

# 1 Students Attitudes and Effect of Mobile Learning on Academic 2 Performance

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## 6 **Abstract**

7 This study investigated the effects of Mobile Learning on students academic performance and  
8 student attitudes about the use of mobile devices for learning. The study used the  
9 quasi-experimental approach. Respondents in this study consisted of (42) Adeyemi College of  
10 education social studies English language major that were on teaching practice at National  
11 Institute for Educational Planning and Administration Ondo. The students were divided into  
12 experimental and control groups of (21) students in each. The soft copy of the course content  
13 on Strategies of Teaching and Learning" was uploaded to the mobile phone for students in the  
14 experimental group. Another hardcopy of the course content was delivered to students in the  
15 control group by hand in the first meeting. Data collection tools included an academic  
16 performance examination and students attitudinal questions. The result was analyzed using  
17 Relative Importance Index, Simple percentage, Analysis of Variance and Independent Sample  
18 t Test. It was found that mobile learning had quite significant effect on students' academic  
19 performance and student attitudes about using mobile phone for learning were moderately  
20 positive with a pooled RII of 89.48

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22 **Index terms—**

## 23 **1 Introduction**

24 Learning anywhere at any time is not a new concept. Books have been available for centuries and were probably  
25 the first "mobile" learning device. In his introduction to The New Landscape of Mobile Learning, Searson (2014)  
26 wrote: "Consider for a moment, the book as education's first mobile device; specifically, the type of book driven  
27 by the invention of Johannes Gutenberg's printing press." What is new in the concept of mobile learning is access  
28 to interactive learning content, contact and communication with teachers and other students, and assessments  
29 through the internet via wireless-enabled smart phones.

30 The availability of contemporary mobile devices has marked a turning point for the rates of 9mobile device  
31 usage. In 2013, vendors shipped more than one billion smart phones worldwide (International Data Corporation  
32 2014) and in 2014, the global mobile penetration rate reached 95% (Ericsson Mobility Report 2014). Ericsson's  
33 Mobility Report (2014) estimated that 90% of the world's population would have a mobile phone by 2020. Tablet  
34 device shipments are expected to surpass personal computer shipments by the end of 2015 (International Data  
35 Corporation 2013). As a consequence of this rapid diffusion of mobile technologies, the ways in which people  
36 interact, communicate, and work have changed (Lam, et al, 2010).

37 Remarkably, even some children under the age of 12 months are already playing with mobile devices (Suoninen,  
38 2010). Mobile technologies have altered our societies and the way we live in many respects.

39 Educational institutions are nowadays facing the reality of the rapid development and widespread of mobile  
40 phones, which are considered one form of those mobile devices used for E-learning all over the world. Such  
41 development has involved an increase in both mobile phones speed and storage capacity. The continuous drop  
42 in prices, on the other hand has resulted in the vast widespread of these mobile phones making them one main  
43 component of most learners' (boys and girls) daily lives. Mobile phones are not accessory anymore; they are  
44 integrated like our clothes, (Dos 2014).

### 3 STATEMENT OF THE PROBLEM

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45 It is true that mobile phones are mainly used for completely communication purposes, but fortunately, some  
46 people have begun to regard them as a core pedagogical activity in higher educational institutions, (El-Hussein  
47 & Cronje 2010). The number of those teachers and students who have begun to use them as a teaching and/or  
48 learning tool is growing tremendously. Most students have started overcoming their difficulties regarding the  
49 place and time of lectures via the effective exploitation of their mobile phones or what has been so called "Mobile  
50 Learning". Teachers, on their turn have instance education has developed in two major directions: 'the individual  
51 flexible teaching model' and 'the extended classroom model' (Rekkedal & Dye, 2007). The former allows students  
52 to start the class at any time, study in isolation and communicate with instructors and classmates through  
53 asynchronous tools. The latter organises students into groups, requires them to meet at local study centres,  
54 and allows them to use interactive technologies such as video conferencing to interact (Rekkedal & Dye, 2007).  
55 Learning can occur inside and outside the classroom and the learning situations can be either formal planned  
56 lessons or informal unplanned and spontaneous learning experiences ??Crompton 2013). D started to think  
57 seriously of providing their students with the teaching materials and activities through their mobile phones.  
58 Nowadays, Mobile Learning has been widely accepted by learners. In other words, learning via mobile devices  
59 is widely accepted by the learner community because of its application as well as its philosophy and standards,  
60 (Lan& Huang, 2012& Little, 2012).

