Effect of perceived ease of use on librarians' e-skills: Basis for library technology acceptance intention

Roland Izuagbe[a],[*], Nurudeen Ademola Ibrahim[b], Lilofa Osamienfa Ogiamien[c], Olajumoke Rebecca Olawoyin[a], Nwanne Mary Nwokeoma[a], Promise Ifeoma Ilo[a], Odaro Osayande[a]

[a] *Covenant University, PMB 1023 Ota, Ogun State, Nigeria*
[b] *University of Ibadan, Ibadan, Nigeria*
[c] *Benson Idahosa University, PMB 1100 Benin City, Nigeria*

A B S T R A C T

Despite the widespread application of technology in the 21st century, making informed decisions regarding its acceptance in organisations is a function of several factors, particularly in developing countries, due to factors such as rising cost of the information technology infrastructure and low technological exposure. A model that incorporated perceived ease of use (PEOU) and e-Skills to examine librarians' intention for actual library technology acceptance was tested. The correlational research design, along with a multistage sampling procedure, was applied to select samples to reduce the sample to a manageable proportion. Professional librarians and library officers in four university libraries provided the data for the study. Results showed that e-Skill is the model's strongest determinant of technology acceptance intention among librarians. Also, PEOU will significantly moderate librarians' intention towards library technology acceptance when e-Skills are insufficient. From these outcomes, the understanding of the determinants of behavioural intention captured in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAT) is extended and refined.

1. Introduction

In the current information environment, technology is an important driver of quality and efficiency of library operations. Its deployment engenders significant transformation from ancient conceptualisation of the library and information science profession to one that is modern. The use of application models such as web-based catalogues, Integrated Library Software (ILS) and other emerging Web technologies are flexibly redefining library operations in no small way. Nowadays, the library is a blend of evolving information technologies and knowledge resources paving the way into the digital world (Kowalczyk, 2016). With technology, new paradigms of opportunities are available to libraries to: create borderless access to information resources and services, adaptively and flexibly engage different users, widen libraries' patron-base and automate house-keeping routine practices, thereby minimising exigencies of physical and mental effort, depending on availability of funding and electronic skills (e-Skills) proficiency.

As an emerging concept, e-Skills describes the Information and Communication Technology (ICT) proficiency required by individuals especially in media and literacy studies, education, computer science, library and information science (Ilomaki, Kantosalo, & Lakkala, 2011) as well as other allied disciplines, to maximise the socio-economic

activities of the digital environment to which they belong. Particularly, e-Skills refers to the set of proficiencies require to create ICT platforms and to use the same to sufficiently improve life prospects and participate adequately in the digital economy (iNeSI, 2016). In the global economy e-Skills are fast becoming the basics for retaining computer-related jobs as well as the entry requirements for key positions in the information provision business. However, the requisite skills for harnessing the potentials of technology have been said to be in short supply in developing countries (Adams, De Silva, & Razmara, 2013; Peter-Cookey & Janyam, 2017). Studies have also lent credence to this assertion from the Nigerian library context (Amuche & Solomon, 2014; Anyoku, 2012; Izuagbe, Ifijeh, Izuagbe-Roland, Olawoyin, & Ogiamien, 2019). Besides the role of e-Skills in the efficient utilisation and the general management of library technology infrastructures, they are also vital for making informed decisions relative to technology adoption. Whether or not these skills will propel librarians' intention towards library technology acceptance, or if intention is dependent on other factors for making the same decisions where relevant e-Skills are absent or lacking, is not certain.

1.1. Theoretical perspectives

Several theoretical frameworks (e.g. Diffusion of Innovation—DoI, Theory of Reasoned Action—TRA, Theory of Planned Behavior—TPB, Technology Acceptance Model—TAM, 2 and 3, Unified Theory of Acceptance and Use of Technology—UTAUT among others have been variously employed in the prediction of system adoption and or usage intention, with TAM standing out as the most widely employed framework among IT researchers across culture and gender (Chin & Lin, 2015; Davis, 1993; Park, 2009; Venkatesh & Davis, 2000). Other citable evidence for the use of TAM is the ability of this theoretical framework to incorporate psychological factors (Teo, Fan, & Du, 2015) and to explain the factors as determinants of technological innovations from the context of attitude and intention (Chin & Lin, 2016).

Of the aforementioned frameworks, TAM and UTAUT reliably revealed the simplicity of using a technology as an important determinant of behavioural intention. Whereas this belief is captured as perceived ease of use (PEOU) in TAM, UTAUT referred to same as effort expectancy (EE). The justification of including the construct in these frameworks stems from the belief that a system would garner more acceptance from users when the system is easy to use. In other words, the more complexities a system portends, the less acceptance and eventual adoption, use and support it attracts (Izuagbe & Popoola, 2017). However, it has been shown that an effective technology could still fail to gain users' support if it is difficult to use (Venkatesh & Davis, 2000).

Both TAM and UTAUT postulate that the effort required in the cause of using a technology and the results derivable from the process directly affect individuals' behavioural intention towards the system (Figl & Derntl, 2011; Venkatesh, Morris, Davis, & Davis, 2003). Given that PEOU was proposed to have direct effect on perceived usefulness (PU) in TAM (even though studies have also found indirect effect) suggests that the former is an important determinant of behavioural intention to acceptance and use (see Fig. 1). In contrast, UTAUT theorised gender, age and experience as moderators of the effect of EE on behavioural intention (Fig. 2). Since TAM captures the ease of use belief more comprehensively as a predictor of both PU and attitude which ultimately determines behavioural intention towards actual acceptance and usage, TAM guides the development of the theoretical model on which the study is anchored.

