Kasetsart Journal of Social Sciences 42 (2021) 854–861

Kasetsart Journal of Social Sciences

journal homepage: http://kjss.kasetsart.org

Exploring the Facets of e-learning acceptance in developing country

Oluyinka Solomon

College of Business Administration & Accountancy (CBAA), Baliuag University, Baliuag, Bulacan 3006, Philippines

Article Info

Article history:
Received 3 August 2018
Revised 27 January 2019
Accepted 29 January 2019
Available online 3 December 2021

Keywords:
acceptance,
development,
e-learning,
facets,
Nigeria

Abstract

The introduction of e-learning and implementation has provided a strong operational framework for tertiary-organizations to extend system of education over the internet, providing students the ability to accept modern learning from any location. Unfortunately, there has been little research into the elements that influence learners' well-known e-learning adaptation in developing nations. This study evaluated the goals of e-learning using a well-known model TAM. A structural modeling (Sem-Pls) was utilized to investigate eight hundred and sixty-nine views of students in four higher education institutions that allowed the learning method in Nigeria. The SmarPls program version 2 explored to test hypotheses on sources of power, technological resources, perceptual usefulness, and ease towards behavior intentions of students toward the specified technology expecting ease of use on behavioral intents to integrate e-learning into the algorithm of partial least squares, expecting ease of use to adopt the behavioral intentions of the system have failed. At the .003 *p*-value, all regressed supported and the *R*-squared suggested about 75 percent, which is a good fit model in this analysis. In other countries, factors that are found supported in the Nigerian context may not always be due to certain cultural differences and the readiness level technology. Therefore, it is suggested to repeat this study to improve the generalizability of the findings accomplished.

© 2021 Kasetsart University.

Introduction

E-learning relates towards a situation wherein one has influence in which students learned easily at work and at home, given resources are available. E-learning raises awareness and this improves learning' trust. Ehlers (2009) considers e-learning to be a brilliant alternative to traditional education. E-learning can be much more cost-effective than learning in the classroom mode nationally, e-learning does not require students to travel to place of learning, or engage in learning materials (Bliuc, Ellis, Goodyear, & Piggott, 2010; Guri-Rosenblit, 2009; Park, 2009; Zawacki-Richter, Bäcker, & Vogt, 2009)

Among the top 10 nations accessing the internet, Nigeria, as the center of this study, clearly ranked eighth (Internet Live Stats, 2016), showing that Nigerians are encouraged to use the internet (Ayo, Adewoye, & Oni, 2011; Oni & Ayo, 2010; Solomon, Shamsuddin, Wahab, Ajagbe, & Enegbuma, 2013; Wilson & Lawan, 2015). Despite the National Universities Commission support to accept e-learning, Nigerian students continue to neglect the relative advantages of technology as a way of learning

E-mail address: solomon467@gmail.com.

https://doi.org/10.34044/j.kjss.2021.42.4.20
2542-3151/© 2021 Kasetsart University.

(Zainab, Bhatti, Pangil, & Battour, 2015). Variables adversely affecting adoption of e-learning among undergraduates were explored. TAM was employed to analyze factors that impeded Nigerian students' from adopting the mentioned modern learning method.

Literature Review

The model of TAM has proven that it is possible to base technology acceptance on perpetual usefulness and the perception of being easy to use it Davis (1989) defined usefulness as degree to which one can use a device to increase their work engagement and ease of use, since anyone feels it may not be difficult to be using a system. Attitude is described as the degree from which a person has an optimism/negative perspective of use technology. Behavioral intention measures the frequency of the intent of the person to conduct a particular task (Davis, 1989).

A few previous studies concentrated on measuring the reliability of the model and the concepts that Davis, Bagozzi, and Warshaw (1989) had developed. In social sciences studies research, TAM has been widely validated (Hsia, Chang, & Tseng, 2014; Shittu, Fakomogbon, Gambari, & Owodunni, 2016; Solomon, Shamsuddin, & Wahab, 2013). The acceptance of technology in the field of e-learning (Hsia et al., 2014; Shittu et al., 2016) was focused on confidence (Mohammadi, 2015; Oluyinka, Shamsuddin, & Wahab, 2015). Integrated TAM towards structural modelling technology acceptance (Legris, Ingham, & Collerette, 2003; Lin, Wang, & Hwang, 2010). With the personal intent to embrace technology, The model was employed by Song and Hill (2007) to propose an extreme conceptual model to explain self-directed learning in virtual communities. In order to acquire resources that could be used to assess consumer knowledge of online companies Loiacono, Watson, and Goodhue (2007) merged TAM and TRA. Tarhini, Hone, and Liu (2014) endorsed the robustness of TAM in the research that explores individual differences in e-learning. In addition, in assessing behavioral intent to accept technology in learning environments, Persico, Manca, and Pozzi (2014), Oshinaike and Adekunmisi (2012) used TAM; Shittu et al. (2016) also endorsed the research of Oshinaike and Adekunmisi.

