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Use of Mobile Learning Applications and Academic Engagement of Library and Information Science Students in Universities in South-West, Nigeria

Julie Owansuan OLALERE
Department of Information Resources Management Babcock University, Ilishan-Remo, Nigeria.,
juliolalere@gmail.com

Opeyemi Deborah SOYEMI PhD

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Olalere, Julie Owansuan and Soyemi, Opeyemi Deborah, PhD
juliolalere@*gmail.com*

Department of Information Resources Management
Babcock University, Ilishan-Remo,
Nigeria.

+2348037266877

ABSTRACT

The study investigated the influence of use of mobile learning applications on academic engagement of Library and Information Science students in universities in South-West, Nigeria. The study adopted survey research design and questionnaire was used for data collection. One hundred and ninety-nine (199) copies of the questionnaire were administered out of which 184 copies were retrieved and fit for data analysis resulting in a 93% response rate. Analysis was done using SPSS version 23, percentages, mean, and standard deviation were used to analyse research questions and regression for the hypothesis which was tested at 0.05 level of significance. The findings revealed that the level of academic engagement of students was high, the purpose of use of mobile learning apps was for academic activities but the level of use of mobile learning application was low. The study concluded that the use of mobile learning apps had the capability to predict academic engagement of students. It was recommended that National Universities Commission (NUC) should include the provision of digital infrastructure and the use of mobile learning apps as part of the criteria for accreditation of courses in universities.

Key words: Mobile learning applications, Academic engagement, Library and Information Science students.

Globally, universities are established for the training of students who will become the skilled manpower for any nation and its development. This implies that students are meant to build their skills and become knowledgeable by engaging in academic activities offered at the university. Other stakeholders such as the university management, the faculty and parents exist to support the students. Therefore, universities will attain their aim if the students who

attend them are committed to their academic activities in order to acquire the knowledge and skills needed for the world of work. In other words, students who are committed to their academic activities are not likely to drop out but complete their programmes and be fit for the world of work while those who are not committed will be found wanting.

During orientation, the students who are newly admitted are educated on the need to be actively involved in and concentrate on their studies. Time is usually spent to emphasise the need for students to participate in academic activities, identify with values, rules and regulations governing the institution. Right from the beginning of their studies, some students seem to understand, concentrate and participate actively while others appear not to understand the significance of their studies. They get distracted, frustrated and engage in frivolous issues along the line because of the inability to manage their time and lack of self-direction. In Nigeria, in recent time, public perception about students' attitude to their studies has focused on some issues relating to students' engagement in their studies. Some appear to be overwhelmed by tasks to be done within a short time, inability to submit assignment on time, not being able to initiate learning, psychological /emotional/social (anxiety, depression) issues.

There is a general perception of falling standard of education which is debatable. There is the issue of unemployability, based on the fact that some universities graduates are apparently not fit for industries after graduation. Many of them appear to be half- baked graduates. Similarly, the general unemployment situation in Nigeria appears to have discouraged many students from devoting their full attention to their studies in the university. Such students feel that those who have graduated with good grades have no job to show for the years of commitment to their studies while in school. As a result, some exhibit lack of interest in their academic activities, concentrating on other non-academic matters they think can give them fulfilment. To worsen it, many universities appear not to have any safety net for students who have challenges with their studies. For further conceptual clarity, an indepth look at more definitions of academic engagement is necessary.

According to Ghasemi, Moonaghi and Heydari (2018), 'academic engagement' refers to students' participation in or attention to their academic work. Some other terms used to describe the concept of academic engagement are student engagement, study engagement and educational engagement (Delfino, 2019; Alrashidi, Phan & Ngu, 2016). Simply put, the term 'academic engagement' is the attention students pay to school work and their interaction with fellow students, teachers, school activities and school environments. Fredricks, Blumenfeld and Paris (2004) conceptualized academic engagement into three factors – cognitive,

behavioural and emotional. This study will adopt this tripartite (three-factor) dimensional model because it is widely accepted by most of the scholars; it is compact and covers students' activities in the university.

The cognitive dimension of academic engagement refers to students expending mental efforts to learning activities so as to understand the concepts. This enables the learners to involve themselves deeply in careful learning processes that are positioned in practical problem-solving tasks. It shows students' use of skills and resources in their participation in school work and the process of attending to assignments and learning experiences (Ekici & Ekici, 2021). It has been found that students who actively use their study materials benefit more from their academic pursuits (Barlow, Brown, Lutz, Pitterson, Hunsu & Adesope, 2020). This implies that students operate beyond route learning, showing self-study skills and advancing skills in personal study and group study, thereby expanding the area of study and research (Muthus, Sivaraman & Singh, 2015). Cognitive construct involves paper or computer-based test, examinations and writing of term papers.

The behavioural dimension is about students' academic, social and co-curricular participation. It involves students' effort, persistence, attention, participation and involvement in academic activities such as going to school, joining the class on time, and doing homework (Akyol & Erdem, 2021). In behavioural engagement, students manage their learning, think about tasks accomplished, ask for help, deploy problem solving methods, training themselves in effective interview, deploy creativity and analyse scientific information (Muthus, Sivaraman & Singh, 2015). To measure behavioural construct, some dimensions are key. These include registration for courses (paper/online), class attendance, participation in discussions during lectures and seminars, submission of assignments in the right format before the deadline and also participation in extracurricular activities. The attention of the students is usually attracted and their academic engagement is determined by the teacher's interaction style, instructional quality and teaching philosophy (Nepal & Rogerson, 2020).

Emotional engagement has to do with students' eagerness for school and involvement in school work. Emotionally engaged students want to participate in school activities and they enjoy that participation. This shows in their attentiveness, happiness, eagerness, weariness and other emotive states which have influence on students' participation with learning. Emotional engagement includes students' sense of belonging and values. It is about the positive and negative response to human and physical resources available in the school. Emotional engagement is measured by the ability to work with other students, attendance of social campus events like matriculation/departmental programmes and interaction with

students from other cultures in the class as well as halls of residence. Therefore, in this current study, the participation of LIS undergraduates in their academic activities is their academic engagement and this will be measured using the following three dimensions: cognitive, behavioural and emotional. Over the years, scholars have used several models and theories to explain use of mobile learning apps and academic engagement variables. Examples of such models and theories are: The paradoxical model of the negative uses and effects of ICT, 5-skill holistic model for digital literacy, E-Literacy model, Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT), Theory of Reasoned Action (TRA), Unified Theory of Acceptance and Use of Technology (UTAUT), Pedagogical Usability criteria for evaluating the digital learning material, Astin's theory of student involvement and Tinto's model of student integration.

