

## Mobile Learning Support in Delivering Distance Education: Perception of Students of University of Cape Coast, Ghana

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### Abstract

*This paper explored the perception of University of Cape Coast distance education students on the use of mobile technologies to facilitate interactions among students and tutors as a learning-support system. The paper aimed at establishing whether distance education students would accept to be taught using a blend of mobile technologies and biweekly direct face-to-face tutorials on weekends. A questionnaire was used to collect data from a sample of 300 students pursuing various Diploma, Bachelor's and Master's degrees by distance at University of Cape Coast using systematic sampling technique. The data was analysed using descriptive statistics. It was found that scheduled face-to-face tutorial sessions of distance education in University of Cape Coast were not supportive enough to address students' learning needs. Also, all the respondents possessed mobile devices and perceived blending of mobile learning in distance education as an avenue to enhance collaborative learning with faculty and colleagues. It was recommended that curriculum and instructional designers of distance education courses must consider incorporating mobile learning pedagogies in the distance courses and learning experiences to address students' learning needs using mobile technologies.*

**Keywords:** blended learning, distance education, learning technologies, m-learning, online teaching, transactional distance.

### Introduction

The expeditious development of information and communication technology (ICT) has contributed to the introduction of new ways of delivering lessons to students. Distance education is one of such new approaches. Based on this assertion, the ways of lesson delivery and acquisition of knowledge are not restricted by space and location any more. According to Bušelić (2012), there are technologies that can offer flexibility in when, how and where students can acquire knowledge. Students worldwide enroll in distance education programmes as a way of increasing access to formal education to otherwise disadvantaged individuals (Collins, McKinnies & Collins, 2010).

Distance education has been conceptualized by various authors. In the view of Larson and Owusu-Acheaw (2016), distance education is a form of education where learners have minimal

physical contact with their tutors. In a similar vein, Mabawonku (2004), described distance education as a form of education in which there is geographical separation between the learner and the learning institution. Such separation between distance learners and their lecturers is often a barrier to interaction among the students, their peers and lecturers which is otherwise necessary to support students' effective learning.

Learning is most successful for students when they are able to interact with each other through interrogating and sharing of ideas (Darling-Hammond, Flook, Cook-Harvey, Barron & Osher, 2019). However, learning tends to be problematic when interaction between lecturers and students are irregular. The incorporation of mobile technologies, such as smart phones and tablet computers in distance education can address this gap. Blending distance education with social interactions using mobile technologies can enhance easy communication between distant learners and lecturers, as well as

between students and peers. According to Makoe (2013), the introduction of mobile technologies in blended learning holds considerable promise for distance education as a cognitive delivery tool to enhance collaborative learning.

Blended learning refers to a learning process that involves use of a combination of technology and direct face-to-face contacts (Singh, 2012). In the view of Kintu, Zhu and Kagambe (2017), adopting blended learning balances success between distance education using technology and traditional face-to-face learning approaches. Examples of blended learning include a combination of e-learning modules and time-tabled online tutorials using chat room facilities that are integrated into a learning management system (LMS).

In Ghana, the situation of inadequate interaction among distance education students and their tutors are not different. Some Universities in Ghana scheduled face-to-face weakened meetings between their distance students and tutors to deliver lessons.

### **Statement of the Problem**

Tertiary institutions are embracing a number of innovations in pedagogies and some of these involve the use of technology in blended learning. The pedagogy of blended learning (combination of face-to-face and online teaching/learning) initiatives is part of these innovations. However, the efficiency of some of these innovations, especially among University of Cape Coast distance education students faces challenges.

From informal interactions the researchers had with some distance education students of the University of Cape Coast, it was revealed that some of the students have difficulty understanding the course content discussed at face-to-face biweekly tutorials sessions. Some of the distance education students complained that they were not afforded sufficient opportunities to clarify their misunderstandings at tutorial sessions because so much contents were hastily discussed by tutors in a limited time.

There is numerous literature that support the use of mobile devices to facilitate communication among students and tutors or lecturers to support collaborative learning in

distance education environments (Yousuf, 2006; Kukulska-Hulme & Traxler, 2005). The use of mobile devices is suitable especially in learning environments where time is a limited asset. However, there is literature gap on how distance education students in Ghana perceive the usefulness of mobile learning as a supportive pedagogy to enhance their interaction with peers and course tutors to facilitate their learning. This study sought to address this gap.