A study investigating the intention of learners in East Africa to accept and use suitable mobile-e-learning for higher education, Mtebe and Raisamo (2014) revealed that facilitating condition has an effect on the intention to adopt specific innovation. Comparably, Urhiewhu and Emojorho (2015) in Nigeria reported power supply had a greater impact on any acceptance of innovation using TAM. Likewise, Obasike, Umeji, and Kurbu (2010) asserted that the factors hindering the acceptance of online libraries in Nigeria are power supply, ease of use and accessibility to technical means. However, in future research analysis indicated a revalidation of the significant factors.

So many studies projected accurate strength of TAM functionality in support of related ideas in addition to technology variables and considered to be essential at the core of other theories of acceptance technology (Hsia et al., 2014; Solomon et al., 2015). These report hypothesized, power supply would have an impact on e-learning on usefulness, technical resources and ease of use.

Methodology

This proposed cross-over quantitative survey and using SmartPLS to anticipate Nigerian students' main impact of power supply on attempts to accept e-learning. This quantitative study methodology was considered acceptable in order to mitigate over confident or biased analyisis and argument (Creswell & Creswell, 2017) considering four universities approved for the e-learning system in Nigeria (Creswell & Creswell, 2017; Fetters, Curry, & Creswell, 2013). A sample size of 100 or more was deemed sufficient for variance-based structural equation modeling (Hair, Sarstedt, Ringle, & Mena, 2012).

Participants

In four accredited tertiary education institutions in Nigeria, 869 valid e-learning answers were obtained (Maiduguri, Danfodiyo, Uyo, and Lagos Open University). Since the National Institutions Commission authorized the planned e-learning institutions in Nigeria, this research considered the learners' location and advised that existing universities be utilized to explain the study's scope (National Universities Commission, 2015).

Data Collection

The surveys were constructed using five-point scales based on earlier research (Agboola, Azizul, Rasidi, & Said, 2018; Solomon et al., 2015). With varmax rotation was conducted. The examination revealed acceptable relationships among the constructs. The Kaiser-Meyer indicated a value of 0.83 and a .000 positive value was obtained (Bartlett, 1954; Kaiser, 1974). On the main part,

the extraction method was used and the rotation converged into 7 iterations. All factors were loaded at the anticipated position, with an AVE of at least 0.5, reliability measures supported at least 0.70 (Hair et al., 2012), substantial *p*-values < .05 used to explain bootstrapped and partial minimum regression square (R^2) representing model variance explanations (Goha, Mohamad, & Amran, 2014; Hair et al., 2012). SmartPLS 3.0 edition tested the measurement model in this analysis. Analysis and details were presented in the next section below. Figure 1 provides a hypothetical model for this study analysis.

An argument in supporting a proposed hypothetical framework is briefly aforementioned in TAM related studies section. Thus, presented are the hypothetical statements provided are based on proven Figure 1;

H1: Power supply substantially impacts perceived usefulness.

H2: Availability of electric power may have a substantial impacts on technical resources.

H3: The power supply may have an indication on the technology's ease of use.

H4: The usefulness perception of e-learning may be a predictor of its adoption.

H5: Technological means have an effect on the intent to accept specific technology.

H6: Acceptance of the technology may be influenced by the concept of ease of use.

H7: Concept of ease of use may influence an e-learning system's useful perception.

Results

Data Processing Report

Approximately, a 79 per cent of the surveys were administered out of a total of 1250 questionnaires distributed to reported participants. A total number of 15 incomplete questionnaires, 31 outliers, and 29 missing data incidents were registered, while 44 e-learners were discarded to avoid prejudice to the fit outcome of this analysis, as the objectives were based on investigative factors that hindered the intent to accept e-learning.