However, the theories considered most relevant for this present study are: Unified Theory of Acceptance and Use of Technology (UTAUT) for use of mobile learning apps and Astin's model of student involvement for academic engagement.

On the interface between mobile learning applications and academic engagement, Omolade and Opesade (2017) reported that there is a link between use of mobile learning apps and academic engagement. The researchers went further to state that the use of mobile learning apps has the potential to improve academic activities and performance of students.
The concept of mobile learning applications (apps) can be explained as the programmes or soft wares used on portable smartphones for academic purposes. The use of mobile learning applications allows learning anytime, anyplace, and anywhere (Nasiri, Baba, Parkision, 2020). It is instantly accessible, anytime, anywhere, and helps to satisfy curiosity, to collaborate with others and enrich experiences (McQuiggan, Kosturko, McQuiggan & Sabourin, 2020). Using mobile learning apps makes education outside the classroom sustainable because it gives opportunity for interaction and facilitates learning at students' convenience. Smart phones through which the apps are accessed and used have, therefore, become a status symbol for undergraduates.

The acceptance or use of mobile learning apps for engaging in academic activities is growing tremendously. Today, more than ever, the use of mobile learning apps has become necessary for the purpose of academic engagement. For instance, the outbreak of corona virus in December 2019 from China to many parts of the world, according to United Nations News (2020), has necessitated compulsory school closure order which has affected about 1.5 billion students globally. Therefore, the UNESCO recommended distance learning programmes to

limit the disruption of education because of the outbreak of corona virus otherwise called 'COVID -19' across the world. One of the preventive measures recommended by the World Health Organisation (WHO) was social distancing to prevent the spread of the covid-19 virus. Already, in Nigeria, many teachers and schools who were initially sceptical or indifferent to the incorporation of digital tools in education have started adjusting by learning and using the mobile apps. So the use of mobile learning apps has enhanced students' academic engagement through online learning while the epidemic continues to ravage the globe. The post COVID-19 pandemic experience will likely lead to increase in the adoption of mobile learning applications for teaching and learning.

Advancement in technology has made smart phones not just useful for making calls and sending messages but also performing other functions such as academic, information sharing, and social networking, among others, because of the applications that are built in them. These applications are called mobile applications. According to Mansour (2016), mobile applications are categorised as follows; applications for news such as news 24nigeria, lindaikeji, newsnaij. Applications for social network/instant messaging include yahoo messenger, WhatsApp, Linkedin, Facebook, Twitter, Skype. For banking, the applications include u-mobile, access mobile, Gt bank mobile. Applications for education such as document to go, Pdf reader, Duolingo, Dictionary, Google translate, Wikipedia and Quick office; applications for games such as cash of clans, real football, green farm. Applications for health are blood pressure diary, woman calendar, bogy fitness guide, fitness calculator and my fitness pal. Massive Open Online Courses (MOOC) platforms such as Futurelearn, EdX, MIT Open CourseWare, Coursera, Udacity are some of the applications that allow students to take structured online courses (Soyemi, Ojo & Abolarin, 2018) and some of these mobile applications are used by Library and Information Science (LIS) students for their academic engagement, according to Nidn (2019).

Library and Information Science (LIS) undergraduates of today will become professionals in their work places in the future and are expected to adapt to the new technologies quickly. Students can record materials provided by the lecturers, access information sources to gather materials, view tutorial videos from the internet, discuss with friends and explain lecture materials using their smart phones. This saves space and time. This is because their smart phones can be carried everywhere and assignments can easily be discussed with friends and library catalogues could be searched.

In a review of research studies of mobile learning in higher education in Africa, Kaliisa and Picard (2017) observed that the use of mobile learning applications has increased

in higher education. Specifically, it was noted that the use of mobile learning apps enhanced student and lecturer collaboration, students' access to course materials, greater students' control over their learning, student participation and engagement (e.g.Osang, Ngole & Tsuma 2013; Gachago, et al, 2015). Similarly, students who had access to the courseware of blended learning programme experience enhanced student-student and student-lecturer communication especially through the use of mobile applications such as Facebook, WhatsApp, Twitter, among others (Mansour, 2016). This experiment also recorded increase in students' engagement and participation, as students reported that they enjoyed the classes. However, Kaliisa and Picard (2017) added that there were challenges such as poor attitude among students and distractions.

There is a dearth of literature on the use of mobile learning applications by Library and Information Science (LIS) students in Nigeria and the interface between use mobile learning application and academic engagement of (LIS), hence the need for this study. The specific objectives are: determine the level of use of mobile learning apps of Library and Information Science students in universities in South-West, Nigeria; determine the purpose of use of mobile of mobile learning apps by Library and Information Science students in universities in South-West, Nigeria; and determine the influence of use of mobile learning apps on academic engagement of Library and Information Science students in universities in South-West, Nigeria.

The research questions that guided the study are:

i. What is the level of academic engagement of library and Information Science students in universities in South-West, Nigeria?
ii. What is the level of use of mobile learning apps by Library and Information Science students in universities in South-West, Nigeria?
iii. What is the purpose of use of mobile learning apps by Library and Information Science students in universities in South-West, Nigeria?

The hypothesis of the study is as follows:

Ho1: Use of Mobile learning apps will not significantly influence academic engagement of Library and Information Science students in universities in South-West, Nigeria.

The remaining part of the study is structured as follows: Review of literature and the theoretical framework followed by the methodological details adopted in the study and then the results. A discussion of the findings is followed by the conclusions, recommendations and suggestions for further studies.

Use of Mobile Learning Apps and Academic Engagement of Undergraduates

The last decade has witnessed a drastic change in the education system around the world as online or digital education has become the norm. A key player in this revolution is the educational mobile apps which help students in the learning process. Adeoye and Adeoye (2017) recommended that lecturers and other academic staff should use electronic media resources in delivering lectures in order to challenge the confident level of undergraduates in using electronic media. Learning appears to be simpler as students migrate from the old/traditional mode of learning to mobile apps.

However, some apps fail to meet the needs of students (Wai, Ng, Chiu & Ho, 2017) carried out a study on exploring undergraduate usage pattern of mobile apps for education. This study used quantitative and qualitative methods to collect data from 150 undergraduate students in Business, Education, and Engineering in Hong Kong. This study took place in Southeast Asia. It was revealed that undergraduate students use mobile apps frequently to engage in learning activities related to their academic studies, with a particular focus on communication and collaborative working, accessing academic resources, and checking a dictionary. It is hoped that tertiary institutions, library service providers and educators will develop strategic planning for education in collaborating with the use of mobile apps.

