Awareness as Personal factor Predicting Utilization of Resarch4Life Databases by National Agricultural Research Institutes Scientists in Nigeria

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Abstract

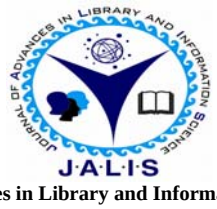
Research4Life databases are important innovations providing access to millions of reliable, accurate, relevant and quality full-text journal articles needed for scientific research. They are available to researchers in many institutions in the fields of agriculture, environment, health and medical sciences both in the developed and developing countries of the world. Utilization of Research4Life databases is influenced by three major factors – personal, institutional and system related factors. Streams of IS researches posit that personal factors are very important in IS research and therefore should be well investigated. This paper reviews other researches in the area of personal factors in IS utilization and proposed a theoretical model that takes into consideration the direct influence of awareness on utilisation of Research4Life databases. The findings of the empirical testing will add to the current researches on direct effect of personal factors on utilization IS and also provide a model to study it.

Keywords

Personal factors, Awareness, Research4Life databases, Utilisation, NARIs, Nigeria
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INTRODUCTION

The need to use qualitative, peer reviewed journal articles for agricultural research gave rise to the use of specialiseddatabases like Research4Life. Research4Lifeis the collective name for the four databases: HINARI - Health Internetwork Access to Research Initiative, AGORA - Access to Global Online Research in Agriculture, OARE - Online Access to Research in the Environment and ARDI – Access to Research for Development and Innovation that provides developing countries with either free or low cost access to 69,000scientific peer-reviewed online journal content to over 7,800 registered institutions in 116 countries. The total value of access to the collections is estimated to be in excess of US$7 million per year. HINARI, AGORA, OARE and ARDI databases were launched in 2002, 2003, 2006 and 2009 respectively and they have been available for use in NARIs. It is a public-private partnership with the goal to attain six of the eight United Nations Millennium Development Goals and Vision 2020.Stakeholders are committed to support Research4Lifeto the year 2020.

Research4Life databases have received high level of acceptance and usage among agricultural scientists in developed nations of the world. Journal articles in Research4Life databases have been used to support and empower research in universities, colleges, research institutes, government ministries, non-governmental agencies and hospitalsin both developed and developing countries (Scott, 2007 and Lwoga, Chimwaza, Aronson and Vent 2007). Utilisation of Research4Life databases have impacted positively on the research productivity of agricultural scientists where the databases have been successfully installed and used. Therefore, National Agricultural Research Institutes (NARIs) scientists need to use Research4Life databases to enhance their research activities and productivity. Unfortunately, utilisation of Research4Life databases by NARIs scientists is not encouraging (ITOCA, 2014). Lwoga et al (2007) posit that the major challenge now is to ensure that Research4Life programs and contents are used to their fullest extent by scientists in developing countries. Okwilagwe and Ogbomo (2012) surveyed the extent of utilising 39 scholarly electronic publications by lecturers in Nigeria and found that utilisation of Research4Life was very low. Therefore, the need to increase utilisation of Research4life databases becomes imperative.

There are various factors influencing utilisation ofResearch4life databases. Technology acceptance literature classified them into three broad groups: personal/individual/users, institutional/organisational and technology/system related factors (Stylianou and Jackson, 2007; Rahim, 2008; Park, 2009; Buabeng-Andoh, 2012;Cubukcuoglo, 2013).In Information Technology (IT) and Information System (IS) research, personal characteristics, personal factors, individual factors, individual characteristics, individual differences, user factors and user characteristics mean the same thing and are used interchangeably. This group of factors is very important in predicting technology use.

Different variables constitute personal, individual and users factors in the literature. Zmud (1979) opined that individual difference can influence utilisation of a particular IT or IS. According to Harrison and Rainer (1992), Zmudcategorised individual difference variables into three groups: demographics, personality, and cognitive styles. They opined that demographic variables are personal characteristics such as age, gender, education, and computer experience. Personality variables relate to the individual's cognitive and affective structures used to understand events and people such as anxiety and attitude. Cognitive styles represent the individual's modes of perceptual and thinking behaviours. It is also referred to as the way an individual collects, analyses, evaluates and interprets data such as creativity, intuition and innovativeness. Similarly, Parsons, McCormac, Butavicius and Ferguson (2012) opined that human factors such as individual difference, cognitive abilities and personality traits play significant roles in information security technology application in Australia. In NARIs, utilisation of Research4Life databases is based on the individual scientist's decision. Each scientist is expected use the databases in the course of his or her task of research.However, he or she may decide to actually use or not to use. The demographic, personality and cognitive characteristics of the scientists are referred to as personal factors in this study and they can influence utilisation of Research4Life databases.

