
 Confirmatory Factor Analysis of the dimensionality of Students' Readiness of using Social-Media for Learning in Nigeria

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ABSTRACT

The adoption of Internet resources for learning continues to grow in the world today. Despite the abundant benefit of utilizing social media which is an offshoot of web 2.0, an internet resource for communication and interaction, its use have not been fully embrace as a teaching tool in Nigeria. In this study therefore, a confirmatory factor analysis was conducted to measure student readiness towards the use of social media in some selected universities in Nigeria. The participants of the study comprises of 700 hundred students from four universities in south-western Nigeria. A survey instrument was developed for the purpose of the study. The internal consistent and the validity of the instrument was established. The reliability of the instrument indicated 0.80, 0.84 and 0.70 Cronbach alpha values on each three construct respectively. A factor analysis with Varimax Rotation conducted revealed a three factor measurement scale on students' readiness and these are (Readiness, Willingness, and Awareness). A confirmatory factor analysis was conducted which confirm the three factors. Based on the result from the data analysis, the hypotheses of the study revealed a statistical relationship between the three constructs extracted. The study showed that there is no significant difference between male and female student readiness to use social media for learning. The study recommends the imperative deployment of social media for leverage teaching and learning among the present generation of students in the population sample for the study. It also provides an empirical measurement scale for ascertaining student readiness to use social media platform for learning in future.

Key words: Social-media, Confirmatory factor analysis, Readiness, Willingness, Awareness,

INTRODUCTION

The advancement of the Internet technology has significantly influenced human communication and interaction, as well as how teaching and learning is implemented, in the world today. The Internet is continuously increasing the convenience in accessing information among the present generation of students. The Internet has allowed the world knowledge to be placed at the finger-tip of the learner (Lever-Duffy & McDonald, 2011). The "Net-generation" as the present

students are known have shifted their interaction and communication online (Shittu, Kamal, & Ahmad, 2011). According to Donaldson (2011) the Internet have expanded communication methods, thereby increased opportunity for collaboration, access to traditional learning, and easy access to information. In the world today, the most prominent Internet resources that the students are familiar with for communication and interaction are social networking software.

Social media is an off-shoot of Web 2.0, and Web 2.0 is a second generation of the Internet technology that allows interactivity, connectivity and interoperability among users. Social media provides various features that allow participatory approaches where the users can contribute and produce his/her own content. It also allows convergence of tools that has created a new culture termed "collective intelligence" (O'Brien, 2007; Sunil, Alex & Deborah, 2009). Collective intelligence connotes that individuals can build collectively on each other's knowledge by forming "participatory communities". (Jenkins, 2006). The participatory culture is a culture community where all members contribute and pool collective knowledge, and compare collective intelligence in participatory communities to a pedagogical process that can be liken to scaffolding (Jenkins, 2006). In learning, scaffolding is a strategy used in providing support for student learning. The current thinking on the type and nature of learning that the 21st century learner should acquire inform the widely endorsement of social-media (Web 2.0 tool) for learning. Globally educators are encouraged to shift from traditional method of instruction to more students oriented and student centered collaborative approach (Jimoyiannis, Tsiotakis, Roussinos&Siorenta, 2013).

The push for adoption of social-media for educational activities continues to grow in the recent time because it can be used to foster students learning. Considering the rate of use of social media among the Net generation a number of institution across the world are now using it to supplement classroom instruction. While some critics were of the opinion that the present generations of students are using the site for unproductive and anti-social activities alone, some were of opinion that the site could be used to improve student technology proficiency thereby fostering student

learning. A study conducted on teenagers' use of social media in Malaysia by Shamsudin (2009) revealed that the teenagers are heavy user of social media and therefore it is important for the teacher to find a way of adopting the site for students learning in order to stem the tide of unproductive use of social media by these groups of user. Similarly, Pew Internet and American Life Project Survey also revealed that almost every teenager's in America were into social-media use. Though, the study reported that 60% of the student use social-media for educational related activities (Lenhart, 2010). The study further enumerates the potential of social media as a site that can be use in education for early identification of student needs; engaging student; increase student achievement; managing information about student; and a platform of providing access to marginalized student.