2. Problem statement

The research prospects of PEOU along with PU has remained constant over time as the literature shows. For example, the effect of PEOU and PU on intention to accept technology have been widely surveyed (e.g. Al-Adwan, Al- Adwan, & Smedley, 2013; Elkaseh, Wong, & Fung, 2016; Hartmann, Kerssenfischer, Fritsch, & Nguyen, 2013) with mixed outcomes. However, a few studies (Nyembezi & Bayaga, 2015; Shen & Chiou, 2010) have explored PEOU as an independent construct relative to intention. Of these efforts, little is known of studies that have extended the construct to the library environment in developing countries where there is perceived lack of skills and technological exposure
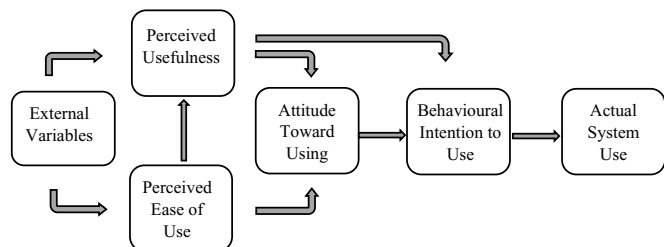

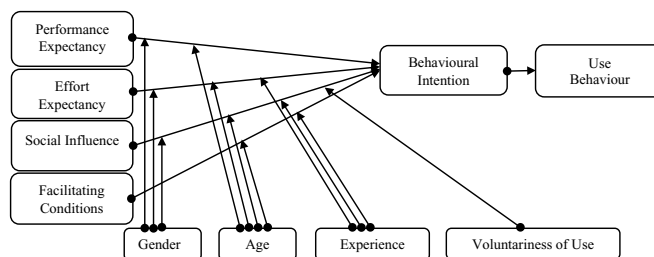**Fig. 1.** Technology acceptance model (TAM).
Source: Davis, 1989.

Fig. 2. UTAUT model.
Source: Venkatesh et al., 2003.

among librarians (Nkamnebe, Okeke, Udem, & Nkamnebe, 2015). Also, studies ascertaining librarians' predisposition to rely more on 'less effort' as the basis for library technology acceptance intention (where technological proficiency is in doubt) are scarce in the literature. While this gap forms the crux of this study, addressing it will have several implications for research, practice and society. To achieve this broad objective, the study developed a model that incorporates e-Skills and PEOU to examine individuals' disposition towards technology acceptance in an environment where the digital skills required to make such choices are less competitive.

As a result, the specific objectives of the study are to: 1) determine if e-Skills will independently predict technology acceptance intention; 2) ascertain if a relationship exists between PEOU and e-Skills towards technology acceptance intention; and 3) identify if PEOU will significantly moderate between e-Skills and intention to accept technology in a less competitive environment.

2.1. Significance of the study

First and foremost, the outcome of the study increases the understanding of behavioural intention when individuals are confronted with the decision to adopt a compelling but complex technology given that the required e-Skills to effectively make such judgement are inadequate. Furthermore, it will foster the infusion of core e-Skills programmes into the library and information science curriculum, geared towards equipping and exposing librarians-in-training to advanced skills for deriving maximum benefits from cutting-edge technologies and practices, in order to compete favourably on a global scale. While this would help carve a good image of the profession in the minds of stakeholders (e.g. prospective librarians, funding authorities and policy makers) in the education sector, particularly in the developing countries (where the reputation of the profession is less competitive), the information services thus offered would help drive scholarship; this would mean good news both for the education sector and the economy.

This is a pioneering effort towards identifying the effect of PEOU on e-Skills vis-à-vis intention towards technology acceptance within the developing country context where e-Skills are insufficiently perceived. As a result, the study represents an important addition to theory and research on technology acceptance by incorporating e-Skills to strengthen PEOU, thereby extending TAM and other theoretical developments that capture the ease of use variable as a direct or indirect determinant of behavioural intention. Consequently, the prediction of technology acceptance where similar constructs and frameworks like effort expectancy in UTAUT and complexity in DoI are employed may also be greatly advanced.

3. Literature review

3.1. e-Skills and library technology acceptance intention

The 21st century falls within the epoch period called the Information Age (Ogunsola, 2011), an era driven by technology and globalisation (Oladele, 2008). In this era, information professionals
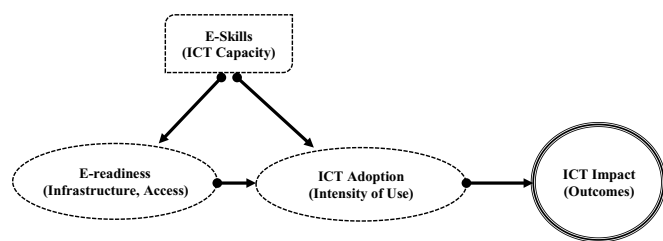
Fig. 3. National ICT development model (Bowles & Wilson, 2010).

