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The prospects of adopting e-learning in the Nigerian education system: a case study of Covenant University

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Abstract. The conventional method of education has shrunken adequate information access and acquisition capability. However, this as further widened the educational knowledge gap. This research study examined the prospect of adopting e-learning in the Nigerian educational system. The Unified Theory of acceptance and use of technology (UTAUT) model was utilized in order to properly investigate the adoption of e-learning for an improved educational system in Nigeria. A descriptive survey design was employed, and a quantitative research method was used for data gathering and analysis. A total of 574 responses was obtained from the research study respondents. The study analysis result showed that the Average variance extracted (AVE) for actual use, behavioural intention, experience, effort expectancy, facilitating condition, performance expectancy and social influence was 0.738, 0.790, 0.670, 0.804, 0.749, 0.861, 0.514 respectively, and the discriminant value for actual use, behavioural intention, experience, effort expectancy, facilitating condition, performance expectancy and social influence were 0.859, 0.889, 0.897, 0.819, 0.865, 0.928 and 0.717 respectively. This analysis result suggests that the research model convergent and discriminant validity were acceptable. Furthermore, approximately 59.7% of the variance of behavioural intention (BI) to adopt eLearning was illustrated by the PE (Performance Expectancy), EE (Effort Expectancy), and SI (Social Influence); Where $R^2 = 0.597$. Furthermore, about 77.5% of the variance of actual adoption (AC) of eLearning was explained by behavioural intention (BI) to adopt eLearning Where $R^2 = 0.775$. The result suggests that Performance expectancy (PE), Effort Expectancy (EE) and Social Influence (SI) have a positive effect of the behavioural intention to adopt e-Learning and the behavioral intention would lead to the actual adoption of eLearning. Additionally, Facilitating condition (FC) and Experience (E) have a positive effect on the actual adoption of e-Learning. The result of the research study suggests that the adoption of e-Learning in Nigeria educational system is influenced by the ease of use, performance gain, public sway, adequate support, and proficiency.

1. Introduction

The growth of every society depends mainly on the amount of attention it gives to the acquisition and delivery of quality and practical knowledge [1]. Information and communication technology (ICT) has revolutionized the manner in which skill and knowledge are acquired and delivered to individuals from the traditional face to face method of learning to a blended and distance method of learning; partially this is as a result of a heightened number of individuals seeking to acquire skill and knowledge from various educational institutions.



In the 2018/2019 academic session, roughly 1.6 million individuals applied for admission into different Nigerian university institution. Nigeria having just 43 federal Universities, 47 State University, and 75 private universities cannot accommodate a large amount of prospective student that applied to different Nigerian University institution[2], [3]. Modernized methods to knowledge dissemination and acquisition such as E-learning platforms thus become a necessity, the urgency to remodel the delivery of educational system has become paramount, and this is due to the development and progress in information and communication technology (ICT) in the world [4]. Electronic learning (e-Learning) is the acquisition of knowledge, attitude, and skills through the utilization of Information and Communication Technology

The utilization of an e-Learning method has become a growing trend in recent time[1]; the e-Learning method is gaining an unprecedented amount of recognition today. The growing popularity of e-learning system is influenced by different determinant which includes and not limited to flexibility and ease of access, reduced cost of training, availability, and convenience[5].

e-learning involves the utilization of all forms of electronic media and technologies in order to aid the educational process[1]. e-learning approach as received a severe amount of research attention as an innovative means that influence the educational system in the world which enhances; partially replacing the familiar face to face technique of knowledge and skill acquisition and delivery[1], [6], [7]. e-learning is a state of the art means of learning towards the acquisition and delivery of chic and interactive learning ecosystem where individuals could be adopted into a learner-centered environment and progress[8].

e-learning implies the utilization of information and communication technology, electronic and network-enabled technology means of acquisition and delivery of knowledge and skill through the techniques and applications which includes and not limited to WBT (Web-Based Training), Digital Collaboration, CBT(Computer Based Test) and VLE(Virtual Learning Environment). In e-learning means of education, educational materials and content are disseminated via the internet, or a CD-ROMs which contains audio, video or text, these materials can be easily accessed and utilized by both the learner and instructor. The Construction and maintenance of all e-learning tools and application used for knowledge transfer and acquisition is the sole responsibility of the educational institution[1], [9].