Demographics

For this analysis a total of eight hundred sixty-nine answers were considered available. Table 1: demographic details showed that 61 percent. The age range between 18-35 constituted 50 percent of the respondents and 55 percent represented full time students. Respondents with Bachelor degree certificate in this study signified a round-off of 57 percent; diploma candidates designate almost 23 percent while masters and doctoral candidates indicate 13 percent and 7 percent respectively of the total eight hundred and sixty-nine respondents.

Demographics in Table 1 showed that 76 percent of the respondents of this study had little access to their device due to lack of technical resources while 24 percent had a connection to a sufficient power source. Roughly 92.0 percent of those surveyed were conscious that e-learning was provided by their universities for students.

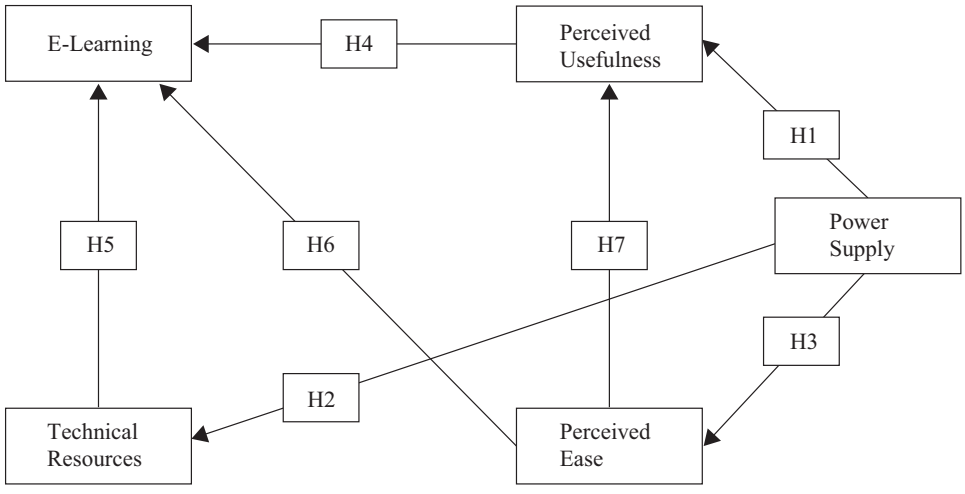


Figure 1 Hypothetical analysis regression based on the basis of TAM

Table 1 Respondents-demographics

Factors	Categorization	Frequency	%
Gender	Male	532	61.2
	Female	346	39.8
Age	18–35	435	50.1
	36–45	326	37.5
	46–50 above	108	12.4
Students 'Status	Full-time	478	55.0
	Part-time	391	45.0
Certificate	Ed/ND	198	22.8
	Bachelor Degree (Bsc/HND)	499	57.4
	Master Degree	113	13.0
	Doctoral Degree	059	06.8
Constant power supply?	Yes	211	24.2
	No	658	75.7
Awareness on E-Learning?	Yes	796	91.7
	No	073	08.3

Factor Analysis Reports

The exploratory factor (EF) analysis can lead to useful model specific algorithmic technique with confirmatory factor analysis prior to cross-validation. Related to techniques are confirmatory factor analyzes (CFA) and exploratory factor analysis (EFA), the data is explicitly analyzed and details of the variety of parameters necessary to reflect the data are provided. Variables measured for the EFA were linked to the latent construct, while, in CFA, researchers define the multitude of indicators expected for the results. CFA may be described as an approach towards validating or rejecting an estimate (Gerbing & Hamilton, 1996; Hair et al., 2012). As an exploratory study, thus, introduces instruments validity adopting exploratory factor analysis approach. Nevertheless, overall conclusions about the instruments used are justified in Table 2.

The sample found adequate at value (.83). Normality tests are performed as described above to demonstrate the statistical model data-set. The normal distribution set is based on skewness and kurtosis reports (Hair et al., 2012; Hanghon & Rinthaisong, 2018; Sheridan, Coakes, & Peta, 2006). The *Z* value for skewness and kurtosis should not be less than 1.96, and the p-value for the Shapiro-Wilk estimate should be more than.05. Nonetheless, data was never supposed to be entirely natural, 80 percent of the skewed z-values are above ±1.96, which was sufficient for further study (Agboola, Azizul, Rasidi, & Said, 2018; Hair, 2012; Sheridan et al., 2006). Further, 31 outliers were observed and deleted.