The evidence of adoption of social-media by the present generation of students either in the advanced or less-advanced society is in-refutable. From teenager, young adult to older students are increasingly connecting and communicating through the online social media platform. Despite the rate of usage of this new innovation in human communication, Goldfard, Pregibon, Shrein and Zyko (2011) reported that students and teacher have been reluctant to use social media for implementing curriculum. Wagner (2005) opined that the adoption of technology does not always translate to usage for learning. Therefore, there is need to probe into other variables that may encourage or hindered use of new innovation for educational related activities. First and foremost, it is imperative to understand users awareness and readiness to deploy an innovation for other purpose than what is been originally designed for. Technology readiness according to Erumban and deJong, (2006) in Elliot, Hall and Meng (2008) "is the extent to which individuals desire to use a new technology", while,

Parasuraman (2000) posited that "individual who are ready to use technology are more likely to use it". Similarly, Davis (1989) posited that perceived usefulness (PU) and perceived ease of use (PEOU) are the main reason why a user may accept or reject to use any technology.

Evidence abound that the students in advanced nation are using social-media for educational purposes. For instance, ECAR (2008) study showed that 49% of students reported to using social-media in their academic life as a way of communicating with their classmate and peers (Salaway & Caruso, 2008). Also, Al-Rahimi, Othman, and Musa (2013) reported the growing use of social media for learning in Malaysia. The success recorded in social media use for learning in developed nations has been reported in several studies, but in the case of less developed nation like Nigeria there are fewer empirical studies in the adoption of this new phenomenon for learning among the students. Therefore, this study is to determine the student readiness in the use of social media for learning in Nigerian. In doing this, the study try to identify variables that determine students readiness through factor analysis.

LITERATURE REVIEW

The reality in the world today is that social media has significantly altered human communication and interaction. Despite digital divide, almost all the present generations of students are using one form of technology or the other for communication as a result of invention of Information Technology devices and the Internet. For instance, Farhan (2014) reported that average undergraduate students in the world are in possession of one form of technology with Internet facility to connect with their friend and acquaintances on social media (Facebook). The feature in social media has

attracted its use for teaching and learning activities in the recent time because it has revolutionize the field of communication and how users access, exchange and share knowledge. Farhan (2014), Morofushi and Pasfield-Neofitou (2012), Lu and Churchill (2012), Ham and Schnabel (2011) reported a number of developing and developed nations like Malaysia, Saudi-Arabia, Japan, China, Hong-Kong, UK, and USA using social media as a teaching and learning tool.

In term of usage of this new media for learning in Saudi Arabia, Farhan (2014) study on awareness of using Facebook for learning among Hail University student revealed that the student has a positive awareness of using Facebook for learning activities. In fact, both male and female students are aware and ready to integrate the use of Facebook as a medium of learning. In a similar study on student readiness to use new technologies for learning conducted by Rahamat, Shah, Din, and Abd-Aziz (2013) reported that the participants of the study displayed readiness and positive attitude to the use of mobile technologies for learning. Al-Ammary, Al-Sharooqi and Al-Sharooqi (2014) study on the acceptance of social networking as a learning tool at University of Bahrain confirm student readiness to use SN for learning and that perceived ease of use and perceived usefulness are very important factors for predicting students' behavioral intention towards its use for learning. In addition, a study of students' readiness towards virtual classroom use for learning in Palestine conducted by Shraim and Khlaif (2014) revealed that the students have positive attitude towards the usefulness of virtual learning (e-learning) method but they are not ready to use it now for their learning. In terms of willingness to use virtual learning, 68% of the respondents of that study are keen to use it if it relevant to their learning needs, 58% indicated to recommend the method of study to their colleagues,

73% agree that they prefer the traditional and face-to-face method of learning than using online interaction. The study reported that 51% of students show willingness to adopt the new method of teaching in future.

Several studies have reported and address various issues of readiness of using and adopting of internet tools for teaching and learning among lecturers and students. Example of such study was Agboola (2006) study of the awareness and perceptions of academic staff in using e-learning in Malaysia. In that study, it was found out that e-learning training and e-learning confidence were practical importance in predicting e-learning readiness among the respondents of that study. So and Swatman (2006) finding on the readiness of Honk-Kong's primary and secondary school teachers to accept and adopt e-learning revealed that the teacher are not fully prepared to use internet tool. The study shows that there is significant difference between male and female primary and secondary school teachers' readiness for e-learning in Hong-Kong. However, Browning, Gerlich and Westermann (2011) study on the new hyper diverse approach to engaging students developed a measurement scale to determine student perception about social media. The findings from the scale provide a measure of readiness that the faculty member can use to ascertain student readiness to efficiently and effectively use social media for learning.