In another study, Lau,Chiu, Ho, Lo, See-To (2017) investigated the differences of the user needs between undergraduate (UG) and postgraduate (PG) students through an online survey with 140 Library Information Systems (LIS) subjects in a Japanese university in order to provide solid foundation for future m-learning studies. It was found that UG and PG students do not show significant differences in adopting m-learning by smartphones despite the fact that they have different learning patterns. The students tend to use these services for handling their daily routines rather than their academic activities. Toperesu, Belle and Turpin (2019) studied the impacts and satisfaction of using smartphones for learning in a university context. This study took place in South Africa and the study used online survey distributed via e-mail to students at a South African university to collect quantitative data. It was found that most students agreed that they can access learning materials from their smartphones, which is of particular importance in enabling mobile learning from a smartphone. Moreover, Kizilcec and Chen (2020) investigated how 93,819 Kenyan students in grades 6, 9 and 12 use a text message-based mobile learning platform. This study took place in Kenya. It was a longitudinal study and the findings revealed that students in Kenya use mobile learning either as an ad-hoc resource or a low-cost tutor to complement formal schooling and bridge gaps in instruction. Dahdal (2020) carried out a study that examined the using the WhatsApp Social

media Application for Active Learning. The study examined the use of WhatsApp as part of course gradable assignments and weekly pre- and post-lecture discussions. The study is based on a survey and interviews conducted with undergraduate university students in the United Arab Emirate (UAE).

The results showed that students are more engaged with assignments that have WhatsApp embedded within the assignment structure. Haron, Abri, Alotaibi (2021) investigated the use of WhatsApp in Teaching and Learning English during COVID- 19: Students' Perception and Acceptance. This study was conducted in Malaysia, a total of 66 students in Penang who have smartphones with WhatsApp were assigned into experimental and control groups. The result revealed that there is a positive perception and acceptance of the use of WhatsApp for teaching and learning. Sharma and Madhusudhan (2017) provided an insight of actual use of mobile devices by LIS students in everyday life and their perceptions regarding the usefulness and effectiveness of mobile phones for academic purpose in Central Universities in Uttar Pradesh State, India. The findings of the study revealed that most of the students use mobile devices daily for more than three hours and Gmail app, Whatsapp, Google app, adobe reader and PDF viewer are the most frequently used mobile apps.

A research was conducted by Rahaded, Puspitasari, Hidayati (2020) to find out about the impact of WhatsApp on undergraduate students' behaviour in the teaching and learning process. This study was descriptive qualitative research. The data were analyzed using descriptive analysis technique. The data were collected using interviews, observation, and documentation. The result of this research showed that there is a positive impact of WhatsApp on student behaviour as it affects the learning process such as, students' sharing knowledge, student preparation for class, attention, student participation in class, student learning, desires to take additional classes or in subject matter. Kobayashi (2015) investigated perceived ease of use and usefulness of Google Hangouts as an instructional/learning tool. After the activity, students responded to a survey to evaluate the ease of use and usefulness of Google Hangouts. Qualitative data were also collected through the survey to examine their overall learning experience.

The results indicated that Google Hangouts is a useful instructional tool, but not easy to use. This is because of the technical issue that does happen during conference. The study provides suggestions as to how Google Hangouts can be integrated into online classrooms based on the findings. Wise, Skues and Williams (2011) examined Facebook usage among first year psychology students cohort and reported that although the majority of students

(94%) had Facebook accounts and spent an average of one hour per day on Facebook; its usage was found to be predominantly social. Personality factors influenced usage patterns, with more conscientious students tending to use Facebook less than less conscientious students. This paper argues that, rather than promoting social engagement in a way that might increase academic engagement, it appears that Facebook is more likely to operate as a distracting influence.

The use of mobile apps which incorporates mobile devices through various technologies such as the use of software applications for academic purposes is not a new innovation. Schools and educators such as teachers and school administrators have utilized these devices to differentiate instructional strategies and methods and hence augment teacher-led instructional methods of teaching to enhance the teaching and learning experiences (Tetzlaff, 2017). Similarly, Heflin, Shewmaker and Nguyen (2017) noted that the use of mobile technology in education provides educational stakeholders with opportunities to revisit the teaching and learning to meet modern development in technology which is different from the traditional pattern of educational delivery. This transformation in the teaching methods which is from teacher-focused to student-focused educational strategies has provided more flexible learning models and opportunities that provided both the teachers such as the faculty members and the students the access to multiple information sources. This is a shift from the well-known authority-based learning structure which was a common practice of teaching of the traditional methods of teaching and learning to a structure-based method which includes the use of mobile technologies to support the community of learners such as undergraduate students in universities (Hamm, Saltsman, Jones, Baldridge & Perkins, 2013).

There have been significant investments in the use of technology for students even at the global levels such as in the use of mobile learning which cuts across the cumulative use of mobile phones and other hardware and software applications for educational purposes towards enhancing the learning outcomes among students. However, there is the lack of information or data to investigate the effects of these technologies such as the use of mobile apps on students' academic outcomes such as academic engagement towards enhancing students' performances. Reflianto, Setyosari, Kuswandi and Widiati (2021) carried out a study on measuring effect of online flipped classroom learning and student engagement during the covid-19 pandemic using Microsoft team and WhatsApp. The study used quasi- experimental model with 2 x 3 factorial pre-test post-test non-equivalent control group design and the population used was early period

undergraduates of Management Economic Study Program. The findings revealed that online flipped learning was better than WhatsApp in improving student engagement and reading comprehension.

In an investigation conducted by Fabian (2019) on students' engagement in mobile learning activities: Breakdowns and Breakthroughs, this study was to evaluate students' engagement in a series of mobile learning activities. The study used critical incident analysis to evaluate the breakdowns and breakthroughs of mobile learning. The study took place in United Kingdom. The findings of the study revealed that mobile learning activities were found to have facilitated visualisation, encouraged reflection and promoted active learning. However, some issues regarding mobile use has affected students' engagement with the activities. Teng and Wang (2021) conducted a study on the effect of two educational technology tools on student engagement in Chinese EFL courses. This study aimed to explore the relationship between technology tools and three dimensions of student engagement. The result revealed that emotional engagement has the strongest positive effect on educational technology engagement.

