

Acceptance of WhatsApp social media platform for learning in Nigeria: A test of unified theory of acceptance and use of technology

Tajudeen Ahmed Shittu ^{1*} , Yusuf Hamdalat Taiwo ² 

¹Department of Science Education, Federal University of Kashere, Gombe, Gombe State, NIGERIA

²Department of Social Science Education, University of Ilorin, Ilorin NIGERIA

*Corresponding Author: t.shittu@fukashere.edu.ng

Citation: Shittu, T. A., & Taiwo, Y. H. (2023). Acceptance of WhatsApp social media platform for learning in Nigeria: A test of unified theory of acceptance and use of technology. *Journal of Digital Educational Technology*, 3(2), ep2309. <https://doi.org/10.30935/jdet/13460>

ARTICLE INFO

Received: 26 Mar. 2023

Accepted: 17 May 2023

ABSTRACT

The study tested the efficacy of unified theory of acceptance and use of technology (UTAUT) for explaining the rationale for the acceptance of WhatsApp social media platform for learning among students of public and private universities in Nigeria. To achieve the goal of the study, a cross-sectional survey research method was employed. A questionnaire was deployed for data collection. The sample for the study was drawn from undergraduate students from two different universities. The data gathered for the study was subjected to structural equation modeling analysis using AMOS statistical package. Prior to that, series of analysis, such as descriptive analysis, (mean and standard deviation), inferential analysis such as factor analysis to ascertain the dimensionality of the factor of the study was computed. The study also established construct, content, discriminant and convergent validity. It also determined the internal consistency of all the variables of the study. All hypotheses generated for the study was analyzed by checking the effect size of the independent on the dependent variable of the study. The findings from the model of the study showed that the data fit the model of the study. The total variance explained of the model was 61% and almost all the independent variables statistically and directly influence acceptance process of WhatsApp media for learning with exception of effort expectancy that showed a negative effect on student behavioral intention towards use of WhatsApp for learning. The findings of the study have implication for students, teachers and administrators of higher institution of learning Furthermore, the finding of the study equally provide evident for the empirical strength of UTAUT for explaining rationale for adoption of social media for teaching 21st century learners.

Keywords: effort expectancy, facilitating condition, social influence, acceptance of WhatsApp

INTRODUCTION

The fact remains that social network may have it positive and negative side but yet these tools are gaining tremendous popularity almost on a daily basis and thus becoming pervasive in people lives and starting to gain it ground in education ... (Cetinkaya, 2017).

Drawing from Cetinkaya's (2017) submission, it is unambiguously clear that social networking platforms are gaining unprecedented popularity in the world today and importantly in education. The outbreak of COVID-19 pandemic had also increased the necessity for its usage. A report from global social media research summary revealed that apart from Facebook, Twitter, YouTube, Instagram, and TikTok social media, WhatsApp social media is acknowledged

to attract many users in the recent time (Yeboah & Nyagarme, 2022). The popularity and use of social media network especially WhatsApp social media is on the increase among students in Nigeria, for instance Shittu et al. (2015) reported that social media has become the major medium of communication and interaction, sharing of pictures, ideas, and experiences as well as information of interest among difference class of people.

Reporting the prevalent use of social media platform, Sasu (2022) noted that approximately 4.9 million Nigerian within 15 years and 64 years old subscribed to WhatsApp platform for interaction during the pandemic period. Beside the popularity of WhatsApp social network, there are array of social media platforms that are developed for different users in the world. A report by Gilsenan (2019) outlines general use of social media to include gathering of information, communication with family and friends, searching for solution to problem, and

promoting a wider social and professional network among others.

Given the primary reason outlined by Gilsenan (2019) for usage of social media, Studies in the recent time has shown that social media software can equally be used to increase students' engagement, collaboration and enhanced their academic performance either in face to face or in distance learning situation (Alismaiel et al., 2022; Awidi et al., 2019; Manca, 2020).

While it is reported that the medium could be used for educational related activities, whether the student would accept or reject to use WhatsApp platform for learning activities is still shrouded with uncertainty in the locale of this study, hence the need for the study. Therefore, the vacuum that the study set to cover is to empirically understand what may influence university student's acceptance and rejection of WhatsApp social platform for learning using unified theory of acceptance and use of technology (UTAUT) as the theoretical framework for the study. This become important because even if there are related studies on social media use for educational purposes, there is still a gap on the use of WhatsApp social media platform for learning in the setting of this study most especially when it is observed that the platform is gaining popularity in term of usage among Nigerian students.