Natural interaction and accessibility with e-Learning environment and resources are one of the primary significance of the e-learning approach to knowledge transfer and acquisition[10]. [11] Conducted a research study where students were engaged in a group-based learning scenario through the utilization of e-learning approach; from the investigation, they realized that e-Learning approach has a significant impact on the students' performance and adequate learning environment.

[12] Studied the utilization of e-learning platform to enhance the traditional and familiar face to face knowledge delivery, the result of his investigation showed an increased level of student satisfaction and improved teacher-learner communication. The uprise of the e-Learning approach provides efficient and straightforward access means to quality and effective education[1].

However, ICT (Information and communication technology) effectiveness is dependent on the means and purpose of utilization[1]. The key to successful delivery of effective and efficient result is Motivation, therefore in the utilization of e-learning in different setting and environment would have its different advantage, disadvantage, and limitation[10], [13], [14].

Presently, the issue about the prospect of e-Learning adaption in the Nigerian educational system is of vital importance; this is because the adaption, implementation, and utilization in the Nigerian educational system would enhance and improve the Nigerian educational system and the overall confidence system. However, several Nigeria institutions still utilize the traditional face to face method of knowledge dissemination and transfer rather than the utilization of the e-Learning approach to transfer and acquisition of knowledge and skill; hence, there is a need for the investigation and examination of the prospect of e-Learning adaption in Nigeria. This research study seeks to investigate the prospects of adopting e-Learning in the educational system of Nigeria. The objective of this study is to identify factors that influence the adoption and use of e-learning system among tertiary institution students in Nigeria.

2. Literature Review

2.1 E-Learning System

e-Learning systems are a special kind of software system, developed to provide a platform for accessible teaching and learning, including online access to learning materials and online support for learning and teaching [15]. e-learning delivers interactive information and learning opportunities to the learners at a time, place and anywhere appropriate and convenient to them.

While the conventional method compels the teachers to deliver his lessons in a physically-constrained environment, e-learning technology emancipates teachers and students from the restrictions of space, time and physical facilities while advancing and encouraging independent study aided by advances in modern computer technology [16]. Despite the inherent advantages of e-Learning over the conventional/traditional way of learning, most institutions in Nigeria are yet to embrace this. According to [17], there are some factors that affect the adoption of e-Learning in Nigerian education system they are: low awareness level, low computer literacy level, vendor issues, the high cost of implementation and students' resistance. [18],[19] also highlighted an almost forgotten disadvantage of this system which is that students such as those with visual impairments have been left behind due to the lack of an accessible content delivery system to ameliorate their disabilities, this issue was addressed in their book.

Several research studies have been done using the UTAUT (Unified theory of acceptance and use of technology) to examine and investigate the link between different constructs, behavioral intention and the actual user behavior of information technology (IT) [20]–[23]. The UTAUT framework is a widely endorsed and adopted technology acceptance theory which is used by several different researchers and studies to illustrate the adoption and utilization prospect of particular information technology by individuals or a group of people [21]–[23].

This research study advances the methodological discussions as it is one of the few research studies that utilize the UTAUT (Unified theory of acceptance and use of technology) to investigate and to examine the prospect of e-Learning adoption in Nigerian. Different recommendation about how the e-Learning approach further enhances and improve Nigeria educational systems as the UTAUT framework would be used to identify the different factors that would influence the adoption and use of e-Learning in Nigeria.

The practical implementation and utilization of e-Learning in the workplace are as a result of the acceptance and endorsement of e-Learning by the members of the workplace. For further explanation of why members of a workplace would accept e-Learning, [24] examined and investigated the motivational factors that influence e-Learning. Furthermore, a study that investigated the users' acceptance towards technology showed that the UTAUT certainty could vary when used in the diverse educational/cultural environment [25].