Also, analysis of the four principal factors indicates that using Learning Manangement System (LMS) could engage students more than adopting social networking systems. Kizilcec and Chen (2020) investigated student engagement in mobile learning via Text Message. The study made findings on how 93,819 Kenyan students in grades 6, 9, and 12 use a text message-based mobile learning platform that has millions of users across Sub-Saharan Africa. This study was longitudinal and a survey design. It was revealed that Kenyan students use mobile learning either as an ad-hoc resource or a low-cost tutor to complement formal schooling and bridge gaps in instruction. Ansari and Khan (2020) carried out a study on exploring the role of social media in collaborative learning the new domain of learning, This study examined the application and usefulness of social media and mobile devices in transferring the resources and interaction with academics in higher education institutions across the boundary wall. The study is a survey of 360 students of a university in Eastern India, focusing on students' perception of social media and mobile devices through collaborative learning, interactivity with peers, teachers and its significant impact on students' academic performance. The result revealed that online social media use for collaborative learning had a significant impact on interactivity with peers, teachers and online knowledge sharing behaviour. Interactivity with teachers, peers, and online knowledge sharing behaviour has seen a significant impact on students' engagement which consequently has a significant impact on students' academic performance. It was concluded that use of

online social media for collaborative learning helps students to be more creative, dynamic and research-oriented. It is purely a domain of knowledge.

Academic engagement describes the involvement of students in academic learning, academic achievement and it influences students' success (Assuncao, et.al, 2020). Sample for this study included senior high school students from two different contexts: Vientiane capital and Luangprabang in Southeast Asia. Convergent parallel design was employed and a purposive sampling technique was the method used. The findings revealed that teacher and peer interactions are the most powerful factors predicting their academic engagement. It implies that students consider the kindness and friendliness of teachers to be important for their engagement. Moreover, the students in the sample also indicate that they are more engaged in learning if teachers provide opportunities to have discussions with peers. It then implies that creating an engaging learning environment for students is very important.

Also, Bawa and Suleiman (2017) investigated social media addiction and academic engagement among undergraduate students of Usmanu Danfodiyo University Sokoto, Nigeria. The study was purposive and 370 undergraduate students from the population of 12,300 across four faculties formed the sample. Self- developed questionnaire was the instrument used to collect data from the respondents. It was found that the addiction level of the undergraduates' social media use was high and their academic engagement was low. It also was discovered that there was strong inverse relationship between the social media addiction and academic engagement of the undergraduate students with $r(368) = -0.91$, $p<0.05$. Adeniji and Mabekoje (2019) studied influence of family functioning on academic engagement of secondary school adolescents in Ogun State, Nigeria. Descriptive cross-sectional survey research design was adopted and multi-stage stratified random sampling technique was used. It was revealed that there was a significant influence of family functioning on students' academic engagement. It then implies that students' academic engagement depends on family functioning.

In their study, Kim, Hong and Song (2019) examined university students' perceptions of e-learning, based on their experiences and the mediating roles of academic engagement and digital readiness within the university context of an e-learning environment for academic achievement. This study was done in Korea and the population used for the study was a total of 614 undergraduate students enrolled in a Korean university participated in this study. This study used descriptive research design. The result revealed that students must possess digital skills to be able to perform academic activities in this technology era. Sengsouliya, Soukhavong, Silavong, Sengsouliya and Littlepage (2020) investigated predictors of student

academic engagement. The study employed a convergent parallel design. Both quantitative and qualitative which involved the use of questionnaires, interviews, and observations were used. Behavioural and emotional dimensions had the highest engagement scores *(*= 3.45; = 3.42*)*, showing that the students in the sample are likely to be engaged in learning behaviourally and emotionally. Only 71 students from the two schools participated, though according to the author, it was a purposive sampling that involved the students with good learning achievement (DeVito, 2016). The gap in this study is that the sample used is small. The population ought to have been more than that which invariably could have increased the sample and a more reliable data would have been gotten that could be generalised.

Another study conducted by Mahdiuon, Salili and Laleh (2020), found that the adoption of telegram among the students has a positive effect on academic engagement. The educational use of telegram affects academic performance in a mediating role of student engagement. Bakhshaee and Hejazi (2017) in a study to investigate the perception of the school climate, their teachers' academic optimism on academic engagement among students, found that the perception of students' autonomy had significant impact on the students' academic engagement and also, the teachers' efficacy influenced students' academic engagement. A critical component of quality digital education is to ensure student engagement (Rajabelee, Santally & Rennie, 2019). A study carried out by (DeVito, 2016) on factors influencing students engagement revealed that collaboration, communication, active involvement in learning activities, classroom and family environment influence student engagement in school activities. This study was a qualitative method. Survey, observation and focus group interview were used so as to allow classifying the factors. What libraries can do to support academic engagement is to develop tools to support students' interaction in the course management systems and virtual worlds, assist faculty in the creation of course curriculum and an online book discussions (Kenton & Blummer, 2010).

The four pillars of tertiary student engagement and success: a holistic measurement approach was investigated by Bowden, Tickle and Naumann (2019). This research was done in Australia and it was revealed that Students' expectations and involvement determine academic engagement of students. Iroegbu and Agboola (2019) investigated student engagement variables and first year undergraduates retention rate in the University of Uyo, Akwa Ibom State, Nigeria. This study used descriptive survey research design. Purposive and simple random sampling techniques were used. The population was 3,447 first year undergraduates of the University of Uyo and the sample size was 548 first year undergraduates studying four-year course in University of Uyo. Data was collected through

the use of Student Engagement Questionnaire (SEQ) and a documentary analysis checklist. It was revealed that student engagement variables of active learning, student-faculty interaction, teaching strategies and co-curricular activities significantly predicted first year undergraduate retention rate in University of Uyo, Akwa Ibom State. It then implies that faculties should create a healthy learning atmosphere and positive student-faculty interaction in order to guarantee student retention. It will be interesting to consider the academic engagement of the final year students.

Also, Tetzlaff (2017) noted that there are few empirical studies on how these components of digital devices such as the use of mobile apps could impact students learning and engagement in the school context. Although mobile learning apps effectiveness is a major concern in the education system but there is need to investigate several factors that could influence its usage and also the several factors that it has affected such as students' academic engagements and also students' performance (Pechenkina, Laurence, Oates, Eldridge & Hunter, 2017). Apart from this, regardless of the age of students, the use of such mobile learning app for enhancing learning and learning outcomes is most effective when students are engaged, cognitively active and guided by a unified and common goal, and when academic activities are interactive (Hirsh-Pasek, Zosh, Golinkoff, Gray, Robb & Kaufman, 2015; Pechenkina et al., 2017). For older learners who may not be part of the digital natives, however, some selected set of factors may be deemed important to influence the patterns of their learning and behaviours which could influence their engagement and also their performance such as their motivation to use, expectations and prior experiences on previous technology use (Salmon, Pechenkina, Chase & Ross, 2016).