LITERATURE REVIEW

Literature is awashed in the recent time on the need of using social networking tools as a platform of interaction in teaching and learning process. For instance, Veletsianos and Navarrete (2012) and Wheaton and Thorpe (2019) have in different studies encouraged student and academic staff to adopt social media tool such as Facebook, YouTube Twitter, Pinterest, and Blogging as a tool for sharing, enriching, and completing student learning, because it is observed that student enjoy using the medium, they preferred to complete their educational related goals. Among social media platforms that is gaining attention in the recent time is WhatsApp application. The platform was developed by Brian Anton and Ian Koom in the year 2009 as a mobile application. According to Kutu and Kutu (2022), WhatsApp application can be used to exchange chat, images as well as audio and video messages through the Internet.

Evidence from literature has shown that users advanced diverging reasons for accepting to use technology to accomplish a task different from the purpose it was created for. Particularly, in education, integration of newer technology for teaching and learning by educators always face some challenges that require research attention. Some of this attention can be seen in some recent studies on social media use for educational purposes. For instance, Al-Sabaawi and Dahlan (2019) carry-out study on acceptance of social media for informal learning in Malaysia. The study tests the theory and the findings of the study showed that perceived usefulness, subjective norms, perceived ease of use all correlate to influence students' intention towards use of social media for learning.

Similarly, a study on intention to use social media for learning by postgraduate student was carried out in Nigeria by

Odewumi et al. (2018), in the finding of that study it was revealed that intention to use social media is a function of students' positive perception towards usefulness and ease of use of the platform. Also, Alismaiel et al. (2022) study on social media integration for education amidst COVID-19 pandemic a test of technology acceptance model, reported that perceive usefulness, perceived ease of use, and enjoyment has direct positive influence on attitude towards use of social media for education.

In another related study conducted in Saudi Arabia by Almogheerah (2020) on the adoption of WhatsApp social media for learning among Saudi Arabia female students, the study confirmed the relationship that exist between performance expectance (PE), effort expectance (EE), facilitating condition (FC) and behavioral intention (BI). Humaid and Ibrahim (2019) study on factor influencing adoption of social media among businessmen in Saudi Arabia using UTAUT model support the findings that reported the significant relationship between the independent variables of UTAUT and intention to acceptance of technologies.

WhatsApp platform is increasingly becoming a major social media tool used by university students in Nigeria, yet its acceptance for pedagogical use may be pervasive in some sub-Saharan African (Durgungoz & Durgungoz, 2022; Yeboah & Nyagorme, 2022), but its use for learning in Nigeria is relatively new. Despite that, research output keeps supporting its effectiveness for pedagogical practice. For instance, it was reported that the instant messaging of WhatsApp feature can encourage students to have unrestricted access to their professor as well as increase their interest in their study (Cifuentes & Lents, 2011). Besides this, it was reported that engaging students through the platform increases students writing skills (Fattah, 2015).

Also, it was reported in the literature that WhatsApp can support synchronous and asynchronous communication and ultimately enhance social interactivity among students and their teachers (Vrocharidou & Efthymiou, 2012). In view of the several pedagogical opportunities inherent in adoption of WhatsApp platform for learning, many researchers in less develop nation take interest in further understanding how the platform can be used for social and learning related activities among students (Yeboah & Nyagorme, 2022).

From literature review, it is evidence that there is less research activity on application of WhatsApp for learning, but what is most common is that the higher institution of learning student is using the media for social interaction (Odewumi et al., 2018). The study, therefore, sought to understand factors that can influence adoption of this platform for learning among private and public university student in Nigeria. Information from the study would in no small measure assist policy makers and university teachers on effective use of platform as emerging learning tool in higher education.

THEORETICAL FRAMEWORK

The study set to understand factors that can influence university students BI toward adoption of WhatsApp social media platform for learning. In searching for these reasons, the theory of acceptance of information technology that was

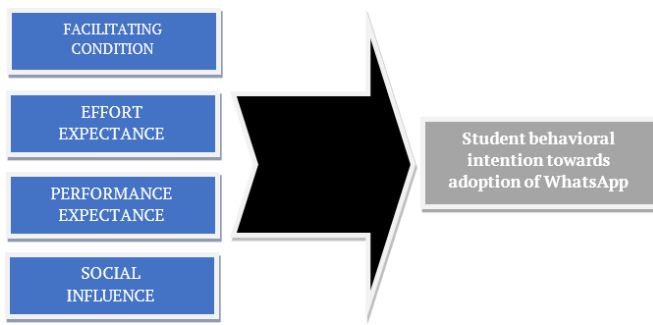


Figure 1. Theoretical framework of the study as adapted from Venkatesh et al. (2003)

developed by Venkatesh et al. (2003) was adopted for prosecuting the study. To achieve this, the conceptual framework shown in **Figure 1** was adapted.

