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**THE USE AND EFFECT OF SMARTPHONES IN STUDENTS' LEARNING
ACTIVITIES: EVIDENCE FROM THE UNIVERSITY OF GHANA, LEGON.**

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Abstract

The use of smartphone is gradually becoming a compelling learning tool used to enhance teaching and learning in distance education. Its usage ensures flexible course delivery, makes it possible for learners to access online learning platforms, access course resources and interact digitally. The purpose of this study was to examine the use and effects of the smartphone as a learning tool in distance education at the University of Ghana. The study was based on the Technology Acceptance Model (TAM) and included 294 total respondents. The survey research design and questionnaires were employed for the study. The major objectives of the study were: to find out the students' perceived ease of use of a smartphone in learning activities, to determine the perceived usefulness of smartphone in students' academic achievement, to investigate the effect of the use of the smartphone in students' learning activities, and to investigate the factors that inhibit the use of a smartphone as a learning tool. The findings revealed that the distance learning students find it easier to use a smartphone in their learning activities. The findings also revealed that the use of smartphones performed remarkable roles among the distance learning students of the University of Ghana in their academic activities. However, the findings found a negative effect on the distance learning students and revealed some inhibiting factors in the use of smartphones which included smartphones freezing during important learning moments, unstable internet connectivity, intruding calls during class hours, and the screen and key sizes, which made the smartphone uncomfortable for learning, as compared to laptops.

Keywords: Smartphones, Mobile learning, Distance Education, Undergraduate, University of Ghana.

Introduction

The emergence of Information and Communication Technology (ICT) and internet facilities have drastically affected almost every facet of human life. Currently, it is greatly evident in the way of teaching and learning. Nowadays, smartphones have become a part of every person's life. Globally, "People around the world have adopted this new and exciting technology as one of the most important required facility in their everyday life" (Fawareh & Jusoh, 2017, p.1). Globally, the explosion of smartphones and its related devices has greatly transformed teaching and learning in developed nations where developing nations are not the exception (Tagoe, 2014).

The proliferation of these facilities has changed the style of learning whereby students or learners no more solely depend on paper-based materials. The introduction of the internet led to the emergence of smartphones which enables learning to take place irrespective of the geographical location or period of time.

Arguably, smartphones came to the scene to replace the works of the camera, video recorders, digital watches, etc. For instance, it is becoming so rare for an individual to purchase a digital camera for personal use except for commercial purposes, and the extent at which people yearn for digital watches has reduced as a result of the introduction of smartphones. In effect, it becomes redundant for one to purchase such gadgets which can be found in smartphones. Fawareh and Jusoh (2017) postulated that having a smartphone is like having a tiny computer in a pocket. It is blatant that, the potency of smartphone is not only meant for placing of calls and receiving of calls. Usually, there are amazing features such as for browsing, checking health status, sending and receiving emails, watching videos, listening to music, chatting, sharing photos, videos and other

documents, to mention but a few. No wonder there is an exponential use of social media as a result of the emergence of the smartphone. According to Masiu & Chukwuere (2018), in the 21st century, smartphones have vastly increased due to its exciting features such as accessing emails, biometric, accessing social media platform and many more.

According to technopedia (2019) “A smartphone is a mobile phone with highly advanced features. A typical smartphone has a high-resolution touch screen display, WiFi connectivity, Web browsing capabilities, and the ability to accept sophisticated applications.” Ebiye (2015) regards a smartphone as a smart device used for fast access to knowledge, geared towards students achieving their teaching and learning and academic research objectives.

The dramatic growth of smartphone users has also increased the growth of social media users. Also, in a report from the International Telecommunication Union, it was indicated that about 60% of the world’s population has access to mobile phones (ITU, 2008 as cited in Sarfoah, 2017). In the same report, it is interesting to note that there are more mobile phone users in the developing nations as compared to the advanced ones (Henry & Quansah, 2013), which means, developing countries utilize smartphones the more. Among the developing countries, Malaysia has the highest use of smartphone where “(55%) of Malaysians use their mobiles to listen to music, half (50%) play online games and almost seven out of ten (67%) Malaysians watch online videos on their phones.”

In the works of (Assabi, 2012 as cited by Quist and Quarshie, 2016), it was reported that as at 2013/2014 growth estimate, Ghana was placed on the 14th position by the World Bank in the Top

29 countries with the highest growth in the adopting mobile phones and ICT technology. In the same study, the author postulated that developing nations in Africa are adopting mobile technology and its related ICT infrastructure at an increasing rate.

Currently, the use of smartphones performs phenomenal roles as far as teaching and learning are concerned. For instance, students can access their lecture materials on their smartphones, quickly access information online to meet their information needs via learning management systems, access academic databases, and a website to mention but a few. This was evident in the works of Masiu & Chukwuere (2018) where it was stated that “The smartphone has also made students’ lives easier, as they can access their school information on the gadget through electronic learning (e-learning), and mobile learning (m-learning).” The development of smartphone keeps on evolving as human lives keep evolving. Due to the varying needs, demand, and taste of smartphone users, the new version comes frequently with additional features (Alfawareh & Jusoh, 2014).