### **Purpose of the Study**

The purpose of this study was to find out whether distance education students in Ghana accept the blend of weekend face-to-face tutorials at two weeks intervals with mobile learning support system outside the tutorial sessions.

### **Research Objectives**

The objectives of the study were to:

1. determine the extent to which distance education students desire for additional learning support systems besides their scheduled biweekly face-to-face tutorial sessions.
2. find out the proportion of distance education students who owned mobile devices.
3. determine the extent of distance education students' willingness to use mobile devices as a complement to face-to-face learning activities.
4. determine how distance education students perceive the effectiveness of blending mobile learning pedagogy with face-to-face tutorial sessions.

### **Research Questions**

- 1 To what extent do distance education students desire for additional learning support systems besides their scheduled biweekly face-to-face tutorial sessions?
- 2 What proportion of distance education students own mobile devices?
- 3 To what extent are distance education students willing to use mobile devices as a complement to face-to-face learning activities?
- 4 How do distance education students perceive the effectiveness of blending mobile learning pedagogy with face-to-face tutorial sessions?

## Meaning of Mobile Learning

There have been a number of definitions of the concept of mobile learning by different authors. Among these, Quin (2001), Brown (2005) and Crescente and Lee (2011) are of the view that mobile learning is a subset or extension of e-learning through mobile computational devices. Others also perceive mobile-learning as the processes of acquiring knowledge “through conversations across multiple contexts among people and personal interactive technologies” (Sharples, Taylor & Vavoula, 2007:224). El-Hussein (2010) defined mobile learning as “any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of the learner and mobility of learning” (p. 20). Keegan (2005) defines mobile learning as learning accomplished with the use of small, portable computing devices such as smartphones, personal digital assistants (PDAs) and similar handheld devices.

One of the paramount features of mobile learning emphasized in all definitions is that it involves the use of devices that are portable and convenient for learners to carry with them anywhere, anytime and enable learners to access sources of learning materials or information at any time anywhere as opposed to devices that are required to be fixed at a place like the desktop computer. Recent innovations in software applications and social media software using Web 2.0 technologies (e.g., blogs, wikis, Twitter, YouTube, WhatsApp) or social networking sites (such as Facebook and Myspace) have made mobile devices continuously changing and spreading. Also, mobile devices give assurance of more potential usage in education.

## Blending Mobile Learning in Distance Education

The rate of penetration and ubiquitous nature of mobile devices present tremendous opportunities to educators, particularly those involved in distance education, to utilize these devices to provide support for enhancement of teaching and learning. Besides high rate of penetration, mobile devices present other advantages which make them suitable for use in supporting learning in distance education (Becking et al, 2008). These advantages include the use for independent and collaborative

learning experiences and affordability. Due to these and more advantages of mobile devices, they are thus used in distance education to address variety of student needs.

One of the challenges encountered by distance education students is a sense of isolation which comes as a result of the geographic distance separating students from their peers, and between students and their tutors (Galusha, 1997; Gibson & Graff, 1992). In addressing this challenge for distance learners, mobile devices are used to increase interaction among students and between students and faculty. Mobile devices are also used to support collaborative learning (Yousuf, 2006; Kukulska-Hulme & Traxler, 2005). Furthermore, mobile devices are used by faculty to provide immediate feedback to distance learners as part of improvement in their interactivity.

As reported by Foti and Mendez (2014), mobile learning affords both students and faculty the additional opportunity to conveniently access information instantaneously regardless of their location. By so doing, learning thus occurs anywhere at any time through the use of mobile devices.

The preceding discussion of literature establishes the foundation for variety of reasons and applications of mobile technologies in distance education to facilitate students’ learning. However, there is not much empirical evidence supporting the awareness of distance education students in Ghana regarding the benefits of blending mobile learning pedagogy in the teaching and learning processes of distance education.

