Development and Validation of an Instrument to Investigate Utilisation of Research4Life Databases by Agricultural Scientists in Nigeria

Luke Osamudiamen Obasuyi [1]; O.A. Okwilagwe [2]

John Harris Library, University of Benin, P.M.B. 1154, Benin City, Edo State, Nigeria.[1];

Department of Library, Archival and Information studies University of Ibadan, P.M.B. 1, UI, Ibadan, Nigeria.[2]

lo.obasuyi@uniben.edu[1], okwilagweandrew@yahoo.com[2]

ABSTRACT

This study aimed to develop and validate Utilisation of Research4life Databases Instrument (URDI) to investigate the factors that will improve utilisation of the databases in Nigerian Agricultural Research Institutes (ARIs). It also identified important factors appropriate for inclusion in URDI. The study answered two research questions and tested one hypothesis. The URDI consists of twenty two(22)factors identified in the literature and the researchers. Thirty (30) Faculty of Agriculture lecturers, University of Benin were used for items validation which was further tried out on the scientists in 13 ARIs. Descriptive and inferential statistics were used to analyse data collected. Results revealed that all 22 factors were significant and appropriate for inclusion in URDI. The instrument was found to possess a high reliability of (α= 0.99) based on Cronbach's alpha coefficient and content validity. This study makes available a new instrument for investigating utilisation of Research4Life databases. Based on this result, librarians and researchers in developing countries should use the URDI for investigating utilisation of Research4Life and similar databases.

Keywords: Research4Life databases: Utilisation: Individual factors: Institutional factors: System factors: Research instrument.

INTRODUCTION

Research4Life consists of five full text databases (HINARI - Health Internetwork Access to Research Iniative, AGORA - Access to Global Online Research in Agriculture, OARE - Online Access to Research in the

Environment, ARDI – Access to Research for Development and Innovation, and GOALI- Research for Global Justice).It provides developing countries with access to over 100,400journal and books in over 10,000 registered institutions with millions full-text articles value dover US$ 7,000,000 yearly(Research4Life, 2020). Research4Life was designed for students, faculty, scientists, and medical specialists in the areas of health, agriculture, environment, applied sciences and law. Research4Life (HINARI, AGORA, OARE, ARDI and GOALI) were established in 2002, 2003, 2006, 2009 and 2018 respectively.

Research4Life databases are very useful to scientists in various institutions. This impact of these databases is not felt among researchers in Nigeria (ITOCA, 2014).According to Lwoga, Chimwaza, Aronson, and Vent(2007), Research4Life contents should be used to their fullest extent. ITOCA (2014) observed that utilisation of Research4Life by scientists in Nigeria is poor due to several factors. Zabukovsek and Bobek (2013) classified factors influencing utilisation of Information Technology (IT) as individual, institutional and system factors. This classification was adopted in this study. Individual factors include demographics, personality and cognitive styles influencing individuals' perception to use IT(Harrison & Rainer, 1992). Institutional factors are infrastructure and services provided by institutions to support the use of Information System (IS)(Buabeng-Andoh, 2012).System factors include information content, design features and quality of an IS that can help users develop favorable perception to use the system.

OBJECTIVE OF THE STUDY

The main objective of this study is to develop and validate an instrument for investigating factors influencing usage of Research4Life in Nigeria. Specifically, the study attempted:

1. To identify constructs for inclusion in Utilisation of Research4Life Databases Instrument (URDI) for use in NARIs.
2. Determine the level of utilisation of Research4Life databases in ARIs
3. Establish a relationship between individual, institutional and system factors, and utilisation of Research4Life databases by agricultural scientists in Nigeria.

RESEARCH QUESTION

The following research questions guided the study:

1. What is the extent of utilisation of Research4Life databases by ARIs scientists in Nigeria.
2. Is there any relationship between individual, institutional, and system factors, and utilisation of Research4Life Databases by ARIs scientists in Nigeria.

HYPOTHESIS

One null hypothesis was tested in this study at 0.05 level of significance.

1. Individual, institutional and system factors will not jointly influence utilisation of Research4Life Databases in ARIs in Nigeria.

IDENTIFICATION OF FACTORS

Twentytwo factors were identified, discussed and questions created based on literature and observations by the researcher in this study. A minimum of four (4) questions were asked on each of the factors. Venkatesh and Davis (1996) confirmed the adequacy of using 4 constructs in measuring an independent variable like perceived usefulness.

INTENTION TO USE

For Research4Life databases to be effectively used, agricultural scientists must form positive intention to use them. Behavioural intention influenced actual and perceived utilisation of various IT in many studies (Davis, 1986 and Venkatesh, Morris, Davis and Davis,2003).