including librarians require a variety of skills and competencies to drive the profession in this Age for success (Nonthacumjane, 2011; Wise, Henninger, & Kennan, 2011). The rapidly evolving changes in this Age affect the roles, job opportunities, self-image, motivation and even the survival of librarians and information specialists (Hashim & Mokhtar, 2012). The exponential expansion of the frontiers of knowledge in the field of IT is phenomenal in this Age. For example, the traditional skills and expertise that steered the library and information science profession in the past recent decades seem inadequate currently based on modern trends in the field. This implies that as the field of librarianship progresses, the requisite skills needed to competitively and innovatively align the profession to international best practices advances correspondingly—underpinning the need for e-Skills. A working definition of e-Skills that encompasses three broad areas (ICT user skills, ICT practitioner skills and e-business skills) was adopted at the European e-Skills Forum in 2004 (Ala-Mutka, 2011). The definition generally denotes the ability to use digital skills to effectively participate in an environment progressively controlled by access to digitally-enabled information and to build capacity towards synthesising the same into relevant knowledge (Fig. 3) (iNeSI, 2016).

Essentially, e-Skills exist at three levels as Ferrari (2012) categorised: ***Know (knowledge level) → Use (application level) → Create (transformation level)***. These levels have been demystified further (Bowles, 2010) into: ***Basic (foundational) → Moderate (extension) → Proficiency (strategic)***. While the basic or knowledge level is hypothesised as a precondition for the use or moderate level, the final level requires proficiency and creativity to innovatively transform a sector or an economy — a process the European Commission (2012) considered the highest achievable cognitive impact of the e-Skills circle. It therefore follows that for any sector of an economy to transform technologically e-Skills are essential. As a result, the authors theorise that:

H1. e-Skills will independently and significantly predict librarians' intention towards library technology acceptance.

3.2. e-Skills, PEOU and library technologies

The absence or inadequacy of e-Skills impede the adoption/deployment of library technology and engenders the underutilisation of the same. This assertion earlier echoed in Edem's (2008) study of librarians' use of ICT where 28% of the respondents who constituted the majority avowed that inadequate relevant skills is the greatest obstacle to librarians' use of emerging technologies in Nigerian libraries. Similarly, poor digital literacy training among librarians has also been attributed to the challenges facing the library profession in Nigeria (Ekoja, 2007). From the technical viewpoint, Akintunde and Anjo (2013) affirmed that for now, many librarians do not have the profile of troubleshooting and fixing bugs in the administration of Institutional Repositories (IRs) in Nigeria, an activity they ascribed to computer scientists. Okede and Owate (2015) corroborated this assertion when they reported that one of the challenges facing IRs in Nigeria is librarians' lack of requisite skills.

Where the required skills for informed decision-making relative to library technology adoption are lacking, librarians may opt for system

characteristics such as ease of use for making decisions. However, an individual's view of ease of use with respect to technology acceptance or use is highly subjective. In other words, factors that facilitate one's opinion (whether positive or negative) about a system differ greatly. The determination of these factors has triggered several scientific enquiries into individual behavioural intention from various technological innovations contexts. For example, Rowlands, Nicholas, Jamali, and Huntington (2007) studied faculty and staff preference for e-books and print titles. Findings showed that the benefits of e-books revolve around convenience of, ease of making copies, perceived up-todateness, space-saving, and around the clock availability. For perceived ease of reading however, e-books evidently compare very negatively with print materials. Al-Suqri (2014) found that the participants who tended to use e-books more were those who perceived them to be easier. A users' opinion of ease of use may then be concluded as more of an individual's subjective opinion relative to other factors than it is for the technology itself.

From longitudinal research of Internet adoption, researchers found that regardless of skills, there is higher intention among individuals to use an online auction platform when the verification process to use the online service is relatively simple (Shen & Chiou, 2010). This suggests that PEOU and not skills is an important determinant of Internet adoption. From the digital library context, it was revealed that the terminology built into a digital library interface has a positive influence on its PEOU (Mohammed & Ali, 2014). This assertion was specifically attributed to users in developing countries who may not have the technical know-how to interpret the digital library terminologies. Furthermore, Erasmus, Rothmann, and Eeden (2015) employed Structural Equation Modeling (SEM) with a cross-sectional survey design to ascertain technology acceptance within a South African enterprise for resource planning. The researchers reported that PEOU indirectly impacted attitudes towards behavioural intentions to use the information system. Without PEOU, individuals' e-Skills level directly affects their predisposition to use technology (Saleh & Drew, 2014). By inference, it can be concluded that where the required e-Skills are lacking, system acceptance and use will not be effective thus, the researchers hypothesises that:

H2. There is no significant relationship between PEOU and e-Skills towards actual technology acceptance intention.

3.3. PEOU and e-skills

The exponential rise in technological advancements gave rise to a social issue called the 'digital divide'— the technological inequalities among individuals, groups or nations (Olufemi & Oluwatayo, 2014). This phenomenon refers to the digital gap between countries or persons with or without adequate access to emerging information technology (Van Dijk, 2006). This situation transcends the basic skills required for ICT and internet use. It entails the functional proficiency of ICT-inclined individuals whose digital productivity stimulates unique innovations (Bowles & Wilson, 2010). This factor explains the unmatched gap in terms of e-Skills capacity between librarians in the developed economies and those in their developing counterpart.