Variables that constitute personal factors are varied and complex to determine. According to Cubukcuoglo (2013), awareness is a personal factor that could influence utilisation of IT.Dalhatu, Abdulllah, Ibrahim and Abideen (2014) opined that awareness is an attitudinal factor of the individual, and therefore it is a personality variable according to Zmud'scategorisation.Taherdoost and Masrom (2009) and Taherdoost, Masrom and Ismail (2009) defined awareness as the degree to which individuals are aware about a technology. Awareness is the ability to perceive, to feel, or to be conscious of events, objects, thoughts, emotions or sensory patterns. For the purpose of this study, awareness is defined as the degree to which ARIs scientists are aware about Research4Life databases. Awareness is a key factor in IT and IS utilisation.In developing countries like Nigeria, there is a general awareness problem among researchers in the use of e-databases and web resources leading to low usage of the resources.Noor, CheAzmi, and Ramalingam (2014) posit that one crucial factor for successful implementation of a new technology is a good level of awareness. Awareness consists of both the general information and understanding of the system. Awareness is essential to gain users' acceptance and confidence in using IT. Before a new technology is accepted and used, users have to knowand are aware of the potentials the new technology is offering (Rogers, 1995). This is where awareness becomes important in database utilisation. When there is awareness, the tendency to use IT is enhanced. Several empirical studies have been conducted to determine the relationship between awareness and utilisation of IT. However, only a few were on direct influence of awareness onutilisation of IT. The purpose of this study therefore, is to investigate the direct influence of awareness onutilisation of Research4Life databases by NARIs scientists in Nigeria.

Statement of the problem

Harle (2010) and Harle (2011) opined that the provision of affordable or free online journals such as Research4Life databases is no longer the principal problem in scientific research. He noted that the challenge now is to ensure that what is available can be accessed and used. The Research4Life 2010 user experience review indicated that the most influential factor limiting the Research4Life impact is limited awareness of the programme among potential users(Gaible, Gedye, Ochs, Parker and Rudgard (2011).Awareness of information resources available to researchers, scientists and students is usually low. Increased awareness of Research4Life databases is essential to gain users' acceptance to use the system. Therefore, awareness is the first personal factor to grapple with in terms of utilisation of Research4Life databases especially in developing country like Nigeria.Despite these facts, awareness has been treated as moderating or external variable in many IS

studies. Therefore, there is the need to incorporate awareness as a direct construct on the use of new IT in IS research especially in developing countries like Nigeria.

Objectives of the study

The main objective of the study is to assess the direct influence of awareness on utilisation of Research4Life databases among NARIs scientists in Nigeria. Specific objectives include:

1. Determine the level of utilisation of Research4Life databases by NARIs scientists in Nigeria.
2. Assess the level of awareness of Research4Life databases among NARIs scientists in Nigeria.
3. Determine the UTAUT construct sinfluencing utilisation of Research4Life databases by NARIs scientists in Nigeria.
4. Develop a model to investigate awareness for the study.

Hypothesis

- There is no significant influence of awareness on utilisation ofResearch4Life databases by NARIs scientists in Nigeria.
- UTAUT constructs do not significantly predict utilisation of Research4Life databasesby NARIs scientists in Nigeria.

Literature review

Rehman and Ramzy (2004) surveyed Electronic Information Resources (EIR) among health professionals in three teaching faculties in a Kuwaiti Universityand found low awareness and poor skills as the primary reasons for underutilisation of EIR at the university health services.Deng (2009) investigated the extent of usage and identification of critical factors for the effective use of digital resources in the university environment. The study revealed that awareness of information was critical for using digital resources. In Makerere University Library, Namugera (2014) found low rate of awareness of library servicesandit hasa direct effect on utilisation of those services.

In India, Mulla and Chandrashekara (2006),Tyagi (2011),Velmuruga, (2012), Singh (2012),Velmuruga, (2013), Das, Anushandhan and Maharaha (2013) and Murugan (2015) found that the level of awareness of faculty and students influenced utilisation of digital resources,online journals,online resources,e-books, e-databases, e-thesis, e-dissertation, e-magazines,e-resources, bibliographic databases, web-based resources such as e-journals, Emerald Management Xtra, EBSCO Business Source Complete, and Science Direct and databases. Therefore, most engineers in India are aware of available e-journals and databases in their profession and their level of awareness influenced their use of the databases.