- Assuming I have access, I will use Research4life databases
- Should I have access, I hope to use Research4Life databases
- I have positive intent to use Research4Life databases for research
- I intend to increase usage of Research4Life databases in the future.

TASK AT HAND

When a scientist develops intention to use an IS, the intention is put into action by the task he or she performs. Antonelli, Almeida, Colauto and Silva (2014)revealed task as a factor affecting use of ICT in different countries like US and China. Therefore, task performed can influence utilisation of Research4Life databases.

- I need Research4Life databases for my research work
- Using Research4Life databases help accomplish my task
- My daily task of research requires I use Research4Life databases
- If I don't have task to perform, I won't use Research4Life databases

COMPUTER ANXIETY

Computer anxiety is a major factor that could influence system success in IS research. According to Alenezi, Abdul Karim and Veloo (2010) computer anxiety can significantly influence students' intention to use e-learningin Saudi Arabia butEl-Gayar, Moran and Hawkes (2011) found a negative correlation of anxiety and intention to use IT.

- Computers do not scare me when using Research4Lifedatabases
- Computers make me feel uneasy to use Research4Lifedatabases
- I feel comfortable working with Research4Lifedatabases
- Computers make me nervous using Research4Lifedatabases
- Computers make me comfortable using Research4Lifedatabases

PRIOR IT EXPERIENCE

Utilisation of Research4Life databases may depend on users' prior IT experience. It is an important factor when developing or applying models in technology use. Lee and Park (2013) posited that prior IT experience positively affects perceived usefulness and utilisation of IT.

- Prior ICT experience can enhance use of Research4Lifedatabases
- Prior ICT experience makes Research4Life databaseseasy to use
- My experience with ICT helps me to use Research4Lifedatabases
- Prior ICT experience is irrelevant in using Research4Life databases

ICT SEARCHING SKILL

Specialised skill are necessary to search and retrieve full-text articles in an IT.Ajuwon (2006) and Muinde and Gorman (2009) reported that researchers in agricultural and health institutions in Nigeria and Kenyalacked specialised searching skills to use HINARI.

- I have good ICT searching skills to use Research4Lifedatabases
- I can conduct searches independently in Research4Lifedatabases

- I can search Research4Life databasesusing different keywords
- I have adequate ICT skills to search Research4Lifedatabases

COMPUTER/INTERNET SELF-EFFICACY

Utilisation of Research4Life databases may depend on users' computer and Internet self-efficacies. Fadare, Babatunde, Akomolafe and Lawal (2011)found that Computer and Internet self-efficacies influenced intention to use e-learning in Nigeria.

- Computer/Internet self-efficacy enhances my use of Research4Life databases
- I am skillful downloading articles in Research4Lifedatabases
- I can comfortably search for articles in Research4Lifedatabases
- I can use computer/Internet to access Research4Lifedatabases

DATABASE ACCESSIBILITY

Database accessibility is the degree of ease with which users can access an IT.Wang and Wu (2011) reported use of ICTs that are most accessible while ITOCA (2013) and Uzuegbu and McAlbert (2012) reported improved accessibility and use of Reaserch4Life and TEEAL databases in Africa and Nigeria.

- Accessibility can enhance utilisation of Research4Lifedatabases
- I use Research4Life databases because the databases are accessible
- Research4Life databases are always accessible to me
- My institution provides access to Research4Lifedatabases

AVAILABILITY OF PASSWORD

Passwords are required to use Research4Life databases. Salaam (2007)reported that researchers don't use AGORA because they have no password to access it. Uzuegbu and McAlbert (2012) found that availability of passwords influenced utilization ofResearch4Life databases by students and faculty members in two Nigerian Universities.

- Passwords to use Research4Life databases are always available to me
- My Librarian provides the password to use Research4Lifedatabases
- Research4Life databases passwords are complex to memorise and use
- Password is useful to download articles in Research4Lifedatabases

FAST INTERNET ACCESS

Research4Life databases require fast Internet access to use them. When Internet is fast, downloading of articles becomes easy. Ogunjobi and Fagbami (2012)revealed that agricultural scientists listed Internet connectivity and small bandwidth as factors influencing accessibility and usage of Research4life.

- Fast Internet access enhances the use of Research4Life databases
- High Internet bandwidth enhances articles download from Research4Life databases.
- Fast Internet access helps in retrieving articles in Research4Life databases without stress
- There is fast Internet to use Research4Life databases in my institution

ADEQUATE TRAINING

Adequate training could influenceResearch4Life databases usage. ITOCA (2013) reported that over 5000 scientist have been trained to use Research4Life databases in Africa.Moronge and Okiko (2012) also recommended adequate training for ARIs scientists in Nigeria.