Despite the socioeconomic factor, this study hypothetically attributes the perceived poor e-Skills competence among librarians in developing countries to the inability to consciously engrain core e-Skills subjects into the library school curriculum, as opposed to the developed economies where such skills are vital components of the academic-related curriculum (Anafo & Filson, 2014). From the Nigerian context for instance, library schools are not conventionally affiliated with technology-based disciplines. As a result, the digital expertise and exposure librarians require to make informed decisions relative to cutting-edge technology acceptance judgments is inadequately perceived. Where the adoption of a complex library technology becomes unavoidable in a less technologically exposed environment, librarians may be compelled to
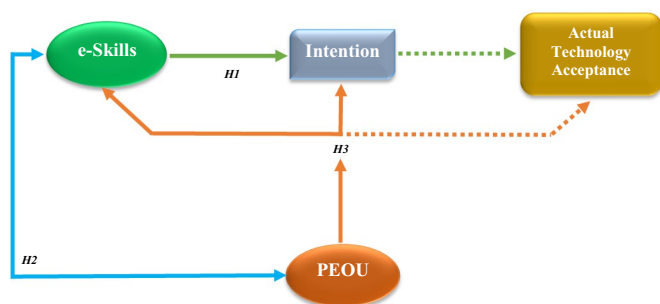
Fig. 4. The proposed conceptual model for PEOU, e-skills and technology acceptance intention.

base their acceptance intention on system characteristics such as ease of use and forego other benefits the system offers. Similarly, librarians may prefer a lesser complex technology that offers less benefits if it promises ease of use. Wu and Yeh (2012) reported that regardless of the user-friendliness (interfaces) built into library technologies, competence remains a fundamental requirement. Accordingly, several relationships have been hypothesised (Fig. 4) to further strengthen the nexus between skills and ease of use as it affects acceptance. The researchers postulate that:

H3. PEOU will not significantly moderate librarians' intention towards actual library technology acceptance where e-Skills are low.

4. Methodology

4.1. Procedures and sampling

The goal of the study wass to ascertain whether PEOU would make up for e-Skills (where they are inadequately perceived) relative to technology acceptance intention among librarians. To effectively address the problem, responses from a technology-mediated library environment, where there is relatively high digital competence among librarians, would be necessary so as not to preempt the respondents' reactions. As a result, public and private university libraries in the South West and South South geopolitical zones of Nigeria provided the data and institutional setting for the research. The choice of the universities and regions was informed by the high intellectual awareness and ICT deployment (Fumilola, 2019). Also, it is to ensure equitable collection of data and generalisability of research outcomes. Correlational research design was applied. This design was adopted due to it suitability in studying relationships that exist between two or more variables to predict future events, taking clues from present knowledge (Stangor, 2011). A multistage sampling technique involving purposive, simple random and total enumeration procedures was adopted to select samples and reduce the same to a controllable proportion.

Universities were selected to provide the institutional setting for the study because they represent the nucleus and best funded higher institutions of learning in Nigeria (Ahmad, Garba, Soon, & Bappah, 2016). The universities chosen through random selection are: University of Benin, Benin City (public), Igbinedion University, Okada (private), Benson Idahosa University, Benin (private) and Covenant University Ota (private). Population and ownership type guided the choice of these institutions. The central and all college branch libraries of these universities were included in the sample.

The population selected was based on professional exposure and included professionals (librarians) and para-professionals (library officers) library personnel (Table 1). The librarians perform core professional functions which include overseeing the affairs of the various divisions and departments of the library, carrying out essential professional duties like acquisition of print and electronic information resources, cataloguing and classification of same, answering users' queries

among other reference services. The library officers, on the other hand, perform elementary professional functions such as physical processing of acquired materials, and supervision of library assistants, and other functions as may be assigned by librarians. One hundred and twelve (112) library personnel selected from the two cadres, including 58 librarians and 54 library officers were included in the sample.

4.2. Instrument

Data were elicited through the use of a questionnaire. The questionnaire was administered to the respondents by the authors. The respondents were given ample time (between two to three months) to respond objectively and conscientiously. While the authors from Covenant University administered the instrument to respondents in their library and retrieved the same within one month, the only co-author from the South South zone elicited the support of two research assistants (who were librarians from the other two responding libraries other than that of the co-author's) to administer the instrument to respondents in Benson Idahosa University, Benin, Igbinedion University, Okada and University of Benin, Benin City respectively. Upon completion of the questionnaires, each were retrieved by the co-author and the two research assistants and couriered to the lead author for transmission to a data analyst for analyses. Out of the 112 copies of the questionnaires administered, 108 copies were completed, representing a high response rate of 96.4%. Since the returned rate exceeded the 60% threshold (Nulty, 2008; Richardson, 2005) it was considered adequate for data analysis.

The study modified the PEOU scale (Cowen, 2009), an adapted version of Davis (1989), to measure the effect of PEOU on library technology adoption intention among librarians. Items in the original scale include: "I rarely make errors when using the digital imaging system", and "Learning to operate the digital imaging system was easy for me". These, among others were revised as; "I rarely make errors when using library technology" and "Learning to operate library technology is easy for me." The scale was originally measured on a 6-point likert scale of: 1 = Strongly Disagree 2 = Disagree 3 = Slightly Disagree 4 = Slightly Agree 5 = Agree 6 = Strongly Agree including Not Applicable—N/A) with a Cronbach's alpha reliability coefficient of 0.92 for PEOU.

