

# Determinants of Adoption and Use of Open Access Publishing by Academic Staff in Nigeria Universities

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## ABSTRACT

The emergence of the World Wide Web (WWW) has changed the scholarly publishing system. Today, Open Access (OA) scholarly publishing offers free access and wide dissemination for research findings anytime and anywhere as an additional value for scholarly content. Despite the potentials of OA publishing, its adoption and use is still low. This paper determines factors influencing the adoption and use of OA publishing by academic staff in universities in Nigeria using an adapted Unified Theory of Acceptance and Use Technology (UTAUT). The study applies methodological triangulation by combining quantitative and qualitative approaches. The empirical data were collected from 317 academic staff in universities in southwest Nigeria. The questionnaire forms were analyzed using the Statistical Package for Social Sciences (IBM-SPSS) 19.0 version to generate descriptive statistics, Analysis of Variance, and Hierarchical Multiple Regression. Thematically, analysis also applies to the interviews. The results show that awareness, attitude, performance expectancy, Internet self-efficacy, and facilitating conditions significantly influenced the adoption and use of OA publishing. The study also reveals that due to lack of OA policy, most of the respondents did not know about OA. The findings further establish that all predictors and moderating variables jointly contributed 64.4% total variance towards the adoption and use of OA publishing. One of the implications of this study is that there is a need for adequate facilities to support adoption and use of OA publishing. The findings inform the proposed framework for improving and evaluating the adoption and use of OA publishing. The findings also have theoretical, societal, and methodological significance to all stakeholders.

**Keywords:** Adoption and Use, Open Access Publishing, World Wide Web, University, UTAUT, Nigeria

## Open Access

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## 1. INTRODUCTION

The world has become a global village as a result of Internet development. This has caused transformation in many phases especially in scientific journal publishing. For instance, the first stage experienced the rapid shift from print-only journals to parallel print and electronic publishing (Tenopir & King, 2000). The next stage of transformation is the granting of access to publications without any barriers imposed by toll access (subscriptions). This is referred to as open access (OA) (Willinsky, 2005). Scholarly communication benefits massively in making scholarly content freely accessible and equally has enjoyed wide dissemination of research findings without any restriction via the Internet. According to Budapest Open Access Initiatives (BOAI), 'Open Access' means

free availability on public Internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself. (BOAI, 2002, p. 1)

Hence, open access publishing can be defined as a publication that is digital, online, and free of charge, free of copyright and without any barrier at the point of consumption by the user. There are enormous benefits of OA publishing to academics and other stakeholders. For example, it promotes collaborative work among scholars; bridges the digital gap between developed and developing countries; promotes accessibility and visibility of research findings; improves the economy by making research outputs available to users; and enriches both academics' and universities' profiles through provision of access without any barriers (Jain, 2012; Bashorun et al., 2013).

Despite these huge benefits, the adoption and use of OA publishing by academic staff in Nigeria still remains low (Gbaje, 2010; Oluwasemilore, 2013). Most scholarly findings are published in local journals that remain less accessible and are poorly visible to users. This has implications on the research findings emanating from researchers and scholars in Africa and Nigeria in particular. Many academics are indisposed to embrace OA publishing because of insufficient aware-

ness of OA initiatives (Bashorun, 2014).

Studies like Dulle, 2010; Gbaje, 2010; Okoye & Ejikeme, 2011; Emorjorho, Ivwighregwa, & Onoriode 2012; and Obuh, 2013 report several factors that have contributed to the low adoption and use of OA publishing in Nigerian universities. Dulle (2010) reported that researcher self-efficacy and lack of Internet skills were part of factors that hindered acceptance and use of OA publishing in Tanzania. Obuh and Bozimo (2012) and Gbaje (2010) posited that lack of awareness of OA journals was responsible for the low adoption and use of OA publishing, while Emorjorho et al. (2012) emphasized inadequate facilitating conditions as an obstacle to the adoption and use of OA publishing. OA publishing is still in its infancy in most developing countries like Nigeria, where poor infrastructural facilities have been established as the bane to its development and adoption (Okoye & Ejikeme, 2011). Obuh (2013) accentuated the fact that attitude has affected the acceptance and use of OA publishing. None of these studies investigated the relationship among factors that influence the adoption and use of OA publishing using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Hence, this study seeks to determine factors that influence the adoption and use of OA publishing among academic staff in order to suggest a framework for improvement in its adoption and use. The UTAUT model was considered because it has the highest explanatory power of 69% (Venkatesh et al., 2003). It is also more robust and expansive than any of the technology acceptance models. The findings reported in this article are part of a doctoral study titled "Developing a framework for the adoption and use of open access publishing in Nigeria Universities." The objectives of the study will be discussed in the next section.