Meanwhile, Darling-Hammond, Zielezinski and Goldman (2014) contended that if appropriate strategies are put in place for the implementation of digital technologies in classrooms such as mobile app usage through mobile devices, it could increase student learning, their academic engagement and productivity. In a study, using mobile technology to increase the Math achievement and engagement of students, Tetzlaff (2017) found that teachers gladly stated that differentiating instructional method such as involving the use of mobile apps through various mobile technologies was not a significant factor to provide effective Math achievement or the engagement of students. Another study by Morris, Lambe, Ciccone and Swinnerton (2016) investigated the perceived benefits of mobile apps for learning neuroanatomy among students, and found that students were more engaged in the use of mobile technology such as the use of mobile apps with their mobile devices in their academic study.

Another study by Pechenkina, Laurence, Oates, Eldridge and Hunter (2017) investigated whether the use of a mobile learning app influence students' academic performance and boost their engagement. Their study revealed that mobile learning app usage has significant effect on students' academic engagement in lecture content. This was different from Sung, EN Chan and Liu (2016) in their study, who found that mobile learning apps use with gamified elements did not appear to provide significant positive effects on learning and learning outcomes among students. There is a difference in the results of Sung et al. (2016) and Pechenkina et al. (2017) as regards the effect of use of a gamified mobile learning app on students' academic engagement and performance, This difference is possible because the game elements could only work in accord with other aspects of the intervention for it to have positive impact on student learning such as their engagement and performance (Laine, Nygren, Dirin & Suk, 2016).

Juxtaposing the studies of Darling-Hammond, Zielezinski and Goldman (2014); Pechenkina et al. (2017) and Tetzlaff (2017), it shows that mobile app usage among schools such as teachers and students did not show significant effect on academic engagement and achievement of students and that appropriate strategies were not put in place and utilized for the implementation of these digital technologies in classrooms. Another reason for the lack of effect of mobile app usage on academic engagement of students could be traced to the works of Hirsh-Pasek et al. (2015) and Pechenkina (2017) that even though mobile applications (apps) usage as learning and teaching tools are not uncommon in Higher Education (HE), what makes an educational mobile app effective is the use of such mobile app on the subject of on-going interest to academics, lecturers, learning designers and other stakeholders interested in education system.

In addition, question-prompting and automated immediate feedback combined with explanatory strategies in the use of mobile apps in mobile devices could also explain the reasons for a differential effect of the use of mobile app on students engagement among different users (Sung, Chang & Liu, 2016). In addition, Garbrick and Clariana (2015) suggested that the use of 'push notification' technology was also deemed useful when tasked with encouraging immediate learning and helping students stay up-to-date with academic content provided. Also of importance is the mobile learning length of intervention's and could have significant influence on intervention's effectiveness, with longer interventions found to be more effective as they allowed students to be fully integrated into the learning process mainstream, with the achievement of the desired effects over time (Sung et al., 2016). According to Sung et al. (2016), learners' age is also another important factor affecting the

use of mobile app for academic intervention towards enhancing students' academic engagement and success because groups of learners homogenous in age showed higher rates of impact compared to the mixed age groups.

Meanwhile, because student-centred learning demand for personalized learning options is growing (Wanner & Palmer, 2015), it is very important to understand the various factors and dimensions of the personal mobile learning apps usage. This is due to the ubiquitous state of mobile device usage among the digital natives to be able to take timely advantage of mobile app technologies to create new learning options for students to personalize their educational experiences (Pechenkina et al. 2017) hence, the need for this study. This study investigates the effect of mobile learning apps usage on academic engagement among undergraduates in Nigerian universities.

In summary, learning mobile apps are portable, have instant connectivity and context connectivity. Many of the studies on use of mobile learning apps are based on the technologically advanced countries, so there is the need to focus on a third world context of Nigerian undergraduates. Mobile learning apps make collaboration between students and lecturers possible. UNESCO believes that some educational applications such as Moodles, Google classroom, Edmodo, Zooom Ekstep are helpful to students, readers and school administrators. Similarly, the most popular apps for education are Facebook, WhatsApps, E-mail; Youtube, Twitter,and Wikipedia for LIS undergraduates, applications such as Moodle, Google meet, Zoom, Google classroom, Google Chrome, Facebook, Evernote, YouTube, WhatsApps and Twitter are useful. This study, therefore, focuses on their uses and the interface with students' academic engagement.

Theoretical framework

Academic engagement in this study is anchored on Astin's model of student involvement. The theory predicts that students who are more involved in school activities, in both the academic and social spheres, have better outcomes than students who are not as involved. Binti, Fadhilah, and Anuah (2018) explained that the theory of involvement emphasize active participation of the student in the learning process. Therefore, institutions are encouraged to focus less on what they do and focus more on what the students do, how motivated the students are and how much time as well as energy they devote to the learning process. Students, who study, interact with faculty and other students, spend time on campus and participate in student organizations would be considered involved students. Student involvement theory states that students play an integral role in determining their degree of

involvement in college classes, extracurricular activities and social activities. Therefore, the more quality resources are accessible to students, the more likely those students will develop academically and wholistically (Astin, 1984).

In addition, the Unified Theory of Acceptance and Use of Technology (UTAUT) will drive the use of mobile learning applications. The relevance of this theory to this study is based on the fact that performance expectancy, effort expectancy, social influence and facilitating conditions are determinants for individual's behaviour towards the use of technology. Performance expectancy is person's beliefs about the benefits of using technology and it is the strongest predictor of the behavioral intention to use technology (Venkatesh et al, 2012). It is the degree to which users believes that using information system can improve their work performance. Students believe that their use of mobile apps can improve their academic engagement. It then implies that the more the students perceive that mobile learning apps will improve their academic performance, the more their use of mobile learning apps for academic engagement.

Methodology

This study adopted the Survey Research Design. The study population comprised 518 Library and Information Science students in universities in South-West, Nigeria. To determine the sample size of the study using Taro Yamane's (1973) formula, a sample size of 199 was gotten. One Hundred and Ninety Nine (199) was selected from the population of Five Hundred and Eighteen (518) which is the population for the study. The sampling technique in this study is multistage sampling technique. One Hundred and Ninety Nine (199) was the sample size. Multistage sampling technique is a sampling strategy (e.g, gathering participants for a study) used when the entire population is divided into naturally occurring clusters from which the researcher randomly selects the sample (Taherdoost, 2016). The questionnaire was the main instrument of data collection. It was structured as follows:

Section A: Demographic information of the students

This section contains questions on the demographic information of the students considered for this study. This section elicited information such as the age of the students, gender and name of university.

Section B: Use of Mobile Apps

This section contains the use of mobile learning apps scale. This section is divided into two subsections: frequency of use and purpose of use of mobile learning apps. The first

part which is the frequency of use of mobile learning apps has (18 items) and the scale measured the frequency of use of mobile learning apps adapting likert scale of Daily =5; Weekly=4; Monthly=3; Bimonthly=2; Never=(1) while the purpose of use has (11 items).