The use of smartphones in learning has become the latest trend in higher education where an individual may not necessarily need a computer set to access electronic learning materials. The phenomenal roles of the smartphone in learning have been revealed by numerous authors such as in the works of Valk, Rashid, & Elder (2010), that, smartphones have made learning more flexible, easy and have helped to reduce the ultimate inherent conventional classroom learning. For instance, a smartphone makes it possible for students to access educational materials at any time, anywhere and it is highly cost-effective since this opportunity is just a function of smartphones. Kumar (2011) also brought to bear that smartphone users are able to download recorded online lectures, and electronic books to enhance learning. According to Norries et al. (2011), smartphones

do not only enable students to access and read materials, but also, they can take pictures of abstract concepts that are taught in class with the camera on their smartphones so that they can relate them with concrete ideas at a later date, mostly in distance education.

The significant progression in technology has brought about tremendous benefits in human life especially in the area of teaching and learning. “Smartphones, the Internet-enabled devices incorporated with computer applications and software, are among the eminent breakthroughs in this latest century” (Foen, Hassan, Nor, Malek, 2017). Most educators have adopted the use of smartphones for teaching due to its perceived usefulness such as affordability, flexibility, readiness, popularity and other practical functions (Ismail, Bokhare, Azizan, & Azman, 2013; Pullen, Swabey, Abadoo, & Sing, 2015). According to Groupe Speciale Mobile Association (GSMA) (2015), “half of the world’s population have a mobile subscription with smartphone adoption already reaching critical masses in developed markets.” In as much as there is a sprout in the use of smartphones among students at the tertiary level, “the extent to which this technology has contributed to their academic achievement is still inconclusive.” In the case of Malaysia, students were not ready for mobile learning. Hence, the use of a smartphone is not used for learning. In works of Woodcock et al. (2012), it was demonstrated that students were always found using their phones for playing games and other leisure activities more than for learning.

According to the researchers own preliminary investigation, it was noted that despite the remarkable benefits of the smartphone in learning, students mostly use a smartphone on social media platforms such as Facebook, WhatsApp, Instagram, twitter, snapchat, tango, rather using it for educational purposes. Those who in turn use smartphones are distracted by other functions with

notification. This study intends to find out about what fuels students to use or not to use smartphones for learning and its inherent effects. Ever since the adoption of smartphones in learning among tertiary students especially in Ghana, few studies have been done on its usage and its effect on learning. Also, “for the few studies that have investigated the potential of the smartphone in e-learning of educational institutions, there is evidence to show that most of these have been carried out in a westernized European context” (Tagoe, 2014, p.1) criteria strictest.

The purpose of the study is to determine undergraduates distance learning students’ use of smartphones and its effect on learning activities in the University of Ghana, Legon and to bring out strategies on how students can enhance their learning activities with the use of smartphones.

It is unconcealed that almost every distance student of the University of Ghana is in possession of a smartphone. As across Africa, and the world, many universities are integrating e-learning platforms into their educational curriculums as a means of not only enhancing the students learning experience (Deng & Tavares, 2013) but also as a way of staying competitive (Mazzarol & Soutar, 2012), and the University of Ghana is no exception. Hence it very imperative to fathom the use of smartphones among the distance learning students and its effect on their learning activities.

Objectives of the Study

The study was based on the following objectives

1. To find out the students’ perceived ease of use of a smartphone in learning activities.
2. To determine the perceived usefulness of smartphone in students’ academic achievement.
3. To investigate the effect of the use of a smartphone in students’ learning activities.

4. To investigate the factors that inhibit the use of a smartphone as a learning tool.

Literature Review

The concept of the smartphone in mobile learning

Mobile learning (m-learning) is a mode of learning whereby mobile computing coupled with wireless technology help learning to take place anywhere and anytime (Asabere, 2013). Naismith et al. (2004 as cited in Sarfoah, 2019, p.29) succinctly define mobile learning as “learning which employs wireless devices like smartphone, PDA, iPod, palmtop, laptop or even digital camera and USB keys in the learning and teaching process”.

The smartphone is an indispensable device in the area of mobile learning. The most crucial features of a smartphone are its availability with users, strong battery, touch screen, millions of downloadable applications (GodwinJones, 2011). According to Fordjour, Zakaria, and Afriyie (2015, p.1), a “smartphone is a mobile phone with more advanced computing capability and connectivity than a feature phone which has limited functionality”. Smartphones were released in the year 2000. It was first manufactured by Ericsson and the model was called R380 (Alfawareh & Jusoh, 2014).

Smartphones support learning either offline or online. Offline access enables users of smartphones to store any form of learning materials such as pdf, powerpoint, word, excel, pictures, animations, symbols; irrespective of the geographical location. Internet access is needed for learners like students and teachers to visit websites to meet their information needs. The exploration of the smartphone has changed the dynamic of students learning activities. It is refreshing to note that,

students can carry a whole semester's learning materials on a small smartphone which gives students the latitude to learn in an area which, on a normal circumstance, will require a laptop or other related form of a computer. For instance, a student can access their lecture materials while in a car, train, plane, and marketplace to mention but a few. It also enables students to register courses online, take a quiz or semester through the use of an assigned or registered learning management system, and can have a group discussion digitally.

Smartphones usage in Distance Education.

It is obvious that mobile learning can be considered as the central hub to enhance distance education. Tegoe (2014, p.1) concur that "Distance education has always grown on the wings of technology. Tuncay, N. (2016) postulated in the study that focused on smartphones as tools for distance education: "Needs of students become so sophisticated that they refuse to carry heavy weight laptops or books, and they save everything in their phones". Ketheeswaran and Mukunthan (2016) investigated the usage of the smartphones for learning purposes by students who pursue 'Diploma in Commonwealth Youth Development Programmes' in the Colombo And Batticaloa Centres of the Open University of Sri Lanka K. The study revealed that "the usage of smartphones related with distance education helps to increase students learning, social interactions, collaborative learning, and socialization of students, etc. It was postulated in the same study that "in the coming decade smartphones will be a main learning tool in the distance learning system" (2016, p.1). Tegoe (2014) revealed that there is a high rate of the adoption of mobile learning across the globe and there is evidence in developing countries complementing mobile learning to its convention mode of teaching and learning. In effect, this has enhanced distance education programs been offered by higher education.