## 2. OBJECTIVES OF THE STUDY

The main objective of this study was to investigate the adoption and use of OA publishing by academic staff in selected universities in southwest Nigeria, with a view to developing a framework. The following were the specific objectives:

1. Identify factors that influence the adoption and use of OA publishing by academic staff in select-

- ed universities
2. Determine the level of university management support towards the adoption and use of OA publishing by academic staff
3. Establish relationships among factors that influence the adoption and use of OA publishing
4. Determine the joint contribution of factors influencing the adoption and use of OA publishing
5. Suggest a suitable framework that can facilitate the adoption and use of OA publishing by academic staff in universities in Nigeria.

### 3. HYPOTHESIS OF THE STUDY

The following null hypothesis was tested in the study at a 0.05 level of significance.

**Ho:** There is no significant relationship between independent variables (awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions) and adoption and use of OA publishing.

### 4. LITERATURE REVIEW

Over the past years, adoption and use of open access (OA) publishing has been a central concern in developed countries with few studies focusing on developing countries. Most studies have been designed at studying the number of factors related to adoption and use of OA publishing and their vital role to scholarly publishing. Therefore, the need to review literature in order to identify the gap and guard against duplication of effort in research is essential. This review also gives the researcher an opportunity to relate the current findings to previous studies.

The OA concept is gaining ground but is yet to be widely known among academics and researchers from various scholarly communities and research disciplines. The adoption and use of OA publishing relies on the researcher being well informed of this mode of scholarly publishing. However, users of information gain from OA initiatives without prior knowledge of this mode of scholarly publishing (Fullard, 2007). This is possible when users by accident gain access to both free and subscribed content while searching

for information on the Internet (Dulle, 2010). It is essential that prior knowledge of this mode of scholarly publishing is known to users. This situation propels the need by many researchers to address the issue of awareness before determining the adoption and use of OA publishing. Awareness plays a vital role and is one of the pre-requisite conditions for successive adoption and use of OA publishing unless an individual uses it unknowingly. According to Dinev et al. (2005, p. 41), "awareness raises consciousness and knowledge about a certain technology and its personal and social benefits." This suggests that awareness is a key determinant of user attitude and behaviour towards technology. Similarly, for successful adoption and use of OA publishing in scholarly community, awareness has also been recognized as one of the crucial factors that determine the adoption and use of this mode of scholarly communication (Warlick et al., 2006). Several approaches have been used in analyzing academics' adoption and use of OA publishing. In this section some of the earlier and relevant studies in OA publishing are briefly discussed.

Utulu and Bolarinwa (2009) investigated the adoption of OA initiatives by academics from Universities of Ibadan and Lagos. It was reported that lack of understanding of the OA concept and the inability to identify appropriate OA journals were observed as part of the contributory factors for its low adoption and use. Emojorho et al. (2012) examined the level of awareness of OA scholarly publication among lecturers at the University of Benin in Nigeria. The findings showed that only 86% of the respondents were aware of OA while only 58% of the respondents were familiar with OA institutional repositories, while 73% lack knowledge of OA journals. Similarly, Obuh and Bozimo (2012) examined awareness and use of OA scholarly publications by 141 lecturers in fourteen universities in southern Nigeria. The researchers reported that there were indications of a fairly high degree of awareness of OA publication among lecturers in universities in the southern part of Nigeria, yet the level of adoption and use of OA publishing is low. The main principle of OA is to maximise access to information in order to promote wide dissemination of knowledge to users. A study carried out by Alemu (2009) examined the role of OA in fostering knowledge sharing and collaboration in Ethiopia. The findings revealed

that respondents in the study had very low awareness of the OA concept and this mode of scholarly publishing was yet to be practiced in the institutions under study. In addition, Dulle (2010) focused on assessment of the adoption of OA in terms of access and dissemination of scholarly information in research activities. The findings showed that 72.1% of researchers compared to 90.5% of policy makers in Tanzania's public universities were aware of OA.

Attitude is an individual's overall affective reaction to using a system (Venkatesh et al., 2003). Several studies (Chau & Hu, 2002; Louho et al., 2006) have established that individuals' attitude towards technology had a strong effect on adoption and use intention. Chau and Hu (2002) in a study of physicians' behavioural intent in using computers pointed out that the attitudes towards computers are important for technology acceptance decisions. In the same vein, Obuh (2013) examined researchers' attitudes towards use of OA publications in order to determine the position of Library and Information Science (LIS) lecturers in southern Nigeria. It was acknowledged that both junior and senior lecturers exhibited high positive attitude towards adoption and usage of OA publications. However, this has not translated into actual use of OA publishing. For the successful adoption and acceptance of OA publishing the Internet is required, which serves as a platform for OA publishing. The Internet is an instrument used for searching, retrieving, and disseminating information across the globe (Adeogun, 2003). Internet self-efficacy is essential for adoption and use of OA publishing. According to Bandura (1986) the concept of self-efficacy involves peoples' judgment of their capabilities to organise and execute courses of action required to attain designated types of performances. Internet self-efficacy refers to "what individuals believe they can do with the Internet skills they possess" (Hsu et al., 2004, p. 768). In support of this claim, Gbaje (2010) stated that unless researchers demonstrate specific skills for using the Internet in accessing and disseminating research findings, they may not benefit from OA publishing. Dulle and Minishi-Majanja (2011) stressed that Internet self-efficacy influences individual decisions towards OA adoption and usage behaviours. It can be apparently concluded that academic staff in universities need to develop Internet skills for them to embrace and use OA publish-

ing. Members of university management are expected to give adequate support to academics by providing facilitating conditions that will motivate them to adoption and use of OA publishing in their scholarly works.