## Theoretical Framework

The study was underpinned by transactional distance theory which defines critical concepts of distance learning. Moore (1997) viewed transactional distance as a distance which is considered as not being a geographic separation but as a pedagogical concept. The theory allows for a programme in which the principal form of communication is through technology and where technology-mediated communication is ancillary to the classroom (Moore, 2007). According to Tatar, Roschelle, Vabey and Pennuel (2003) the latter programme is important for mobile learning because mobile devices are used in the school settings as an ancillary element but

mostly extend beyond the classroom to non-traditional, informal and non-institutional settings. This view is supported by Park (2011) who revealed that the nature of transactional theory and its applicability makes it useful for mobile learning.

Educational applications of mobile learning can be classified based on the transactional distance theory. Park (2011) modified the transactional distance theory and used it to classify mobile learning into four categories viz. high transactional distance socialized m-learning, high transactional distance individualized m-learning, low transactional distance socialized m-learning and low transactional distance individualized m-learning.

In high transactional distance socialized mobile learning activity, learners are said to have more psychological and communication space with their teacher (Park, 2011). The learners engage in group learning where they communicate and collaborate with one another. Also, the learning resources are provided from a predetermined programme through mobile devices. Communication mainly occur among learners, and the teacher has little involvement in facilitating the group activity.

In high transactional distance and Individualized mobile learning activity, the individual learners have more psychological and communication space with the instructor or instructional support (Park, 2011). According to her, the individual learners receive well organized content and resources through mobile devices. The individual learners receive the content and control their learning process in order to master it and the interactions are usually carried out between the individual learner and the content. This type of mobile device application learning demonstrates an expansion of the scope of e-learning which allows greater flexibility and portability.

A third type of mobile technology application in learning is the low transactional distance and socialized mobile learning activity in which individual learners communicate with the teacher and fellow learners through mobile devices (Park, 2011). According to Park (2011), the learners have less psychological and communication space with the instructor and the instruction is loosely structured. This type is said to demonstrate the most advanced form in terms

of the variety of mobile devices and learners' social interactions.

This last type which is the low transactional distance and individualized mobile learning activity refers to less psychological and communication space between instructor and learner. On this basis, individual learners can interact directly with the instructor and the instructor leads and controls the learning in an effort to meet learners' needs while maintaining their independence (Park, 2011). This type has the features of mobile learning that supports blended mode.

## **Materials and Methods**

### **Research Design**

The research methodology employed in this study was descriptive quantitative methodology. The descriptive methodology has varied approaches such as observation studies, correlational research and survey research.

Among the various approaches to descriptive methodology, survey research design was used in this study because it was found to be most suitable. Survey research, as described by Leedy and Ormrod (2010, p.187), involves obtaining information about the characteristics, opinions, attitudes or previous experiences of one or more groups of people, perhaps by asking them questions and tabulating their answers. The ultimate goal of survey research design is to generalize findings to a larger population.

The choice of survey design for this study was due to its merit of gathering various responses from a wide range of people. Furthermore, descriptive survey helps to present the true state of affairs of a given situation after data have been collected from a number of people who respond to the same set of questions about a given situation (Gay, 1992). This approach is more suitable for this research because it was intended to acquire information about the attitude of distance learners concerning the possibility of blending mobile learning pedagogy in instructional activities.

### **Sampling Procedure**

Systematic sampling technique was used to select the participants of the study. The sample included students pursuing various programmes at Master's degree, Bachelor's degree and

Diploma levels. They comprised three hundred students studying at the Cape Coast study center of the College of Distance Education, University of Cape Coast. The use of random sampling was informed by its merit of enhancing

representativeness of the population by the sample. The breakdown of the constituent of the sample according to academic levels were presented in Table 1.

**Table 1.** Breakdown of respondents included in the study

	<b>Diploma</b>	<b>Bachelor's degree</b>	<b>Master's degree</b>	<b>Total</b>
Population	1340	730	215	2285
Sample	134	134	32	300

**Source:** of population figures: UCC-SRIMS, Record Guide (2019).

As indicated in Table 1, the sample of the study consisted of 134 students pursuing various programmes at each of Diploma and Bachelor's degree levels and 215 students at the Master's degree level. Thus, a total of 300 sample size was obtained for the study.

