretations or conclusions based on the reviewers' own experience, existing theories, and models (Hill & Burrows, 2017). We also made our search criteria and the criteria for inclusion explicit by including in our review process, keywords and term identification, article identification, quality assessment, data extraction, and data synthesis. Methodological triangulation has been defined as the use of multiple sources of data to gain multiple perspectives, maximize reliability and validation of data and build coherent justification of data interpretation that relates to the study case or phenomenon (Durif-Bruckert, et al., 2014). We adopted methodological triangulation to ensure the reliability and validity of data, and justification of interpretations from the reviews.

5. Data Collection

Data collection came from reviewed research findings that are relevant and related to our study. Many of such findings came from the ProQuest databases, ScienceDirect, Walden University international library databases and peer-reviewed, and other related texts. We used phrases and terms as key search words in the databases for related literature on challenges of ICT adoption among women in Nigeria. Such phrases and terms included "women in ICT", "leveraging women resources via ICT", "female gender productivity and trends for ICT", etc., and many others. We reviewed the. Our reviews incorporated 27 references. Twenty five (93%) of total references incorporated in the study is peer-reviewed, while twenty one (84%) are peer-reviewed journals that are within the last 5 years.

6. Findings

ICT adoption has been identified as important innovation-enablers of sustainable productivity and empowerment of all ICT dependent interfaces (Oladimeji & Foltyn, 2018). However, sustainable female gender empowerments in Nigeria have remained weak and vulnerable. Major contributing factors have been classified into four groups by Dwivedi, et al. (2015): (a) management of ICT processes, policies and guidelines, (b) literacy level of

ICT users and how it impacts usage and adoption, (c) well defined ICT project size, goals, performance, robustness, and implementation, and (d) technology failures resulting from ICT use and misuse. On the other hand, Ho, Hsu, and Yen (2015) suggested three major strategies or skills to improve or manage ICT adoption, usage, and sustainability: (a) adherence to usability guidelines and policies, (b) process control, and (c) information and data transmission and dissemination. Other factors identified to affect access and use include: illiteracy, poor ICT interface design strategy, lack of infrastructure, education, and sociocultural and economic challenges. These gender gaps in ICTs in Nigeria requires the customization of the ICT interfaces to suit the women literacy and cultural backgrounds, and a change via training of women's attitudes towards ICT use. Educational and economic empowerment, and ICT policies and programs should be put in place to address the needs of women for the betterment of women and the society at large.

There is evidence that suggests that corrupt practices and non-adherence to policies and rules are increasingly exploiting ICT sustainability, and adversely affecting its usability in a sustainable manner. Reasons for non-sustainable ICT that also adversely affected the accruing benefits for women productivity and empowerment included problems associated with corrupt policies, and not placing required value to ICT by users (GreavuSerban & Serban, 2014), and limited perception of the usefulness and ease of use of ICT innovations (Aguboshim & Miles, 2019). The major reasons for this might be corruption, ignorance, and illiteracy. This claim is supported by UNDP statistical report that revealed the fact that 14% of Nigerian adults considered corruption as the major significant challenges militating against sustainable ICT in Nigeria (UNDP, 2016). There is a need for awareness and training in the country for people to understand and be able to perceive available technological innovations as useful and easy-to-use. This may bring about sustainable ICT that will leverage women's economic development and social change, and bridge the gender gap in ICT adoption.

7. Conclusion and Recommendation

There is no one, single, "one size fits all" approach to measuring relationship between ICT adoption sustainability and women empowerment. The relationship between women, their empowerment and the use of ICTs in Nigeria is complex; there are no simple summaries or solutions. However, women's access to and use of ICTs cannot be understood in isolation from their gender positions and identities and how these positions and identities interact with their literacy levels, cultural backgrounds, political, and economic situation. When ICTs are fully implemented in all required sectors and systems, Nigerian women may start to reap the dividends capacity empowerment and

enhancement and economic growth as witnessed in the developed nations with the best ICT facilities. Issues and challenges of ICTs in Nigeria should be given urgent and top priority attention in the national assembly and bills passed on the effective use of ICT for sustainable capacity empowerment and enhancement and economic development in Nigeria, powered by electricity supply that is stable. ICT innovations are now handled with better interconnected and interdependent facilities because connectivity is widely integrated into ambient or ubiquitous environments through an intuitive interface or "smart" interaction. The way forward to overcome the hindrances of ICT adoption by women is to engage ICT system interfaces that are easy-to-use, and that incorporates the cultural backgrounds and literacy levels of women. ICT interfaces that are user-centered, with pictorial images and voice prompts should be engaged to cater for the literate, semi-literate and illiterate female users, and may encourage ICT adoption, acceptance and sustainability among female genders that may positively close the gap in gender discrepancy in ICT usage, resulting in positive social change and national economic development in Nigerian. The technology being developed must take into account the limited free time available to many women. Content must be pertinent and in a language and environment that is comfortable and gender-sensitive. Women must have the opportunity to develop competency on all ICTs. Older ICTs are crucial in developing women's capabilities and must be an important focus of ICT policy and planning. Women need to be encouraged and trained to become producers on all ICTs. Clear engendered ICT policy need to be developed. Relevant areas of interest need to be developed to bring women to ICTs so that they can then use these ICT tools to enhance their capabilities.

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