Unified Theory of Acceptance and Use of Technology

UTAUT was developed by Venkatesh et al. (2003). The theory was originally developed to determine what may influence acceptance of newer information technology in an organization setting. In an attempt to come up with this model, Venkatesh et al. (2003) reviewed and compared several information acceptance models and eventually UTAUT model was formulated. Some of the models reviewed by Venkatesh et al. (2003) includes theory of reason action developed by Sheppard et al. (1988); technology acceptance model developed by Davis (1989); theory of planned behavior developed by Ajzen (1991); the combine TPB/TAM by Taylor and Todd (1995); innovation diffusion theory developed by Rogers (2003) and many others, based on systematic analysis of all the existing model and theory in psychology and sociology, Venkatesh et al. (2003) proposed UTAUT model, which was used to explained 70% of variance in users BI towards acceptance of information technology.

In fact, it was reported that UTAUT model stands out to be the most effective model for understanding and analyzing technology acceptance (Chao, 2019). The model consists of six main constructs, these constructs are PE, EE, social influence (SI), FC, BI, and final usage, or acceptance to use a system. According to Venkatesh et al. (2003), performance expectation is the degree to which individual information system user believes that the system will improve his/her performance in each task. EE is the degree to which the system would be easy or difficult for an individual to use. These two constructs PE and EE share similar psychological meaning with PEOUS and PU in technology acceptance model of Davis (1989). Similarly, the construct shares similar meaning with complexity and compatibility as contained in innovation diffusion theory of Rogers (2003), thus we can conclude that the two constructs have their antecedent from IDT and TAM.

In the case of SI, it is defined as the degree to which individual perceive that people who are important to him/her believes he/she should use a new technology while FC, therefore, is the degree to which an individual perceived the existence of technical support and other resources for using a new technology and BI is the subjective probability that individual user would employ a system for accomplished a given task in the future. According to this present study, the

adoption of UTAUT was premised on its explanatory strength as reported in Venkatesh et al. (2003) that the model can explained 70% variance on BI to use an information technology/system.

In this study therefore, EE represent university student belief on easy or difficulty of use of WhatsApp social media for learning; PE represent their belief on whether WhatsApp platform would enhance their learning performance; SI represent their belief that those who are important to them would expect them to adopt the platform for learning; FC in the context of this study represent the availability of resources needed for using social media for learning and BI represent the conscious plan to adopt WhatsApp platform for learning by the students. Based on this, the following hypotheses are proposed for the study.

Hypotheses of the Study

- Hypothesis 1: EE would have significant influence on student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 2: PE would have significant influence on student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 3: SI would have significant influence on student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 4: FC would have significant influence on student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 5: PE would correlate with EE to influence student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 6: PE would correlate with SI to influence student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 7: PE would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 8: EE would correlate with SI to influence student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 9: EE would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning.
- Hypothesis 10: SI would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning.

RESEARCH METHODOLOGY

The main objectives of this study were to ascertain what could influence students' acceptance of WhatsApp social media for learning through UTAUT. By extension the study set to validate the theory and report how much the theory can gauge student BI. To achieve this, the study employed cross sectional survey method with justification that it will enable the researcher to adequately draw the required sample for the

Table 1. Characteristic of the participants

| Characteristic | Number of students | Percentage |
|---------------------------|--------------------|------------|
| Gender | | |
| Male | 105 | 58.3 |
| Female | 75 | 41.7 |
| Student level of study | | |
| 100-200 | 117 | 65.0 |
| 300-400 | 63 | 35.0 |
| Student specialization | | |
| Science | 105 | 58.3 |
| Non-science | 75 | 41.7 |
| Institutions | | |
| Private | 98 | 54.4 |
| Public | 82 | 45.6 |
| WhatsApp usage | | |
| No | 1 | 0.5 |
| Yes | 179 | 99.5 |
| Years of usage | | |
| Less than 1 years | 0 | 0.0 |
| 1-3 years | 29 | 16.0 |
| 4-6 years | 54 | 30.0 |
| More than 6 years | 96 | 53.0 |
| Not subscribe to WhatsApp | 1 | 0.5 |

study (Creswell, 2012). The participants of the study were drawn from public and private university in Kwara State of Nigeria (**Table 1**). In drawing the sample proportional stratified random sample technique was used.

The data of the study was collected through an adapted research instrument, which was divided into two sections, demography, and items section. The demography section sought participants' information while the items section sought for response to the statement, which represent the indicator to the variables of the study. 5-point Likert scale was used as response. The response on items ranges from 1-strongly disagree to 5-strongly agree. In all 25 items were used to measure the five constructs of the study. The variable was classified into endogenous with four variables (EE, PE, SI, and FC) and exogenous with one variable (BI).