Table 2 Mayer results

KMO and Bartlett'sTest		Value
Measure of Sampling Adequacy		.830
Sphericity	Chi-Square value	19727.877
	Df value	2775
	Sig/supported	.000

Components Analysis

Factor analyses (FA) considered was considered as one of the most highly relevant in structural equation modeling researches (Agboola & Rasidi, 2018; Ayodele, Endozo, & Ogbari, 2018; Ayodele, Oga, Bundot, & Ogbari, 2016; Hanghon & Rinthaisong, 2018; Kline, 2015; Sheridan et al., 2006). The factor loading of the components was evaluated. The specificity of such variables was identified as the components and the system of rotation was considered for this analysis with a loading above 0.6 value. Out of a total number of 23 items, the total of 3 items failed to meet or load the required FA < 0.6 requirements. FA < 0.6 originates from notion ease to use, e-learning techy and technological means. In addition, the derived mean variations and composite reliability for each measurement model are shown in table 3.

Table 3 shows the average variation and reliability of each suggested measuring construct, with extracted

variation exceeding 0.5 and measurement reliability exceeding 0.6, indicating the constructs' convergent confirmability.

Model Structuring

Five standards constructs, models namely perceived usefulness, technological means, power source, notion related easy to use, and 75 percent of the variance, accounted for the adoption and operation of e-learning (Hsia et al., 2014). Table 4 tracks the path coefficients with related measures (standardized deviation, sample means, *t*-report & *p*-values) after bootstrapping.

In addition, both Bootstrapping and PLS Algorithm reported perceived relative of useful desire to accept indicated insignificant e-learning suggesting that the route must be excluded in the model structuring. So, the final computed values of the structured model are shown in Figure 2, showing the *R*-squares and the model direction coefficients achieved.

Table 3 Measurement structural quality criterion

Elements	Loaded items	Extracted-average variance	Composite Reliability
E-learning	4items	.73	.81
Perceived usefulness of e-learning	5items	.78	.84
Perceived ease use of technology	4items	.66	.87
Technical resources (means)	4items	.65	.89
Power supply to use technology	5items	.25	.84

Table 4 Path coefficients

Paths Constructs			Original Samples	Samples' Mean	Standardized Deviation	T-reports	*p*
Perceived-Ease	→	E-Learning	0.336	0.344	0.112	3.000	.003
Perceived Ease	→	Perceived-Usefulness	0.456	0.468	0.105	4.334	.000
Perceived Usefulness	→	E-Learning	0.067	0.066	0.089	0.753	.452
Power Supply	→	Perceived Ease	0.697	0.704	0.061	11.406	.000
Power Supply	→	Perceived Usefulness	0.357	0.348	0.100	3.573	.000
Power Supply	→	Technical Resources	0.649	0.655	0.069	9.371	.000
Technical Resources	→	E-Learning	0.532	0.523	0.099	5.384	.000

Note: $p < .05$.