- Training enhances Research4Life databases utilisation

- Training received improves use of Research4Life databases
- I need more specialized training to use Research4Life databases
- Adequate training received improves Research4Life databases use

ADEQUATE ICT INFRASTRUCTURE

Availability of ICT facilities can influence the use of Research4Life databases. Lwoga et al, (2007) and Muinde and Gorman (2009) identified inadequate infrastructure as one threshold to use Research4Life databases. On the contrary, Miller and Khera (2010) reported non significance of infrastructure to use the TEEAL in Kenya and Peru.

- Computers enhances use of Research4Life databases
- There is constant electricity to use Research4Life databases
- Internet is always available to use Research4Life databases
- Printers are always available to print articles fromResearch4Life databases

HELP AND TECHNICAL SUPPORT SERVICES

These services may influence utilisation of Research4Life databases. Abbad, Morris and De Nahlik (2009) revealed facilitating conditions and technical support services as factors influencing utilisation of a technology.

- Available help service enhances use of Research4Life databases
- Availability of help desk encourages searching articles in Research4Life databases
- Staff are available when technical problems arise while using Research4Life databases
- Frequent technical problems discourage the use of Research4Life databases

AVAILABILITY OF FULL-TEXT ARTICLES

Research4Life databases is to provide access to full-text contents. Shabi, Shabi, Akewukereke and Udofia (2011) concluded that availability of full-text article is a major determinant of utilising PubMed, HINARI and other medical database in Nigeria. Therefore, availability of full-text materials could influence utilisation of the databases.

- Full-text are always availability in Research4Life databases
- Majority of Research4Life databases full-text articles are downloadable
- Available full-text in Research4Life databases are not restricted to users
- Availability of full text articles is an advantage usingResearch4Life databases

QUALITY OF DATABASE CONTENT

Quality of content may influence utilisation of the database. Paj and Huang (2011) reported that information service and system qualities impacted on behavioral intention and actual use of technology. Alshare and Alkhateeb (2008) observed that perceived content quality did not affect students' usage of the Internet.

- Quality of Research4Life databases contents are reliable and satisfactory
- Research4Life databases contents are relevant and accurate
- Research4Life databases do not compromise content quality
- The articles in Research4Life databases are of high quality

CURRENCY OF DATABASE CONTENT

The currency of information in Research4Life databases can encourage utilisation of Research4Life databases. Bringula and Basa (2011) revealed that currency of information predicts web portal usability among faculty of the University of East-Manila, Philippines. ITOCA (2013) reported high demand for current materials to use Research4Lifedatabases.

- I use Research4Life databases because the articles are current
- Very recent articles are found in Research4Life databases
- Current research findings are always available inResearch4Life databases
- Currency is the hallmark of Research4Life databases

FREE DOWNLOAD OF JOURNAL ARTICLES

Research4Life is aimed to provide access to free information resources. Parker (2009) submitted that not all materials in Research4Life databases are freely downloaded and many NARIs scientists are not ready to pay to download articles. Ajuwon (2006) found cost as a barrier to utilisation of HINARI databases.

- Articles in Research4Life databases are free to download
- Because the articles are free, I use Research4Life databases
- If asked to pay, I will not download articles from Research4Life databases
- I have downloaded free articles in Research4Life databases

AVAILABILITY OF LOCAL CONTENT

Availability of local content is very important in every database. Lowga et al, (2007) opined that researchers at Sokoine University of Agriculture and Institute for Medical Research in Tanzania indicated the need for more local content into TEEAL and Research4Life databases.

- Local journals are available in Research4Life databases
- I need locally published journals in Research4Life databases
- Local journals are rare to find in Research4Life databases
- Local journals in Research4Life databases are useful for my research

DATABASE DESIGN FEATURES

The design, complexity, navigation features are critical factors in IT. When the design and navigation of any device is complex, it becomes difficult to use. Lee and Park (2013) found screen design and portal site quality to influence intention to use Smartphone in Korea.

- The design features make Research4Life databases easy to navigate
- The Research4Life databases are very attractive to use
- Research4Life databases designs are simple and of high quality
- The interface to access article in Research4Life databases is easy to follow
- Research4Life databases designs are clear and understandable

QUICK ACCESS TO ARTICLES

Quick access to journal articles could be a major determinant to use databases. When information is difficult to access, users tend to abandon it even though it may be very useful. Salaam (2007) and Shabi, et al (2011) posit that researchers tend to ignore the use of AGORA, PubMed and HINARI because it takes much time to access their contents.