Out of 250 questionnaires administered, only one hundred and eighty were fully attended to, and returned, which represents 75% return rate. Among the participants, 105 (58.3%) were male, while 75 (41.7%) were female. On the participant area of specialization, 105 (58.3%) were science base, while 75 (41.7%) were non-science base. For student level of study, 117 (65%) were 100 to 200 levels students, while 63 (35%) were 300 to 400 level students. Among the participants, 98 (54.4%) were students of AlHikmah University Ilorin, a private own institution, while 82 (45.6%) were students of Kwara State University, a public institution of learning. Greater percentage of the participants (99.5%) were user of WhatsApp platform, while 53% of the participants indicated to have been using platform more than six years ago.

RESULTS

Data Analysis

In this study, structural equation modeling (SEM) was used to test the hypotheses generated for the study. To achieve this, the following analysis were carried-out. Reliability tests were

Table 2. Correlation matrix of variables & square root of AVE

| | M | SD | PE | EE | SE | FC | BI |
|----|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PE | 10.88 | 2.64 | .512 | | | | |
| EE | 11.57 | 2.23 | .360** | .502 | | | |
| SE | 14.13 | 3.23 | .432** | .352** | .505 | | |
| FC | 11.11 | 2.46 | .338** | .354** | .324** | .603 | |
| BI | 11.20 | 2.30 | .412** | .310** | .401** | .538** | .670 |

Note. M: mean; SD: Standard deviation; & **Correlation is significant at the 0.01 level (2-tailed)

computed for all the variable of the study. Then, the validity of the measurement model was ascertained through convergent and discriminant validity.

After that confirmatory factor analysis (CFA) was computed. Finally, path analysis was used to evaluate and examine the proposed hypotheses of the study.

Reliability Analysis

The reliability of all the constructs of the study was examined. The reliability analysis is used to measure the consistency of items of the same construct. According to Hair et al. (2010) it was recommended an alpha value of 0.7 (>0.7) to be classify as highly reliable construct. Based on the computation carried out using Cronbach's alpha value, it was established that all the constructs had a greater alpha value above 0.7 as shown in (**Table 2**). The reliability of all the constructs were established.

Convergent Validity and Discriminant Validity Analysis

The study ascertained the validity of all the construct used. Both convergent and discriminant validity was examined. In establishing the convergent validity, factor analysis was computed using varimax rotation. In computing this, the behavior of each item was observed and how the items converge to explain the universe of the construct they represented was also observed. The items loading for each of the construct were examined and they were in the range of 0.52 to 0.82. Thus, the loading was above the recommended level of 0.5 (Hair et al., 2010).

The variance explained for each construct are PE (31%), EE (10%), SI (9%), FC (7%), and BI (6%). The total variance explained stands at 63% as against 70% earlier established by Venkatesh et al. (2003). The eigenvalue is greater than one, KMO, which measures the sample adequacy was .89, Bartlett's test of sphericity was 2,246.675. The output of factor analysis indicated that the sample was adequate for the study (Hair et al., 2010).

The study also computed the discriminant validity. To establish this, the square root of average variance explained (AVE) was used to correlate the construct of the study as shown in **Table 2**. The bolded value on the diagonal is the square root of AVE. To check this, the diagonal value should be greater than the off-diagonal value in the corresponding row and column (Fornell & Larcker, 1981; Hair et al., 2010). In the study the diagonal value exceeded the inter construct correlation. With this DV of the study was also established.

To increase the critical mass of the analysis, items correlation was computed. It was established that all the items were moderately correlated. Not too high nor too low (Hair et al., 2010) as shown in **Table 3**.

Table 3. Correlation matrix of all the items used in the study

| | PE3 | PE4 | PE5 | EE3 | EE4 | EE5 | SE2 | SE3 | SE4 | SE5 | FC3 | FC4 | FC5 | BI1 | BI2 | BI3 |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|
| PE3 | 1 | | | | | | | | | | | | | | | |
| PE4 | .572** | 1 | | | | | | | | | | | | | | |
| PE5 | .465** | .492** | 1 | | | | | | | | | | | | | |
| EE3 | .257** | .292** | .194** | 1 | | | | | | | | | | | | |
| EE4 | .123 | .264** | .153** | .331** | 1 | | | | | | | | | | | |
| EE5 | .192** | .240** | .261** | .313** | .335** | 1 | | | | | | | | | | |
| SE2 | .126 | .219** | .336** | .197** | .234** | .301** | 1 | | | | | | | | | |
| SE3 | .226** | .172** | .179** | .080 | .122 | .199** | .413** | 1 | | | | | | | | |
| SE4 | .271** | .295** | .405** | .209** | .193** | .268** | .483** | .463** | 1 | | | | | | | |
| SE5 | .212** | .326** | .393** | .186** | .130 | .221** | .343** | .396** | .474** | 1 | | | | | | |
| FC3 | .177** | .129 | .334** | .139 | .139 | .239** | .378** | .118 | .210** | .113 | 1 | | | | | |
| FC4 | .104 | .131 | .192** | .100 | .059 | .367** | .224** | .178** | .025 | .192** | .371** | 1 | | | | |
| FC5 | .308** | .297** | .251** | .133 | .264** | .369** | .273** | .258** | .166** | .155** | .426** | .445** | 1 | | | |
| BI1 | .245** | .276** | .237** | .203** | .135 | .263** | .202** | .198** | .164** | .277** | .226** | .448** | .444** | 1 | | |
| BI2 | .267** | .240** | .334** | .177** | .199** | .235** | .263** | .217** | .265** | .427** | .310** | .295** | .476** | .462** | 1 | |
| BI3 | .287** | .223** | .261** | .092 | .131 | .177** | .351** | .166** | .131 | .192** | .310** | .202** | .282** | .403** | .388** | 1 |