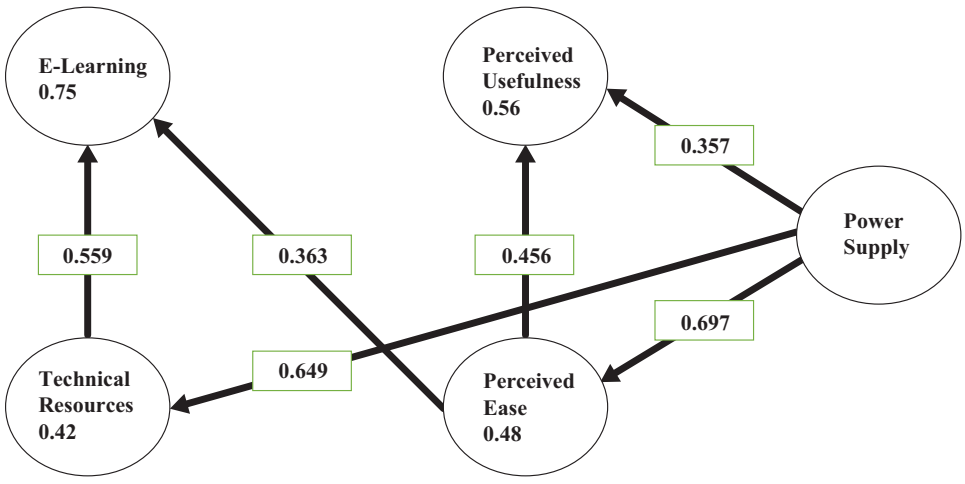


Figure 2 Achieved Structured Model

The final standardized e-learning shows that the power source positioned on ease of using (H3) displays the highest substantial variation (β = 0.69, R-square indicated 48 percent of factors explained), followed by (H2) on technological means (β = 0.64, R-square equal to 42 per cent of factors examined) and on the pathway (H1) of usefulness perception indicated (β = 0.35, R-square of 56 per cent of analyzed dimension). The dimension (H4) implied failed with β=0.067 for perceived usefulness in the attempt to embrace e-learning. Path (H5) is a technological means with intention of accepting significant e-learning β = 0.55, and (H6) eases use of perception with the intention of accepting significant e-learning of β = 0.36, and concluded dimension (H7) eases use of perception regression to perceive useful in order embrace noteworthy e-learning with (β = 0.45, R-square equal to 56 per cent of analyzed), and all suggested pathways supported the indication of $p < .05$ (Hair et al., 2012). Conclusively, PLS algorithm showed a deviation of 75 percent for the entire organized model.

The actual standardized model indicated that Nigeria's e-learning strategy would be effective if the power supply problem can be addressed correctly. Moreover, analysis offers inputs and limitations and potential areas of study for research.

Discussion

This study investigated the e-learning model, utilizing technology acceptance model, a well-established innovation acceptance theory. As reported, the study agreed with robustness of TAM and this was found to be consistent with Persico et al. (2014) adapting the TAM to evaluate potential for e-learning acceptance, and Tarhini et al. (2014) also established individual variations in relation to the behavior of e-Learning users in developing nations. Clearly, the findings have shown that the intention of students to consider e-learning may be affected by technological means and the inability to perceive ease to use. The current research also points out that availability of energy sources will give the device a better understanding of ease of use. According to the report's predictions, technological means might be employed appropriately to greatly impact e-learning embracement among the report's respondents. It is presumed that the view of usefulness in the setting of e-learning in Nigeria might be strengthened by a reliable supply of energy.

The actual findings highlight importance as well as the power of TAM to elucidate the student's attempt at e-learning at approved higher colleges and universities in the country. Power sources, accessibility of technological means, usability and ease of use of the system which statistically explained they have effect on acceptability on the specified technology. Specifically, power source can be a better tool to facilitate e-learning, ease to use awareness, technical means and measurement of power source. Seminars and workshops can also be provided in order to keep track of technical means, to think about the simplicity of use and relative usefulness of innovation. The achievement and reliability of TAM towards the behavioral intentions of students to participate in e-learning in Nigeria have been established in the context of this important study.

Large number of 61 percent of male respondents could be study vulnerabilities, which may distort the end result in terms of the impact on the gender's intent to act. This analysis also took only the reactions of university students into account, and could be affect generality. This study was based on the assessment of Nigeria's apprehension of full/part-time e-learning students from four national higher education and e-learning organizations. As a result, the modelling can be checked and validated as a different concept, demonstrating technological factors, awareness, and power source principles. Other limits include the study's location as well as the use public higher institutions. The attempt at massive data collection from Nigeria's northern areas has been hampered due to their opposition to modern academic ideologies. Aside from the difficulties of stating that contemporary schooling is unnecessary, there are political and theological concerns to consider. Respondents responded cautiously to survey questions out of fear of humiliation; investigators have been discouraged by the extensive data gathering in the northern areas. In addition, this concluding study suggests that nonpublic university students could be used as target respondents in future studies.

Conclusion and Recommendation

This research confirmed the e-learning mode of study of four universities in the country under investigation, and also noted that western education is not completely recognized in some northern areas of Nigeria. It is noted that Nigerian students preferred part-time learning over e-learning. This study also recorded electricity supplies as an arbitrator for e-learning in the subject country studied, Nigeria.

It will also make things easier if the Nigerian Universities Commission sanctioned e-learning universities in other parts of Nigeria. Providentially, the massive investment made by the Nigerian federal government in technology

adoption could be clarified. This study will suggest future studies in the analysis could be repeated in various areas of Nigeria and interpreted in different contexts as a mediating factor in technology adoption, such as small and medium sized businesses, the banking industry and other institutions. This study be replicated and supported for developing countries, especially African countries, in order to achieve a strong generalization of the acceptance of technology in West and Central Africa.