Students' Perceived Ease of Use of Smartphones in Learning Activities.

“Perceived ease of use (perceived complexity) has been found to be an important determinant of technology usage, both in a direct and indirect manner, and technology users have been proven to attempt to minimize their cognitive effort on their behaviors” (Cho, 2011). The author further concluded that individually students develop the intention to use smartphones in their learning activity, if it is perceived to be easy to use. Ifeanyi and Chukwuere (2018) revealed that most of the respondents 269 (71.7%) concur that, they sometimes find it a daunting task accessing academic material on their smartphones. Consequently, it affects their academic performance. This findings support the study of Sarfoah (2017) in which it was revealed that, most respondents strongly disagree to the statement that “I find smartphone learning easy.” This is an indication that, the students did not find it comfortable using a smartphone as a supplement tool for learning. On the other hand, Iqbal and Bhatti (2015) investigated University students' readiness towards M-learning using Technology Acceptance Model in Pakistan and it was brought to bear that, students possess the right skills to use mobile learning; they will find it easy to use a smartphone; and this also enhances their perceived usefulness of using smartphone for learning activities.

Perceived Usefulness of Smartphone in Students' Academic Achievement.

In a study conducted by Jung (2014) on determinants impacting learners' satisfaction and performance with smartphones in North-West University (NWU) in South Africa, it was revealed that one of the usefulness of smartphones is the ability to enable users to study anywhere and at

any time, making learning more attractive. Ifeanyi and Chukwuere (2018) investigated the impact of using smartphones on the academic performance of undergraduate students in South Africa using a quantitative methodology with 375 sample size and data was collected using a questionnaire. The study revealed that smartphones help students to communicate with their classmates as well as their courses masters/ tutors. Also, students use smartphones to explain the facts, illustrations, and concepts with colleagues. In the same study, it was brought to bear that, smartphones support students' learning activities in myriads of ways such as downloading of study materials, recording of live lectures, accessing lecture slides at a convenient time, aiding in research work and doing assignments.

In the same vein, Almansour and Alzougool (2017) undertook a study on “the use of smartphone for learning activities by university students in Kuwait”, the study recorded that, the use of smartphones performs prodigious roles in students learning activities. For instance, students use smartphones for registering courses, checking lecture time table and exams schedule, checking grades, having group discussion, reading announcements and for the payment of school fees and many more.

Similarly, the usage of smartphones among Malaysian students was reported in the works of Mohtar Hassan, Hassan, and Osman (2013). The study revealed that university students in Malaysia had adopted smartphones as a necessity for learning at higher learning institutions. Students used smartphones for sharing notes between classmates, recording lectures, as well as helping to take pictures of assignments for future reference and sharing exam results on Facebook

through their smartphones. In the same vein, Tunca (2016) undertook a study on smartphones as tools for distance education. The study found that smartphones were very useful to the students; it enables them to take lecture notes, surfing the internet and instant taking of concept for later use.

Further, Corbeil and Valdes-Corbeil (2007), investigated the topic “are you ready for mobile learning”, the study found that, smartphones greatly enhance interaction between instructors/lecturers and students, thereby, paving way for instructor and students to learn whiles on the move as compared to the traditional face-to-face mode of teaching and learning.

In the case of Ghana, Akaglo and Nimako-Kodu (2019) investigated the effects of the use of mobile phones on second cycle students in Ghana. The study brought to bear that the use of smartphone enhances learning activities; it helps students to conduct research at their own pace, they are able to retrieve relevant and up to date information for their assignments and projects without necessarily visiting the library physically. Also, it enables students to read ahead of time before class to have a fair idea of lessons yet to be taught.

Also, Tuncay (2016) investigated smartphones as tools for distance education at the British University of Nicosia, the school delivered distance education course via Smartphones. The study found that the use of the smartphone has made course delivery via distance mode very effective. For instance, it provides the opportunity for students to save all their lecture materials on a portable smartphone device without carrying heavy weight laptops or books. And students can access their lecture materials on their phones whiles lecturers can also interact with their students digitally irrespective of the geographical location.

On the contrary, while smartphones provide communicative needs, their extensive use may have collateral damages on the physical, psychological, social, and the educational well-being of students (Kang & Jung, 2014).

Effect of the use of a smartphone in students learning activities.

Ifeanyi and Chukwuere (2018) postulated that the use of smartphone on students has both a negative and positive effect depending on how it is used. Further, the author emphasizes on the negative side of the coin where the smartphone has become a great distraction to studies. For instance, there is a high propensity that students who are glued to their smartphone check updates or notification almost every minute if not strictly controlled. Consequently, this diverts their focus from their studies and even at a lecture time when a lecturer is at the peak of teaching. The author concluded that the effect of smartphones on academic performance or the learning of students is mixed with challenges

Kibona and Mgaya (2015) postulated that despite the phenomenal advantage of smartphone in learning it is considered as double edge sword where most of the applications such as WhatsApp, Facebook, and games, affect students in Tanzania negatively in all level because of its addictive nature. Thusly, it inadvertently steals away students' time which affects their academic performance adversely. In the same vein, Lee et al., (2015) investigated smartphone addiction in university students and its implication for learning among 210 Korean female university students (mean age=22 years). The study revealed high-risk addictions and consequently rated themselves low on 'self-regulated using smartphones'. Similarly, this study agrees with Ifeanyi and Chukwuere (2018) where smartphone consumes most of the users time and in addition does not

enhance their academic performance but rather decrease as they envisioned before getting them as indicated by the majority 270 (72.0%). This is also affirmed in the works of (Lin et al., 2014; Tossell et al., 2015). In further elucidation, high excessive use of smartphones leads to complications which include vascular permeability, neck pain, and musculoskeletal disorders and mouse brain damages.