- It is quick to access articles in Research4Life databases.
- It is less technical accessing articles in Research4Life databases
- Accessing articles in Research4Life databases are fast and quick
- Links to articles in Research4Life databases are easy to use

COMPATIBILITY OF DATABASES

Compatibility is to the functions scientists. If the databases are compatible with the scientists' tasks, they become relevant and used. Zabukovsek and Bobek (2013) confirmed that compatibility has significant positive effect on perceived usefulness of IS.

- Research4Life databases are compatible with my job
- Using Research4Life databases fit into my work style
- I find Research4Life databases compatible with my research work
- Research4Life databases are relevant to my daily work

PRECEIVED EASE OF USE

Research4Life databases are expected to be easy to use. A technology that is difficult to use could be avoided even though it is useful. Miller and Khera (2010) found that perceived ease of use significantly influenced IT usage.

- Research4Life databases are clear, understandable and easy to use
- Research4Life databases are user friendly and flexible to navigate
- I find Research4Life databaseseasy in accessing journal articles
- Research4Life databases require serious mental efforts to use
- Overall, I find Research4life databases easy to use

PRECEIVED USEFULNESS

Perceived usefulness could influence utilisation of Research4Life databases. When an ICT is useful, the tendency to use it is high. Davis (1989) found perceived usefulness as a key determinant of acceptance and usage of a technology.

- Using Research4Life databases improve my research performance
- Quality of my research is enhanced using Research4Life databases
- Using Research4Life databases increased my research productivity
- Using Research4Life enhanced my work effectiveness
- I find Research4Life useful and advantageous in my job

UTILISATION

Utilisation of Research4Life databases can be measured in terms of frequency of use; time spent in using the databases, intensity of use and number of downloads from the databases. Adeleke, Asiru, Oweghoro, Jomoh and Ndana (2015) reported that time and early exposure influence current and continuous use of computer and Internet in Nigeria.

- I use Research4life databases regularly for my research
- I use Research4life databases on a weekly basis
- I spent at least 1 hour anytime I use Research4Life databases
- I use most features in Research4life databases regularly
- I have downloaded articles from Research4life database
- My intensity of using Research4life databases is low

METHODOLOGY

Based on the questions created, an instrument was designed to investigate each of the 22variables. The instrument as 105 questions arranged in sections A - E. Section A contains 7 items on demographics of respondents. Section B elicited information on individual factors with 25 questions. Section C collected information on institutional factors with 24 questions. Section D obtained information on system factors with 43 questions. Section E has 6 items on

utilisation of the databases. The instrument was validated and pre-tested using 30 agricultural lecturers in University of Benin, Benin City. The reliability was assessed using the Cronbach Coefficient Alpha method. The questionnaire adopted the Likert scale (strongly agree = 4 to strongly disagree =1). Each question must score a mean of 2.5 to be significant. A total of 744 copies of the questionnaire were administered and 497 (66.80%) usable responses were retrieved. The response rate is considered adequate as Malaney (2002) reported that acceptable response rate is 60% while Nulty (2008) reported a 56% response rate for paper based survey.

Reliability value obtained for the instrument was (α= 0.99) while the values obtained for the various sections are: Section B (α= 0.98); Section C (α= 0.98); Section D (α= 0.98); and Section E (α= 0.96). Reliability coefficients of the 22 factors are as follows: intension to use (α= 0.74), task at hand (α= 0.91), computer anxiety (α= 0.87), prior ICT experience (α=0.84), ICT searching skills (α= 0.85), computer/Internet self-efficacy (α=0.92); database accessibility (α=0.89), availability of password (α= 0.88), fast Internet access (α= 0.81), adequate training (α= 0.89), adequate ICT infrastructure (α= 0.92), help/technical support (α= 0.87); availability of full-text articles (α= 0.90), quality of content (α= 0.90), currency of content (α= 0.91), free download of articles (α= 0.88), local journal content (α= 0.88), design features (α= 0.92), quick access to articles (α= 0.91), compatibility (α= 0.95), perceived usefulness (α= 0.97), perceived ease of use (α= 0.97). These results are adequate as they are above 0.7 (Nunnally, 1978).

RESULTS AND DISCUSSION

Research Question 1: What is the level of utilisation of Research4Life databases by scientists in ARIs in Nigeria.

Result of data collected on utilization of Research4Life databases presented in Table 1 revealed a mean of 2.13 and a standard deviation of 1.14. Furthermore, it showed that 60.4% of the scientists do not use Research4Life databases while only 39.6% utilise the databases. Therefore, the level of utilisation of Research4Life databases by ARIs in Nigeria is low.