For intention to use library technology, Teo's (2011) Behavioural Intention to Use scale was adapted. Teo's scale measured factors influencing teachers' intention to use technology. Items in the scale include: "I intend to continue to use technology in the future." and "I plan to use technology in the future." Examples of the modified versions of these include among others: "I plan to use library technology in the future" and "I intend to continue to use library technology in the future". The scale was based on a 7-point likert scale, ranging from strongly disagree–1 to strongly agree–7. The Cronbach alpha reliability coefficient of the scale showed 0.96.

Lastly, the 16 cluster e-Skills Training Needs Scale was modified to suit the current study to examine librarians' e-Skills relative to technology acceptance intention. This scale was originally designed to measure the effect of digital literacy and e-Skills on digital economy participation by Innovation and Business Skills Australia (ISBA) (2013). Of the 16 clusters that make up the instrument, one item each from 5 clusters (Table 2) considered most appropriate for the current study were applied and revised with clusters 2, 3 and 5 considered essential (see Appendix A for the complete questionnaire).

4.3. Data analysis

Inferential statistical methods such as correlation and multiple regression analyses were applied to test the formulated hypotheses at 0.05 level of significance. While the need to determine the relative influence of the independent variables (i.e. e-Skills and PEOU) on the dependent variable (i.e. technology acceptance intention) informs the

Table 1
Distribution of job status and work experience of respondents.

Job status		Work experience					Total
		1–5	6–10	11–15	16–20	21 & above	
Para-professional cadre	Library officer	9	9	7	–	2	27
	Higher library officer	–	6	4	1	–	11
	Senior library officer	1	4	4	2	–	11
	Principal library officer	–	–	3	–	1	4
Professional cadre	Assistant librarian	3	2	4	–	–	9
	Librarian II	5	10	2	1	–	18
	Librarian I	–	9	5	1	1	16
	Senior librarian	–	1	5	2	–	8
	Principal librarian	–	–	–	2	2	4
Total		18	41	35	9	6	108

use of multiple regression, ascertaining the direction and strength of relationship between or among the proposed variables necessitated the use of correlation analysis.

5. Results

5.1. Demographic information

Table 3 shows that female library personnel are the majority with 60 (54.6%), as opposed to their male counterpart that accounted for 48 (45.4%) of total participants. With respect to highest educational qualification, librarians with a master's degrees (MLIS/MSc) top the distribution with 50 (42.3%) being female. Comparatively, there are more male HND, BLS/BSc and PhD holders than female. However, respondents with OND and PhD ranked least in the sample with 8 (7.4%).

Table 1 (see Methodology section) juxtaposes library personnel's job status and their work experience. Based on cadre, professional librarians constituted the majority of participants 55 (50.9%) in comparison to the para-professionals 53 (49.1%). Individually, library officers form the majority 27 (25%), followed by librarian II 18 (16.7%) and librarian I 16 (14.8%) respectively. Principal library officers and principal librarians were least in the sample with 4 (3.7%) each. In terms of work experience, library personnel between the work experience age range of 6–10 years form the majority 41 (40%) followed by 11–15 which accounted for 35 (32.4%). Twenty-one years and above was least in the work experience distribution 6 (5.6%).

5.2. Testing of hypotheses

H1: e-Skills will independently and significantly influence librarians' intention towards library technology acceptance.

Hypothesis one was tested using regression analysis as presented in Table 4. The prediction of e-Skills on librarians' intention towards library technology acceptance revealed that e-Skills (e.g. proficiency to

Table 3
Distribution of gender and educational qualification of respondents.

Gender	Highest educational qualification					Total
	OND	HND	BLS/B·Sc	MLIS/M.Sc	PhD	
Male	2	6	17	19	5	49
Female	6	4	15	31	3	59
Total	8	10	32	50	8	108

OND = Ordinary National Diploma; HND = Higher National Diploma; BLS = Bachelor in Library Science; B·Sc = Bachelor of Science; MLIS = Master in Library and Information Science; M.Sc = Master of Science; PhD = Doctor of Philosophy.

Table 4
Summary of regression analysis of the combined influence of *e*-Skills on librarians' intention towards library technology acceptance.

R	R-square	Adjusted R-square	Std. error of the estimate
0.354	0.126	0.083	0.565

ANOVA					
Source of variation	Sum of square	Df	Mean square	F	Sig.
Regression	4.672	5	0.934	2.929	0.016*
Residual	32.541	102	0.3319		
Total	37.213	107			

* Significant at $p < .05$.

securely communicate and search the internet, use of social media tools for professional network and collaborations, programming, application of digital media technology to market library products and services and the ability to determine the appropriateness of IT solutions) positively influence librarians' intention towards library technology acceptance. The results show a coefficient of multiple correlations ® of 0.354, and a

Table 2
e-Skills measurement items.

Cluster	e-Skills set	Item	Modified
2	IT users digital literacy	Use, communicate and search securely on the internet	I have the skills to use, communicate and securely search the internet
3	Internet technology and social networking	Use social media tools for collaboration and engagement	I can use the social media as a tool for professional collaborations and engagement
5	Digital content development and collaboration	Operate a digital media technology package	I am proficient at using digital media technology packages effectively
10	Sell products and services online	Market goods and services internationally	I have the skills to internationally market library products and services online
12	Develop a business case and select appropriate IT strategies and solutions	Determine appropriate IT strategies and solutions	I can ascertain the appropriate IT strategies and solutions for

Cluster*: New skill sets from the 16 cluster e-Skills Training Needs Scale (Innovation & Business Skills Australia, 2013).

multiple R^2 of 0.126. This suggests that 12.6% of the variance in the librarians' intention towards library technology acceptance was accounted for by e-Skills when combined. The significance of the combined contribution of the prediction was tested at $\alpha < 0.05$ employing the F- ratio at the degrees of freedom (df = 5, 102). Also, it could be observed from the Table that the analysis of variance for the regression produced F-ratio of 2.929 (significant at 0.05 level). This infers that the combined contribution of e-Skills to librarians' intention towards library technology acceptance was significant and other factors not taken into consideration in this model may be responsible for the remaining difference.