The study revealed among others that there was no significant difference between male and female belief about social media site adoption for education related activities.

There are streams of study that has bearing with this present study, among the studies was Aydin and Tasci (2005) in Turkey, the study assess the organizational readiness for e-learning with instrument that has four constructs: self-development, innovation, people and technology. Similar to that study was Watson, Winogran and Kalmon (2004) study which develop an instrument to measure an individual perceived readiness to use e-learning. In this study therefore, effort would be made to empirically measure student readiness to adopt social media for learning since it is a new tool which is currently gaining attention of educators all over the world.

METHODOLOGY

Sample

The study is a survey type and quantitative in nature. A questionnaire with 5 Likert scale option from Strongly Disagree (1) to Strongly Agree (5) was designed and administered on the respondents of the study. The sample of the study consisted of 750 students from selected universities in the South-West of Nigeria. In all, 150 students each from 5 higher institutions of learning were involved in the study.

Table 1: Characteristic of the Sample of the Study

| | Frequency | % |
|-------------------------|-----------|-------|
| Gender | | |
| Male | 294 | 56.3% |
| Female | 228 | 43.1% |
| Faculty of Study | | |
| Education | 387 | 74.1% |

| | | |
|--------------------------------------|-----|-------|
| Science | 63 | 12.1% |
| Engineering | 09 | 1.7% |
| Social Science | 63 | 12.1% |
| Level of Study | | |
| Undergraduate | 294 | 56.3% |
| Post-Graduate | 228 | 43.7% |
| Social Media used by Students | | |
| Badoo | 62 | 17.8% |
| Facebook | 492 | 94% |
| 2go | 256 | 49.7% |
| Faceparty | 18 | 3.4% |
| Twitter | 249 | 47.7% |
| Eskimi | 69 | 13.2% |
| Whatsapp | 390 | 74.7% |
| Maxit | 60 | 11.5% |
| Gtalk | 78 | 15% |
| Hi5 | 54 | 10.3% |
| Friendster | 45 | 8.6% |
| Ning | 15 | 2.9% |
| Frequency of Using SM | | |
| Daily | 396 | 75.9% |
| 2-3 Time a week | 93 | 17.8% |
| 2-3 Time a month | 15 | 2.9% |
| Once in a month | 15 | 2.9% |

The Table 1 above presents the demographic characteristic of the participants of the study. Out of 522 students that finally took part in the study, 294 that represent 56.1% were male, while 228 that represent 42.1% were female. Among the participants, 387 (74.1%) were education students, 63 (12.1%) were science students, 63 (12.1%) were social science students, while engineering students have the least participants with 09 (1.7%) in the study. In all, 294 (56.3%) were

undergraduate students, while 228 (43.7%) were at postgraduate level. On the frequency and the type of social media use by the students, the result showed that most of the students are using one form of social media or the other. Specifically, 62 (17.8%) indicated to use Badoo, 492 (94%) uses Facebook, 256 (49.7%) uses 2go, 18 (3.4%) uses Faceparty, 249 (47.7%) uses Twitter, 69 (13.2%) uses Eskimi, 390 (74.7%) uses Whatsapp, 60 (11.5%) uses Maxit, 78 (15%) uses Gtalk, 54 (10.3%) uses

Hi5, 45 (8.6%) uses Friendster, and 15 (2.9%) uses Ning social media. On the period and daily use of the social media, majority of the participants 396 (75.9%) indicated to be using social media on a daily basis.

Instrument’s Reliability and Validity

The main focus of this study is to conduct a confirmatory factor analysis of student readiness to use social media for learning from where the research hypotheses were generated. In doing this, the measurement items of the questionnaire were assessed to determine its content and construct reliability and validity. To improve the content of the measuring items, academic colleagues were asked to examine the

questionnaire for clarity and relevance. After which the items were pilot tested with a non-random sample of volunteers of thirty-five students. The essence of pilot testing is to empirically validate the reliability of measuring instrument so as to know its accuracy and precision. The data from pilot test were analysed with SPSS statistical package to determine the internal consistency of the measurement items. The reliability of the instrument demonstrated a value of 0.82 Cronbach alpha which is higher than 0.7 alpha value that is considered to be in the acceptable threshold (Al-Ammary et al. 2014).The result of factor analysis is presented below.