### **Data Collection and Analysis**

A questionnaire was used as an instrument to collect data for the study. Questionnaire is a useful and widely used instrument for collecting survey information, providing structured and often numerical data in various scales of measurement such as nominal and ordinal. Also, it is useful for the collection of data without the presence of the researcher, and it is often comparatively straight forward to analyse (Cohen, Manion & Marrison, 2005). Questionnaire is a very effective instrument for acquiring factual information about practices and conditions of which the respondents are presumed to have knowledge. It is also suitable for enquiring into the opinions and attitudes of respondents. Furthermore, questionnaire was deemed appropriate for this study because the respondents were all literate in English language.

The questionnaire items were adapted from related studies conducted in other parts of the world (Vyas & Nirban, 2014; Alsaadati, 2017). Relevant information from the literature reviewed aided in the design of the questionnaire which consisted of three sections. The first section of the questionnaire centered on the demographic information about the respondents while the second section focused on finding out about whether students owned mobile devices and which mobile devices were owned by the students. The third and final part

focused on finding out whether students perceived that their learning needs were satisfied through the scheduled biweekly weekend face-to-face tutorial sessions alone, or they needed additional learning support from their peers and lecturers. Also, the final part of the questionnaire enquired whether students would embrace academic support from peers and lecturers offered through mobile devices besides the scheduled face-to-face tutorial sessions.

### **The Scale**

The content and face validity of the questionnaire were established with the help of two lecturers in Educational Technology. Also, the reliability of the instrument was tested using Statistical Package for Social Sciences (SPSS) after a pilot test. The reliability test produced Cronbach's Alpha of 0.742 on 20 responses of 8 items. The Cronbach's Alpha obtained was greater than the recommended acceptable minimum value of 0.70, therefore the instrument was found to be reliable enough to be used for the main study.

### **Data Collection Procedures**

The researchers visited various lecture rooms in turns and sought permission from the course tutors. They explained the purpose of the study to the various classes and sought the consent of students who wished to voluntarily participate in the study. In each class, after some students volunteered to participate in the study, a systematic random sampling technique was used to select a sample. Subsequently, copies of the questionnaire were given to the sample for completion. For each class the researchers visited, the participants completed the questionnaires and returned same to the former on the same day.

## Data Processing and Analysis

The data obtained from the completed questionnaires were screened, coded and analyzed using descriptive statistics. Frequencies and percentages were generated for responses to the various questionnaire items using IBM Statistical Package for the Social Sciences (IBM SPSS) version 25. The descriptive statistics so generated were further presented in frequency tables.

## Results

The study targeted all students pursuing various undergraduate and graduate programmes by distance at the Cape Coast study center of the College of Distance Education (CoDE) of the University of Cape Coast, in Ghana. However, a sample was drawn to participate in the study. The data obtained on sex characteristics of the participants were presented in Table 2.

**Table 2.** Distribution of participants by sex

Sex	No. of Students	Percentage (%)
Male	160	53.3
Female	140	46.7
<b>Total</b>	<b>300</b>	<b>100.0</b>

As shown in Table 2, the participants consisted of 300 distance education students. These comprised 160 males representing 53% and 140 females (48%). This shows the number of male students who participated in the study

slightly outnumbered the female counterparts.

The study also obtained data on the academic levels at which the participants pursued various programmes. This data was presented in Table 3.

**Table 3.** Distribution of Respondents by Programme Level

Programme Level	No. of Students	Percentage (%)
Diploma	134	44.7
Bachelor's Degree	134	44.7
Master's Degree	32	10.6
<b>Total</b>	<b>300</b>	<b>100.0</b>

The data presented in Table 3 indicates that the participants were pursuing various programmes at the Diploma, Bachelor's and Master's degree levels. At each of diploma and bachelor's degree levels, 134 students representing about 45% participated in the study. The least number of participants being 32 (approximately 11%) were pursuing programmes at the Master's degree level.

**Research Question 1:** To what extent do distance education students desire for additional learning support systems besides their scheduled biweekly face-to-face tutorial sessions?

The study sought for information from the participants as to whether they perceived biweekly weekend face-to-face tutorial sessions to be sufficiently supportive to their learning or they desired for additional learning support systems. Item 7 on the questionnaire made a positive declaration that: "Face-to-face tutorial sessions held every other weekend are sufficient for distance learners to effectively learn all they need to learn.". The participants indicated their perception by selecting one of five-point Likert scale responses ranging from strongly disagree to strongly agree. Their responses were presented in Table 4.