There are different models that have been proposed to address the issue of adoption and use of technology or technologically based systems like OA publishing. The technology acceptance models include: Theory of Reasoned Action (TRA); Theory of Planned Behaviour (TPB); Decomposed Theory of Planned Behaviour (DTPB); Motivational Model (MM); Technology Acceptance Model (TAM); Technology Acceptance Model (TAM2); Combined TAM and TPB (C-TAM-TPB); Social Cognitive Theory (SCT); Model of PC Utilization (MPCU); Innovation Diffusion Theory (IDT); and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al, 2003; Wu et al., 2007; Jayasingh & Eze, 2010). These models appear to be widely embraced among information system researchers. OA publishing is a technology driven system and the UTAUT model is the most suitable for analysis of the present study because it has the highest predictive power (69%). The UTAUT model posits that a user's adoption of a new system is determined by that user's behavioural intention to use the system, which in turn determines the actual behavioural use of the system. The model is one of the more recent theories established by Venkatesh et al. (2003). It has four core determinants of intention and actual usage behaviour. The four core determinants are: performance expectancy, effort expectancy, social influence, and facilitating conditions. In this study, social influence was not considered important at this developmental stage because the OA initiative has not been adequately embraced. Despite various approaches used in analyzing academics' adoption and use of OA publishing, none of the studies uses the UTAUT model in the context of OA publishing.

## 5. METHODOLOGY

This study used the quantitative method of a survey approach for data collection. The semi-structured questionnaire was used as data collection instrument. Three universities of various ownership levels in Nigeria were purposively selected. Federal universities were represented by University of Ibadan, state universities

represented by Adekunle Ajasin University, and private universities represented by Babcock University. The availability of functional Internet facilities was used as a criterion for the selected universities. This is necessary because Gbaje (2010) established that the Internet is the platform for OA publishing.

Participants were randomly selected from the three universities by using the lottery method. This was to avail equal opportunities to all potential participants in the study. A self-administered questionnaire was distributed to 337 participants selected from a population of 2,362 academic staff from the selected universities. Interviews were conducted with four universities' management staff members that understand and implement university policies on scholarly communication.

## 6. DATA COLLECTION INSTRUMENT

A questionnaire and interview format were used to gather data from the respondents. The choice of a questionnaire was informed by its prevalent use in most studies on scholarly communication. The items from the questionnaire were adapted from various related studies (Venkatesh et al., 2003; Dulle, 2010; Mammo & Ngulube, 2013; Obuh, 2013).

The survey questionnaire consisted of four pages containing 61 items. The questionnaire was designed under nine different headings and harmonized in one single questionnaire that contained ten sections (A to J). Section A required demographic information of the participants: age, gender, work experience, educational qualification, position, and discipline, and covered items 1-7. Section B contained items on level of adoption and use of OA publishing, covering items 8-17. Section C contained awareness of OA and had items 18-25. Section D contained attitude towards OA (ATOA) and covered items 26-31.

Section E elicited information on Internet self-efficacy (ISE) beliefs using the generalized self-efficacy scale (GSS) developed by Stanley et al. (2002) and covered items 32-36. Section F contained effort expectancy (EE) with items 37-42; Section G contained performance expectancy (PE) and covered items 43-48. Lastly, Section H contained facilitating conditions (FCs) and covered items 49-54. Section I contained behavioural intention to use (BIU) with items 55-57, and Section

J contained an open questions on important factors of adoption and use with items 58-61. De Vaus (1991) states that closed questions are easier to code and recommended exhaustive alternative responses. Items in the questionnaire were rated on a 4-point Likert scale with end points of 4 "Strongly agree" and 1 "Strongly disagree"; the two mid-points were 3 "Agree" and 2 "Disagree." The questionnaire was validated and pre-tested on part of the population which was exempted from participation in the study. The researcher assumed that most questions were based on previous empirical studies and that they had been validated. Quantitative data (questionnaire) collected were coded and analyzed using Statistical Package for Social Sciences (IBM-SPSS) version 19.0 while qualitative data (interviews) were thematically analysed.

## 7. RESULTS

### Demography of the Participants

The demographic information of the academic staff that participated in the survey is shown in Table 1.