Conflict of Interest

The authors declare conflicts of interest. One of the co-author of this paper removed due to agreement of no interest to support the quality and re-submission.

References

Agboola, O. P., & Rasidi, M. H. B. (2018). Residents' socio-cultural experiences and effects on neighbourhood public space in Nigeria. *International Journal of Sustainable Society*, *10*(2), 123–139.

Agboola, O. P., Azizul, M. F., Rasidi, M. H., & Said, I. (2018). The cultural sustainability of traditional market place in Africa: A new research agenda. *Journal of Rural Studies*, *62*, 87–106.

Ayo, C. K., Adewoye, J. O., & Oni, A. A. (2011). Business-to-consumer e-commerce in Nigeria: Prospects and challenges. *African Journal of Business Management*, *5*(13), 5109–5117.

Ayodele, S. O., Oga, O. E., Bundot, Y. G., & Ogbari, M. E. (2016, October). Role of power supply towards e-learning acceptance: VBSEM-AMOS. In *2016 6th International Conference on Information Communication and Management (ICICM)* (pp. 151–155). IEEE.

Ayodele, S., Endozo, A., & Ogbari, M. E. (2018, October). A study on factors hindering online learning acceptance in developing countries. In *Proceedings of the 10th International Conference on Education Technology and Computers* (pp. 254–258).

Bartlett, M. S. (1954). A note on the multiplying factors for various χ^2 approximations. *Journal of the Royal Statistical Society*. Series B (Methodological), 296–298.

Bliuc, A. M., Ellis, R., Goodyear, P., & Piggott, L. (2010). Learning through face-to-face and online discussions: Associations between students' conceptions, approaches and academic performance in political science. *British Journal of Educational Technology*, *41*(3), 512–524. doi: 10.1111/j.1467-8535.2009.00966.x

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.

Davis F. D. (1989). Perceived usefulness, perceived ease of use, and acceptance of information technology. *MIS Quarterly*, *13*(3), 391–340. doi: 10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982–1003. doi: 10.1287/mnsc.35.8.982

Ehlers, U. D. (2009). Web 2.0–e-learning 2.0–quality 2.0? Quality for new learning cultures. *Quality Assurance in Education*, *17*(3), 296–314.

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health services research*, *48*(6pt2), 2134–2156. doi: 10.1111/1475-6773.12117

Gerbing, D. W., & Hamilton, J. G. (1996). Viability of exploratory factor analysis as a precursor to confirmatory factor analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, *3*(1), 62–72. doi: 10.1080/10705519609540030

Goha, C. F., Mohamad, B. A., & Amran, R. (2014). The use of partial least squares path modelling in causal inference for archival financial accounting research. *Jurnal Teknologi*, *68*(3), 57–62. doi: 10.11113/jt.v68.2930

Guri-Rosenblit, S. (2009). Distance education in the digital age: Common misconceptions and challenging tasks. *Journal of Distance Education*, *23*(2), 105–122.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433.

Hanghon, P., & Rinthaisong, I. (2018). Confirmatory factor analysis of collaboration model in non-formal higher education management in southern Thailand. *Kasetsart Journal of Social Sciences*, *39*(3), 472–477. doi: 0.1016/j.kjss.2018.06.012

Hsia, J. W., Chang, C. C., & Tseng, A. H. (2014). Effects of individuals' locus of control and computer self-efficacy on their e-learning acceptance in high-tech companies. *Behaviour & Information Technology*, *33*(1), 51–64. doi: 10.1080/0144929X.2012.702284

Internet Live Stats. (2016*). Internet users by country*. Retrieved from http://www.internetlivestats.com/

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36. doi: 10.1007/BF02291575

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & management*, *40*(3), 191–204. doi: 10.1016/S0378-7206(01)00143-4

Lin, W. B., Wang, M. K., & Hwang, K. P. (2010). The combined model of influencing on-line consumer behavior. *Expert Systems with Applications*, *37*(4), 3236–3247. doi: 10.1016/j.eswa.2009.09.056

Loiacono, E. T., Watson, R. T., & Goodhue, D. L. (2007). Web-qual: An instrument for consumer evaluation of web sites. *International Journal of Electronic Commerce*, *11*(3), 51–87. Retrieved from https://www.jstor.org/stable/27751221

Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behavior*, *45*, 359–374. doi: 10.1016/j.chb.2014.07.044

Mtebe, J. S., & Raisamo, R. (2014). Investigating students' behavioural intention to adopt and use mobile learning in higher education in East Africa. *International Journal of Education and Development using Information and Communication Technology*, *10*(3), 4–20.