Table 1: Level of utilisation of Research4Life databases by ARIs scientists in Nigeria

Items	SD	D	A	SA	Mean	S.D
I have downloaded articles from Research4Life databases	218 43.9%	53 10.7%	122 24.5%	104 20.9	2.23	1.21
I use Research4Life databases regularly for my research	198 39.8%	84 17.0%	134 27.0%	81 16.2%	2.20	1.13
My intensity of using Research4Life databases is low	210 42.3%	72 14.15%	124 25.0%	91 18.3%	2.20	1.17
I spent at least 1 hour anytime I use Research4Life	225 45.3%	61 12.4%	119 24.0%	91 18.3%	2.15	1.18
I use most features in Research4Life databases regularly	225 45.3%	102 20.5%	107 21.5%	63 12.7%	2.02	1.08
I use Research4Life databases on a weekly basis	233 46.9%	122 24.5%	77 15.5%	65 13.1%	1.96	1.07
Total	**218 43.9%**	**82 16.5%**	**114 22.9%**	**83 16.7%**	**2.13**	**1.14**

Research Question 2: What are the individual, institutional and system factors influencing utilisation of Research4Life Databases in NARIs.

Development and Validation of an Instrument to Investigate Utilisation of Research4Life Databases by Agricultural Scientists in Nigeria

To ascertain the individual factors influencing utilisation of the database, six questions were correlated against utilisation of Research4Life Databases. Results in Table 2 showed that there were significant relationships between individual factors - intention to use, (β = .519**, P(.000) <.05), task at hand, (β = .567**, P(.000) <.05), computer anxiety, (β = .651**, P(.000) <.05), prior ICT experience, (β = .613**, P(.000) <.05), ICT searching skills, (β = .629**, P(.000) <.05), computer/Internet self-efficacy, (β =.644**, P(.000) <.05) and utilisation of Research4Life databases. There was a strong correlation between the individual factors and utilisation of Research4Life databases as their correlation values range from 0.519 to 0.651. This find ingimplies that individual factors were significant and thus can be used in creating URDI.

Table 2: Correlation matrix showing the significant relationships between Individual factors and Utilisation of Research4Life databases by NARIs scientists in Nigeria

	Utilisation of Research4Life	Intention to use	Task at hand	Computer Anxiety	Prior ICT Experience	ICT Searching Skills	Computer/ Internet Self Efficacy	Mean	S.D
Utilisation of Research4Life	1							34.16	19.07
Intention to use	.519** .000	1						28.95	14.85
Task at hand	.567** .000	.805** .000	1					26.45	12.84
Computer Anxiety	.651** .000	.659** .000	.772** .000	1				30.59	15.28
Prior ICT Experience	.613** .000	.726** .000	.757** .000	.829** .000	1			25.81	12.89
ICT Searching Skills	.629** .000	.688* .000	.718** .000	.782** .000	.864** .000	1		25.93	13.58
Computer/ Internet Self Efficacy	.644** .000	.719** .000	.735** .000	.767** .000	.497** .000	.878** .000	1	27.11	14.28

Assessing institutional factors influencing utilisation of Research4Life, six questions were correlated with utilisation of Research4Life Databases. Results in Table 3 revealed that there were significant relationships between institutional factors - accessibility, (β = .718**, P (.000) <.05), availability of password, (β = .684**, P (.000) <.05), fast Internet access, (β = .684**, P (.000) <.05), adequate training, (β = .652**, P (.000) <.05), adequate ICT

infrastructure, (β = .643**, P (.000) <.05), help/technical support services, (β = .663**, P (.000) <.05) and utilisation of Research4life databases. The finding also showed a strong correlation between the institutional factors and utilisation of the databases as their correlation value range from 0.643 to 0.718. The finding implied that institutional factors were significant and appropriate for inclusion in URDI.

Table 3: Correlation matrix showing the significant relationship between institutional factors and utilisation of Research4Life databases by NARIs scientists in Nigeria

	Utilisation of Research4life Databases	Accessibility	Availability of Password	Fast Internet Access	Adequate Training	Adequate ICT Infrastructure	Help/Technical Support Services	Mean	S.D
Utilisation of Research4life Databases	1							34.16	19.07
Accessibility	.718** .000	1						26.54	13.09
Availability of Password	.684** .000	.841** .000	1					22.68	12.03
Fast Internet Access	.684** .000	.843** .00	.764** .000	1				26.19	13.59
Adequate Training	.652** .000	.817** .000	.721** .000	.917** .000	1			26.36	13.96
Adequate ICT Infrastructure	.643** .000	.739** .000	.688** .000	.797** .000	.848** .000	1		23.23	12.61
Help/Technical Support Services	.663** .000	.840** .000	.731** .000	.848** .000	.875** .000	.877** .000	1	24.91	13.33