**Table 4.** Students' contentment with biweekly weekend face-to-face tutorial sessions

Responses	No. of Students	Percentage (%)
Strongly Agree	2	0.7
Agree	8	2.7
Neutral	35	11.7
Disagree	157	52.3
Strongly Disagree	98	32.7
<b>Total</b>	<b>300</b>	<b>100.0</b>

The data in Table 4 showed that 255 participants representing 85% disagreed with the statement that biweekly face-to-face tutorial sessions were sufficiently supportive for their learning. This was an indication that the greatest majority of the participants felt that their learning needs were not satisfied by the biweekly face-to-face tutorial sessions alone.

As a follow-up to the data obtained in Table 4, item 11 of the questionnaire made a negative

statement that “Face-to-face tutorial sessions held every other weekend alone are **Not** sufficient for distance students to effectively learn all they need to learn”. This statement was meant to solicit perceptions of the participants regarding whether and the extent to which they felt face-to-face tutorial sessions alone did not meet their learning needs and therefore they desired for extra learning support systems. Their responses were presented in Table 5.

**Table 5.** Distance education students’ perception that biweekly face-to-face tutorial sessions alone do not meet their learning needs

Responses	No. of Students	Percentage (%)
Strongly Agree	105	35
Agree	177	59
Neutral	0	0
Disagree	18	6
Strongly Disagree	0	0
<b>Total</b>	<b>300</b>	<b>100</b>

The data presented in Table 5 indicated that 282 participants representing 94% agreed that biweekly face-to-face tutorial sessions held on weekends alone did not meet their learning needs. It was evident that majority of the participants had perception that biweekly face-to-face tutorial sessions alone were not sufficient to meet their learning needs. This confirmed the findings from Table 4. Supplementary learning support systems would therefore be desirable.

**Research question 2:** What proportion of distance education students own mobile devices?

The study solicited responses from the participants to the question: “Do you have a mobile communication device?”. The purpose of this question was to ascertain the proportion of students who had mobile communication devices that could be used in mobile learning pedagogy. Responses from the participants to this question were summarized in Table 6.

**Table 6.** Proportion of distance students who owned mobile devices

Responses	No. of Students	Percentage (%)
Yes	300	100
No	0	0
<b>Total</b>	<b>300</b>	<b>100</b>

The data presented in Table 6 showed that all the participants (100%) owned mobile communication devices.

In an attempt to find out the specific mobile communication devices the participants owned, a follow-up question was posed: “If yes, which

mobile communication devices do you have?”. Alternative choices provided by the questionnaire were smart phone, tablet, laptop and ‘other’ (to be specified by respondents). The responses obtained were summarized in Table 7.

**Table 7.** Mobile devices possessed by distance students

Responses	No. of Students	Percentage (%)
Smart phone	135	45.0
Smart phone and Laptop	119	39.7
Smart phone and Tablet	11	3.7
Tablet and Laptop	35	11.7
<b>Total</b>	<b>300</b>	<b>100.0</b>

The data presented in the Table 7 revealed that 135 participants representing 45% owned smart phones alone, 119 (40%) owned both smart phones and laptop computers, 11 (4%) owned smart phones and tablets, and 35 (12%) owned both tablets and laptop computers. It was evident from the data that 265 participants representing 88% owned either a smart phone alone or a smart phone and another mobile device. Also, all the participants possessed some kind of mobile communication devices.

**Research question 3:** To what extent are distance education students willing to use mobile devices as a complement to face-to-face learning activities?

The participants were further probed to affirm whether they would be willing to participate in

mobile learning activities with their course mates and tutors/lecturers besides their biweekly face-to-face tutorial sessions. This was accomplished through item 10 of the questionnaire which stated that “If formal arrangements are made by the university for lecturers/tutors and students to use mobile applications such as WhatsApp messenger to discuss academic work anytime, anywhere; I will seriously participate”. The respondents indicated their level of willingness to participate in mobile learning activities by choosing an option in the continuum from strongly disagree to strongly agree on a five-point Likert scale. The responses obtained were presented in Table 8.