Since the *p*-value is 0.016 which is less than 0.05, it is therefore deduced that e-Skills will independently and significantly influence librarians' intention towards library technology acceptance. Therefore, the hypothesis which states that "e-Skills will independently and significantly influence librarians' intention towards library technology acceptance" was supported. This means that librarians' e-Skills are important determinants of library technology acceptance intention.

H2: There is no significant relationship between PEOU and e-Skills towards actual technology acceptance intention.

Hypothesis two was tested using Pearson Product Moment Correlation Coefficient (PPMCC), as presented in Table 5. The results of hypothesis two indicated a significant relationship between PEOU and e-Skills on one hand ($r = 0.302$, $p = .01$, $p < .05$) and e-Skills and intention for actual technology acceptance on the other ($r = 0.230$, $p = .016$, $p < .05$), suggesting that a strong relationship exists between e-Skills and PEOU as well as librarians' intention towards technology acceptance. The results of the path analysis in Fig. 5 reveal the degree of significance of the hypothesised relationships among the proposed constructs. Thus, the hypothesis seeking to establish if a significant relationship exists between e-Skills and PEOU towards intention for actual technology acceptance among librarians was not supported.

H3: PEOU will not significantly moderate librarians' intention towards actual library technology acceptance where e-Skills are low.

Hypothesis three was tested using regression analysis at 0.05 level of significance and the results are presented in Table 6. Whereas only the moderating influence of PEOU on librarians' intention vis-à-vis library technology acceptance was hypothesised, the joint contribution of the model's factors was also tested. Consequently, analysis showed a coefficient of multiple correlation ($R = 0.630$ and a multiple R^2 of 0.397). This suggests that 39.7% of the variance was accounted for by the two determinant variables when jointly taken together. The significance of the composite contribution was tested at $P < .05$. The findings also indicate that the analysis of variance for the regression produced was an F-ratio of 2.941 ($P < .01$). This implies that the composite contribution of e-Skills and PEOU to library technology
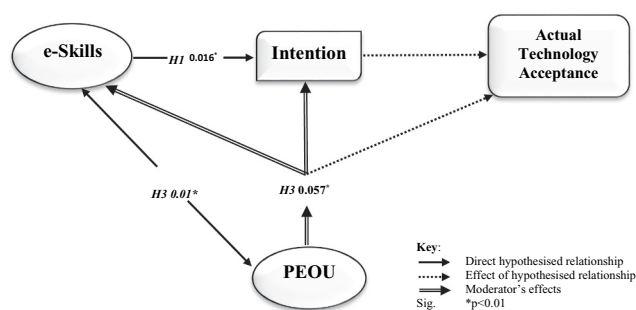

Fig. 5. Results of path analysis.

acceptance was significant and other factors not taken into consideration in this model may be responsible for the remaining difference. From the joint contribution tested, PEOU is a significant moderator of librarians' intention towards library technology acceptance where e-Skills are insufficiently perceived. As a result, hypothesis three was not supported.

Further analysis of the results which showed relative contribution of PEOU and e-Skills is presented in Table 7. To ascertain the proposed model's strongest factor, it was necessary to determine the relative contribution of PEOU and e-Skills. From analysis, the relative contribution of PEOU and e-Skills to actual library technology acceptance intention, are expressed as beta weighs, viz.: e-Skills ($\beta = 0.330$, $P < .05$) and PEOU ($\beta = 0.104$, $P < .05$). It could be observed that although the two variables had significant contribution on librarians' intention to accept library technology however, e-Skills had higher beta contribution which was significant. This implies that e-Skills is a stronger determinant of librarians' actual intention to accept library technology than PEOU.

6. Discussion

To ascertain the influence of the ease of use variable in fostering technology acceptance intention where the required skills for doing so are inadequate is the broad objective that guided the study. As a result, a model was proposed to offer empirical explanation regarding individuals' disposition towards technology acceptance, employing e-Skills and PEOU as factors of intention. A positive correlation of the relationship between e-Skills and intention was found. This suggests that e-Skills levels independently and significantly influence intention to accept technology or otherwise. This finding corroborated a prior study where skills was reported as the basis for individuals' propensity to use a system (Saleh & Drew, 2014). Therefore, making informed decisions regarding cutting-edge technology adoption in organisations, such as the library, by librarians and other stakeholders in the information sector is strongly predicated on e-Skills capacity levels. In other words, the extent to which technology deployment permeates a sector or an economy is a direct reflection of its ICT model and the

Table 5
Correlation matrix showing relationship between e-Skills and PEOU on library technology acceptance intention.

