EFFECTIVENESS OF MOBILE LEARNING USING VIDEO LESSONS AND ANALYZING THE PERFORMANCE OF UNDERGRADUATE ENGINEERING STUDENTS

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ABSTRACT

Research study used quasi experimental design to measure student's performance using video lessons in engineering education using mobile learning, questionnaire is used to evaluate the effectiveness of mobile learning and learning outcome is the results of engineering students. In this paper main study reveals results of 506 learners(male students 299 and female students 207) affiliated colleges and deemed universities of second year undergraduate engineering students of Electronics and Communication (ECE), Electrical and Electronics (EEE) and Bio-Medical Engineering (BME) at Chennai, Tamil Nadu, India about their usage of mobile communication technology, mobile learning using video lesson. The video lesson used for this study is Electrocardiography is common for ECE and BME and Electromagnetism is common for EEE and ECE, the duration of the video lesson is 30 minutes. The smart phones, mobile phones and wireless devices tablet pc, personal digital assistants are used for this study. The video lesson can be transferred via Bluetooth technology within classroom, library and corridors in their free hours.

I.INTRODUCTION

This research paper describes the interdisciplinary research project (PhD) in progress. The main aim of this study is to give awareness of the mobile learning in India and improve the self study or individualized learning style in an adaptive mobile learning environment. The recent trends to focus on mobile learning as an additional source to many universities and colleges to provide a unique approach in personalized learning experience. Nowadays smart phones and tablet pc are popularly increasing with the students. Mobile learning system with dynamically adapted video content is an effective medium for individualized learning.'Mobile learning is a method in which wireless and mobile technologies is used for education by extending access to a desktop based on-line environment to handheld devices such as mobile phones or wireless devices used as part of a mobile community [Farooq 2002].

Mobile learning uses the latest mobile phones and wireless network technology to achieve the effectiveness of traditional learning process. It offers more interactivity, greater flexibility, more functionality, reusability, interoperability, accessibility and educational experience with a single device. This project is focused on the usage on video lesson in education using mobile learning system which paves way to the improvement of learner's knowledge, performance, achievements and individual learning system and also to develop their

problem solving skills. The main motivation of the research is to attract student's attention and motivate them to learn difficult subjects and also to find alternative methods to practice in the field of mobile learning.

According to Mlearn 2002 to Mlearn 2009 and WMTE'02 conference proceedings, the characteristics of physical, psychological of the learners environment in which the study of mobile learning features as follows:

- Mobile or wireless device are attractive, availability and accessibility of wireless network is 24/7 method
- Mobile learning is greater flexibility and functionality in a single device
- Mobile learning with students interactive and interoperability
- Mobile learning is improving of communicative and collaborative learning in education system
- Mobile learning supports adaptability and affordability of learning environment
- Theory of mobile learning is mobility and memory ability for learners
- Mobile devices use reusability and reliability

II.REVIEW OF LITERATURE

Mohamed Osman M.El-Hussein and Johannes C.Cronje (2010) has explained the meaning of mobile learning by applying its key concepts to learning experiences in education. Disassemble the basic components and provide an interpretation of the model in the context of higher education. The author further states comprehensive understand and define mobile learning. The key concepts can be arranged under three different concepts. The first concept relates to the mobility of technology. The second concept hinges on increased learner mobility. And the third concept examines the mobility and dynamism of the learning processes and the flow of information. The authors define 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 learners and mobility of learning". The article concludes that knowledge in the modern world is transformed by the development of revolutionary technologies in society.

Edward J. Cherian and Paul Williams (2008) Mobile learning has evolved from electronic learning, which evolved from distance learning. The barriers previously available for mobile learning have now all but disappeared and the number of adult learners available for mobile learning represents a sizeable student population. The study indicates that no significant difference between most forms of distant learning and tradition face-to-face learning, which may represent the last barriers to fall in the march toward the adoption of widespread mobile learning. Mobile Learning as a viable learning platform in and of itself as opposed to a mere extension of face to face learning principles and the traditional learner therein.