RESULT OF FACTOR ANALYSIS

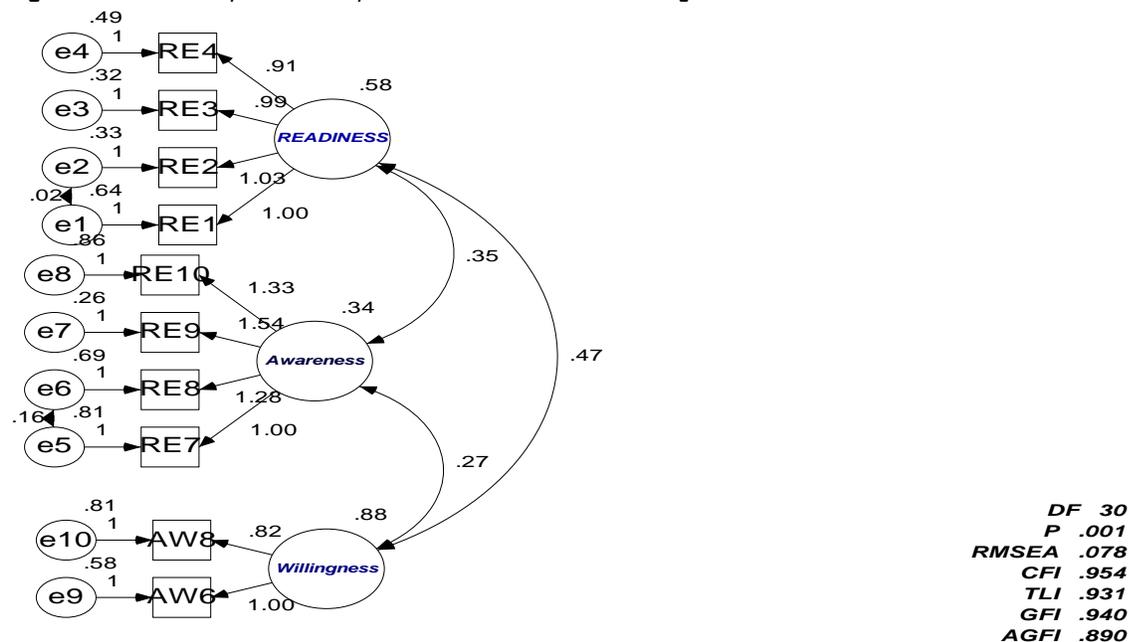
Table 2: Valid Items and Their Corresponding Loading, Average Variance Explain (AVE) and Alpha Values

| | Items Measure | Loading | Alpha =0.7 | AVE =0.5 |
|-------|--|---------|------------|-------------|
| Rel | I am interested in using social-media for learning | 0.60 | | |
| Re2 | Use of social-media will enhance my learning | 0.70 | | |
| Re3 | I will like to use social-media to learn when I have the opportunity | 0.62 | | |
| Re4 | I will like to learn about social-media use for teaching and learning | 0.64 | .80 | 0.56 |
| Wil7 | I see myself using social-media for my study | 0.67 | | |
| Wil8 | I am eager to see my instructor given assignments to us on social-media | 0.78 | | |
| Wil9 | Social-media will help us as students to catch up and revise the topics we learn | 0.80 | | |
| Will0 | All my mate will learn through social-media | 0.70 | .84 | 0.55 |
| Aw6 | I am aware that I can fulfill my learning desires with social-media | | 0.51 | |
| Aw8 | I have basic understanding of social-media use for learning | | 0.67 | .70 |
| | | | | 0.51 |