As shown in Table 1, the majority of participants (206) were from the University of Ibadan and 57 were from Babcock University, while 54 were from Adekunle Ajasin University. Of 317, 212 of the participants were male while 105 were female.

**Objective 1:** The objective sought to identify factors that influence the adoption and use of OA publishing by academic staff in selected universities.

Table 2 shows that each of the independent variables (factors) made a significant contribution to the prediction of adoption and use of OA publishing. Effort expectancy made an insignificant contribution but has a positive relationship with adoption and use of OA publishing. As regards the magnitude of contribution, attitude towards OA publishing made the most significant contribution ( $\text{Beta} = .407$ ,  $t = 8.774$ ,  $p < 0.05$ ) to the prediction of adoption and use of OA publishing. This is followed by awareness, with value  $\text{Beta} = .367$ ,  $t = 8.361$ ,  $p < 0.05$ . Next is the performance expectancy that made significant contribution ( $\text{Beta} = .149$ ,  $t = 2.878$ ,  $p < 0.05$ ). Also, facilitating conditions ( $\text{Beta} = .127$ ,  $t = 2.505$ ,  $p < 0.05$ ) made significant contribution to the prediction. Moreover, other factors made significant contribution in the following order: Inter-

**Table 1.** Background of the Participants

University	Frequency	Gender	Frequency
University of Ibadan	206	Male	212
Adekunle Ajasin University	54	Female	105
Babcock University	57		
Total	317		317

Source: Field Data, 2015

**Table 2.** Determinants of the Adoption and Use of OA Publishing (N=317)

Model	Unstandardized Coefficient		Standardized Coefficient	t	Significant
	Beta(B)	Std. Error	Beta(B)		
Constant	3.451	1.452		5.821	.000
Awareness of OA Publishing	.473	.057	.367	8.361	.000
Attitude towards OA Publishing	.638	.073	.407	8.774	.000
Performance Expectancy	.208	.072	.149	2.878	.004
Effort Expectancy	.007	.081	.005	.082	.935*
Internet self-efficacy	-.196	.076	-.114	-2.564	.011
Facilitating conditions	.169	.068	.127	2.505	.013
Behavioural intention	-.151	.075	-.070	-2.001	.046

Significant level at  $p < 0.05$

net self-efficacy (Beta=-.114,  $t = -2.564$ ,  $p < 0.05$ ), and behavioural intention (Beta = -.070,  $t = -2.001$ ,  $p < 0.05$ ) with negative relationship. This implies that the lower the relationship of both Internet self-efficacy and behavioural intention, the better the adoption and use of OA publishing. Effort expectancy (Beta = .005,  $t = .082$ ,  $p > 0.05$ ) made an insignificant contribution to the prediction of adoption and use of OA publishing. Thus, the higher the beta value the greater the influence of the predictor variable on the criterion (adoption and use of OA publishing). This suggests that all the factors (awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions) have an established relationship with

adoption and use of OA publishing. Also, all predictors are a good measure for the adoption and use of OA publishing. Hence, it was identified that awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions influenced the adoption and use of OA publishing.

**Objective 2:** The second objective sought to establish relationships among factors that influence the adoption and use of OA publishing.

Multiple Regression (MR) analysis was used to address the hypotheses and relationships among the influencing factors that contribute to the adoption and use of OA publishing. According to Swanson and Holton (2005, p. 118), MR has been used widely in



organisational research to “predict and explain” the concerns of research questions in a survey instrument. Although simultaneous, step-wise, and hierarchical tests are available methods of multiple regression for analysis of data, this study used the hierarchical method because it is a theory-driven research.

Table 3 shows that there are relationships among variables and adoption and use of OA publishing. This suggests that independent variables of the study have strong relationships with dependent variables which are significant and strongly influence the adoption and use of OA publishing. Hence, it can be deduced from the findings that awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions are determinants of the adoption and use of OA publishing. Also, behavioural

intention to use has a significant relationship with the adoption and use of OA publishing.

**Objective 3:** The third objective sought to determine the joint contributions of the factors influencing the adoption and use of OA publishing.