61 The advances in technology used in today's mobile phones qualify them to be instructional as well as  
62 communicational tools. In addition to their main purpose, mobile phones, are nowadays used to send and  
63 receive instructional messages through text, voice or even images, (Kim, et. al., 2013). Furthermore, mobile  
64 phones and consequently Mobile Learning facilitate accessing various educational resources on Internet and help  
65 developing and creating interesting teaching content that can be used inside or outside classrooms, (UNISCO,  
66 2013).

67 Mobile Learning can deliver the right information to the right person at the right time better than any other  
68 learning/teaching technology yet devised, (Little, 2012). Besides, students' interest to use all available resources  
69 of Mobile Learning through their mobile phones and Personal Digital Assistants (PDAs) to access information  
70 anytime and anywhere has also played a significant role in the success of mobile learning prevalence, (López, et.  
71 al. 2009). Mobile Learning not only fosters the way we access information, but also helps learners be innovative  
72 and good problem-solvers, (West, 2013). However, teaching-learning materials should be redesigned, developed,  
73 and carried out in a way that fits this new kind of learning and makes it more effective. It is on this back  
74 ground, this research work intend to assess the impact of mobile learning on students' learning behaviours and  
75 performance.

## 76 2 II.

### 77 3 Statement of the Problem

78 Researchers have agreed that mobile technologies have great potential to improve teaching and learning. Some  
79 authors have highlighted that with mobile learning, learning can take place in different contexts inside and outside  
80 the classroom (Traxler, 2007;Shih, et al. 2011) and that mobile devices at their best can enable learning that is  
81 "just in time, just enough, and just for me" (Peters, 2005;Traxler, 2007). However, far too little attention has  
82 been paid to educational practices.

83 Educational outcomes and impacts, however, cannot be fully assessed before the use of mobile technology  
84 in education is integrated into everyday educational practices or at least all affecting variables are well known.  
85 For instance, when mobile learning employs design and evaluation principles taken from traditional or electronic  
86 learning, it may fail to take into account the unique possibilities of learning through mobile technologies (Shuler,  
87 2009).

88 Chen and de Noyelles (2013) indicated that in a study about mobile-device usage, more than half of college  
89 students utilized a mobile device for academic purposes. Eighty-two percent of students that owned a tablet device  
90 reported using the device for academic purposes while only 58% of students that owned a smart phone used their  
91 device for academic purposes. The study also indicated that there was a negative relationship between students'  
92 GPA and academic use of smart phones and that freshman used smart phones and small mobile devices in an  
93 academic setting more than juniors or seniors. Students also expected technological support from instructors,  
94 but only about 54% of students indicated that their instructors provided support ??Chen & Denoyelles, 2013).

95 Most mobile learning projects occur in isolation and are disconnected from teacher development programs  
96 and broader ICT initiatives and goals (UNESCO, 2011). Thus, many mobile learning projects may not have  
97 had a direct impact on educational practices. According to the Cognitivist, learning is an active, constructive,  
98 cumulative, and self-directed process that is dependent on the mental activities of the learner, (Shuell, 1986).  
99 However one can argue that Mobile Learning, because of the advanced technology embedded inside, can provide  
100 such mental, social, contextual, and spatial activities via micro learning all the daylong and make the learning  
101 process more selfdirected and regulated, ??dge, et.al. (2011).