The Table 2 above presents the result of the factor analysis of the study. Due to the confirmatory nature of this study, factor analysis using principal component factor extraction with VARIMAX rotation was carried-out to identify the factors of this study. The result obtains showed KMO and Bartlett's test of sphericity of 0.86 this is greater than 0.50 cut off point (Nunnaly, 1978). Nineteen items were initially developed. Out of these items were some with offending estimate, which were removed. Three factors were finally extracted and these factors are Readiness, Awareness, and Willingness. The following common threshold was used to identify the three factors of the study. These thresholds according to Hair, Anderson, Tatham, and Black (1998) are a cut-point of 0.4 to 0.5 and no significant cross loading of items that is one item measuring two psychological constructs are considered an offending estimate. Another threshold is the

consideration of the Eigen value magnitude, the simplicity of factor structure and the exclusion of single item factor. A look at the result showed that loading on all the items of the study are in the range of 0.50 to 0.80 this result is considered adequate (Hair et al. 1998). In other to determine the internal consistency of the items of the study, the reliability of each factor was established by using Cronbach's alpha. The result exhibit a strong reliability with a threshold above 0.70, which is considered to have showed a proof of internal consistency (Nunnaly, 1978). Following this, is the computation of average variance explain (AVE) which is supposed to be greater than 0.5 (Fornell & Lurcker 1981). The entire construct were found to meet the parameter for computing confirmatory factor analysis, based on this, the psychometric properties of the instrument was considered suitable for the study.

Figure 1: Confirmatory factor Analysis with AMOS Statistical Package



The result of confirmatory analysis is presented in Figure 1 above. AMOS 16 statistical tool was used to estimate and confirm how related the identify construct of the study. In doing this, the goodness of fit for measuring the strength of relationship was examined. The fit indices include χ^2 , P-value, Root Mean Square Error of Approximation (RMSEA), Tucker Lewis Index (TLI), and Comparative Fit Index (CFI). According to

Hair et al. (2003), goodness of fit index (GFI), normed fit index (NFI) and comparative fit index (CFI) are best if above 0.90. The recommended value for RMSEA is (0.8). The confirmatory model of this study exceed their respective common acceptable parameter (Hair et al. 1998) indicating a good measurement estimate with the data of the study.

Table 3: Recommended value and the Result of Confirmatory Estimate

| Fit Indices | Recommended Value | Results |
|---|-------------------|---------|
| χ^2/df | 3 | 0.2 |
| GFI (Goodness of fit index) | 0.8 | 0.94 |
| RMSEA (Root mean square error of approximation) | 0.08 | 0.78 |
| CFI (Comparative fit index) | 0.9 | 0.95 |
| TLI (Tucker Lewis index) | 0.9 | 0.93 |
| NFI (Norm fit index) | 0.9 | 0.91 |

Given the result of the confirmatory estimate, the following hypotheses were generated and tested.

H1: There will be a positive relationship between student readiness and their awareness to use social media for learning

H2: There will be a positive relationship between student readiness and their willingness to use social media for learning

H3: There is no significance difference between male and female student readiness to use social media for learning

TESTING THE HYPOTHESES OF THE STUDY

To test the hypotheses of the study, the casual relationship of the specified measurement was observed in other to determine the statistical significance of the

correlation coefficient. The out-put of the measurement supported hypotheses 1 and 2, the finding showed that there is positive relationship between students readiness and their awareness to use social media for learning with path coefficient of (=0.35, p 0.005) with total variance explained of 0.58% on readiness and 0.34% variance on awareness. Similarly, the casual relationship of the measurement revealed that there is positive relationship between student readiness and their willingness to use social media with correlation coefficient of (=0.47, p 0.005) with total variance explained of 0.58% on readiness and 0.88% variance on willingness. T-test analysis of significant difference between male and female readiness to use social media was conducted with independent sample test.

Table 3: T-test analysis of male and female readiness to use social media for learning

| | gender | N | Mean | Std. Dev | T-cal | Df | Sig (2tail) | Mean diff | 95% Confidence Interval of the difference | |
|-----------|--------|-----|-------|----------|-------|-----|-------------|-----------|---|------|
| Awareness | male | 294 | 38.21 | 5.70 | 0.57 | 520 | .60 | .53008 | -1.39 | 2.45 |
| | female | 228 | 37.68 | 7.17 | | | | | | |

An independent sample t-test was carried-out to test the hypothesis (H3) that state that there is no significance difference between male (M=38.21, SD=5.70) and female, M=37.68, SD=7.17; $t(520)=0.57$ student readiness

use social media for learning. The finding showed that the magnitude of the differences in the mean (Mean Difference = .53, 95% CI: -1.39 to 2.45 is not statistically significant therefore the hypothesis is accepted.