Table 4. Hierarchical Regression Showing Joint Contributions of Independent Variables to Adoption and Use of OA Publishing

Table 4 shows that awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, facilitating conditions, and behavioural intention jointly accounted for 62% ( $R^2 = .620$ ) of the total variance in OA publishing adoption and use by academic staff and it was significant ( $p < .05$ ). The moderating variables accounted for an additional 2.3% ( $R^2 = .023$ ) and is also significant at ( $p < .05$ ). Hence, it can be concluded that

**Table 3.** Summary of Hypotheses (Hierarchical Multiple Regression Analysis) (N=317)

Hypotheses	Variable(Independent)	Statistical Results	Implication
Ho <sub>1</sub>	Awareness of OA	B=.37, t=8.36, p<.05	Significant at p<.05
Ho <sub>2</sub>	Attitude towards OA	B=.41, t=8.77, p<.05	Significant at p<.05
Ho <sub>3</sub>	PerformanceExpectancy	B=.15, t=2.88, p<.05	Significant at p<.05
Ho <sub>4</sub>	Effort Expectancy	B=.01, t=0.08, p<.05	Significant at p<.05
Ho <sub>5</sub>	Internet self-efficacy	B= -.11, t= -.56, p<.05	Significant at p<.05
Ho <sub>6</sub>	Facilitating conditions	B=.13, t=2.51, p<.05	Significant at p<.05
Ho <sub>7</sub>	Behavioural intention to use	B= -.07, t= -2.00, p<.05	Significant at p<.05

**Dependent variable: Adoption and use of OA Publishing**

**Level of Sig. at p<0.05**

**Table 4.** Hierarchical Multiple Regression Showing Joint between Independent Variables and Dependent Variable(Adoption and Use of OA Publishing)

Model	Sum of Squares	Df	Mean Square	F	Sig.	R	R <sup>2</sup>	R <sup>2</sup> Change	Implication
1. Regression	3924.656	7	560.665						
Residual	2401.836	309	7.773	72.130	.000 <sup>a</sup>	.788	.620	.620	Significant
Total	6326.492	316							
2. Regression	4071.636	21	193.887						
Residual	2254.856	295	7.644	25.366	.000 <sup>b</sup>	.802	.644	.023 (.165)	Significant
Total	6326.492	316							

**Level of Sig. at p<0.05**

influencing factors predict 62% ( $R^2 = .620$ ) of adoption and use of OA publishing.

**Objective 4:** The fourth research objective sought to investigate the level of university management support for OA publishing. To meet this objective, interviews were conducted on university management staff of the selected universities as shown below.

The findings revealed that most respondents did not know if there is any policy that supports OA adoption and use by academics in the targeted universities. One of the respondents observed that:

Lack of OA legal framework is an issue affecting us (academic staff). If the university endeavours to formulate an OA policy, it will encourage many academics like ours (lecturers) to increase adoption and use of OA publication as we will do more of OA publishing to showcase our scholarly research findings. However, if the university does not provide an enabling environment, it becomes impossible for many academics. The university should fulfil their part by playing the role that will enhance the adoption and use of OA publishing.

Another respondent acknowledged the need of OA and stated that:

At the moment, there is no written policy that supports OA adoption and use by academic staff in my university (University of ...). Additionally, a plan is in the pipeline on OA legal framework and the university librarians and academic staff from the Faculty of Law has been mandated to be part of the anticipated OA legal framework committee. If the framework has been put into place to support the adoption and use of OA, it would have boosted the morale of academic staff by increasing the adoption and use of OA publishing.

Similarly, another respondent from the third university stated that:

...we need an OA policy. The university management needs to introduce policies that would support and assist the adoption and use of OA publishing in the university community in Nigeria. Academics require some level of support from the Annual Promotion Committee (APC). It seems the lack of a written policy for OA publishing leads to rejection by the promotion committee.

Comments made by university management staff of the three universities suggest that there was no OA

policy in any of the selected universities. These findings affirmed the general comments of respondents in the questionnaire that they did not have any knowledge of the existence of an OA policy in their universities. This suggests that the perceived fear of rejection by academic staff could have been totally eradicated if universities could put in place an OA publishing policy.

Furthermore, insights from the respondents suggest that university management's support for the adoption and use of OA publishing could be of significant help to academics in universities in Nigeria. In other words, the university management's role with respect to supporting academic staff's adoption and use of OA publishing is a key to successful free access to OA publications as well as wide dissemination of research. Having an OA publishing policy in place will motivate academics and alleviate the perceived fear of rejection of OA publication by the university promotion committee. This will increase adoption and use of OA publishing by academic staff.

**Objective 5:** The fifth objective sought to develop a suitable framework that can facilitate the adoption and use of OA publishing by academic staff in universities in Nigeria.

The findings of this study guide the proposed framework that is based on the existing theory—the Unified Theory of Acceptance and Use of Technology. This framework will facilitate and enhance the academic staff adoption and use of OA publishing.

A framework is described as a set of broad ideas and principles taken from the result of empirical findings and relevant literature, and one can be used to structure a subsequent presentation (Reichel & Ramey, 1987). According to Dix (2007, p. 116), a framework is “a general structure that provides an overarching set of concepts and processes.” At times, a framework may reflect a model or guide the development of a model or a number of models.