Among researchers in the US and China, Wang and Wu (2011) listed awareness as one of the factors affecting use and non-use of Internet and portals. In Iran, Anaraki and Babalhavaeji (2013) investigated awareness and ability of medical students in using integrated digital library portal and found that those students who are not aware of the portal used general search engines to meet their information needs. This result implied that those students who are aware were able to use the portal to get information needed for their study and vice versa. At the Aristotle University of Thessaloniki, Greece, Togia and Tsigilis (2009) finding indicates that factors that discourage graduate students from using the EIR was lack of awareness and majority did not know how to use the resources.Investigating awareness and use of evidence-based medicine databases and Cochrane library among physicians in Croatia, Novak et al. (2010) concluded that awareness and use of evidence-based medicine (EBM) databases and Cochrane Library among physicians in Croatia was not satisfactory. There was low awareness about EBM and The Cochrane Library as well as low usage thus creating the need for educational interventions about EBM for the benefit of health care in Croatia.

In Nigeria,Ugah (2007) reported that many scientists in developing countries including NARIs are not aware of Internet resources and databases thus they are not taking advantage of these opportunities to access research materials for themselves. Researching on the level of consciousness and awareness about evidence-based medicine (EBM) among consultants in tertiary health care institutions in Nigeria, Nwagwu (2008) concluded that consultants in the teaching hospitals do not appear to have the high level of EBM consciousness and awareness that is expected of them. However, the consultants expressed a good level of awareness about, and use of already existing EBM resources. At the Nigerian Institute of Medical Research, Lagos, Abolarinwa, Adewoyin and Aderanti (2015) investigated ICT availability, use and challenges by staff of the institute. They found that majority of the respondents affirmed that they are aware of the availability of ICT facilities in NIMR library while those not aware seem not to be informed or failed to appreciate it usefulness to their profession.

In Nigerian universities, Gbaje (2010) identified lack of awareness of open access journals as factors of underutilisation of open access publishing in Ahmadu Bello University.At the University of Lagos, Okiki (2012) confirmed that 55 percent of academic staff indicated that the level of awareness of the subscribed EIR by the Library was rather low hence the result of its usage was not encouraging. In Southern Nigeria, Obuh and Bozimo (2012) revealed that awareness of open access concepts accounts for the tendency of Library and Information Science lecturers in Southern Nigeria universities to use open access scholarly research publications.Okite-Amughoro, Makgahlela and Bopape (2014) reported that postgraduate students of Delta State University, Abraka are aware of the various EIR even if their use is limited to the ones that are available and accessible in the institution's library.

On utilisation of Research4Life databases, Smith et al (2007) study of awareness, reported use and factors influencing use of on-line medical literature via HINARI database in four teaching hospitals in Cameroon, Nigeria, Tanzania and Uganda showed that awareness of free-access initiatives including HINARI is limited as HINARI scored 47% awareness. Angello (2010) assessed awareness and use of EIR among livestock researchers in Tanzania and found that the overall results indicated that despite the reasonable number of EIR availableto livestock researchers, there exist a relatively low (55.6%) awareness among the researchers of the e-resources available; and 20 of the respondents (44.4%) were not aware of any subject gateways, databases and directories in their fields of research. Similarly, Angelloand Wema(2010) reported that livestock researchers in Tanzania had very few e-resources for their researchers and most of them were not aware of most of the e-resources available to them hence they could not access and use them effectively in their research. Only 24% of agricultural researchers in Tanzania were aware of AGORA, 11% of them were also aware of HINARI, and only about 7% were aware of OARE databases. This result indicated low level of awareness of Research4Life databases among the researchers resulting in low usage. If researchersare aware of the potentials of a database, they will form the intention to use it. Constant use of the IT may lead the researcher to continue to use it.

Methodology

The questionnaire will be used in this research by adopting the modified UTAUT model. The questionnaire will be distributed to research scientists in the NARIs. Ten questions will be used to elicit responses from NARIs scientists on the construct awareness. The questions are: 1). I am fully aware of Research4Life databases; 2). I know the contents of Research4Life databases; 3). Research4Life databases are not strange to me; and 4). I have long been aware of the various databases; 5). I would welcome Research4Life databases if I am aware more about it; 6). Being aware of Research4Life databases is important in order to use it; 7). I am familiar with how Research4Life databases work; 8). I have enough knowledge to use Research4Life databases, 9). Awareness help reduce Research4Life databases abuse; 10). NARIs scientists are aware that the use of Research4Life databases aid research work. Questions 1 - 4 were developed by the researcher while the rest were adapted from Taherdoost, Sahibuddin and Jalaliyoon (2011) and Oladosu (2012).The instrument to assess UTAUT constructs (facilitating conditions, performance expectancy, effort expectancy and social influence) will beadapted from Venkatesh, Morris, Davis, and Davis (2003).