Section D: Academic engagement

This section contains three subsections viz: cognitive, behavioural and emotional academic engagement. Cognitive has (8 items), behavioural (8 items) and emotional (8 items) measured on a five point likert scale of Very High Level (VHL) =5; High Level (HL)= 4; Average Level (AL)= 3; Low Level (LL)= 2 and Very Low Level (VLL)=1. The variables for the study were subjected to reliability test using the SPSS, the instrument was considered valid and reliable (0.978). A total of 199 copies of the questionnaire were administered and 184 copies were retrieved and fit for data analysis resulting in a 93% response rate. The demographic characteristics of the respondents revealed that 102 (55.4%) of the respondents were 21-25 years old, indicating that majority of the respondents were young adults. The result equally revealed that 101 (54.9%) of the respondents were female and 83 (45.1%) were male students. This means that there are more female Library and Information Science students than their male counterparts. Tai Solarin University of Education has 136(73.9) of the respondents. This means that it has more Library and Information Science students.

RESULTS

In this section, the researcher presents the descriptive analysis of all the study variables to answer stated the research questions.

Research Question one: What is the level of academic engagement of Library and Information Science students in universities in South-West, Nigeria?

This question sought to find out the level of academic engagement of Library and Information Science students in universities in South-West, Nigeria as contained in the first specific objective of the study. The academic engagement scale is measured with the following rating VHL=Very High Level; HL=High Level; ML=Moderate Level; LL=Low Level; VLL= Very Low Level while SD stands for standard deviation.

Table 1: Level of academic engagement of Library and Information Science students

	Very High Level (%)	High Level (%)	Moderate Level (%)	Low Level (%)	Very Low Level	Mean	SD

BEHAVIOURAL ENGAGEMENT						**3.93**	**1.04**
I attend the minimum(75%) lectures for each course	75(40.8)	70(42.9)	14(7.6)	8(4.3)	8(4.3)	4.11	1.021
I submit assignment before deadline	66(35.9)	82(44.6)	21(11.4)	8(4.3)	7(3.8)	4.04	.996
I register early for my courses before deadline	61(33.2)	87(47.3)	21(11.4)	5(2.7)	10(5.4)	4.00	1.024
I participate actively in group work discussions	60(32.6)	84(45.7)	24(13)	9(4.9)	7(3.8)	3.98	1.000
I participate actively during lectures	52(28.3)	92(50)	22(12)	9(4.9)	9(4.9)	3.92	1.018
I discuss ideas from my studies with others	57(31)	81(44)	26(14.1)	10(5.4)	10(5.4)	3.90	1.074
I use the library resources of the university	54(29.3)	81(44)	27(14.7)	15(8.2)	7(3.8)	3.87	1.048
I participate in co-curricular activities on campus	42(22.8)	86(46.7)	25(13.6)	16(8.7)	15(8.2)	3.67	1.160
EMOTIONAL ENGAGEMENT						**3.93**	**1.02**
I develop communication skills relevant to my career	65(35.3)	80(43.5)	25(13.6)	10(5.4)	4(2.2)	4.04	.951
I am friendly with other students	70(38)	76(41.3)	22(12)	6(3.3)	10(5.4)	4.03	1.060
I am confident of doing well in my academic work	60(32.6)	87(47.3)	23(12.5)	8(4.3)	6(3.3)	4.02	.961
I have fun with my course mates	60(32.6)	85(46.2)	26(14.1)	8(4.3)	5(2.7)	4.02	.944
I interact easily with students from other cultures	65(35.3)	78(42.4)	26(14.1)	10(5.4)	5(2.7)	4.02	.980
I work with other students easily	51(27.7)	84(45.7)	29(15.8)	10(5.4)	10(5.4)	3.85	1.060
I discuss my career with my classmates	49(26.6)	82(44.6)	28(15.2)	11(6)	14(7.6)	3.77	1.138
I attend social campus events	49(26.6)	73(39.7)	37(20.1)	14(7.6)	11(6)	3.73	1.116
COGNITIVE ENGAGEMENT						**3.84**	**1.01**
I seek to improve on cognitive skills that can make me employable	60(32.6)	87(47.3)	23(12.5)	6(3.3)	8(4.3)	4.01	.989
I strive to get a good grade in each course	62(33.7)	82(44.6)	24(13)	7(3.8)	9(4.9)	3.98	1.032
I evaluate the value of any information I come across	56(30.4)	87(47.3)	28(15.2)	8(4.3)	5(2.7)	3.98	.938
I look through my notes between classes to ensure I understand them	46(25)	90(48.9)	27(14.7)	12(6.5)	9(4.9)	3.83	1.036

I apply the theories to practical problems/the course contents	42(22.8)	91(49.5)	33(17.9)	7(3.8)	11(6)	3.79	1.030
I start studying early in the semester	37(20.1)	95(51.6)	31(16.8)	13(7.1)	8(4.3)	3.76	.996
I write my term papers without supervision	39(21.2)	87(47.3)	37(20.1)	11(6)	10(5.4)	3.73	1.036
I prepare two or more drafts of an assignment before submitting it	31(16.8)	96(52.2)	31(16.8)	13(7.1)	13(7.1)	3.65	1.066
Grand Mean						**3.90**	**1.02**

Source: Researchers field work, 2022

Decision Rule: if mean is ≤ 2.99= low, 3.0-3.49=Average, 3.5-4.49=high, 4.5-5.0=very high

The result presented in table 1 reveals the level of academic engagement of the participants. The grand mean (3.90, SD=1.02) showed that the level of the students' academic engagement is high. The result also revealed that the behavioural engagement (mean=3.93), emotional engagement (mean=3.93) and cognitive engagement (mean=3.84), and emotional engagement (mean=3.93) were high. Under behavioural engagement, the respondents indicated that they attend the minimum 75% of lectures for each course (mean=4.11), submit assignments before deadline (mean=4.04), and register early for their courses before the deadline (mean=4.00). On emotional engagement, the respondents indicated that they develop communication skills relevant to their career (mean=4.04), and they are confident of doing well in their academic work (mean=4.02). They also indicated they are friendly with other students (mean=4.03), hence they have fun with course mates (mean=4.02), as well as interact with students from other cultures (mean=4.02). Under cognitive engagement, the respondents indicated that they seek to improve cognitive skills that can make them employable (mean=4.01), they strive to make good grades in each course (mean=3.98), evaluate the value of any information they come across (mean=3.98), and look through their notes between classes to ensure they understand them (mean=3.83).