In the research study carried out by [24], it was established that due to the relevance of UTAUT in the diverse educational/cultural environment, there is a need for further examination and investigation. In order to examine and address the deficiencies, [24] examined two different motivator categories which include the intrinsic and the extrinsic. The study enumerated the influence of the motivators have on the employees' intention to the adoption and utilization of e-Learning in the workplace. Additionally, the study was carried out in the South Korean context in order to get empirical evidence that supports the utilization of UTAUT in a different educational/cultural environment. From the result of the research study, it was established that intrinsic motivators such as attitude, anxiety and effort expectancy had a strong influence on the intention of employees' to adopt and utilize e-Learning than the extrinsic motivators such as social influence, performance expectancy and facilitating condition. Furthermore, the effects of the intrinsic motivators arbitrated the effects of the extrinsic motivators. [26] Conducted a research study that examined and investigated the motivators of e-Learning and the educational portal acceptance in developing countries. The study sought to empirically validate a modified UTAUT framework through the addition of a new e-Learning motivation construct in the context of South America. The findings of the study suggested that eLearning motivation construct and social influence positively influence the behavioral intention while the facilitating condition had little or no effect on the use of the eLearning portal. Furthermore, behavior positively influenced e-Learning motivation.

A study conducted by [27] explored and developed a UTAUT model of how and why general practitioners (GPs) adopt and utilize Decision support systems (DSS). The study gained an insight into the rationale why general practitioners do not utilize clinical Decision support systems linked the knowledge of why general practitioners utilize clinical Decision support systems will allow the development and advancement of strategies that facilitate more widespread adoption and utilization ensuing improvement spanning across many different areas [27], [28].

An intense interview was conducted with 37 general practitioners that comprise of individuals with a different educational background, gender, and experience. The study came up with a framework which indicated four main factors that influence the adoption and utilization of Decision support systems (DSS). [29] utilized the technology acceptance framework to examine the adoption and utilization of biometric technology in developing societies from the aspect of the institutions. The research study suggested that job position could be an influential factor that affects the perception of characteristics of innovation in the resolution to adopt biometric technology. From the study, it was also gathered that unified organizational analyses signify that communication, size, ease of use and organizational types have significant effects on the biometric technology adoption decision [29]. Investigated the readiness of public servants on the adoption of government in Nigeria thereby utilizing the UTAUT framework.

2.2 Research Model and Hypotheses

Disciplines such as psychology and Information Systems frequently utilize the UTAUT model in order to examine the user acceptance and intention to adopt the technology. The user acceptance of different information system technologies have been explained, predicted and enhanced by different researcher and studies over the years; the research studies were hinged on the modified UTAUT theoretical model [21], [31], [32].

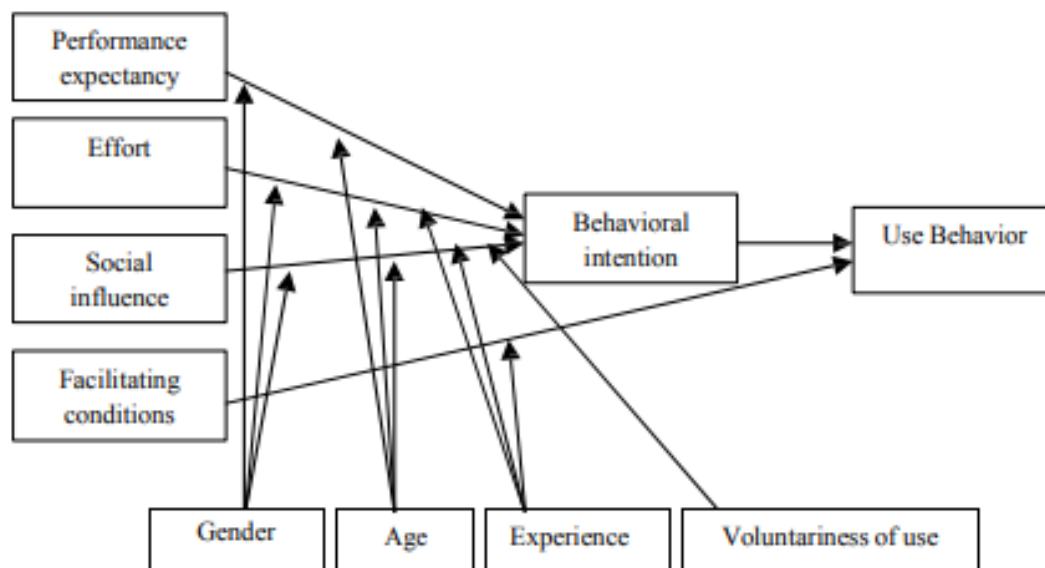


Figure 1.0: The UTAUT Model [31]

One of the most robust, comprehensive, and up-to-date information systems theory is the UTAUT model. In the research study conducted by [32], seven constructs were significant determinants of user intention or usage in several individuals. In the research study, construct such as performance expectancy, effort expectancy, social influence and facilitating condition will perform the role of the independent variable as well as direct determinants of the user acceptance and the user behavior. Further, behavioral intention and use behavior of the student to eLearning were included in the model; where the behavioral intention performed the role of the mediating variable and the user behavior of the student to eLearning is the dependent variable[21], [32].