Technology Acceptance Models

According to Tan (2013) a wide body of research focuses on identifying factors affecting people's intentions to use new technologies and how these intentions predict actual usage (Davis, Bagozzi, and Warshaw, 1989). Eight of such major theories include:Innovation diffusion theory (IDT);Theory of reasoned action (TRA);Theory of planned behavior (TPB);Technology Acceptance Model (TAM);Combined TAM and TPB (C-TAM-TPB);Social cognitive theory (SCT); Motivational model (MM) andModel of Personal Computing (PC) utilisation (MPCU). These theories and models have been used to predict various IT and IS using different determinants. Venkatesh et al (2003) reviewed these models to form the Unified Theory of Acceptance and Use of Technology(UTAUT).

Unified Theory of Acceptance and Use of Technology (UTAUT).

UTAUT is a model of individual acceptance that was compiledfrom eight models and theories (TRA, TAM, MM, TPB,C-TAM-TPB, MPCU, IDT, and SCT),(Venkatesh et al, 2003).Each of the constructs mentioned in IDT, TRA, TAM,TPB, C-TAM-TPB,

MPCU, MM, and SCT pertained toone of UTAUT's main constructs and measurement items. The purpose of formulating UTAUT was to integrate thefragmented theory and research on individual acceptance ofITinto a unified theoretical model(Venkatesh et al., 2003). To do so, the eight specific modelsof the determinants of intention and usage of IT were compared and empiricalsimilarities across these models were used to formulateUTAUT. UTAUT advanced individual acceptanceresearch by unifying the theoretical perspectives common inthe literature and incorporating four moderators to accountfor dynamic influences, including gender, age, voluntariness,and experience. UTAUT has been used in different culture and context including Nigeria. Abubakar and Ahmad (2013) opined that there are substantial justifications to theorise that UTAUT constructs are related to the Nigerian context and therefore fit to investigate system use in Nigeria.According to El-Gayar and Moran (2006) the UTAUT model can be used to investigate individual, organisational and technological factors predicting different IT and IS.

The Research Model

Researchers like Zmud (1979), Harrison and Rainer (1992) and Agbonlahor (2008) suggested that individual differences of various kinds should be incorporated into studies of technology use. Beginning with McElroy, Hendrickson, Townsend and Demarie (2007) several studies included personality factors within the framework of TAM and UTAUT or both.For instance, using TAM model, Islam and Gronlund (2011) investigated individual factors predicting perceived usefulness and perceived ease of use of mobile phones among rural farmers in Bangladesh where awareness was found to be one of the variables associated with individual characteristics. Similarly, in a recent pilot study, Dalhatu, Abdulllah, Ibrahim and Abideen (2014) opined that awareness was an attitudinal factor affecting online banking usage. They extended TAM to investigate awareness as a predictor of perceived usefulness and perceived ease of use of online banking by Nigerian retail customers of an Islamic Bank. Using a variety of Technology Acceptance Models (TAMs) to develop an instrument to measure smart card acceptance in Iran, Taherdoost, Masrom and Ismail (2009) included awareness as the first constructs directly influencing attitude to use and adopt smart card in Iran.These studies are consistent with an influential theoretical framework in applied psychology, interactional psychology which suggests that simultaneous consideration of both person and the situation is essential to understanding behavior (Barnett et al, 2014).