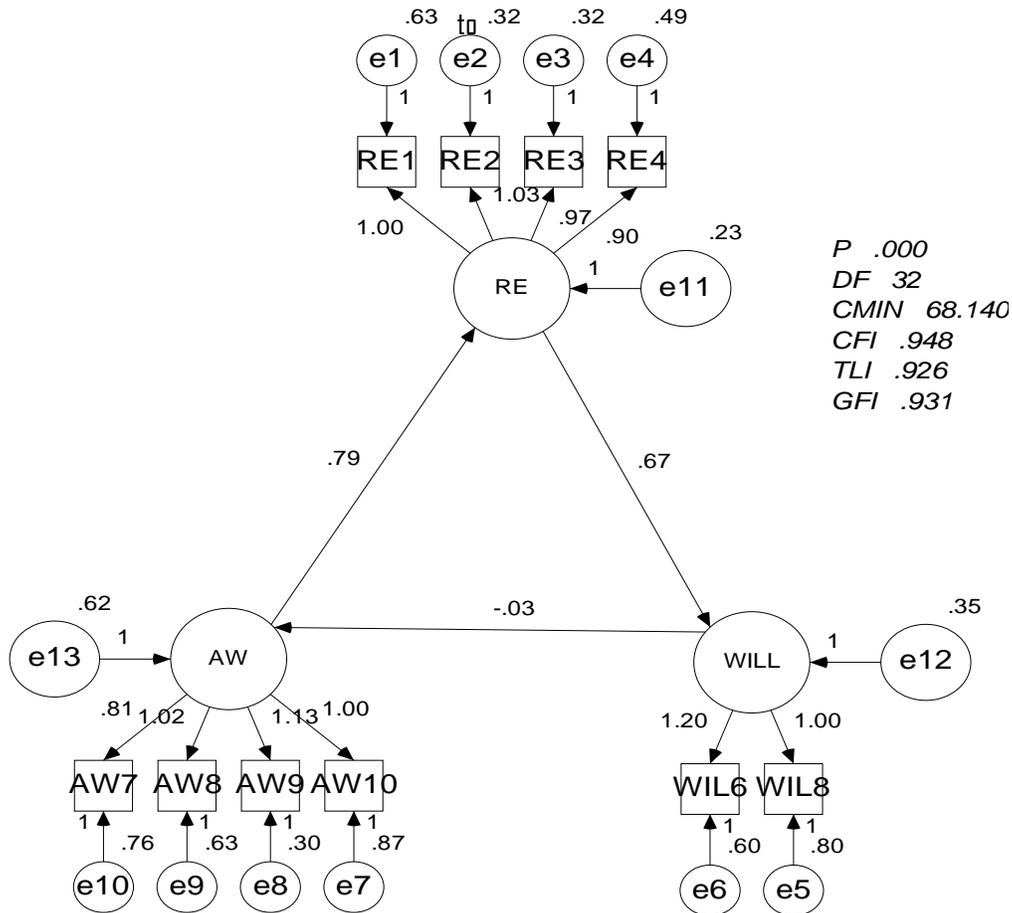


Fig 2: Readiness, Awareness, & Willingness to use Social media for Learning Regression Measurement Model

To further establish the critical mass of this study, measurement model was conducted to observe the effect size of the construct generated from the study. The output in (fig 2) revealed that the influence of student awareness on their readiness to use social media was statistical strong, the effect size show a ($f^2 = .79$; $P < .05$). Similarly, the effect of

their readiness on willingness to use social media show a ($f^2 = .67$; $P < .05$). Surprisingly, the effect size of student willingness on awareness to use social media for learning was statistically insignificant ($f^2 = -.03$; $P > .05$). The fit indexes of each of the construct are hereby presented in Table 4.

Table 4: Confirmatory factor analyses fit indexes of Readiness, Awareness and Willingness scale

| Scale | X ² | DF | CMIN | GFI | CFI | TLI |
|-------|----------------|-----|------|------|------|------|
| RE | 12284.1 | 0.2 | 0.6 | 0.99 | 1.00 | 1.00 |
| AW | 8380.7 | 0.2 | 5.98 | 0.98 | 0.98 | 0.94 |
| WIL | 3431.8 | 0.3 | 7.96 | 0.97 | 1.00 | 0.88 |

$P < .001$

DISCUSSION AND CONCLUSION

In line with the objective of this study, which aim at conducting a measurement scale for determined the student readiness for using social media for learning, nineteen items was initially developed for this purpose, factor analysis was conducted and all the items with offending estimate was removed from the final estimation with structural equation model. The factor analysis revealed a load on readiness, willingness, and awareness to use social media for learning. In furtherance of the objective of the study, three hypotheses was generated and tested. The findings of the analysis revealed that there are numerous social media which students indicated to be using almost on daily basis. Some of this media include Facebook, 2go, Twitter, Whatsapp and other social media, but facebook stood to be the most preferred site among the students. The finding was consistent with the finding of Browning et al. (2011) and the finding of Al-Ammary et al. (2014) who reported that majority of college and university students are using social media especially Facebook.