Note. *Correlation is significant at the 0.05 level (2-tailed) & **Correlation is significant at the 0.01 level (2-tailed)

Table 4. Factor loading' reliability and AVE

| | Mean | SD | FL | Reliability | AVE |
|-----|------|-------|-----|-------------|------|
| PE3 | 3.69 | 1.003 | .82 | .80 | 0.51 |
| PE4 | 3.77 | 1.007 | .79 | | |
| PE5 | 3.41 | 1.204 | .64 | | |
| EE3 | 3.91 | .962 | .63 | .70 | 0.50 |
| EE4 | 3.85 | .942 | .72 | | |
| EE5 | 3.74 | 1.099 | .66 | | |
| SE2 | 3.42 | 1.072 | .58 | .80 | 0.51 |
| SE3 | 3.50 | 1.054 | .74 | | |
| SE4 | 3.51 | 1.075 | .76 | | |
| SE5 | 3.68 | 1.074 | .72 | .70 | 0.60 |
| FC3 | 3.62 | 1.139 | .78 | | |
| FC4 | 3.71 | 1.022 | .74 | | |
| FC5 | 3.77 | .989 | .57 | .70 | 0.67 |
| BI1 | 3.75 | .943 | .77 | | |
| BI2 | 3.74 | .957 | .61 | | |
| BI3 | 3.70 | 1.04 | .52 | | |

Note. SD: Standard deviation & FL: Factor loading

Table 4 shows the factor loading' reliability and AVE.

Path Analysis of the Structured Model

Confirmatory factor analysis

CFA was computed in order to examine the pattern of interrelationship that exist among the construct of the study (Figure 2). Computing this would further allow the researcher to check whether there is misspecification. To examine CFA, several indices were used. Among the fit indices as suggested by Hair et al. (2010) used include Chi-square test, since it is sensitive to sample size, Chi-square normalized by degree of freedom was also used. Other incremental indexes that are important as suggested by Hair et al. (2010) were also included as part of model fit indices.

In this study the following fit indices were used to ascertain the fitness of CFA. RMSEA was selected because its consistency in providing same result. Other fit indices chosen are CFI, TLI, and IFI, respectively. Any acceptable fit should be greater than .90, while RMSEA value is expected to be close to .06 for it to be accepted (Hu & Bentler, 1999; Shittu et al., 2016). The output in Figure 2 shows that the data is consistent with model.

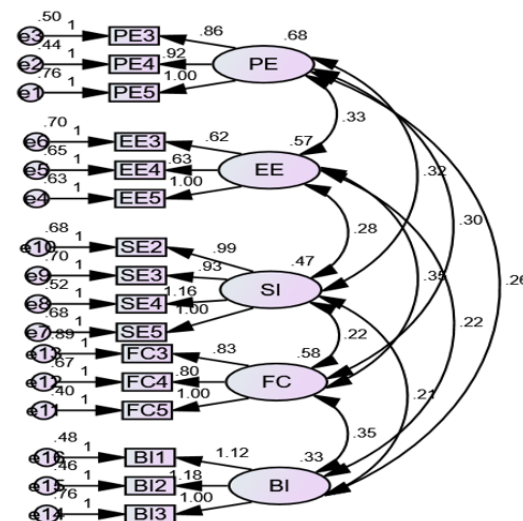


Figure 2. CFA of SEM (Source: Authors, SEM computed and generated using AMOS statistical software)

The computed CFA output: p-value=.000, RMSEA=.076, df=.80, TLI=.931, CFI=.925, and IFI=.962.

Hypotheses testing

SEM in Figure 3 was evaluated to test the hypotheses of the study. The result of the statistical analysis of the model specified for the study demonstrated adequate fit with Chi-square=122.445, df=.84, p=.000, RMSEA=.070, CFI=.903, TLI=.904, and IFI=.907. The estimate of the model was free from offending value. Almost all the coefficient of the entire path of the model were statistically significant with critical ratio (CR>1.96). Having fit the model specified with the data of the study, the hypotheses generated for the study are therefore evaluated based on the effect size of the independent variable and the dependent variable as specified in the model as shown Figure 3.