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102 **4 III.**

103 **5 Research Questions**

104 1. What are students' attitudes about using personal mobile devices for learning? 2. What are students' beliefs  
105 about the ease of learning on mobile devices? 3. Is there any difference between the effect of Mobile Learning in  
106 comparison with Face-to-Face learning on the academic achievement of students'

107 IV.

108 **6 Methodology a) Study design**

109 The study adopted the experimental approach to check whether the use of mobile phones has an effect on students'  
110 academic achievement. An experimental design is usually used because it identifies easily the independent,  
111 dependent, and inconvenience variables. Also an academic achievement pre and posttests of equivalent groups  
112 were employed for both groups. Besides, pre and post-participants' conversational skills ratings were implemented,  
113 as illustrated in table 1.

114 Therefore, this study intends to assess the effect of mobile learning on students' achievement. Participants in  
115 this study consisted of (42) Adeyemi college of education social studies English language students that were on  
116 teaching practice at National Institute for Educational Planning and Administration Ondo were enrolled in two  
117 equal groups of "Strategies of Teaching and Learning" within the three months of teaching practice . One of these  
118 groups was assigned as a control group, was taught by Face-to Face Learning while the other one represented the  
119 experimental group, and studied the course content via Mobile Learning.

120 V.

121 **7 Data Collection Instruments**

122 Two main instruments were developed for this study, namely an academic achievement test and a scale for rating  
123 students' conversational skills. However, items in the achievement test were drafted based on the desired learning  
124 outcomes of "Strategies of Teaching and Learning" course in addition to participant students' academic level.  
125 The test consisted of two main parts. In the first part there were (7) questions of the essay type to answer  
126 (5) with question (1) compulsory and any other (4) questions. The second part involved (20) multiple-choice  
127 statements whereas,. Twenty (25) points were assigned for the first part, i.e. (10) points for compulsory easy  
128 question and 5 point for each of the remaining 4 essay question. (20) points were devoted to the second one, one  
129 point for each statement. Thus, the total mark on the achievement test was (50) points.

130 **8 a) Validity of the research b) Content validity of the ques-  
131 tionnaire**

132 Experts in the field of measurement and evaluation as well as computer science engineers at the National Institute  
133 for educational planning and National Open University of Nigeria help to validate the entire instrument designed  
134 for the study. Their expert advice and observations was used in revising the draft instruments to meet both the  
135 face and content validity. In general, they agreed that the questionnaire is suitable to achievethe goals of the  
136 study. Important comments and some modifications have been done.

137 **9 c) Reliability of the research i. Cronbach's coefficient alpha**

138 Prior to implementation, the test was piloted on (15) Industrial Training Students at (NIEPA) who were enrolled  
139 in "Practicum" course to determine the test needed time for completion, validity, and reliability. After calculating  
140 the time needed by those 15 students, it was found that the approximate needed time was 2 hours. Cronbach  
141 Alpha was then used to extract the test's reliability coefficient. Calculations showed that it was (0.93) indicating  
142 that results of such a test is fit for the study purpose and results will trustful which is also referred to as excellent  
143 as shown in table 2 .

144 **10 Methods of Presentation of the Analysis**

145 The questionnaire quantitative statistical analysis was done by using Statistical Package for Social Sciences  
146 (SPSS) version 22 and Excel sheet. The analysis of data was done to rank Student Attitudes about Learning on  
147 Mobile Devices. The following statistical tests were done:

148 1. Cronbach's coefficient alpha for questionnaire reliability 2. The relative importance index (RII) and ANoVA  
149 3. Independent sample t test Burns and Grove (1993) define the validity of an instrument as a determination of  
150 the extent to which the instrument actually reflects the abstract construct being examined. There are two ways  
151 to evaluate instrument validity: content validity and statistical validity, which include criterion-related validity  
152 and construct validity.