Variables		PEOU	e-Skills	Intention for actual technology acceptance
PEOU	Pearson correlation	1	0.302[a]	0.070
	Sig. (2-tailed)		0.001	0.472
	N	108	108	108
e-Skills	Pearson correlation	0.302[a]	1	0.230[a]
	Sig. (2-tailed)	0.001		0.016
	N	108	108	108
Intention for actual technology acceptance	Pearson correlation	0.070	0.230[a]	1
	Sig. (2-tailed)	0.472	0.016	
	N	108	108	108

[a] Correlation is significant at 0.05 level (2-tailed).

Table 6

Joint contribution of PEOU and e-Skills to librarians' intention towards technology acceptance.

R	R-square	Adjusted R-square	Std. error of the estimate
0.630	0.397	0.135	0.639

ANOVA					
Source of variation	Sum of square	Df	Mean square	F	Sig.
Regression	2.403	2	1.201	2.941	0.057*
Residual	42.893	105	0.409		
Total	45.296	107			

* Significant at $p < .05$.

Table 7

Multiple regression analysis showing the relative contribution of PEOU and e-Skills of librarians' intention towards technology acceptance.

Model		Unstandardised coefficients[a]		Standardised coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	2.575	0.407		6.329	0.000
	e-Skills	0.231	0.100	0.330	2.311	0.023
	PEOU	0.000	0.110	0.104	0.003	0.798

[a] Dependent Variable: Library technology acceptance intention.

extent to which citizens are equipped technologically. This nexus has been described as a catalyst that predicts a nation's technological contribution to the overall economic growth and development outcomes (Fig. 3) (Bowles & Wilson, 2010). This phenomenon underpins the continuous widening digital divide between the developed and developing economies.

Having established the effect of e-Skills on intention to accept technology, it was necessary to test whether or not e-Skills and PEOU are directly and significantly correlated, relative to technology acceptance intention. The essence was to validate the constructs as the model's explanatory base factors. A relationship was found in the affirmative, thereby lending unique and pioneering credence to the proposed model. While the outcome specifically suggests that the two factors are important drivers of librarians' intention to accept library technology, the wider influence can as well be implied. This result corroborated that of Mac Callum, Jeffrey, and Kinshuk (2014) who reported that ease of use and digital skills are major factors influencing lecturers' adoption of educational technologies intention. Given this scenario, individuals' level of relevant skills could determine the extent to which they consider a system free or less of effort. Extent of ease of use and skills had earlier been implied (Wen & Kwon, 2010). It has also been observed that the less effort required to use a system could lead to further acquisition of skills that will in turn make the system's use easier (Olumide, 2016). This may not be unconnected to why Nanthida (2011) observed computer self-efficacy as a factor of PEOU.

In an attempt to determine the relative contribution of e-Skills and PEOU on technology acceptance, the e-Skills factor was reported as the strongest predictor of intention towards actual technology acceptance in the proposed model. Lack of empirical evidence from literature to support this result further strengthens the uniqueness of this study and model. However, relevant ICT competences have been posited as factors; not only for technology implementation but for increasing the users' level of confidence towards using the system (Ghavifekr & Rosdy, 2015). In contrast, greater self-efficacy has been shown as an insignificant correlate of end-user intention to adopt a system (He, Chen, & Kitkuakul, 2018). Obviously, what endears an individual to a given technology varies significantly due to his/her subjective opinion about the system. As a result, the joint effect of e-Skills and PEOU may not

hold sway in all contexts. This argument notwithstanding, the current study has demonstrated that the role of proficiency and system characteristics are vital components of technology acceptance intention.

6.1. Model validation

The proposed model was developed to explain an individuals' intention towards technology acceptance from a developing country perspective. The proposed model draws on the already established direct/indirect effect of PEOU on behavioural intention, hypothesised particularly in TAM (Davis, 1989) and other theoretical underpinnings (e.g. TAM2—Venkatesh & Davis, 2000; TAM3— Venkatesh & Bala, 2008; UTAUT—Venkatesh et al., 2003). While several modifications have been witnessed and are still ongoing with mixed findings emerging, the general understanding of the determinants of individuals' intention to accept or use technology is advancing correspondingly across the board. Whereas different constructs (e.g. performance expectancy, effort expectancy, social influence, facilitating conditions, perceived usefulness, attitude etc.) have all been posited to influence behavioural intention from different standpoints, the role of e-Skills in the determination of same has not been tested. As a result, the proposed model incorporates e-Skills along with PEOU towards the prediction of technology acceptance intention.

Having established e-Skills as a factor of intention towards technology acceptance, PEOU was theorised to moderate same relationship. Significantly, e-Skills independently accounted for 12.6% of the variance in individual intention towards technology acceptance and 39.7% when jointly combined with PEOU. Having subjected the instrument to a reliability test using the Chronbach alpha, the following values were obtained: PEOU 0.77, Intention 0.83 and e-Skills 0.92 respectively. The extended model has particularly helped this study to broaden the scope of PEOU (both as a base construct and as a moderator) relative to intention. It has further lent empirically evidence to e-Skills as the strongest predictor of intention to accept technological innovations in organisations within the precinct of the proposed model. Thus, the model reliably premised intention to accept a complex technological innovation on ease of use where the digital competences required for making such decisions are lacking.