On the contrary, Shai (2016) assessed the use of smartphone in the University General Physics Laboratory. Using 120 students with a survey approach, the study found favorable responses on the effect of smartphones on students learning activities. Respondents affirmed that smartphone had a positive effect on their studies, for instance, it “provides an effective background on the lab safety information, administrative requirements and general knowledge of physics lab equipment” (p.33 as cited in Sarfoah, 2018).

Factors that inhibit the use of a smartphone as a learning tool.

In as much as numerous phenomenal advantages of the smartphone has been revealed, there are some inhibiting factors that halt students in their quest to adopt smartphone for their learning activities. In the works of Gikas and Grant (2013) students experience in mobile computing in higher education was focused. The study revealed that students were not willing to adopt smartphone as a tool for learning because of its small screen size as compared to a laptop which provides a wider screen, small keyboard, and serving as a distraction factor during lecture hours. Similarly, it was also found in the works of Sarfoah (2017) where 79% of the respondents agreed that smartphones make learning uncomfortable.

Also, Sarfoah (2017) revealed that unstable or unreliable internet connectivity is a critical factor that inhibits students from adopting smartphone as a learning tool where 72% of the respondents responded in affirmative to this assertion. In the same study, it was found that some lecture content is not supported by smartphones. Also, 80% of the respondents agreed to the assertion that the smartphone device does get frozen at the crucial leaning moments. This occurrence according to general comments makes learning ineffective.

Further, in the same study, it was found that “intruding calls may come in during learning” (73%). This factors greatly distract learning by driving away their focus from the core purpose of being in class or a place or moment set aside for effective studies.

Theoretical Framework.

There are several theoretical models that have been used to underpin studies especially in the area of acceptance, perception, and use of electronic systems, however, Technology Acceptance Model (TAM) created by Davis et al. (1989) has been widely used. Based on this background and the constructs of the model which will help guide the study, the Acceptance Model (TAM) was adopted

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) created by Davis, Bagozzi, and Warshaw (1989) focuses on the variables affecting users’ satisfaction in technology use. The TAM, and variations of it, aims to understand the underlying factors affecting users’ technology acceptance of systems, such as LMS (Padilla-Meléndez, 2008). TAM is used to theorize that the behavioral intention of

an individual to use a system is determined by two main factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEU) (Davis, 1993).

Methodology

This study adopted the survey methodology. According to Kumar (2011), survey methodology is a popular research design for collecting a huge amount of data from a sizeable population in an economical way. This study dealt with a larger population therefore, survey research methodology was considered appropriate and as such it will lead to the high reliability of findings. In addition, the choice is fueled by the fact that it allows for the use of a questionnaire which aids in data comparison. Students from the Department of Distance Education at the University of Ghana was used as the target population for this study. The reason is fueled by the fact that Department of Distance Education runs their program using the blended mode of teaching and learning whereby students attend lectures during weekends and the rest of the course activities via the Sakai Online Learning Management System (LMS) supported by the use of smartphone and laptops. During the implementation of the Sakai LMS, the first batch of students were given tablets to be loaded with lecture materials and to use it to access the platform. Therefore, it is imperative to know how they also use a smartphone and its effect on their learning activities. The population for this study comprises all the level 300 studies students from distance education. The total number of students was 982, which constituted the population of the study.

Table 1: Study of Population.

PROGRAMMES	POPULATION
Bachelor of Arts	458
Bachelor of Science in Administration	234
Bachelor of Science in Nursing	320
Information Technology	90
	982

Source: Field Data, 2019

In this study, the researcher selected a sample size with reference to the sampling ratios proposed by Alreck and Settle (as cited in Ankrah, 2014, p.124). “They proposed that for different population sizes; a sampling ratio of 30% is adequate for a population of less than 1,000; a sampling ratio of 20% is adequate for a population between 1,000 and 10,000 and a sampling ratio of 10% is adequate for a population greater than 10,000. Only a small fraction of the entire population ordinarily provides sufficient representation of the group as a whole and enough accuracy to base decisions on the results with confidence”. The researcher, therefore, selected a sample size of 294 which is 30% of the 982 of students from the Department of Distance Education, University of Ghana.

This study adopted a convenient sampling technique. The rationale behind the choice of sampling technique is the fact that the distance students are usually the busy type, they have tutorials on weekends and for that matter have limited time at their disposals. It may be very difficult for the students to squeeze part of their busy schedule to answers questionnaires at ago hence simple random sampling which is known to have very critical objectivity in terms of data collection was not be ideal for this study. Again, most of the distance students do not attend the weekend tutorials classes regularly hence, it will be difficult for the researcher to use simple random sampling. Despite all the advantages of simple random sampling, it was ideal for the researcher to adopt

convenient sampling where those students who were available at the point of data collection were included in the study. A questionnaire was adopted for this study. The data collected were analyzed using the Statistical Package for Social Science (SPSS) version 23.0. Descriptive and inferential statistics were used for this research. For easy interpretation of data, pie chart, and tables were used to present data of findings.