The graphical representation of the proposed framework illustrates the pattern and structure of links among the set of measured variables. It serves as a research device intended to assist a researcher in developing awareness and understanding of the state of adoption and use of OA publishing in Nigeria universities. It also communicates research findings and recommendations for the purpose of effective implementation and promotion of rapid adoption and use



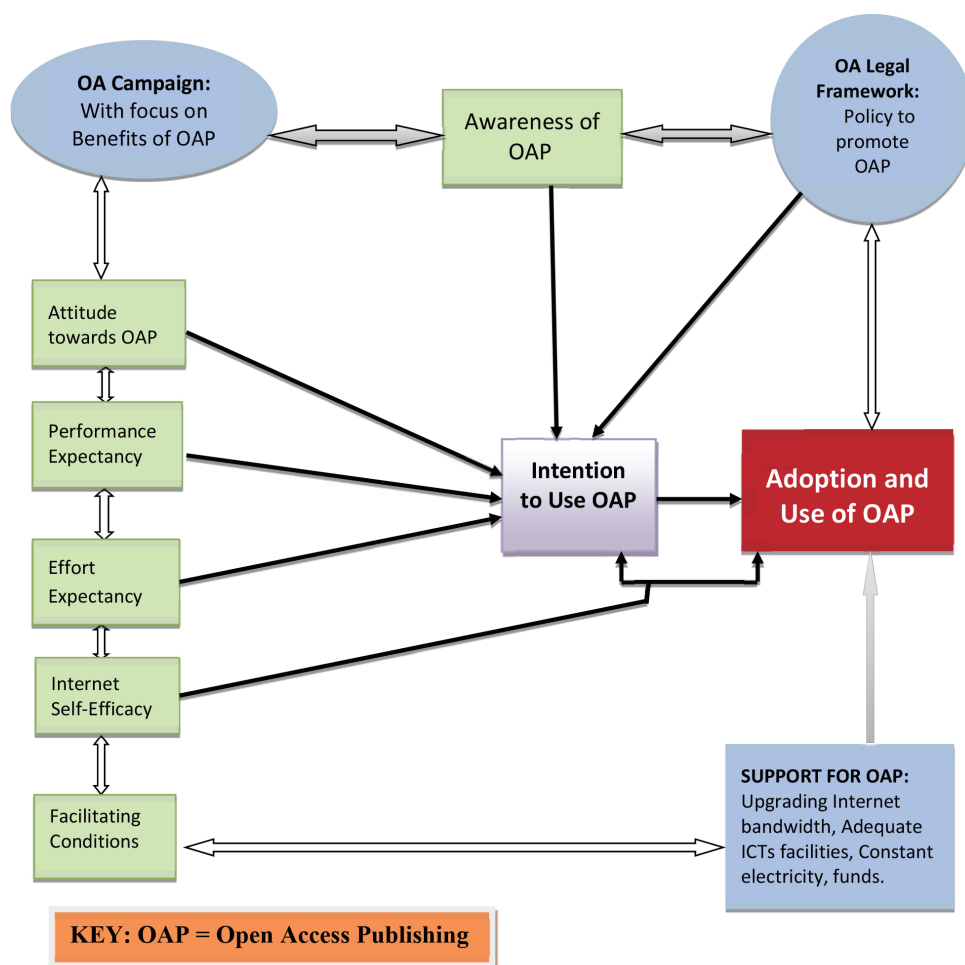


Fig. 1 Proposed framework for the adoption and use of OA publishing (FAUOAP)

of OA publishing among the stakeholders, as shown in Figure 1.

In the investigation, the adoption and use of OA publishing was taken as the dependent variable, and awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions were taken as independent variables, behavioural intention to use taken as an intervening variable. The researcher used a regression analysis to establish the relationship and existence of influence between the measured variables. Factors that influenced the adoption and use of OA publishing and their relationships,

based on what was explained in previous sections, are presented as  $H_{01}$  to  $H_{07}$  below.

### Awareness

The knowledge or perception of a situation or fact is paramount in any decision to adopt and use new innovation. OA publishing is a new concept that needs to be known before accepting or using this technology based system. According to present and previous studies (Chritian, 2008; Obuh & Bozimo, 2012), awareness plays a vital role and is a key factor influencing the adoption and use of OA publishing (see  $H_{01}$ )

**Ho<sub>1</sub>:** There is no significant relationship between awareness and adoption and use of OA publishing

### **Attitude**

Attitude can be described as a way of thinking or feeling about something either negatively or positively. Attitude towards adoption and use of OA publishing plays an essential role. Academic staff that develop a positive attitude towards adoption and use of OA publishing will embrace and use it to perform a given task. The findings of current and previous studies (Wickham, 2011; Khalli & Singh, 2012) established that attitude is a determinant in adoption and use of OA publications. Attitude towards OA publishing is a factor influencing the adoption and use of OA publishing and has relationships with other variables (factors). This was established by testing the hypothesis as presented in Ho<sub>2</sub> below:

**Ho<sub>2</sub>:** There is no significant relationship between attitude and adoption and use of OA publishing

### **Performance Expectancy**

Performance expectancy concerns the degree to which a person believes that using OA publishing would improve his or her performance. The current finding was in congruence with previous studies (Al-Qeisi, 2009; Dulle, 2010).