To investigate systems factors ten questions were correlated against utilisation of Research4Life databases. Result in Table 4 revealed that there were significant relationships between system factors - availability of full-text articles, (β = .78**, P (.000) <.05), quality of content, (β = .717**, P (.000) <.05), currency of content, (β = .729**, P (.000) <.05), free download of articles, (β = .704**, P (.000) <.05), local journal content, (β = .753**, P (.000) <.05), database design features, (β = .750**, P (.000) <.05), quick access to journal articles, (β = .730**, P (.000) <.05),

databases compatibility, (β = .703**, P (.000) <.05), perceived usefulness, (β = .714**, P (.000) <.05), perceived ease of use, (β = .734**, P (.000) <.05) and utilisation of Research4Life databases. The finding also showed a strong correlation between the system factors and utilisation of Research4Life databases as their correlation values range from 0.704 to 0.753. Therefore, all ten system factors were appropriate for inclusion in URDI.

Table 4: Correlation matrix showing the significant relationships between system factors and utilisation of Research4Life databases in NARIs

	1	2	3	4	5	6	7	8	9	10	11	Mean	S.D
1	1											34.16	19.07
2	.748** .000	1										24.91	13.56
3	.717** .000	.869** .000	1									25.60	14.65
4	.729** .000	.864** .000	.920** .000	1								25.17	14.54
5	.704** .000	.819** .000	.834** .000	.870** .000	1							24.68	12.68
6	.753** .000	.870** .000	.847** .000	.868** .000	.846** .000	1						24.62	13.49
7	.750** .000	.877** .000	.872** .000	.870** .000	.822** .000	.890** .000	1					31.08	17.49
8	.730** .000	.879** .000	.851** .000	.850** .000	.819** .000	.857** .000	.916** .000	1				24.31	13.85
9	.703** .000	.847** .000	.837** .000	.831** .000	.793** .000	.828** .000	.834** .000	.869** .000	1			25.91	14.82
10	.714** .000	.848** .000	.842** .000	.826** .000	.780** .000	.831** .000	.837** .000	.857** .000	.938** .000	1		33.65	19.00
11	.734** .000	.828** .000	.810** .000	.812** .000	.785** .000	.802** .000	.814** .000	.838** .000	.899** .000	.922** .000	1	31.03	18.70

Key: 1. Utilisation of Research4Life databases; 2. Availability of full-text Articles; 3. Quality of content; 4. Currency of content; 5. Free download of articles; 6. Local journal content; 7. Database design features; 8. Quick access to journal articles; 9. Databases compatibility; 10. Perceived usefulness; and 11.Perceived ease of use.

Hypothesis 1: Individual, institutional and system factors will not jointly influence utilisation of Research4Life databases by scientists in NARIs.

Testing the overall influence of individual, institutional and system factors on utilisation of Research4Life databases, multiple regression analysis was performed on the mean scores of individual, institutional and system factors, and utilisation of Research4Life databases. Results in Table 5 indicated that the joint influence of individual, institutional and system factors on utilisation of the databases were significant. The null hypothesis is therefore rejected.The result also shows a coefficient of multiple correlation (R = .817 and a multiple R^2 of .668. This means that 66.8% of the variance was accounted for by the predictor variables when taken together. The significance of the composite contribution was tested at P < .05. The table also shows that the analysis of variance (ANOVA) for the regression yielded a F-ratio of 43.279 (significant at 0.05 level). Findingimplies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance.This result confirms earlier findings that the 22individual, institutional and system factors appropriate for inclusion in URDI.

Table 5: Correlation of individual, institutional and system factors and utilisation of Research4Life databases by NARIs scientists in Nigeria

R	R Square			Adjusted R Square	Std. Error of the Estimate
.817	.668			.652	11.2475
A N O V A					
Model	Sum of Squares	DF	Mean Square	F	Sig.	Remark
Regression	120449.6	22	5474.984	43.279	.000	Sig.
Residual	59963.486	474	126.505			
Total	180413.1	496				

DISCUSSION OF FINDINGS

The finding in this study revealed that utilisation of Research4life databases in ARIs was low. This finding corroborates ITOCA (2014) report that utilisation of Research4life databases byARIs scientists in Nigeria is low. Based on this finding attempt to investigate factors that will influenced increased utilisation of these databases becomes imperative. Factors identified in this study are individual, institutional and system factors. These factors could influence usage of the databases individually and collectively. Furthermore, there was a positive significant combined influence of individual, institutional and system factors on utilisation of Research4Life databases by ARIs scientists in Nigeria.Osubor and Chiemeke (2015) obtained strong and positive relationship of individual, institutional, technological factors and stakeholders' intention to use e-learning in 10 federal universities in Nigeria. Miller and Khera (2010) also found that individual, institutional and system factors are major drivers of the TEEAL by researchers in Kenya and Peru. It therefore becomes necessary to use these factors to develop an instrument that will be used to enhance utilisation of Research4life databases in Nigeria.