GoncaTelli Yamamoto, OzlemOzan and UgurDemiray considers the learning activity from past to the present and evaluates the opportunities and changes that are expected to arise in the future. This study argues the extent of orientation towards discussing the necessity of tending concrete m- and t-learning, moreover u-learning technology in Distance Education practices. Distance learning on the first hand is mostly for the distant scaled and influenced very much from the classical learning. Some technological advancement confronts e-learning and m-learning and up-t-learning are more interactive. Since there cannot be a single application of

technology, only multi education system would survive. Some of them would replace their status to the other or merge. The u-learning could be evaluated as the prepared systems only teach conscious or unconscious situations.

John Traxler (2005) defines the preliminary attempt to address the issues of definition and conceptualization and draws on recent research examining case studies from the UK and elsewhere. Learning from learners' and users' perspective, a definition of mobile learning becomes clearer. People use a variety of words to describe the nature of learning when it is mobile. Many of these characteristics are the core of separates from mobile learning (m-learning) from ('tethered') e-learning. This paper attempts to summarize the factors that will influence our understanding of mobile learning in the coming years. This understanding will itself influence the progress and direction of mobile learning and its perception and acceptance by the wider educational community. The definition and depiction of mobile learning as 'merely' portable e-learning is a gradualist position which will ease its diffusion but weaken its contribution whereas the definition and depiction of mobile learning as something wholly new and distinct is a radical position that will make diffusion and acceptance more problematic but maintain its identity and coherence.

III.METHODOLOGY

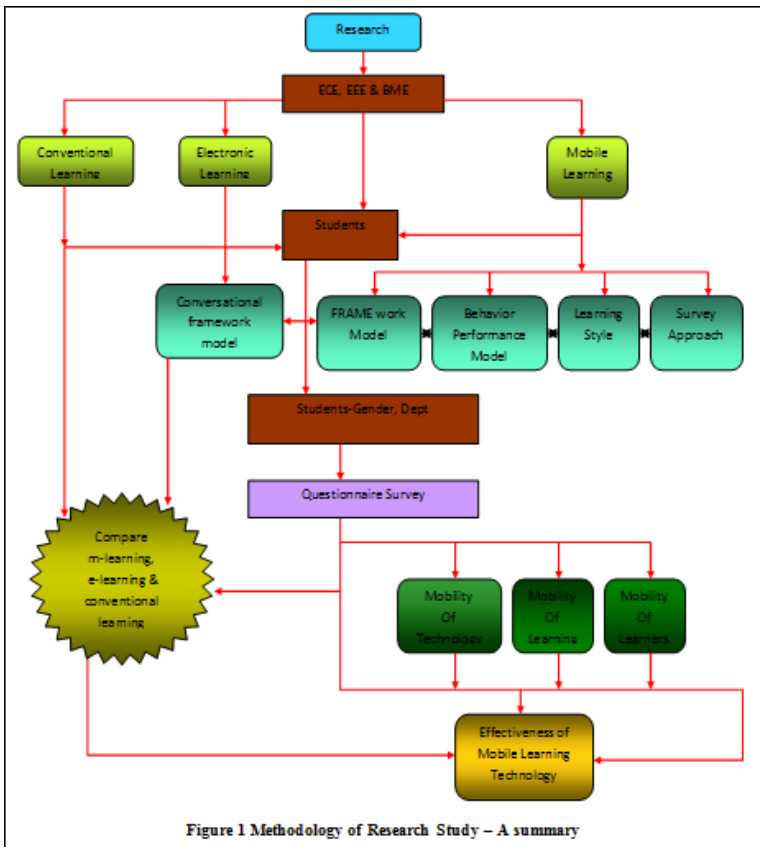


Figure 1 Methodology of Research Study – A summary

The survey was conducted with 301 students of electronics and communication, electrical and electronics and bi-medical engineering students to collect the following data. The mobile learning concept can be divided into three areas: mobility of technology, mobility of learning and mobility of learners. Wireless devices usage in learning, motivates the students to learn, convenient to access the network anytime, any network, anywhere, any

data on any wireless device. The result of the survey showed that more than 90% of students reveal that it is useful for their self study and supports as an additional source of learning. At the same time, two main objectives were identified which have effectiveness of mobile learning and usage of wireless devices for learners.