Although IS researchers have taken an interactional perspective to demonstrate the relevance of personality within the framework of TAM and UTAUT, extant research is neither comprehensive nor definitive. However, some personal factors have been incorporated into UTAUT studies to predict usage through intention.Oshlyansky, Cairns and Thimbleby (2007) incorporated self-efficacy and anxiety, to validate the UTAUT model cross-culturally.Dulle and Minishi-Majanja (2011) also adjusted UTAUT to investigate Internet self-efficacy of open access whileAhmad, Tarmidi, Ridzwan, Hamid and Roni (2014) proposed UTAUT to studied self-efficacy as individual factor influencing behaviourial intention. Using awareness as a construct in UTAUT,Abubakar and Ahmad (2013) posit that there are few studies that examined the relationship between awareness and behaviourial intention. The result of such studies found awareness to have significantly influence onbehaviourial intention.Using awareness as moderating variables in UTAUT, Tibenderana and Ogao (2008)and Dulle and Minishi-Majanja (2011) used awareness to moderate relevance and attitude of hybrid library services in Uganda and Open access respectively.Ayele and Sreenivasarao (2013) also used awareness as moderating factor on SO-UTAUT model independent constructs towards their respective dependent constructs. Noor et al. (2014) added awareness as external variable to study taxation in Malaysia and awareness predict all UTAUT constructs in that study.In Nigeria, Abubakar and Ahmad (2013) proposed awareness as a moderating variable of UTAUT constructs to investigate adoption and use of Point of Sale (POS) in Nigeria.

McElroy et al. (2007) directly tested the effect of personality and cognitive style on three measures of Internet use. The results support the use of personality - but not cognitive style - as an antecedent variable. After controlling for computer anxiety, self-efficacy, and gender, including the "Big Five", personality factors in the analysis significantly adds to the predictive capabilities of the dependent variables. In this vein, Barnett et al. (2014) adapted the UTAUT (Venkatesh et al., 2003) by adding individual–level technology adoption model (Sykes at al., 2009) with five personality constructs to predict perceived and actual usage of technology directly, and indirectly through behaviourial intention. The result indicated direct significant

relationship between the personality traitsand actual use of IT and not mediated by expressed intentions to use the IT. Therefore, this study willadapt UTAUT and individual–level technology adoption models previously used by Barnett et al (2014)and incorporate personal construct (awareness) to replace the Big Five personality constructs to predict utilisation of Research4life databases directly. Facilitating condition will directly predict utilisation of Research4life databases also. Performance expectancy, effort expectancy and social influence will predict utilisation of Research4life databases through behavioural intention. The emergedproposed model is as shown in figure 1.

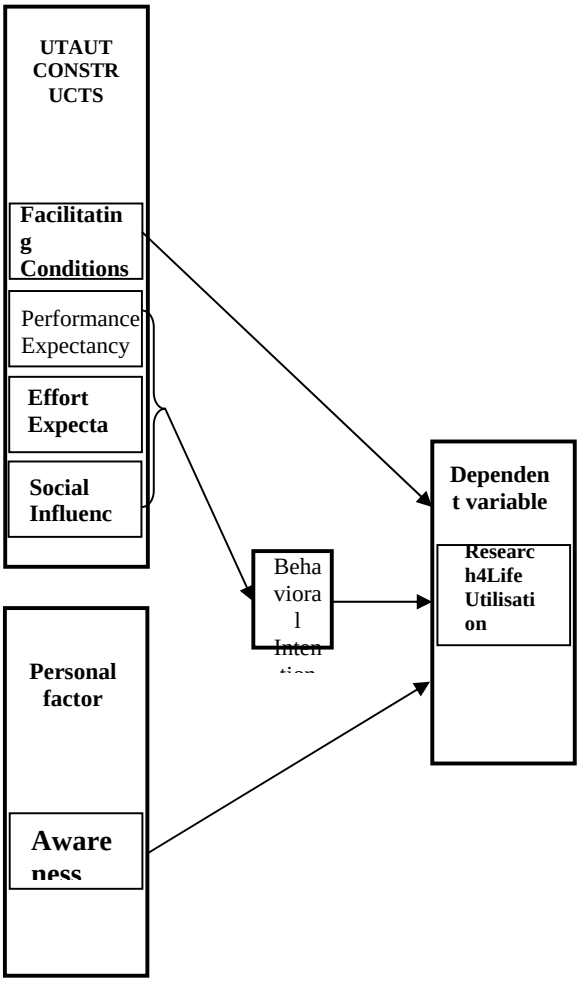


Figure 1: Adapted UTAUT (Venkatesh et al. 2003) ConceptualModel

Conclusion

This study has successfully provided a theoretical framework that models awareness as direct predictor of system use. This is a clear departure from prior research where awareness was treated either as an external variable or a moderating variable. A theoretical model is proposed for the development of hypotheses based on UTAUT constructs and individual factors of system use. Three UTAUT constructs will predict utilisation of Research4Life databases through intention to use while awareness and facilitating conditions will have direct effect on system use. The subsequent phase of this study will be the empirical testing of the research model. The research would establish the applicability of UTAUT for the prediction of intention and usage of Research4Life databases as well as confirm the direct prediction of awareness on system use.

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