Furthermore, the hypotheses 1 and 2 of the study stand validated. H1: There will be a positive relationship

between student readiness and their awareness to use social media for learning. The finding of the study showed that there is statistical significant correlation between student readiness and their awareness to use social media for learning. The study revealed that all the respondents of study have account with social media. This is an indication of their awareness of the usefulness of social media. Once a technology is perceived to be useful and easy to use, there is likelihood that a user will use it (Davis, 1989). This finding is in congruent with Al-Ammary et al. (2014) finding that perceived usefulness was one of the strongest predictor of student intention to use social media in Bahrain. The finding equally supported the finding of Dwivedi, William, Ramdani, Niranjana and Werrakody (2011) study that revealed that perceived usefulness is a predictor of successful adoption of Web 2.0 application. Similar to that is the finding of Saeed, Yang, and Sunapan (2009) on user acceptance of second life, an extension of technology acceptance model, reported that usefulness is an important factor for adoption of technology that is related to teaching and learning process.

The second hypothesis that state that H2: There will be a positive relationship between student readiness and their willingness to use social media for learning. The hypothesis

equally stands validated. The study revealed a very strong relationship between student readiness and willingness to use social media for learning. This implied that once the student is ready to use social media this would arise their willingness to integrate it for teaching and learning activity taking into consideration their earlier intention on its usage was not for learning but for interaction and communication. The finding of this study was in tandem with Shraim and Khlaif (2011) on secondary school student in Palestine willingness to use e-learning sufficient it is relevant to their learning needs. The finding was consistent with Aydin and Tasci (2005), it also supports So and Swatman, (2006) finding which suggests that the present generation of Net generation would be ready and willing to use new media for learning. Therefore, the media should be used in form of blended or hybrid learning.

The third hypothesis that states H3: There is no significant difference between male and female student readiness to use social media for learning was statistically supported. The finding showed that there is no significant difference between male and female student readiness to use social media for learning. The finding was congruent with Browning et al. (2011) finding on a similar study of a measurement scale for student readiness to use social media, this study and that of Brown et al. recorded no significant difference in male and female readiness to use social media for learning related activities. Similarly, the study corroborates the finding of Rahamat et al. (2013) on male and female readiness toward the use of mobile technologies for learning. What this suggests is that the

RECOMMENDATIONS

The following recommendations are put forward based on the findings of the study:

- That it is high time for faculty members in higher institutions of learning to be considered

present generation of students possessed similar interest in technology use, most especially, communication and internet related technologies such as social media.

Conclusively, the study has shed light on the state of readiness of students in the population sample to social media use for learning in Nigeria. The finding indicated a strong readiness on the part of students and therefore, educators are encouraged to take advantage of this to deploy several social media applications for content delivery to the student. This becomes imperative because of the felt needs to leverage teaching through a medium that the students will prefer and to equip them with the required skill to make them a functional member of the present knowledge society and a life-long learner. Finally, faculty members in our universities could create a dedicated account for a course on social media for instance (Facebook) and use it for teaching through uploading learning content be it text, stream-video or make a link to other relevant internet material that will be of use to student learning. In doing this, the faculty member would be solving the problem of unavailability of course management systems in our universities, e.g. (LMS, Blackboard etc.) and it also serves as a means of familiarity with internet related resources for implementing the curriculum, so that when the universities finally provide learning management systems, they would find it easy to use. However, in the interim social media use could solve the problem of lack of LMS in our universities.

deployment of social media for instructional related activities

- That seminars and workshops should be organized periodically for updating knowledge of our faculty members in higher institutions of learning on new innovations of teaching the

present generation of student through the medium they preferred

- That in the absent of learning management system (LMS) higher institution of learning can take advantage of social media through productive use of the platform for reaching out to their staff and student as another way of going paperless and thereby reduce administrative cost.

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