The main contribution of this study was the successfully development of a valid and reliable instrument to investigate factors influencing utilisation of Research4Life databases by scientists in Nigeria. Twenty two(22) factors were validated and appropriate for inclusion in URDI. For Research4Life to be adequately utilised in Nigeria, all the significant factors should be considered holistically as they jointly influenced utilisation of Research4Life databases. It implies that individual, institutional and system factors must be jointly considered increating URDI to investigate utilisation of Research4Life databases as presented in Appendix I.

CONCLUSION

This study investigated and identified factors appropriate for the creation of an instrument, the Utilisation of Research4Life Databases Instrument (URDI). From the finding obtained in this study, Utilisation of Research4Life Databases Instrument (URDI) is a valid and reliable instrument that can be used in determining factors influencing utilisation of Research4Life databases in Nigeria. The instrument can also be used to assess the level of utilisation of the databases and impact of usage of the databases on users for research purposes.

REFERNECES

[1] Abbad, M.M., Morris, D. &De Nahlik, C. (2009).Looking under the bonnet: factors affecting students' adoption of e-learning systems in Jordan. *The International Review of Research in Open and Distance Learning,* 10(2),1-25.

[2] Adeleke, I.T, Asiru, M.A., Oweghoro, B.M., Jimoh, A.B. & Ndana, A.M. (2015). Computer and Internet use among tertiary healthcare providers and trainees in a Nigerian public hospital. *American Journal of Health Research. Special Issue: Health Information technology in Developing nations; Challenges and prospects Health Information Technology,* 3(1), 1-10.

[3] Ajuwon, G.A. (2006). Use of the Internet for health information by physicians for patient care in a teaching hospital in Ibadan, Nigeria.*Biomedical Digital Library,* 12(3), 12.
Doi: 10.1186/1742-5581-3-12

[4] Alenezi, A.R., Abdul Karim, A.M. &Veloo, A. (2010). An empirical investigation into the role of enjoyment, computer anxiety, computer self-efficacy and Internet experience in influencing the students' intention to use e-learning: a case study from Saudi Arabian governmental universities. *TOJET: The Turkish Online Journal of Educational Technology,* 9(4), 22-34.

[5] Alshare, K. A. & Alkhateeb, F. B. (2008).Predicting students' usage of Internet in two emerging economies using an extended technology acceptance model (TAM).*Academy of Educational leadership Journal,* 12.2: Retrieved June 8, 2011, from http://www.freepatentsonline.com/article/Academy-Leadership-Journal/190795

[6] Antonelli, R.A., Almeida, L.B., Colauto, R.D. & Silva, W.V. (2014).Perception of accounting professionals about the influence of information technology in their individual work process.*African Journal of Business Management,* 8(5), 146-157.

[7] Bringula, R.P. &Basa, S. (2011). Factors affecting faculty web portal usability. *Educational Technology and Society,* 14(4), 253-265.

[8] Buabeng-Andoh, C. (2012). Factors infliuencing teachers' adoption and integration of information. *InternationalJournal of Education and Development using Information and Communication Technology,*8(1), 136-155.

[9] Davis, F. D. (1986). A technology acceptance model for empirical testing new end-user information systems: theory and results. Doctoral Dissertation, MIT Sloan School of Management, Cambridge, MA.

[10]   (1989).Perceived usefulness, perceived ease of use, and user acceptance of information technology.*MIS Quarterly* 13(3), 318-34.

[11] El-Gayar, O., Moran, M. & Hawkes, M. (2011).Students' acceptance of tablets PCs and implications for educational institutions. *Educational Technology and Society,* 14(2), 58-70.

[12] Fadare, O.G., Babatunde, O.G., Akomolafe, D.T. &Lawal, O.O. (2011).Behavioural intention for mobile learning on 3G mobile Internet technology in South-West part of Nigeria.*World Journal of Engineering and Pure and Applied Sciences,* 1(2), 19-28

[13] Harrison, A.W. & Rainer, R.K. (1992).The influence of individual differences on skill in end-user-computing. *Journal of Management Information Science,* 9(1), 93-111.