Table2: Alpha Coefficients for Constructs with Multiple Items

CONSTRUCT	NUMBER OF ITEMS	CRONBACH ALPHA
Adoption Factors	11	.867
Perceived Ease of Use (PEU)	6	.655
Perceived Usefulness	15	.880
Extent of Use	8	.828
Effect of the use of a smartphone	6	.721
Factors that inhibit the use of smartphone.	7	.779

Major Findings And Discussion.

Perceived ease of use of a smartphone in learning activities.

Any electronic device as theorized in the TAM by Davis (1989) is influenced by one the critical factors which is perceived ease of use. Upon this revelation, respondents were asked to indicate how easy in the use of smartphone in their learning activities as shown in Table 3.

Table 3. Respondents’ perceived ease of use of smartphone in learning activities.

No.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I find it easy to use smartphone for reading.	3(1.3)	65(22.1%)	74(25.2)	112(38.1)	40(13.6%)
2.	Using smartphone for learning does not require any special computer literacy skills in order to use.	8(2.7%)	18(6.1%)	62(21.1%)	154(52.4%)	52(17.7%)
3.	I finds it easy to use the smartphone for retrieval course material from the Sakai LMS	18(6.1%)	62(21.1%)	56(19.0%)	100(34.0%)	58(19.7%)
4.	Smartphone interfaces is user-friendly and flexible to use	18(6.1%)	84(28.6%)	57(19.4%)	92(31.3%)	43(14.6%)
5.	I do not encounter technical problem when using smartphone for learning.	3(1.0)	32(10.9%)	34(11.6%)	147(50%)	78(26.5%)
6.	My interaction with the smartphone for learning is clear and understandable.	7(2.4%)	18(6.1%)	69(23.5%)	127(43.2%)	73(24.8%)

It is evident from Table 3 that, 112(38.1) of the respondents find it easy to use a smartphone for reading, a couple of them 74(25.2) were neutral and 65(22.1%) disagree. This response is an indication that the distance learning students find it easy using a smartphone for reading. Again, on the assertion, “using a smartphone for learning does not require any special computer literacy skills in order to use.” Majority of the respondents 154(52.4%) agreed, 62(21.1%) of them were ambivalent whiles 18(6.1%) disagree. Also, on the statement “I find it easy to use the smartphone for retrieval course material from the Sakai LMS”, greater percentage 100(34.0%) of the

respondents agree, 62(21.1%) felt otherwise by indicating disagree while 56(19.0%) neither agree nor disagree.

Further, as shown in Table 3, it is revealed that 92(31.3%) of the respondents agreed to the fact that smartphone interfaces are user-friendly and flexible to use, 84(28.6%) disagree while 57(19.4%) indicated neutral. Also, on the statement “I do not encounter a technical problem when using a smartphone for learning”, 147(50%) agree, 34(11.6%) neither agree nor disagree and 32(10.9%) disagree. Addition, a considerable number of the respondents 127 (43.2) agreed to the fact that their interaction with the smartphone for learning is clear and understandable, 69 (23.5%) were ambivalent while 18 (6.1%) responded otherwise by indicating disagree.

In summary, it can be inferred from these findings that, the distance learning students of the University of Ghana finds it easy to use a smartphone in their learning activities. These findings are also an indication that since part of their learning materials is in digital forms, they will be fueled to learn how to utilize smartphone for learning and there is the tendency that, most of the distance students will find smartphones useful and which will intend to increase their extent of its use. These findings support the works of Iqbal and Bhatti (2015) in which it was revealed that majority of the respondents finds it easy to use a smartphone which also enhance their perceived usefulness of using a smartphone for learning activities. However, the findings are inconsistent with the works of Ifeanyi and Chukwuere (2018) in which it was found that majority of the respondents responded in affirmative that sometimes they find it a daunting task accessing academic material on their smartphones, likewise same perception was evident in the works of Sarfoah (2017) where most of the respondents disagree to the fact that using smartphones for learning was easy to use.

Perceived usefulness of smartphone in students' academic activities.

Perceived usefulness is one of the critical construct that fueled the behavioral intention to use any information system platform Davis (1989). Sarfoah, (2017, p.) asserted that in “the technology acceptance literature two measurement yardsticks are employed to evaluate probable factors that could impact on adoption”. These two factors as elucidated by Davis (1989) are the perceived usefulness and perceived ease of use. Based on this background, the researcher sought to find out the perceived usefulness of smartphones used in students' academic activities as shown in Table 4.

Table 4 : Respondents' perceived usefulness of smartphone in their academic activities.