Hypothesis 1: PE would have significant influence on student BI towards adoption of WhatsApp platform for learning. The effect size of PE on student BI towards use of WhatsApp social media revealed ($\beta=.13, p<.005$). Based on this finding, the hypothesis stands validated.

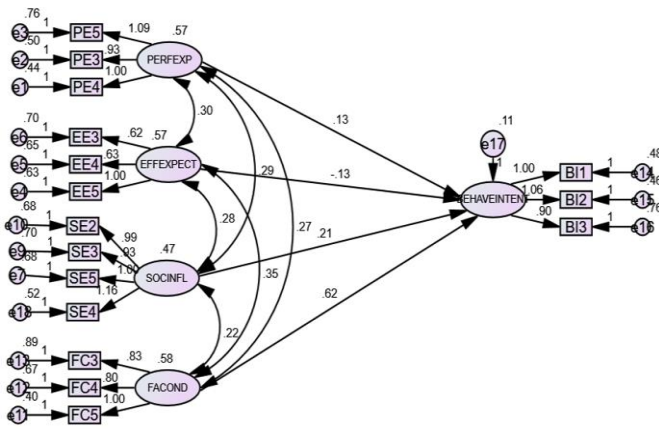


Figure 3. Output of final path analysis & model of the study (Source: Authors, using AMOS statistical software)

Hypothesis 2: EE would have significant influence on student BI towards adoption of WhatsApp platform for learning. The effect size of EE on student BI towards use of WhatsApp social media revealed ($\beta = -.13$, $p < .005$). Based on this finding, the hypothesis was not supported.

Hypothesis 3: SI would have significant influence on student BI towards adoption of WhatsApp platform for learning. The effect size of SI on student BI towards use of WhatsApp social media revealed ($\beta = .21$, $p < .005$). Based on this finding, the hypothesis stands validated.

Hypothesis 4: FC would have significant influence on student BI towards adoption of WhatsApp platform for learning. The effect size of FC on student BI towards use of WhatsApp social media revealed ($\beta = .62$, $p < .005$). Based on this finding, the hypothesis stands validated.

Hypothesis 5: PE would correlate with EE to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between PE and EE was statistically significant ($\beta = .30$, $p < .005$). Based on this finding this hypothesis stands validated.

Hypothesis 6: PE would correlate with SI to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between PE and SI was statistically significant ($\beta = .29$, $p < .005$). Based on this finding this hypothesis stands validated.

Hypothesis 7: PE would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between PE and FC was statistically significant ($\beta = .27$, $p < .005$). Based on this finding this hypothesis stands validated.

Hypothesis 8: EE would correlate with SI to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between EE and SI was statistically significant ($\beta = .28$, $p < .005$). Based on this finding this hypothesis stands validated.

Hypothesis 9: EE would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between EE and FC was statistically significant ($\beta = .35$, $p < .005$). Based on this finding the hypothesis stands validated.

Table 5. Summary of the results

| Hypotheses | Paths | Findings | Results |
|------------|-------|----------|---------------|
| H1 | PE→BI | Positive | Supported |
| H2 | EE→BI | Negative | Not-supported |
| H3 | SI→BI | Positive | Supported |
| H4 | FC→BI | Positive | Supported |
| H5 | PE↔EE | Positive | Supported |
| H6 | PE↔SI | Positive | Supported |
| H7 | PE↔FC | Positive | Supported |
| H8 | EE↔SI | Positive | Supported |
| H9 | EE↔FC | Positive | Supported |
| H10 | SI↔FC | Positive | Supported |

Hypothesis 10: SI would correlate with FC to influence student BI towards adoption of WhatsApp platform for learning. The finding of the correlation between SI and FC was statistically significant ($\beta = .22$, $p < .005$). Based on this finding this hypothesis stands validated.

DISCUSSION AND CONCLUSIONS

Table 5 shows the summary of the results. The primary objective of this study was to test UTAUT as it relates to widespread use of WhatsApp social media among students of higher institutions of learning. It also checks what would influence the student to accept the platform for their learning engagement. A robust analysis was carried out on the data collected before it was used to fit the model specified for the study. Like what other studies have reported in literature on the strength of UTAUT model to measure acceptance of new innovation in education, this study also finds out the following.

First, based on the output from structural path analysis in Figure 3, an inspection of the first hypothesis (PE→BI), the finding revealed there is positive and significant influence of PE on BI of students towards use of WhatsApp social media for learning. This finding supported the original theoretical foundation of UTAUT (Venkatesh et al., 2003). The implication is that the student has perceived social media as a useful platform for learning and they anticipate if deploy for learning it will increase their learning performance.