### 153 11 VII.

### 154 12 Results

155 Table ???.1: Demographic Characteristics of the Respondents Table ???.1 shows that 38.01% of the participants  
156 were male while 61.9% were female. The table also indicates a pre-instruction survey of the students on ownership  
157 and usage of personal mobile devices. The students affirmed that they all have a Smartphone with majority of  
158 them 57.1% owned an Android phone, 23.8% to Windows phone, 11.9% and 7.1% to the ownership of Blackberry  
159 and Apple phones. The table further reveals that 97.6% and 100.0% of the students had received classroom  
160 information, alerts, and announcements to your mobile device and also use mobile device to support learning  
161 during class. ???.2 shows that student attitudes about using personal mobile phone for learning were moderately  
162 positive with a pooled RII of 89.48% )using Likert scale of1 = Not at all well, to 5 = Extremely well. However  
163 with an RII of 97.1%, the students affirmed that their fellow students would be in favor of utilizing mobile learning  
164 in their coursework. So also 96.7% contends that it is acceptable for lecturers to contact them with class-related  
165 information, announcements, alerts and reminders about assignments on their personal mobile device. This is  
166 closely followed by those who taught mobile devices can help them stay on top of assignments and instruction  
167 with an RII of 96.2%.

168 Similarly, with an equal RII of 95.2% the students affirmed that Using mobile learning in their coursework  
169 would be a pleasant experience as well as using mobile device to learn all their course content in the classroom.  
170 ???.3 indicates that calculated F. ratio (2.128) was statistically insignificant at ( $?=0.05$ ). This analysis implies  
171 that there were no statistically significant differences between both groups in the academic pre-test achievement.  
172 That is students' academic achievement levels were homogeneous before the exposure to the treatment. ???.4  
173 revealed that, the value for the difference between participants' gain ratio in the control group ( $M= 55.145$ ) and  
174 the experimental group ( $M=64.222$ ) regarding the academic achievement posttest was (9.077). However, the  
175 table also show that the difference between both groups' mean scores was statistically significant at ( $?=0.05$ )  
176 between the academic achievement of both participant groups in favor of the experimental group that was taught  
177 by the use of Mobile Learning.

### 178 13 VIII.

### 179 14 Discussion of Findings

180 This study found that student attitudes about using mobile phone for learning were moderately positive with a  
181 pooled RII of 89.48% on a likert scale of 1 = Not at all well, to 5 = Extremely well. This is in line with findings  
182 concluded by Dos (2014) as well as Elaine (2017) regarding the development of students' achievement and met  
183 cognition as a result of Mobile Learning. They also assert the findings of Jabbour (2013) with regard to students'  
184 positive attitudes towards Mobile Learning, the enjoyment they had, and the positive learning experience they  
185 went through.

186 The study also revealed that Mobile learning was more effective than the use of traditional teaching methods  
187 in helping students enrolled in "Strategies of Teaching and Learning" course to achieve better with achievement  
188 test score of  $m= 64.222$  for mobile learning (experimental group) and  $m =55.145$  for traditional teaching methods  
189 (control group). This implies that, students' understanding and comprehension of the course's learning content  
190 provided by the use of Mobile Learning was much better than their peers' understanding and comprehension  
191 of the same content through the use of traditional ways of teaching, i.e. Face-to-Face learning. Such success  
192 and effect can be referred to a set of elements related to mobile phones' characteristics and technology. One  
193 of these factors is the fact that mobile phones could make learning easier and fast without time and place  
194 constraints. On the other part, the mobility that Mobile Learning depends upon could allow students to easily  
195 interact and discuss the learning topics with colleagues or instructor anytime and anywhere. Their leisure was  
196 effectively used and changed into precious time full of useful activities. Besides, mobile learning contributed to  
197 the support of the interactive characteristics of learning and teaching environment making students' role more  
198 effective through the active interaction with the teaching/ learning materials via mobile sets. Furthermore, Mobile  
199 Learning spontaneity and contextualization could make the teaching process student-centered going along with  
200 the philosophy of Constructivist Approach resulting in making them willingly able to access the teaching content  
201 and interact with it. Another important element in the success of students learning via Mobile Learning was  
202 the various opportunities and occasions through which learners were allowed to access and make use of the large  
203 amount of information available on Internet for the sake of educational aims and assignments.