No.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Smartphone enables me to take quiz and Interim Assessment (IA) anywhere and anytime.	4(1.4%)	20(6.8%)	46(15.6%)	119(40.5%)	105(35.7%)
2.	Smartphone has save me from buying personal laptop for studies.	6(2.0%)	47(16.0%)	43(14.6%)	114(38.8%)	84(28.6%)
3.	It help me in quick access to information online.	5(1.7%)	30(10.2%)	59(20.1%)	119(40.5%)	81(27.8%)
4.	Using the smartphone for learning has enabled me to gain extra skills and experiences outside the classroom.	10(3.4%)	27(9.2%)	52(17.7%)	142(48.3%)	63(21.4%)
5.	It enable me to take a snapshot of illustration which	3(1.0%)	19(6.5%)	52(17.7%)	135(45.9%)	85(28.9%)

	cannot be memorize at instance for later date.					
6.	Smartphone enable me to easily receive notification when announcement is posted on the Sakai LMS.	8(2.7%)	6 (2.0%)	20(6.8%)	126(42.9%)	134(45.6%)
7.	Smartphone enable me to easily effectively use the Sakai LMS for learning.	7(2.4%)	17(5.8%)	45(15.3%)	104(35.4%)	121(41.2%)
8.	Smartphone enable me to record lectures delivered by my tutors	6(2.0%)	12(4.1%)	24(8.2%)	92(31.2%)	160(54.4%)
9.	Smartphone enable me to schedule my lecture activities with reminder.	2(0.7%)	11(3.7%)	39(13.3%)	119(40.5%)	123(41.8%)
10.	I can easily access my e-mail using smartphone.	10(3.4%)	6(2.0%)	19(6.5%)	129(43.9%)	130(44.2%)
11.	Smartphone helps me to store all my lecture materials.	20(6.8%)	17(5.8%)	8(2.7%)	189(64.3)	60(20.4)
12.	Smartphone help me in sharing lecture materials among colleagues.	0(0.0%)	24(8.2%)	33(11.2%)	116(39.5%)	121(41.2%)
13.	The use of the smartphones in online group discussion	2(0.7%)	4(1.4%)	33(11.2%)	124(42.2%)	131(44.6%)
14.	Smartphone enable me to use social media platform for class activities.	2(0.7%)	7(2.4%)	9(3.1%)	107(36.4%)	169(57.5%)

Table 4 indicates that 119(40.5%) of the respondents agreed that smartphone enables them to take their quizzes and Interim Assessment (IA) anywhere and anytime, on this assertion, 46(15.6%) were undecided whiles 20(6.8%) disagreed. Also, it is revealed that 114(38.8%) representing the majority of the respondents agreed to the assertion that “smartphone has save me from buying a

personal laptop for studies, 47(16.0%) disagree while 43(14.6%) indicated neutral. Also on the statement “It helps me in quick access to information online” 119(40.5%) and 59 (20.1%) of the respondents agreed and were ambivalent respectively while 30 (10.2%) disagreed. Again, it is refreshing to note from the table that 142(48.3%) of the respondents agreed that using the smartphone for learning has enabled them to gain extra skills and experiences outside the classroom, 52(17.7%) did not take any stand while 27(9.2%) opposed to the statement by indicating disagree. Also, on the assertion “using a smartphone enables me to take a snapshot of illustrations which cannot memorize at the instance for a later date, majority of the respondents 135(45.9%) agreed to this perceived useful factors, 52(17.7%) were neutral while 19(6.5%) disagreed.

Further, 135(45.9%) of the responded by indicating strongly agreed to the fact that smartphone enables them to easily receive notification when announcement is posted on the Sakai LMS which is the adopted learning management systems for the distance learning students, 126(42.9%) agreed, 52(17.7%) were ambivalent and 19(6.5%) disagreed. It can also be seen that 121(41.2%) strongly disagreed to the statement “smartphone enables me to easily effectively use the Sakai LMS for learning.” 104(35.4%) agreed, 45(15.3%) indicated neutral and 17(5.8%) disagreed. It is also evident in the Table that, a greater portion of the respondents created by indicating strongly agree to the point that smartphone enables me to record lectures delivered by my tutors”, 160(54.4%) agreed, 24(8.2%) were undecided while 12(4.1%) disagreed. Again, on the assertion “smartphone enables me to schedule my lecture activities with a reminder”, a considerable number of the respondents 123(41.8%) strongly agreed, 119(40.5%) agreed, 39(13.3%) indicated neutral while 11(3.7%) disagreed. Furthermore, in terms of accessibility majority of the respondents 130(44.2%)

brought to bear that they can easily access their e-mail using a smartphone, 129(43.9%) agreed, 19(6.5%) were uncertain, while 6(2.0%) disagreed.

Additionally, majority of the respondents 189(64.3) claim that smartphone helps them to store all their lecture materials, 17(5.8%) were not sure while 8(2.7%) disagreed. In terms of sharing resources, it is refreshing to observe that a considerable number of the respondents 121(41.2%) strongly agreed that smartphones help them in sharing lecture materials among colleagues, other responses were as follows ; agree 116(39.5%), neutral 24(8.2%) and 33(11.2%) disagree. Further, as reported in Table 4, the use of the smartphones in online group discussion which is a critical opportunities to distance learning students, 131(44.6%) strongly agreed, 124 (42.2%) agreed, 33(11.2%) indicated neutral and a few of the respondents 4(1.4%) disagreed. Also, from the responses gathered, it can be observed that 169(57.5%) of the respondents indicated strongly agree to the assertion “smartphone enable me to use social media platform for class activities”, 107(36.4%) agreed, 9 (3.1%) neither agree or disagree and 7(2.4%) disagreed.