[14] Information Training and Outreach Centre for Africa (2013). Report on post workshop surveys for the ITOCA ToT workshops held in seven Sub-Saharan countries. South Africa: ITOCA.

[15]   (2014).Research4Life and TEEAL training manual. 15 –17 July, 2014. University of Benin, Benin City: ITOCA, 2014.

[16] Lee, J. & Park, M. (2013). Factors affecting the Smartphone users to use the mobile portal services: focusing on Korean mobile portals. *InformationSystem E-Bus Manage,* 11, 235-252.

[17] Lwoga, E.T., Chimwaza, G., Aronson, B. & Vent, O. (2007). Building science information fluency in African Universities: how libraries and researchers are benefiting from improved access to science scholarship. *World Library and Information Congress: 73rd IFLA General Conference and Council, 19-23 August,* Durban, South Africa. Retrieved May 2011, from http://www.ifla.org/iv/ifla73/index.htm

[18] Malaney, G.D. (2002). You still need high response rates with web-based surveys. *Student Affairs Online,* 3.1.Retrieved March 26, 2016, from http://www.studentaffairs.com/ejournal/winter_2002/rates.html.

[19] Miller, J. &Khera, O. (2010). Digital library adoption and the Technology Acceptance Mode: a cross-country analysis. *The Electronic Journal on Information Systems in Developing Countries,* 40(6), 1-19.

[20] Moronge, A. & Okiko, L. (2012). The perception of banks employees towards cost of adoption, risk of innovation, and staff training influence on the adoption of information and communication technology in the Rwandan commercial banks. *Journal of Internet Banking and Commerce,* 17(2), 1-15.

[21] Muinde, F.N.N. & Gorman, G.E. (2009).Barriers to open access to scientific information in Kenya, with particular reference to agricultural information. *World Library and Information Congress: 75th IFLA General Conference and Council, 23 - 27 August, 2009, Milan, Italy*.

[22] Nulty, D.D. (2008). The adequacy of response rates to online and paper surveys: what can be done? *Assessment & Evaluation in Higher Education,* 33(3), 301-314.

[23] Nunnally,J.C. (1978). *Psychometric theory*. New York: McGraw Hills.

[24] Ogunjobi, T.E. &Fagbami, O.O. (2012).Use of the Internet by researchers in agricultural research instituties in Ibadan, Oyo State. *International Journal of Library and Information Science,* 4(4), 52-56.

[25] Osubor, V.O. & Chiemeke, S.C. 2015.The impacts of information culture on e-learning innovation adoption in learning institutions in Nigeria. *African Journal of Computing & ICT* 8.1:17-26.

[26] Paj, F. &Huang, K. (2011).Applying the Technology Acceptance Model to the introduction of healthcare information systems.*Technological Forecasting and Social Change,* 78(4: 650-660.

[27] Parker, K. (2009).Further reflection of open access. *Bulletin of World Health Organisation,* 87, 732.Doi: 10.2471/BLT.09.070946

[28] Research4Life. (2020). About Research4Life.Retrieved June.24, 2020, from http://www. research4Life.org/about/

[29] Salaam, M.O. (2007).Options for access to journals, print, CD-ROM, On-line in a Nigerian agricultural University library.*Samaru Journal of Information Studies,* 7(2), 24-27.

[30] Shabi, I.N., Shabi, O.M., Akewukereke, M.A. &Udofia, E.P. (2011).Physician utilisation of Internet medical database at the tertiary health institutions in Osun State, Nigeria. *Health Information Library Journal,* 28(4), 313-320.

[31] Uzuegbu, C.P. &McAlbert, F.U. (2012).Digital librarians and the challenges of open access to knowledge; the Michael Okpara University of Agriculture (MOUAU) library experience. *Library Philosophy and Practice 2012*. Retrieved March 27, 2014, from http://unllib.unl.edu.LPP

[32] Venkatesh, V. &Davis, F.D. (1996). A model of the antecedents of perceived ease of use: development and test. *Decision Science,* 27(3), 451-481.

[33] Morris, M.G., Davis, G.B. & Davis, F.D. (2003). User acceptance of information technology: towards a unified view. *Management Information SystemsQuarterly,* 27(3), 425-478.

[34] Wang, P. & Wu, L. 2011.*Research use of the Internet ICT by Faculty: an interdisciplinary and cross cultural comparison*. Retrieved May 27, 2011,   from: www.cci.utk.edu/files/u14/wang pdf.

[35] Zabukovsek, S.S. &Bobek, S. (2013). TAM-based external factors related to ERP solutions acceptance in organisations. *International Journal of Information System and Project Management,*1(4), 25-38.