The UTAUT theory is a theory which is used in the information system field; this theory is a combination of eight different technology acceptance theories for the sole purpose of having a universal technology acceptance theory. The theories for which the UTAUT model is based on are The Motivational model, Theory of reasoned action (TRA), The Technology Acceptance Model (TAM), The Theory of Planned Behaviour (TPB), The model of personal computer utilization, The Innovation Diffusion Theory and The Social Cognitive Theory, The combined TAM and TPB [21], [32], [33]. The UTAUT model at its foundation utilizes the behavioral intention as the predictor of the actual user behavior of the technology. The predictors of the behavioral intention are based on the elements of the eight technology adoption models [21], [32]. Furthermore, the UTAUT contains moderating variables such as

age, gender, education and voluntariness of use. The predictor constructs in the UTAUT model are as follow:

Performance Expectancy: The degree to which persons believe that the utilization of technology would lead to performance gains. This construct is also regarded as the perceived usefulness of technology[32].

Effort Expectancy: This is known as the degree to which a technology is easy to use [32].

Social Influence: This is the degree to which individuals believe that significant others believe that they should utilize the technology [32].

Facilitating Condition: This is the degree to which technical and organizational support and infrastructures are available for technology utilization [32].

Use behavior of the technology utilization: This can be defined as the overall individual's affective reaction to the utilization of a technology or system. In the model, it is expected that there should be a strong relationship between the performance expectancy and the behavioral intention, and also a strong relationship between effort expectancy and behavioral intention[32]. From the UTAUT theory, the performance expectancy, effort expectancy, and social influence are predictors of behavioral intention while facilitating condition have a direct and positive effect and influence on the user behavior of e-e-learning system. Also, the interactive effect of experience with each of the effort expectancy and social influence on the behavioral intention to utilize e-e-learning system. Thus the following hypotheses:

Hypothesis 1: Performance expectancy has a direct positive influence on behavioral intention

Hypothesis 2: Effort expectancy has a direct positive influence on behavioral intention

Hypothesis 3: Social influence has a direct positive influence on behavioral intention

Hypothesis 4: Facilitating conditions has a direct positive influence on use behavior

Hypothesis 5: Behavioural intention has a direct positive influence on use behavior

Hypothesis 6: Experience has a direct positive influence on use behavior

3. Research Methodology

These research study respondents were majorly students of Covenant University Ota Nigeria. The research study population cuts across the different cadres of student's irrespective age, sex, departments or colleges or programmes. Based on an online source, the total number of full time student of Covenant University is 9369[34]. The questionnaire was formulated, and a pilot test was carried out in other to check the questionnaire validity and reliability.

Furthermore, a review of the questionnaire was done by experts in statistics and the information systems field in other to check further and confirm the validity of the questionnaire. A sum of 574 convenient university students participated in the research survey 55.9% (321) Male and 44.1% (253) Female in which 61.5% are Undergraduate students (Tertiary), 30.3% are postgraduate, and 7.85 are from high school. The variable contained in the questionnaire includes; Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Experience, gender, age, educational level, occupation [21], [32], [33], [35]. The questionnaire was based on the five-point Likert scale where; 1: strongly disagree 2: disagree 3: neutral 4: agree 5: strongly agree. The responses gathering was from 6th November to 11th November 2018.

3.1 Research Methods

In this study, data analysis was done with the use of the Structural Equation Modelling (SEM) software such as Smart PLS 3.2.7 and SPSS 20.0. A confirmatory factor analysis (CFA) was conducted on the sample data.