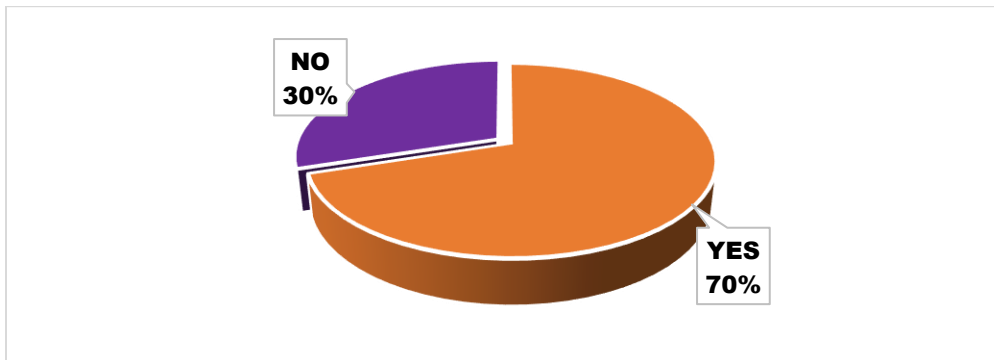
In summary, it is clearly evident that the use of smartphones performed remarkable roles among the distance learning students of the University of Ghana in their academic activities. This finding is consistent with the study of Ifeanyi and Chukwuere (2018) where it was revealed that undergraduate students of South Africa indicated that the use of smartphone is very useful in the academic work, for instance, keeping records of lecture materials, sharing and communicating with colleagues digitally, also congruent with the study of Tuncay, N. (2016); Corbeil and Valdes-Corbeil (2007), Almansour and Alzougool (2017); Akaglo and Nimako-Kodu (2019) . However,

it did not support the works of Kang & Jung (2014) in which it was brought to light that the use of smartphones among students may have collateral damages on the physical, psychological, social, and the educational well-being of students hence not useful.

Effectiveness of the distance mode of learning by the use of a smartphone.

It is blatant that, the distance mode of teaching and learning blended with face-to-face and fully online mode of course delivery at the University of Ghana, respondents were asked to confirm if they think the use of smartphone has made distance mode of teaching and learning effective as shown in Figure 1

Figure1: Respondents perception on the effectiveness of the use of smartphone in distance mode of learning



It can be observed from Figure 1 that, out of the total respondents, 206 (70%) responded in affirmative that, the use of smartphone has made distance mode of learning very effective. However, 88(30) of the respondents indicated otherwise. This finding is an indication that the use of smartphones is a contributing factor to the success of the distance mode of learning in the University of Ghana, therefore, the distance unit of the University of Ghana should endeavor to

consider blending smartphones as a learning tool for courses delivery. For instance, those who responded in affirmative shared their refreshing stories such as; with help of smartphone they do not necessarily have to go class to get what topic is being taught, the lecturer can just take a video explanation or topics using screenshot and upload on the Sakai platform for students to download. Others also brought to light that, the use of smartphones enable them to have class discussions with their colleagues before examination where the impact on their academic performance was impressive and among others. The finding is in agreement with the works of Tuncay (2016) whereby the study found that the use of smartphones has enhanced distance learning leading to a greater behavioral intention of students to use smartphones in their learning activities.

The effect of a smartphone in the students’ learning activities.

The use of smartphones for learning is denoted as is “a double edge sword” depending on how it is utilized for the purpose of learning. The effect could be positive or negative. In light of this background respondents were asked to indicate the effect of smartphones on their learning activities as the shown in Table 5.

Table 5: Responses on the effect of the smartphone on students learning activities.

No.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I always use my smartphones more for playing games and accessing social media platforms instead of using it for learning.	11(3.7%)	30(10.2%)	27(9.2%)	126(42.9)	100(34.0)
2.	Smartphone can potentially increase multitasking and task switching during	6(2.0%)	52(17.7%)	119(40.5%)	84(28.6%)	33(11.2%)

	academic activities leading to decrease in academic performance.					
3.	Smartphone takes more of my attention from studies.	4(1.4)	21(7.1%)	44(15.0%)	151(51.4%)	74(25.2%)
4.	Sometimes I am not able to pay attention in class because of my smartphone.	20(6.8%)	63(21.4)	73(24.8)	92(31.3%)	46 (15.6%)
5.	Using smartphone for learning consumes a lot of data bundle which increase my expenditure.	5(1.7%)	33(11.2%)	31 (10.5%)	147 (50%)	78(26.5%)
6.	Smartphone usage in learning create an isolation or a feeling of being out-of-the-loop for both instructors	10(3.4%)	21(7.1%)	64(21.8%)	142(48.3%)	57(19.4%)

As shown in Table 5, majority of the respondents 126(42.9) indicated agree to the statement “ I always use my smartphones more for playing games and accessing social media platforms instead of using it for learning, 100(34.0) strongly agreed, 27(9.2%) indicated neutral and a few of them 30(10.2%) indicated disagree. Also, a considerable number of the respondents 119(40.5%) were undecided on the statement “smartphone can potentially increase multitasking and task switching during academic activities leading to decrease in academic performance”, 84(28.6%) concurred whiles 52(17.7%) disagreed. Further, it can be noticed from the table that smartphone takes more of respondents’ attention from their studies as the majority of the respondents 151(51.4%) agreed whiles 44(15.0%) and 21(7.1%) indicated neutral and disagree respectively.

Further, one of the effects of smartphone usage on student learning activities which states that, “sometimes I am not able to pay attention in class because of my smartphone” had 92(31.3%) and 73(24.8) of the respondents agreeing and undecided respectively whiles 63(21.4) disagreed. In terms of data bundle usage, majority of the respondents 147 (50%) agreed that “using a smartphone

for learning consumes a lot of data bundle which increases my expenditure”, 33(11.2%) of the respondents agreed, and 31 (10.5%) were undecided. In addition, 142(48.3%) representing the majority of the respondents confirmed by indication, agreeing to the assertion that “smartphone usage in learning creates isolation or a feeling of being out-of-the-loop for both instructors” 64(21.8%) were ambivalent while 21(7.1%) disagree.