On the second hypothesis, which stated that EE would influence student BI towards acceptance of WhatsApp platform for learning, this hypothesis was not supported. The finding revealed a negative influence on student BI, which is at variance with the original theoretical foundation of this study. By implication, the student may tend to prefer using the platform for social activities rather than using it for learning more especially when the interface of the platform was not designed for learning engagement. By this finding the effort required to use the platform no matter how less difficult it appears may not necessarily influence student subjective probability to accept it for learning.

Thirdly, the hypothesis, which stated that SI would impact student BI towards acceptance of WhatsApp social media stands validated. The finding equally affirmed the finding of the original theoretical foundation of the study on the importance of SI on acceptance of information system by users. What this finding suggests is that if the student peer

group and associate choose to accept use of the platform for learning that would trigger their intention towards accepting it for learning. In other words, peer influence and societal influence constitute one of the major reasons why the platform can be adopted for learning among the students.

Fourthly, the hypothesis, which stated that FC would impact student BI towards acceptance of WhatsApp social media stands validated. In fact, this hypothesis stands to be the strongest in terms of effect size. This finding is consistent with the finding of the original theoretical foundation of this study. By implication, if the student is equipped with all necessary ICT resources and the software this will go a long way in encouraging them to use the platform for learning.

The fifth hypothesis shows that there is correlation between PE and EE of the model. This finding implied that if the students found WhatsApp social media easy in terms of effort required to use it for their learning engagement this will in turn increase their perception of usefulness (PoE) of the platform and this can induce the adoption of the platform by the students. This finding supported Almogheerah (2020); and Humaid and Ibrahim (2019) finding that reported the existence of relationship among UTAUT construct for explaining adoption of newer technologies in teaching and learning.

The sixth hypothesis found there is a positive significant relationship between PE and SI. This finding indicated that if the student found many of their peers using the media for learning this will increase their PoE of the platform and in turn encourage them to accept it for learning engagement. This finding is also consistent with previous study (Chao, 2019; Venkateh et al., 2003).

The seventh hypothesis also showed that there is a positive significant relationship between PE and FC. The finding implies that if the student subscribed to WhatsApp social media as a means of relating with their peers this would in turn affect their PoE positively and induce it usage for learning engagement. This finding is consistent with the studies of (Almogheerah, 2020; Humaid & Ibrahim, 2019).

The eighth hypothesis also indicated that there is positive significance in the relationship between EE and SI. This finding implies that if those that are important (peers and family) to students adopt WhatsApp platform for interaction this would increase their ease of use of the platform for learning engagement. This finding supported the earlier finding of (Eke-Okpala et al., 2014; & Humaid & Ibrahim 2019).

The ninth hypothesis found there is a positive significant relationship between EE and FC. The finding indicated that if there is an increase in the resources required for use of WhatsApp this would in turn increase ease of use of the platform for learning engagement. This finding supported the finding of the original theoretical foundation of UTAUT (Venkatesh et al., 2003).

Lastly, the tenth hypothesis found there is a positive significant relationship between SI and FC. This finding is consistent with other studies (Almogheerah, 2020; Humaid & Ibrahim 2019; Venkatesh et al., 2003).

Author contributions: All co-authors were involved in all stages of this study while preparing the final version. They all agree with the results and conclusions.

Funding: No external funding is received for this article.

Ethics declaration: The authors declared that the participants voluntarily participated in the study. Their consent for participation were duly sought and granted, their identity was duly protected with utmost confidentiality.

Declaration of interest: The authors declare that they have no competing interests.

Availability of data and materials: All data generated or analyzed during this study are available for sharing when appropriate request is directed to corresponding author.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alismaiel, O. A., Cifuentes-Faura, J., & Al-Rahimi, W. M. (2022). Online learning, mobile learning, and social media technologies: An empirical study on constructivism theory during the COVID-19 pandemic. *Sustainability*, 14(18), 11134. <https://doi.org/10.3390/su141811134>
- Almogheerah, A. (2020). Exploring the effect of using WhatsApp on Saudi female EFL students idiom-learning. *Arab World English Journal*, 11(4), 328-350. <https://doi.org/10.24093/awej/vol11no4.22>
- Al-Sabaawi, M. Y. M., & Dahlan, H. M. (2019). Acceptance model of social media for informal learning. In F. Saeed, N. Gazem, S. Patnaik, A. Saed Balaid, & F. Mohammed (Eds.), *Recent trends in information and communication technology* (pp. 679-687). Springer. https://doi.org/10.1007/978-3-319-59427-9_70
- Awidi, I. T., Paynter, M., & Vujosevic, T. (2019). Facebook group in the learning design of a higher education course: An analysis of factor influencing positive learning experience for student. *Computers & Education*, 129, 106-121. <https://doi.org/10.1016/j.compedu.2018.10.018>
- Cetinkaya, L. (2017). The impact of WhatsApp use on success in education process. *The International Review of Research in Open and Distance Learning*, 18(7). <https://doi.org/10.19173/irrodl.v18i7.3279>
- Chao, C.-M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in Psychology*, 10, 1652. <https://doi.org/10.3389/fpsyg.2019.01652>
- Cifuentes, O. E., & Lents, N. H. (2011). Increasing students teachers interaction at an urban computer campus through instant messaging and online office hours. *Electronic Journal of Science Education*, 14(1), 1-13.
- Creswell, J. W. (2012). *Educational research planning, conducting and evaluating quantitative and qualitative research*. Pearson.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340. <https://doi.org/10.2307/249008>