**Ho<sub>3</sub>:** There is no significant relationship between performance expectancy and adoption and use of OA publishing.

### **Effort Expectancy**

Effort expectancy is defined as the degree to which a person believes that using OA publishing would help achieve a set target. The findings revealed that the influence of effort expectancy is not significant. Hence, the findings are not opposing the previous findings (Louho et al., 2006; Butler & Richardson, 2008) which report a high proportion of the respondents to have significantly expressed less effort expectancy towards the usage of new technologies.

**Ho<sub>4</sub>:** There is no significant relationship between effort expectancy and adoption and use of OA publishing.

### **Internet Self-Efficacy**

According to Bandura (1997) self-efficacy is a per-

sonal judgments of one's capabilities to organize and execute courses of action to attain designated goals, and Bandura sought to assess its level, generality, and strength across activities and contexts (Schunk, 1991). Internet self-efficacy is personal self-assurance of having capability to use the Internet to achieve specific tasks. Gbaje 2010 established that the Internet is a platform for OA publishing. The present findings support Dulle (2010) in that Internet self-efficacy has significant influence on adoption and use of OA publishing. Besides, both Internet usage skills and self-efficacy have been conceded as key determinants for the effective exploitation of information in the digital environment (Waldman, 2003; White & Gendall, 2005).

**Ho<sub>5</sub>:** There is no significant relationship between Internet self-efficacy and adoption and use of OA publishing.

### **Facilitating Conditions**

According to the current study and previous studies (Okoye & Ejikeme, 2011) the role of facilitating conditions in adoption and use of OA publishing is very crucial. Facilitating conditions refer to factors like funding training on ICTs and the Internet, technical support, Internet facilities, and regular electric power that are essential for the successful adoption and use of OA publishing (Christian, 2008; Fatunde, 2008; Njoku, 2016). The current findings corroborate results from previous studies (Dulle et al., 2011; Zhou et al., 2010) that facilitating conditions have significant influence on adoption and use of OA publishing.

**Ho<sub>6</sub>:** There is no significant relationship between facilitating conditions and adoption and use of OA publishing.

### **Behavioural Intention**

Behaviour intention is defined as a person's perceived likelihood or subjective probability that he or she will adopt and use OA publishing. Showing only intention to use might not translate to actual usage of OA publishing.

**Ho<sub>7</sub>:** There is a significant relationship between behavioural intention and adoption and use of OA publishing.

### **OA Legal Policy**

Findings from both the questionnaire and inter-

views revealed that none of the sampled universities has a policy on OA publishing and this has created a perceived problem of rejection of OA publications for promotion and tenure by the constituted University Promotion Committee.

There is a need to establish a policy that will promote acceptance and use of OA publishing by academics. This implementation is possible by incorporating an OA publishing policy into the existing one regarding subscription-based journals. The university authority should ensure that for appointment, promotion, and tenure, OA peer reviewed publications should be considered and given equal treatment as toll-accessed publications. If necessary, precautions should be taken with a better understanding of the relationships that exist among the variables in Figure 1 so that the problem of low adoption and use of OA publishing will be solved. Hence, the visibility and accessibility of research findings will significantly improve the adoption and use of OA publishing.

## 8. EXPLANATION OF THE FRAMEWORK

The proposed conceptual framework in Figure 1 analysed the interactions between independent variables (awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, facilitating conditions) and OA policy interacts with the behavioural intention that serves as a mediating variable and influences the adoption and use of OA publishing. Specifically, the model analyzed the key variable connections as shown in Figure 1 and provided a useful viewpoint for examining variables that influenced the adoption and use of OA publishing by academic staff. With the exception of facilitating conditions, behavioural intention mediates the involvement of all independent variables that influence adoption and use of OA publishing by academics. This proposed framework (see Figure 1) will assist the researcher to figure out how the interactions between independent variables influenced the level of adoption and use of OA publishing. These variables are theoretically associated with the adoption and use of OA publishing. The independent variables are explained as predictors that influence adoption and use of OA publishing (dependent variable). Furthermore, these factors are multi-dimensional and

interact with each other. These interactions can play a significant role in the decisions of academic staff either to use or reject OA publishing.

The support for OA publishing will influence facilitating conditions, and this in turn influences Internet self-efficacy because the development of self-efficacy depends on Internet facilities with high Internet bandwidth. This will in turn interact with effort expectancy as a result of self-confidence in the ability to use the Internet with less difficulty. This chain of interactions influences and induces academics to embrace the OA system because of its benefits to aid job performance (performance expectancy) for the set target. The performance expectancy in turn influences the ability to achieve the set target with little effort (effort expectancy) and impacts the development of the right (positive) attitude by academic staff. This will attract an OA campaign which leads to OA awareness, and later influences the formulation of OA policies. Further, an OA policy will trigger and enhance the adoption and use of OA publishing by academic staff.