**Table 8.** Students’ willingness to participate in mobile learning activities besides face-to-face tutorial sessions

Responses	No. of Students	Percentage (%)
Strongly Agree	146	48.7
Agree	154	51.3
Neutral	0	0
Disagree	0	0
Strongly Disagree	0	0
<b>Total</b>	<b>300</b>	<b>100</b>

The summary of responses presented in Table 8 indicated that all the 300 respondents representing 100% agreed that they would willingly participate in mobile learning activities to complement the scheduled biweekly face-to-face tutorial sessions.

**Research question 4:** How do distance education students perceive the effectiveness of blending mobile learning pedagogy with face-to-face tutorial sessions?

The study solicited information on how the participants perceived the effectiveness of

blending mobile learning pedagogy with biweekly face-to-face tutorial sessions. This was accomplished by asking the subjects to make a comparison of two modes of distance education delivery and select one they perceived would help students learn better. The first mode involved only biweekly face-to-face tutorial sessions while the other mode involved a blend of the earlier mode with mobile learning activities that would be available to learners anytime in their convenience. Responses of the participants were summarized in Table 9.

**Table 9.** Students’ comparison of distance education delivery modes

Responses	No. of Students	Percentage (%)
Only face-to-face tutorials	5	2.0
Blended face-to-face tutorials and mobile learning	295	98.0
<b>Total</b>	<b>300</b>	<b>100.0</b>

The data in Table 9 showed that 295 participants (98%) were in favour of blended face-to-face tutorial sessions with mobile learning support in distance education delivery. This data gave indication that the participants perceived distance education delivery mode that involve a blend of mobile learning pedagogy with face-to-face tutorial sessions as being more

effective in supporting students’ learning than only biweekly face-to-face tutorial sessions.

## Discussion

The analysis of the data revealed that a great majority of the participants being 85% disagreed with the statement that biweekly face-to-face tutorial sessions were sufficiently supportive for



their learning. Also, 94% of the participants agreed that biweekly face-to-face tutorial sessions held on weekends alone did not meet their learning needs. These two findings from the study revealed that distance education students of the University of Cape Coast deeply desired for additional learning support systems that would adequately address their learning needs. Consistent with the findings of this study, Hagel and Shaw (2006) also found in a study in which students compared face-to-face study mode to web-based mode that the students perceived the latter study mode to be more functional than the former.

It was also found that all the participants being 100% possessed smart phones. In addition to the smart phones, some owned tablet computers and or laptop computers. This finding is consistent with Huang (2016) and Hussin, Manap, Amir and Krish (2012). Huan observed that among Chinese undergraduate students, mobile phones were a major mobile technology that they possessed and 100% of the Chinese students who participated in his study owned mobile phones before starting college. Similarly, Hussin *et al.* found that all the students sampled in two Malaysian universities owned mobile phones. This makes mobile phones a feasible technology for pedagogical use in university education.

All the participants (100%) affirmed that they were willing to participate in mobile learning activities if implemented by the university for them to interact with fellow students and tutors/lecturers in connection with academic work anytime, anywhere, besides their scheduled biweekly weekend face-to-face tutorial sessions. This finding is consistent with Economides and Grousopoulou (2010) who observed that university students were most likely to use their mobile devices for obtaining information about lessons and exams, and arranging meetings with classmates. Also, the finding underscores that distance education in Ghana is characterized by high transactional distance and individualized learning (Park, 2011) which students perceive does not sufficiently meet their learning needs. As a result, the students desired for low transactional distance and socialized mobile learning activities in which individual learners communicate with the teachers and fellow learners through mobile devices.

Finally, 98% of the participants expressed their perception that distance education delivery involving a blend of fortnight face-to-face tutorial sessions with mobile learning activities that are always accessible to students would be more effective than only weekend face-to-face tutorial sessions held fortnightly. This finding is also consistent with Huang (2016). Huang found that Chinese undergraduate students were optimistic about the potential benefits of mobile phone integrated learning and that students were more likely to initiate mobile learning activities than their faculty.

## Conclusion

It could be concluded that distance education students of the University of Cape Coast need additional learning support that would always be available from their course mates and faculty members by which their learning needs could be addressed anytime, and anywhere. This need could be met by incorporating mobile learning in distance education to close the transactional distance among learners and their lecturers. Also, because all the students possessed at least one mobile device and expressed willingness to participate in mobile learning activities, if mobile learning is incorporated into distance education in Ghana, it will possibly have massive acceptance by all the students.

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