- Durgungoz, A., & Durgungoz, F. C. (2022). "We are much closer here": Exploring the use of WhatsApp as a learning environment in a secondary school mathematics class. *Learning Environment Research, 25*, 423-444. <https://doi.org/10.1007/s10984-021-09371-0>
- Eke-Okpala, H. N., Omekwu, C., & Odoh, J. N. (2014). The use of social media networking sites among the undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice*, 1195.
- Fattah, S. F. E. S. A. (2015). The effectiveness of using WhatsApp messenger as one of mobile learning technique to develop student writing skills. *Journal of Education and Practice, 6*(32), 115-127.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation model with observable variable and measurement errors. *Journal of Marketing Research, 18*(1), 39-50. <https://doi.org/10.2307/3151312>
- Gilsenan, K. (2019). *Social media is changing, and it's not a bad thing*. <https://blog.gwi.com/trends/2019-in-review-social-media/>
- Hair, J. F., Black, W. C., & Babin, B. J. (2010). *Multivariate data analysis: A global perspective*. Pearson Education.
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Humaid, A. B., & Ibrahim, Y. M. (2019). The examination of factor influencing Saudi small business social media adoption by using UTAUT model. *International Journal of Business Administration, 10*(27), 96-114. <https://doi.org/10.5430/ijba.v10n2p96>
- Kutu, J. O., & Kutu, F. I. (2022). The use of social media for academic purpose by postgraduate information studies students: A case of university of KwaZulu-Natal South Africa. *Library Philosophy and Practice*, 6917.
- Manca, S. (2020). Snapping, pinning, liking or texting: investigating social media in higher education beyond facebook. *The Internet and Higher Education, 44*, 100707. <https://doi.org/10.1016/j.iheduc.2019.100707>
- Odewumi, M. O., Yusuf, M. O., & Oputa, G. O. (2018). UTAUT model: Intention to use social media for learning interactive effect of postgraduate in South-West Nigeria. *International Journal of Education and Development using Information and Communication Technology, 14*(3), 239-251.
- Rogers, E. M. (2003). *Diffusion of innovations*. Free Press.
- Sasu, D. D. (2022). *Number of active social media users in Nigeria 2017-2022*. <https://www.statista.com/statistics/1176096/number-of-social-media-users-nigeria>
- Sheppard, B. H., Hartwick, J., & Warsaw, P. R. (1988). The theory of reason action: A meta-analysis of past research recommendation for modification and future research. *Journal of Consumer Research, 15*(3), 325-343. <https://doi.org/10.1086/209170>
- Shittu, A. T., Gambari, A. I., Yusuf, M. O., & Alabi, T. O (2015). Confirmatory factor analysis of the dimensionality of students' readiness of using social media for learning in Nigeria. *ATBU Journal of Science, Technology and Education, 3*(2), 116-128.
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing model. *Information Systems Research, 6*(2), 144-176. <https://doi.org/10.1287/isre.6.2.144>
- Veletsianos, G., & Navarrete, C. (2012). Online social network as formal learning environment and activities. *The International Review of Research in Open and Distance Learning, 13*(1), 144-166. <https://doi.org/10.19173/irrodl.v13i1.1078>
- Venkatesh, V., Moriss, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology, toward a unified view. *MIS Quarterly, 27*(3), 425-478. <https://doi.org/10.2307/30036540>
- Vrocharidou, A., & Efthymiou, I. (2012). Computer mediated communication for social and academic purposes: Profile of use and university student's gratification. *ComputerS & Education, 58*(1), 609-616. <https://doi.org/10.1016/j.compedu.2011.09.015>
- Wheaton, B., & Thorpe, H. (2019). Action sport media consumption trends across generations: Exploring the olympic audience and the impact of action sports inclusion. *Communication & Sport, 7*(4), 415-445. <https://doi.org/10.1177/2167479518780410>
- Yeboah, D., & Nyagorme, P. (2022). Student acceptance of WhatsApp as teaching and learning tool in distance higher education in sub-Saharan African. *Cogent Education, 9*(1), 2077045. <https://doi.org/10.1080/2331186x:2022.2077045>