National Universities Commission. (2015). *List of Nigerian universities and years founded.* Retreived from https://9jatoday.com/full-list-of-universities-in-nigeria/

Obasike, T, I., Umeji, C. E., & Kurbu, D. (2010). Electronic resources: Affording Nigerian academic libraries a competitive edge. *Madonna Journal of Research in Library and Information Science 1*(1), 35–47.

Oluyinka, S., Shamsuddin, A., & Wahab, E. (2015). Regions of trust to technological know-how structured for banking customers. *Asian Journal of Applied Sciences*, *3*(4), 679–691.

Oni, A. A., & Ayo, C. K. (2010). An empirical investigation of the level of users' acceptance of e-banking in Nigeria. *Journal of Internet Banking and Commerce*, *15*(1), 1–13.

Oshinaike, A. B., & Adekunmisi, S. R. (2012). Use of multimedia for teaching in Nigerian university system: A case study of university of Ibadan. *Library Philosophy and Practice (e-journal)*, 682.

Park, S. Y. (2009). An on to use e-learning. *Educational technology & Society*, *12*(3), 150–162.

Persico, D., Manca, S., & Pozzi, F. (2014). Adapting the Technology Acceptance Model to evaluate the innovative potential of e-learning systems. *Computers in Human Behavior*, *30*, 614–622. doi: 10.1016/j.chb.2013.07.045

Sheridan, J., Coakes, L. S., & Peta, D. (2006). *SPSS 13.0 for windows. Analysis without anguish*. National Library of Australia.

Shittu, A. T., Fakomogbon, M. A., Gambari, A. I., & Owodunni, A. S. (2016). Acceptance of information technology for teaching in Nigerian vocational and technical education a confirmatory factor analysis. *Malaysian Online Journal of Educational Management*, *4*(1), 1–16. Retreived from http://repository.futminna.edu.ng:8080/jspui/handle/123456789/9514

Solomon, O., Shamsuddin, A., & Wahab, E. (2013). Identifying factors that determine intention to use electronic banking: A conceptual study. *Middle-East Journal of Scientific Research*, *18*(7), 1010–1022.

Solomon, O., Shamsuddin, A., & Wahab, E. (2015). Regions of trust to technological know-how structured for banking customers. *Asian Journal of Applied Sciences*, *3*(4), 679–691.

Solomon, O., Shamsuddin, A., Wahab, E., Ajagbe, M. A., & Enegbuma, W. I. (2013). A study of electronic commerce adoption factors in Nigeria. *International Journal of Information Systems and Change Management*, *6*(4), 293–315.

Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, *6*(1), 27–42. Retreived from http://www.ncolr.org/jiol/issues/pdf/6.1.3.pdf

Tarhini, A., Hone, K., & Liu, X. (2014). The effects of individual differences on e-learning users' behaviour in developing countries: A structural equation model. *Computers in Human Behavior*, *41*, 153–163. doi: 10.1016/j.chb.2014.09.020

Urhiewhu, L. O., & Emojorho, D. (2015). Conceptual and adoption of Technology Acceptance Model in digital information resources usage by undergraduates: Implication to higher institutions education in Delta and Edo of Nigeria. *Journal of Education and Practice*, *6*(21), 82–92.

Wilson, J., & Lawan, A. K. (2015). The internet and the Nigerian woman: A case of female undergraduates. *KOME: An International Journal of Pure Communication Inquiry*, *3*(1), 47–65.

Zainab, B., Bhatti, M. A., Pangil, F. B., & Battour, M. M. (2015). E-training adoption in the Nigerian civil service. *European Journal of Training and Development*, *39*(6), 538–564.

Zawacki-Richter, O., Bäcker, E. M., & Vogt, S. (2009). Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *The International Review of Research in Open and Distributed Learning*, *10*(6), 21–50. doi: 10.19173/irrodl.v10i6.741