In summary, it can, therefore, be extrapolated from these findings that, despite the incredible usefulness of smartphones in learning activities, it tends to results in a negative effect on the distance learning students. This finding supports the study of Kibona and Mgyaya (2015) where it was revealed that the use of smartphone for leading negatively affects students in all level because of its addictive nature shifting the focus of students from their studies. Similar findings were also found in the works of Ifeanyi and Chukwuere (2018) and Lee et al., (2015). On the other hand, the study is inconsistent with the study Shai (2016) and Sarfoah (2018) where favorable effect were revealed from the participants.

Factors that inhibit the use of smartphone as a learning tool.

There are several factors that mitigate against the use of smartphones as a learning tool.

Responses from respondents are shown in Table 6.

Responses on factors that inhibit the use of the smartphone as a learning tool.

No.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Unstable internet connectivity	3(1.0%)	5(1.7%)	34(11.6%)	147(50%)	105(35.7%)
2	The screen and key sizes make Smartphone uncomfortable for learning	4(1.4%)	17(5.8%)	36(12.2%)	152(51.4%)	86(29.3%)
3	File/formats of contents sometimes do not support Smartphone browsing	11(3.7%)	13(4.4%)	32(10.9%)	103(35%)	135 (45.9%)
4	The phone can freeze during important learning moments	61(20.7%)	40(13.6%)	34(11.6%)	98(33.3%)	61(20.7%)
5	Intruding calls may come in during learning	14(4.8%)	25(8.5%)	39(13.3%)	117(39/8%)	99(33.7%)
6	Difficult to get access to use smartphone during constant power cut	4(1.4%)	16(5.4%)	41(13.9%)	147(50.0%)	86(29.3%)
7	Without internet bundle or wifi connection, I cannot access course information online.	3(1.0%)	40(13.6%)	55(18.7%)	104(35.4%)	92(31.3%)

Responses from Table 6 shows that, majority of the respondents 147(50%) agreed to one of the inhibiting factors that affect the use of smartphones for learning by students, which is unstable internet, 105(35.7%) strongly agreed, 34(11.6%) and 5(1.7%) indicated neutral and disagree respectively. Also, more than half of the respondents 152(51.4%) agreed that the screen and key sizes make smartphone uncomfortable for learning, 36(12.2%) and 17(5.8%) were ambivalent and disagreed respectively. Again, on the assertion, “file/formats of contents sometimes do not support Smartphone browsing” 135 (45.9%) strongly agreed, 103(35%) agreed while 32(10.9%) and 13(4.4%) were undecided and disagreed respectively.

Further, a considerable number 98(33.3%) of the respondents agreed to this plight “The phone can freeze during important learning moments”, 61(20.7%) of them strongly agreed, and the same number 61(20.7%) strongly disagreed, while 34(11.6%) were not sure. In terms of access, a greater percentage of the respondents 104(35.4%) agreed to the statement “difficult to get access to use a smartphone during constant power cut”, 41(13.9%) and 16(5.4%) were neutral, and disagreed respectively. Additionally, one of the gateways to use a smartphone for learning especially when searching for information is the use of bundle. A total number of 104(35.4%) representing the majority agreed to the assertion “without internet bundle or Wi-Fi connection, I cannot access course information online”, 55(18.7%) reacted with a neutral response, while 40(13.6%) opposed by indicating disagree.

In totality, it can be seen from these findings that, in as much as the respondents brought to bear favorable perception about the use of a smartphone as a learning tool, it is lumbered with some inhibiting factors. This finding is consistent with the works of Gikas and Grant (2013) where it was revealed that the small screen size of smartphones as compared to a laptop make it unfavorable for learning. Also, the finding is congruent with the study of Sarfoah (2017) where it revealed inhibiting factors such as unreliable internet connectivity and devices do get frozen at a critical point while studies is ongoing, and many others.

Conclusion and Recommendation.

It is blatant that, the proliferation of the Internet and Information Communication Technology has affected almost every facet of teaching and learning, especially in distance education where course

is being delivered either by blended mode of teaching or fully online. With reference to the findings of this study, it was revealed that the distance learning students of the University of Ghana find it easy to use a smartphone in their academic activities which enhance their perceived usefulness of using a smartphone for learning activities. The findings can be attributed to the fact that since part of their course is delivery via digital mode, there is the tendency that, they were fueled to learn how to use a smartphone to access the Sakai which is a common platform for course delivery. Also, the study found a positive usefulness of the use of smartphone in the students learning activities such as easy sharing and accessing of lecture materials online, easy communication with colleagues and course masters, being able to carry smartphone any anywhere and at any time because of its portability as compared to a laptop and many others. Again, the study revealed negative effect on students' academic activities by the use of smartphones whereby, for instance, smartphones shift the focus of users because of its addictive nature, intruding calls coming in during lecture hours and the tendency of checking social media platform which distract learning on the part of the distance learning students and some of the inhibiting factors found were unreliable internet connectivity, the screen and sizes make smartphone uncomfortable for learning. Also, smartphone can be frozen at the peak of learning moments and many others. The study recommended that there should be constant strong Wi-Fi connection, constant power, and the distance education unit of the University of Ghana should orient students on how they can effectively utilize their smartphones for their academic activities with minimal distractions.

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