The mobile learning was evaluated through quasi experimental design, the design involve three groups which are control group and experimental group1 (e-learning), and experimental group2 (m-learning). The control group attended the treatment of using conventional learning method, experimental group1 used for desktop and laptop for electronic learning and experimental group2 use for mobile and wireless devices for mobile learning.

The 22 parameters were analyzed from questionnaire survey results, the students have assessed the effectiveness in the range of undecided (Mean 3) to agree (Mean 4) almost for all the areas; these parameters were used with students to collect their personal opinion about the video lesson using in the wireless devices. From the survey results strongly agree is combined a grouped with agree. Similarly, strongly disagree with disagree. Accordingly three attributes Agree, Undecided, and Disagree is reflected in the graph.

IV.RESULT AND DISCUSSION

The data collected into three phases, first phase pre-test for Control group (CG), experimental group1(EG1) (e-learning) and experimental group2 (EG2) (m-learning) before attending the classroom lecture and watching the video lesson. Second phase conducted by attending the classroom lecture for same topic of control group and delivered the video lesson for experimental group1 in the form of DVD or memory stick and transferred the video lesson for experimental group2 through Bluetooth technology in their free hours.In the third phase the students from control group and experimental groups go for the post-test to evaluate their performance. Finally, the effectiveness of mobile learning technology data were examined and questionnaires given to the experimental groups about usage of mobile device and usage of technology in the field of learning. The concept of mobility of technology, mobility of learning and mobility of learners'questionnaire included 22 indicators.

The Table I shows the sample frequency of the control group and experimental group on pre-test and post-test. And 506 students from each of the following discipline, ECE, EEE and BME students of second year undergraduate engineering (engineering) participated in the study. The contents of the video lesson is consists of Function of Stethoscope, function of Sphygmomanometer, working of Electrocardiography, heart functioning, Diagnosis and prevention of heart disease and public awareness. Hence these topics were used to evaluate the effectiveness of the video lesson using mobile learning technology, with the pre-test and post-test correspondingly.

The quantitative data were collected through pre-test, post-test and questionnaire. Pre-test was used to obtain a baseline performance of students and compare with their post-test result. Finally, questionnaires were used to measure the impact on video in providing assistance to the learners. Meanwhile, the qualitative data were collected using subjective questionnaires and also comments either written or orally which cannot be represented numerically. Qualitative data is used for decision making process. The comparison of the pre-test and post-test will indicate the effectiveness of the mobile learning technology in education system in terms of improving performance.

To analyze the quantitative data both effectiveness of mobile learning and mobility concept of mobile learning analysis were used. The following section will discuss the two analyses of elements.

1. Effectiveness of mobile learning using video lesson in education system
2. Is the mobile learning is effective than electronic and conventional learning
3. Is performance results improved using mobile learning

Effectiveness is used to determine the efficiency of the video lesson through enhancing students' understanding and conducted pre-test and post-tests to measure its efficiency. The maximum mark of test is 15. The analysis was done by comparing the control and experimental groups.

The first objective of this survey is effectiveness of mobile learning using video lessons was measured using twenty two indicators, Table 1 shows the mean value of the effectiveness of mobile learning. Responses to each of the indicators on effectiveness of mobile learning were measured on a Likert scale of 1 to 5 ranging from "Strongly agree to Strongly disagree" scores greater than 3.0 indicate relative importance, below 2.0 indicate relative unimportance; a score of 2 to 3 shows it to be neither important nor unimportant.