In confirmatory factor analysis (CFA), the verification of the factor structure of the observed variable is carried out. This statistical method allows for testing the research hypothesis of the proposed by the researcher. The structural equation modeling technique allows for the illustration of the relationship that is present between the underlying latent variable and observed variables [36]. The statistical tool used to perform the confirmatory factor analysis test in this research study was the Smart PLS (Partial least square) 3.2.7. For proper confirmatory factor analysis test and convergent and discriminant validity checks, test such as variable significance, composite reliability, Average variance extracted (AVE) and the correlation was carried out.

4.0 Results and analysis

4.1 Demographic data

A total of five hundred and seventy-four (574) responses was gathered from the questionnaire. This section discusses the demographic profile of the sampled respondents who took part in the study

Table 1.0: Demographic characteristics of respondents

Characteristics	Respondents	
	F	%
Sex		
Male	321	55.9
Female	253	44.1
Age		
15-20	92	16
21-25	327	57
Above 25	156	27.2
Education		
Secondary	45	7.8
Tertiary	353	61.5
Postgraduate	174	30.3

Occupation		
Student	50.6	88.5
Civil servant	14	2.4
Self-employed	24	4.2
Total	574	100

4.2 Assessment of measurement model

A presentation of the various distinctive tests and analysis carried out in this research study is contained in this section. The hypothesized research model for this study contains

Five independent variables: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Condition (FC) and Experience (E);

One mediating variable: Behavioural Intention (BI);

One dependent variable: Actual Use (AC);

The latent variable /constructs in the research study are reflective; in the reflective measurement model, the prime indicator influences the latent variable thereby displaying a high level of correlation between indicators in the research model.

In other to evaluate the validity and the reliability of the research model, the Cronbach's alpha and composite reliability analysis were carried out. The minimum acceptable threshold of Cronbach's alpha is 0.6. For a construct to be considered to be in the acceptable range, the value of the Cronbach's alpha must be equal to or above 0.6(≤ 0.6) [38], [39] while the minimum accepted value for the composite reliability is 0.7 [41]. For a construct to be considered to be in the acceptable range, the value of the composite reliability must be equal to or above 0.7(≤ 0.7). The composite reliability is thought of by scholars as a more accurate, precise and rigid validity and reliability test [41]. Table 2.0 illustrates the composite reliability and the Cronbach alpha value exceeding the minimum acceptable threshold; consequently, the research model can be considered valid and reliable.

4.3 Convergent validity

In other to evaluate the convergent validity of the model, the outer loading of the individual construct should be above 0.5 [41]. Furthermore, the AVE (Average variance extracted) for individual construct should be above or equals to the minimum accepted value of 0.5 [43]–[45]. Table 2.0 illustrates the outer loading (Factor Loading) and the average variance extracted respectively. Where both the Average variance extracted (AVE) and the factor loading value exceeding the minimum acceptable threshold. Base on the result of the analysis, the research model convergent validity proves to be acceptable.

Table 2.0: Reliability and validity items

Latent variable	Factor loading	Cronbach alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Actual Use	0.907	0.820	0.836	0.894	0.738
	0.897				
	0.765				
Behavioral intention	0.906	0.867	0.867	0.919	0.790
	0.859				
	0.902				
Experience	0.633	0.751	0.819	0.856	0.670
	0.911				
	0.883				
Effort expectancy	0.892	0.757	0.757	0.891	0.804
	0.901				
Facilitating condition	0.910	0.831	0.868	0.899	0.749
	0.923				
	0.752				
Performance expectancy	0.913	0.919	0.922	0.949	0.861
	0.932				
	0.938				
Social influence	0.712	0.689	0.765	0.806	0.514
	0.568				
	0.703				
	0.855				

4.4 Discriminate validity

The examination of the discriminate validity was carried out in order to investigate the uniqueness of measure in the model. A construct in the research model should share more variance with its measure than other measure in the research model; this illustrates the criterion for evaluating discriminant validity in PLS (Partial least square) [46]. The examination of the discriminate validity was done by evaluating the correlation amongst the measure of the construct and must be distinctive when compared to its unity [47]. The table below illustrates the discriminate validity of the research model. The analysis of the research model suggests that the discriminant validity was based on the assumption that the square root of the AVE (average variance extracted) of the constructs must be greater than the entire cross-correlation amongst the constructs [45].