6.2. Limitations of the study and further research directions

Non-inclusion of moderating factors has been generalised to weaken the explanatory and predictive strength of a model (Sun & Zhang, 2006) and increase understanding of same where they provided (Wu & Wang, 2005). Proposing PEOU alone as a moderator of the model is inadequate; further effort should therefore be made to expand the strength of the model through the inclusion of relevant modifiers. Having provided justification for the choice of two geopolitical zones purposively selected for the study, the sample selected specifically from the Southwest region may be both biased and inadequate for making definitive conclusions. To make up for this limitation, regions should be

scientifically generalised to select larger and representative samples to validate the position of the current study. Similarly, pooling together data with a view to generalising outcome may not present the actual results on an institutional basis. To address this drawback, a comparative study should be conducted to differentiate responses and to ascertain how each institution fares relative to the problem studied.

7. Conclusion

This study incorporated variables used to test a model in order to ascertain the effect of PEOU on low e-Skills in relation to system acceptance intention. While the former significantly moderated e-Skills, the direct effect of the latter on intention was adequate to stimulate technology acceptance. Parts of the outcome of this research are reactions to the future research direction suggested to refine and strengthen TAM's major determinants of intention (Venkatesh & Speier, 1999). While other direct determinants (e.g. learning and training) of intention not proposed in the model were recommended (Venkatesh & Davis, 2000), the independent and significant effect of e-Skills in the prediction of intention demonstrated in the current research has uniquely extended technology acceptance discourse beyond earlier reported factors. Consequently, this research has lent concrete empirical support for PEOU as a strong alternative factor for system acceptance where the e-Skills for making such decisions are less competitive. Whereas the outcome of this study can help to reliably explain librarians' intention towards library technology acceptance, whether or not e-Skills level are high, the research implication can be extended beyond the library profession to other environments or sectors that depend on technological infrastructure service provision.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.lisr.2019.100969.

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Roland Izuagbe, is a serials librarian with Librarian II designation in Center for Learning Resources, Covenant University, Ota, Nigeria. Roland holds a Bachelor of Science (BSc) in library and information science from Ambrose Alli University (AAU) Ekpoma, and a master degree in library and information studies (MLIS) from the University of Ibadan, Ibadan. He has published in The *Journal of Academic Librarianship (JACALIB), International Journal of Disaster Risk Reduction (IJDRR), Library Review (Now, Global Knowledge, Memory and Communication), Journal of Cases on Information Technology (JCIT), Journal of Information Science Theory and Practice (JISTaP),* among others. His research interests include information and communication technology (ICT), information systems acceptance/adoption, electronic information resources, disaster management in libraries, social media use in libraries and organisational science.

Nurudeen Ademola Ibrahim, is a librarian at the University of Ibadan. He holds a BSc in physics and a masters degree in library and information studies (MLIS) from the University of Ibadan, Ibadan. He is currently at the postgraduate unit of the Faculty of Law, University of Ibadan. His research interests include application of ICT to library services, information product marketing and services, conservation and preservation of library and information resources and emerging trends in LIS.

Lilofa Osamienfa Ogiamien, is a librarian II at Benson Idahosa University, Benin City. She holds a BSc in Business Management and a masters in library and information science (MLIS) from Benson Idahosa University, Benin City and the University of Ibadan, Ibadan respectively. Lilofa has published in *The Journal of Academic Librarianship (JACALIB), Open Access Library (OALib), Journal of Information and Knowledge Management (JIKM) and Nigerian Journal of Library and Archival Information.*

Olajumoke Rebecca Olawoyin is a doctoral student in the department of information resource management, Babcock University Ilishan-Remo, Ogun State, Nigeria where she obtained her master's degree in information resource management. Olawoyin is presently a Librarian II in the Centre for Learning Resources (Covenant University Library). Her research interests include information behaviour, collection development, preservation of information resources, service quality of information personnel, team building and information policy. She has published in *The Journal of Academic Librarianship (JACALIB), Journal of Cases on Information Technology (JCIT), Library Philosophy and Practice, Jewel Journal of Librarianship.*

Nwanne Mary Nwokeoma is a readers' services librarian in the Centre for Learning Resources, Covenant University. She holds a bachelors degree (BLIS) in library archival and information studies and a master's degree (MIS) in information science both from the University of Ibadan. Currently, her research interests include information literacy for youth, application of technology to library services and users' access and satisfaction. She has published in *Journal of Cases on Information Technology (JCIT), International Journal of Information and Communication Technology (ICT), International Journal of Library Science, Association of College and Research Libraries, Information Technologist,* among others.

Promise Ifeoma Ilo is the Director, Centre for Learning Resources, Covenant University Ota, Nigeria. Dr. Ilo obtained a PhD in library and information science from the University of Nigeria Nsukka (2017). She has published in *International Journal of Disaster Risk Reduction (IJDRR), Disaster Prevention and Management: An International Journal, New Review of Academic Librarianship, Evidence Based Library and Information Practice, Global Review of Library and Information Science,* etc. Her research interests include disaster management in libraries, library users education, information and communication in libraries, and health information awareness among rural dwellers.

Odaro Osayande is a doctoral student in the Department of Information Studies, University of KwaZulu-Natal, Pietermanitzburg, Campus, South Africa. Odaro is also a librarian at the Centre for Learning Resources (University Library), Covenant University, Canaan Land, Ota- Ogun State, Nigeria. He holds a masters degree in library and information studies (MLIS) from the University of Ibadan, Ibadan. He has published in *Chinese Librarianship: An International Electronic Journal, Annals of Library and Information Studies, Library Philosophy and Practice, and The International Journal of Communication and Health.* His research interests include library security, academic libraries, user education and gray literature.