In summary, the behavioural engagement, emotional engagement cognitive engagement of Library and Information Science students is high. This means the students are active participant in their academic activities.

Research Question two: What is the level of use of mobile learning apps of Library and Information Science students in universities in South-West, Nigeria?

This question sought to find out the level of use of mobile learning apps of Library and Information Science students in universities in South-West, Nigeria as contained in the

third specific objective of the study. The use of mobile learning app scale is measured with the following rating; Daily; Weekly; Monthly; Bimonthly; Never, while SD stands for standard deviation

Table 2: Level of use of Mobile Apps

How often do you use the following applications?	**Daily (%)**	**Weekly (%)**	**Monthly (%)**	**Bimonthly (%)**	**Never (%)**	**Mean**	**SD**
Learning management apps						**2.43**	**1.254**
Microsoft Team	55(29.9)	58(31.5)	13(7.1)	24(13)	34(18.5)	3.41	1.491
Google Classroom	19(10.3)	53(28.8)	43(23.4)	44(23.9)	25(13.6)	2.98	1.221
Schoology	13(7.1)	15(8.2)	30(16.3)	46(25)	80(43.5)	2.10	1.248
Edmodo	9(4.6)	14(7.6)	18(9.8)	44(23.9)	99(53.8)	1.86	1.170
Moodle	7(3.8)	16(8.7)	15(8.2)	45(24.5)	101(54.9)	1.82	1.138
Massive Open Online Courses platforms(MOOC)						**2.05**	**1.109**
Edx	6(3.3)	15(8.2)	40(21.7)	48(26.1)	75(40.8)	2.07	1.116
Coursera	7(3.8)	11(6)	25(13.6)	55(29.9)	86(46.7)	1.90	1.087
Udacity	5(2.7)	14(7.6)	37(20.1)	59(32.1)	69(37.5)	2.06	1.062
Udemy	10(5.4)	20(10.9)	45(24.5)	61(33.2)	48(26.1)	2.36	1.142
Alison	4(2.2)	15(8.2)	34(18.5)	39(21.2)	86(46.7)	1.88	1.139
Learning Support Apps						**3.67**	**1.065**
Zoom	31(16.8)	87(47.3)	32(17.4)	22(12)	12(6.5)	3.56	1.105
WhatsApps	91(49.5)	53(28.8)	25(13.6)	12(6.5)	3(1.6)	4.18	1.006
Telegram	44(23.9)	82(44.6)	35(19)	18(9.8)	5(2.7)	3.77	1.009
Email	45(24.5)	81(44)	34(18.5)	17(9.2)	7(3.8)	3.76	1.044
Skype	12(6.5)	69(37.5)	45(24.5)	34(18.5)	24(13)	3.06	1.160
						2.72	**1.142**

Source: Researchers field work, 2022

Decision Rule: if mean is ≤ 2.99= low, 3.0-3.49=Average, 3.5-4.49=high, 4.5-5.0=very high

The result presented in table 2 reveals the mobile applications used by the respondents. The result revealed that level of use of mobile learning apps was low (grand Mean=2.72, SD=1.142). This is further supported as the result equally revealed that use of

learning management apps was low (SD=2.43) as well as use of MOOC platforms (mean=2.05). However use of learning support applications was high (mean=3.67) in which majority of the respondents indicated that they use whatsapp daily (mean=4.18), telegram (mean=3.77), Email (mean=3.76), and zoom (mean=3.56) were used weekly by majority of the respondents. This means that Library and Information Science students are not using learning management apps and also not using MOOC platforms but rather using learning support applications such as whatsapp, telegram, Email.

Research question three: What are the purposes of the use of mobile learning applications?

This question sought to find out the purpose of use of mobile learning apps by Library and Information Science students in universities in South-West, Nigeria as contained in the fourth specific objective of the study. The purpose of use of mobile learning applications scale is measured with the following rating; Strongly Agree; Agree; Disagree; Strongly disagree; Uncertain while SD stands for standard deviation

Table 3: Purposes of use of mobile learning application

I use mobile learning applications to:	**Strongly Agree (%)**	**Agree (%)**	**Disagree (%)**	**Strongly Disagree (%)**	**Uncertain (%)**	**Mean**	**SD**
Participate in online classes	83(45.1)	64(34.8)	22(12)	3(1.6)	12(6.5)	4.10	1.104
Ask lecturer questions	66(35.9)	81(44)	24(13)	4(22)	9(4.9)	4.04	1.010
Watch videos related to my school activities	66(35.9)	81(44)	23(12.5)	5(2.7)	9(4.9)	4.03	1.018
Participate in test, quizzes and examinations	66(35.9)	83(45.1)	19(10.3)	7(3.8)	9(4.9)	4.03	1.029
To read for examinations	58(31.5)	92(50)	19(10.3)	9(4.9)	6(3.3)	4.02	.955
Engage in group discussion	57(31)	91(49.5)	19(10.3)	8(4.3)	9(4.9)	3.97	1.016
Submit assignments	56(30.4)	88(47.8)	20(10.9)	11(6)	9(4.9)	3.93	1.046
Organise my notes	59(32.1)	80(43.5)	26(14.1)	11(6)	8(4.3)	3.93	1.04

							6
Engage in a group chat	58(31.5)	78(42.4)	30(16.3)	5(2.7)	13(7.1)	3.89	1.103
Chat with class members	46(25)	52(28.3)	20(10.9)	2(1.1)	64(34.8)	3.08	1.641

Source: Researchers field work, 2022

The respondents in table 3 indicated that they use mobile applications to participate in online classes (mean=4.10), ask lecturers questions (mean=4.04), watch videos related to their school activities (mean=4.03), participate in test, quizzes and examinations (mean=4.03), and read for examinations (mean=4.02) amongst other purposes. It means that Library and Information Science students use mobile learning apps more for academic purposes than any other purpose (charting with class members).

Test of Hypothesis

The null hypothesis was tested at.05 level of significance:

Hypothesis one: Use of Mobile learning apps will not significantly influence academic engagement of Library and Information Science students in universities in South-West, Nigeria.