Table 3.0: Discriminate validity

	AC	BI	EE	Experience	FC	PE	SI
AC	0.859						
BI	0.827	0.889					
EE	0.837	0.667	0.897				

Experience	0.689	0.627	0.652	0.819			
FC	0.839	0.805	0.751	0.749	0.865		
PE	0.886	0.726	0.737	0.668	0.779	0.928	
SI	0.784	0.682	0.681	0.635	0.725	0.716	0.717

4.5 Hypothesis Testing

The analysis result suggests that the research model met the required acceptance level. In other to validate the hypothesis, an examination of the research model construct relationship was conducted. The diagram and table below illustrate the path diagram of the model.

The result of the hypothesis test of the research model suggests that Performance expectancy (PE), Effort Expectancy (EE), and Social Influence (SI) have significant positive effect on the behavioral intention to adopt eLearning; where the value of P is significant at ($P < 0.05$), this result suggests that Hypothesis 1,2,3 respectively were supported by the analysis result of the model. Additionally, the analysis result also suggests that Facilitating Condition (FC) and Experience (E) have a significant positive effect on Actual adoption of eLearning; where the value of P is significant at ($P < 0.05$), this result suggests that Hypothesis 4 and 6 respectively were supported by the analysis result of the model. Furthermore, Behavioral Intention to adopt eLearning also have a significant positive effect on Actual adoption of eLearning; where the value of P is significant at ($P < 0.05$), this result suggests that Hypothesis 6 respectively were supported by the analysis result of the model.

Additionally, approximately 59.7% of the variance of behavioral intention (BI) to adopt eLearning was illustrated by the PE (Performance Expectancy), EE (Effort Expectancy), and SI (Social Influence); Where $R^2 = 0.597$. Furthermore, about 77.5% of the variance of actual adoption (AC) of eLearning was explained by behavioral intention (BI) to adopt eLearning Where $R^2 = 0.775$.

Table 4.0: Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
BI -> AC	0.422	0.420	0.040	10.629	0.000
EE -> BI	0.199	0.199	0.046	4.282	0.000
Experience -> AC	0.114	0.117	0.033	3.421	0.001
FC -> AC	0.414	0.413	0.043	9.676	0.000
PE -> BI	0.386	0.383	0.049	7.917	0.000
SI -> BI	0.270	0.275	0.045	6.017	0.000