Academic staff that benefit from the adoption and use of OA publishing will inevitably influence university management to formulate an OA policy that will promote awareness of OA. This in turn will drive the need to intensify more efforts in the OA campaign, with a focus on its benefits that can inform the development of positive attitudes towards OA by academic staff. This chain of interactions influences performance expectancy of academic staff, having realized the benefits of OA to enhance performance on the set target. Further interactions attract academics to use OA, since it requires little effort (effort expectancy) to deliver on the set target. This also encourages academic staff to develop Internet self-efficacy through an enlivened environment (facilitating conditions) that supports OA publishing. These chains of interactions drive more support for OA that will finally lead to the adoption and use of OA publishing. Additionally, each independent variable (OA policy, awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy) has a direct influence on intention to use OA publishing as indicated by the arrow, and intention to use has direct influence on the actual use of OA publishing. Finally, following each step thoroughly will lead to successful adoption and use of OA publishing (outcome) as shown in Figure 1.

## Justification for the Framework

The rationale for this proposed framework are as follows:

- The adoption and use of OA publishing by academics in most universities witnesses a high consumption of OA publications but low patronage of OA publishing outlets;
- Persistence of serial and permission crises in academic libraries;
- Low access and poor visibility of research findings in Africa and Nigeria in particular, and
- Lack of OA policy to encourage the adoption and use of OA publishing by academic staff in universities in Nigeria.

The above justification calls for the development of a framework that assists users to have wider access to information, especially research findings; also, to help stakeholders to appreciate, embrace, and evaluate OA publishing.

## 9. LIMITATIONS

This study focused on lecturers and librarians (academics) only. The present study used data collection instruments such as a questionnaire and structured interviews for data gathering on the adoption and use of OA publishing.

## 10. SIGNIFICANCE OF THE STUDY

The significance of this study is three-fold: first, theoretical significance—it adds to the existing literature. Rindova (2011) asserts that the vital reason to conduct a scholarly guided study is to contribute to a theory or develop one. Therefore, this study successfully contributes to theory by identifying new constructs (awareness, attitude, and Internet self-efficacy) to the existing variables of the UTAUT. Second is the societal significance: The study promotes adoption and use of OA publishing, which can facilitate access and wide visibility of research findings to all stakeholders (lecturers, librarians, researchers, and industrialists). Third, it will minimise the persistent serial crisis (shortage of reading materials) in academic libraries. Furthermore, it adds value to the methodological approach by com-

binning quantitative and qualitative techniques. This paper also contributes a framework that improves academics' and other stakeholders' adoption and use of OA publishing.

## 11. CONCLUSIONS

The use of OA publishing is still in its infancy and more research is required to update its evolving nature. Open access publishing proffers a new scholarly communication model to scholars, researchers, academics, students, and other stakeholders. However, there are various factors that influence the adoption and use of OA publishing. The present study concludes that awareness, attitude, performance expectancy, Internet self-efficacy, and facilitating conditions are determinants of the adoption and use of OA publishing. The findings also revealed that universities did not have OA policies to motivate academics' adoption and use of OA and to alleviate the perceived fear of rejection of OA publications for promotion.

The results show that there are relationships between predictors (awareness, attitude, performance expectancy, effort expectancy, Internet self-efficacy, and facilitating conditions) and adoption and use of OA publishing. Predictors (factors) that potentially influence the successful adoption and use of OA publishing need to be taken into account by university authorities while embracing and using OA publishing. Also, factors that influence adoption and use of OA publishing are explored and presented as a framework.

This study established that all predictors (factors) of OA made a contribution of 62% towards the adoption of OA publishing. The findings imply that all predictors (factors) jointly influence the adoption and use of OA publishing.

## 12. RECOMMENDATIONS

### OA Awareness

Based on the findings, the following recommendations are made: It is recommended that universities should increase OA awareness by assigning reference librarians or scholarly communication officers to provide access to OA publications. Also, libraries should

organise OA monthly awareness programmes.

### Adequate Facilities

The universities should strengthen the existing ICT facilities by providing/ensuring regular power supply and upgrading Internet bandwidth as well as more funds.

### Training

To understand and adopt OA publishing effectively, regular training is essential for academic staff. Universities should organise refresher courses for staff on ICTs and Internet searching and for training newly recruited staff. In summary, universities should ensure that all factors leading to successful adoption and use of OA publishing by academic staff are enhanced.

### OA Publishing Policy

Universities should formulate an OA legal framework that will alleviate academic staff's fears of rejection of OA publications for promotion and tenure. This can be achieved by ensuring that OA peer reviewed publications are given equal treatment as toll-accessed printed journals.

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