Table 4: Influence of use of mobile learning apps on academic engagement

Variables	***B***	***Std. Error***	***Beta (β)***	***T***	***P***	***R^2***	***Adj. R^2***	***ANOVA (Sig)***
Constant	63.186	7.913		7.985	.000	.077	.072	.000
Mobile App Use	.387	.099	.278	3.908	.000			

Dependent Variable: academic engagement

R=.278

F=15.276

Df= 1, 182

Dependent variable: Academic engagement

Table 4 shows the influence of the use of mobile learning apps on academic engagement of Library and Information Science students in universities in South-West, Nigeria. The result revealed that use of mobile learning apps (R^2=.077, *F* (1,182) =15.276, *P=<.05)* had significant influence on academic engagement of students. This implied that the use of mobile learning applications was responsible for only 7.7% of the variations in the academic engagement of the students. Relatively, the indicators of mobile learning apps have also contributed in predicting academic engagement of students. Hence, the result revealed that learning support apps (*β*=.212, *t*=2.939 *p*<0.05) have 21.2% influence on academic engagement, while Learning management apps (*β*=.068, *t*=.637, *p*=.525), and MOOC Platforms (*β*=.094, *t*=.883, *P=.379*) were found to have no significant influence on academic engagement of students.

Discussion of findings

This study investigated use of mobile learning apps on academic engagement of Library and Information Science students in South –West, Nigeria. The discussion of findings was based on three researches and one hypothesis tested in this study.

The research question number one in this study was to determine the level of academic engagement of library and information science students in universities in South-West, Nigeria. This was measured by 24-items scale covering cognitive engagement, behavioural engagement and emotional engagement. The research question was analysed using descriptive statistics and a grand mean of (3.90, SD=1.02) was obtained, indicating that there was high level of academic engagement among library and information science students. The students were rated high in their cognitive, behavioural and emotional engagement. The students indicated that they seek to improve on the skills that can make them employable, strive to make good grades in their courses, evaluate the value of any information they came across, attend the minimum 75% of lectures for each course, submit assignments before deadline. The students also indicated that they were friendly with other students and it has been established that the characteristics of students who are academically

engaged include exhibition of interest, attention to, investment and participation in their academic work (Quaye et al, 2020).

This finding negates that of Chukwuorji et al (2018) who found that the level of academic engagement among Nigerian students was low. This study also found that the cognitive, behavioural and emotional engagements of the students were high and has been established that academically engaged students strive to make good grades in every course, look through their course notes in-between classes, start studying early in the semester, and submit assignments before deadlines, as well as participate actively during lectures. Ekici & Ekici (2021) opined that cognitive engagement refers to students expending mental effort to learning activities so as to understand the concepts, hence, it students show their use of skills and resources in their participation in school work and the process of attending to assignments and learning experiences.

The second research question examines the level of use of mobile learning apps by Library and Information Science students in South-West, Nigeria. The result reveals that level of use of mobile learning apps was low, grand mean (2.72, S=1.142). The findings also revealed that the level of use of learning management apps was low; the level of use of massive open online courses platforms was low while the level of use of learning support apps was high. Level of mobile learning application use was found to be low and this is however significantly different from the finding of Wai et al (2017) whose study revealed that undergraduate students use mobile apps frequently to engage in learning activities related to their academic studies, with a particular focus on communication and collaborative working, accessing academic resources and checking a dictionary. It was also revealed that majority of the students use learning support applications such as whatsApps, telegram, and email weekly.

The third research question answered in this study examined the purpose of use of mobile learning apps by Library and Information Science students in universities in Nigeria. The result revealed that students use mobile learning apps to participate in online classes, ask lecturers questions, participate in test, and read for their examinations. Similarly, the study of Toperesu et al (2019) found that most students agreed that they can access learning materials from their smartphones which is of particular importance in enabling mobile learning from a smartphone. Oyeniran et al (2020) have described mobile learning applications as the meeting point for lecturers and students. Some scholars have stated that mobile apps make it easy for students to have easy and quick access to information and it is also very attractive as

students can get feedback and easily practise (Demir & Akpinar, 2018). As Nasiri et al (2020) posited, the use of mobile learning applications allows learning anytime and anywhere.

Though this study has established that the use of mobile learning applications was low, the study by Lau et al (2017) found that undergraduates and postgraduate students do not show significant differences in adopting mobile learning by smartphones despite the fact that they have different learning patterns. The study discovered that students used learning support apps such as zoom, whatsApp, telegram, and email, and also found that students used mobile applications to participate in online classes, ask questions, and participate in tests. This finding agrees with that of Haron et al (2021), in which it was discovered that there was a positive perception and acceptance of the use of WhatsApp for teaching and learning. This finding also supports Dahdal (2020) whose study found that students are more engaged with assignments that have WhatsApp embedded within the assignment structure. This supports the earlier finding of Toperesu et al (2019) and Madhusudhan (2017) who found that the students use mobile devices daily for more than three hours. In addition, they found that Gmail app, WhatsApp, Google app, adobe reader and PDF viewer are the most frequently used mobile apps, and most students agreed that they can access learning materials from their smartphones.

The hypothesis one was formulated to test the influence of use of mobile learning apps on academic engagement of Library and Information Science students in universities in South-West, Nigeria. This study also found that mobile learning apps had the capability to predict academic engagements. This finding is in agreement with that of Teng and Wang (2021) whose result revealed that using Learning Management System (LMS) could engage students more than adopting social networking systems. Similarly, this finding supports Fabian (2019) whose findings revealed that mobile learning activities were found to have facilitated visualisation, encouraged reflection and promoted active learning. A recent study by Reflianto et al (2021) found that online flipped learning improved students' academic engagement and reading comprehension. With mobile learning apps, students can refer to previous lectures for better understanding of concepts. Similarly, Mahdiuon et al (2020) found that the adoption of telegram among the students has a positive effect on academic engagement.

CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDIES

Based on the findings of this research, the study concluded that academic engagement, specifically their cognitive, behavioural and emotional engagement was high. Use of mobile learning apps had significant influence on academic engagement of Library and Information Science students. Relatively, the use of mobile learning apps contributed in predicting academic engagement of the students. Learning management apps and MOOC platforms were found to have no significant influence on academic engagement of students.

1. The academic engagement of students was rated high, during the orientation programme for new students, Students' Affair Unit of the universities should emphasise the need for students to take charge of their academic activities by being actively involved in the processes. They should be made to realise that students are at the centre of academic activity and should therefore take charge of their academic life. It is recommended that a conscious effort should be made by the students to improve their cognitive, behavioural and emotional engagement.
2. The study revealed that the level of use of mobile learning apps was low. Universities managements should organise training on the use of mobile learning apps and put infrastructures in place to enhance the usage.
3. National University Commission (NUC) should include the provision of digital infrastructure and the use of mobile learning apps as part of the criteria for accreditation for courses in universities.

Further studies should consider carrying out this study among undergraduates using other geographical zones like North- East, North- West, South- East and South-South so as to find out if there is a geographical deference in the level of academic engagement and even use of mobile learning apps. Also, future research could consider using qualitative (interview and focus group discussion) or mixed method to test the use of mobile learning apps on academic engagement of Library and Information Students.

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