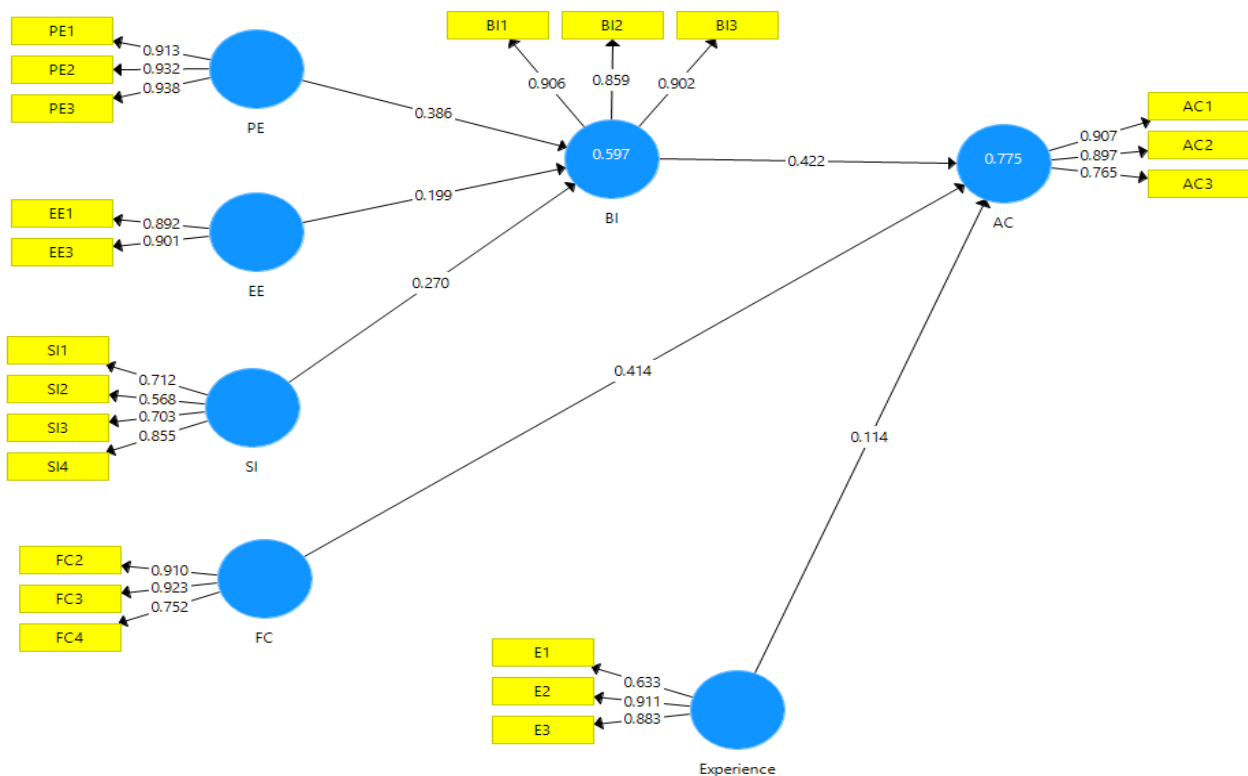


Figure 2.0: Path analysis

4.6 Discussion

This research study primarily seeks to investigate the prospects of adopting e-Learning in the educational system of Nigeria. In other to investigate the phenomenon, this research study utilized the UTAUT model (Unified theory of acceptance and use of technology).

The UTAUT framework provides an explanation to illustrate the behavioral intention of an individual in a particular situation.

The result from the analysis suggests that Performance expectancy (PE), Effort Expectancy (EE) and Social Influence (SI) have a positive effect of the behavioral intention to adopt eLearning and the behavioral intention would lead to the actual adoption of eLearning in Nigerian educational system. Additionally, Facilitating condition (FC) and Experience (E) have a positive effect on the actual adoption of eLearning in Nigerian educational system; therefore confirming and validating the stated hypothesis. The gathered result suggests that performance expectancy, effort expectancy, social influence, facilitating condition and experience are factors that influence the adoption of e-learning amongst student of tertiary institutions in Nigeria.

The result suggests that e-Learning would willingly be adopted if the technology would lead to increased and improved performance gain when the system is adopted and implement. Furthermore, the research model result also suggests that learning technology would be adopted if the technology/system is easy to access and utilized. Also, the result further suggests that the eLearning technology would be adopted and utilized by individuals if

their relations or someone close to them adopt and utilize the eLearning technology. Additionally, the result of the research model analysis showed that the availability of the necessary mechanisms and support such as adequate infrastructure, technical support, and incentives to assist the individual in utilizing the eLearning technology would inevitably lead to the adoption of eLearning. Furthermore, as suggested by the research result, if relevant experience has been attained it would lead to continual utilization of the eLearning technology.

4.7 Implication of Study

In the research study, the UTAUT model was used to examine the phenomenon. In this research study, the reliability and validity of the proposed research model were carried out. The result derived from the examination illustrated that the model demonstrated a high level of validity and reliability.

The examination of the prospect of adopting eLearning would help institutions to develop, implement and utilize proper policies and procedures for adopting eLearning that would ensure delivery and development quality and effective educational system.

Furthermore, it would institutions provide proper awareness and sensitization of the different stakeholders to the benefits and prospect of learning to the improvement and enhancement of the educational system.

5 Conclusion

E-learning provides a means by which the traditional means of teaching and learning in the educational system especially in Nigeria can be improved. E-learning involve the utilization of all forms of electronic media and technologies in order to aid the educational process. This research study investigated the prospect of adopting e-Learning in Nigeria university. The Unified theory of acceptance and use of technology (UTAUT) theoretical framework was utilized to investigate the prospect of adoption and acceptance of eLearning system in the education system. The research study findings suggest that Performance expectancy, Effort Expectancy, and Social Influence have a positive effect of the behavioral intention to adopt e-Learning and the behavioral intention would lead to the actual adoption of eLearning. Additionally, Facilitating condition and Experience have a positive effect on the actual adoption of e-Learning. The result of the research study suggests that the adoption of e-Learning in Nigeria educational system is influenced by the ease of use, performance gain, public sway, adequate support, and proficiency.

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