204 Findings of this study are in accordance with ??ang, et.al. (2009) and Abdellahet.al, (2016)in relation to the  
205 ability of Mobile Learning to convert learners from passive into active ones who were behaviorally, intellectually,  
206 and emotionally involved in their learning tasks. However, findings of the present study do not go along with  
207 or support the findings of some studies, i.e. Kuzne koff & Tits worth (2013) and Chu (2012) Which found  
208 that Mobile Learning was not an effective learning style and consequently could not affect learners" academic  
209 achievement.

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## 210 15 IX.

## 211 16 Conclusion

212 This study indicates that students are skilled with their mobile devices and are receptive to using them for higher  
213 education or are already using them to capture lecture notes, images of instruction written on black and white  
214 boards, and reminders for class. Some students responded positively to receiving instructional content on their  
215 mobile devices. Teachers, on the other hand, can monitor all online students' mobile phone screens without too  
216 much delay, so as to facilitate instructor supervision of students' learning activities and to provide guidance when  
217 necessary.

218 It is now up to educationists as well as educational institutions to take the next step in effectively integrating  
219 mobile devices and instruction optimized for mobile devices in education in order to improve teaching and  
learning.

1

Group	Pre-test	Treatment	Post-test
Experimental	O 1 : Achievement of pretest	X 1 : Mobile learning Treatment	O 2 : Achievement of posttest
Control	O 1 : Achievement of pretest	X 2 : Traditional Treatment	O 2 : Achievement of posttest

b) Research Population

Figure 1: Table 1 :

2

's alpha and internal consistency  
(Prabhala, 2011)

Cronbach's alpha

? ? 0.9

0.9 >? ?0.8

0.8 >? ?0.7

0.7 >? ? 0.6

0.6 >? ? 0.5

0.5 >?

VI.

Internal consistency

Excellent

Good

Acceptable

Questionable

Poor

Unacceptable

Figure 2: Table 2 :

**32**

ic Performance	Students Attitudes and Effect of Mobile Learning on Academ	
Characteristics		
Gender		
Male		
Female		
Total		
Type of Smartphone Owned		
Android		
Apple		
Windows		
Year	Blackberry Total Hours used on Mobile Device Per day Less	
2018	than 1	
10	1-3	
Volume	4-5 6-7 more than 7 Total Has lecturer sent classroom information, alerts, and announcements to you	
XVIII		
Issue		
IX		
Ver-		
sion		
I		
G )	No	
(	- Total I think my fellow students would be in favor of uti-	5 4
Global	lizing mobile learning in their coursework. It is acceptable	16 13
Jour-	for lecturers to contact me with class-related information,	20 10
nal of	announcements, alerts and reminders	
Hu-		
man		
So-		
cial		
Sci-		
ence		
	about assignments on my personal mobile device.	
	I think mobile devices can help me stay on top of assign-	19 13
	ments and instruction	
	Using mobile learning in my coursework would be a pleasant	14 13
	experience.	
	I think I can use my mobile device to learn all my course	14 16
	content.	
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Figure 3: Table 3 . 2 :

Figure 4: Table

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**33**

	Sum of Squares	df	Mean of Square	F. ratio	Sig.
Between Groups	1.975	1	.329	2.128	.081
Within Groups	4.332	38	.155		
Total	6.307	39			

Figure 5: Table 3 . 3 :

Figure 6: Table

**34**

Group	N	?? ? (Mean)	MeanDifference	Df	t-cal	Sig	Prob
Experimental	20	64.222	9.077	19		0.0180	
Control	20	55.145			1.782		

Figure 7: Table 3 . 4 :



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## 16 CONCLUSION

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