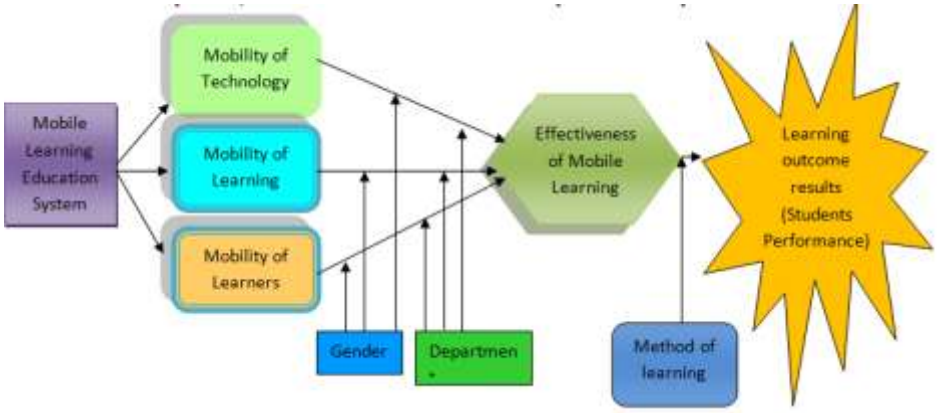


Figure 2 Research Model - Effectiveness and Performance of students in Mobile Learning Education

Figure 2 Snap Shots of video lesson & video lesson in mobile phone

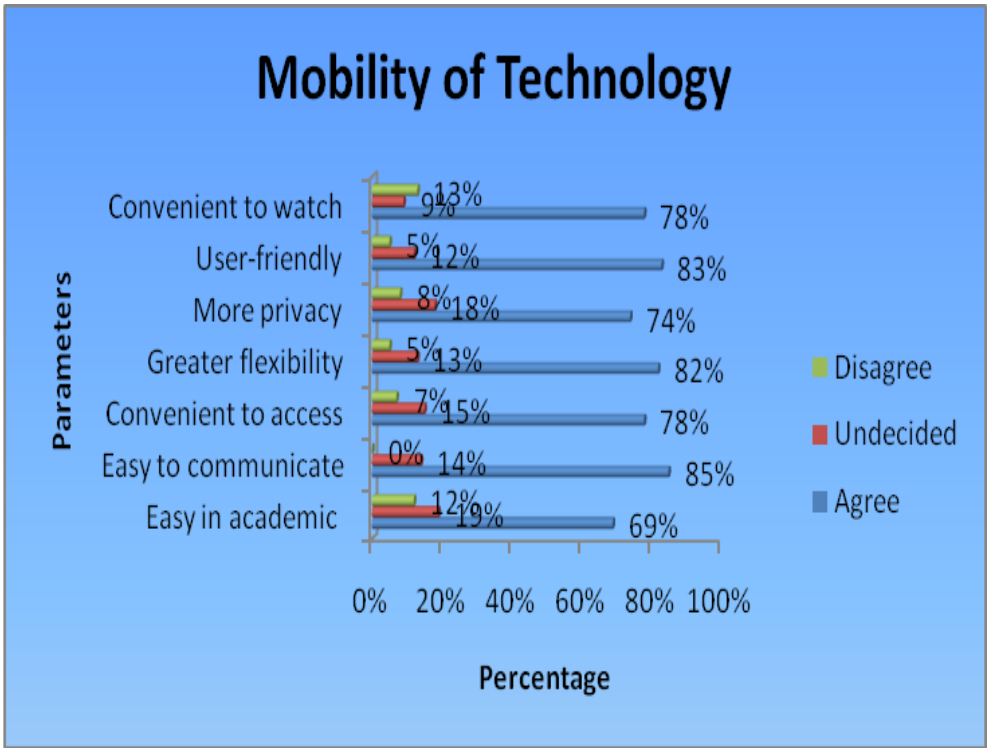
Table 1 Mobility Concepts

Sl.No.	*Parameters*	*Mean*	*SD*	*Mean Ranks*	*Chi-square value*	*P value (sig)*
	Mobility of Technology				87.644	0.000
1.	Use of mobile phones or wireless devices is **easy in academic** environment	3.73	1.016	3.41		
2.	Mobile phones or a wireless devices is **easy to communicate** with students and other teachers	4.18	0.659	4.28		
3.	Mobile learning technology is **convenient for accessing** information anywhere, at any time, any network, any data on any wireless devices	3.92	0.924	3.75		
4.	Mobile phones offers greater **privacy** than other learning devices	4.09	0.870	4.17		
5.	Mobile learning technology has**greater flexibility** where and when learning needs are present	3.97	1.004	3.99		
6.	Mobile learning is **user-friendly**	4.14	0.904	4.23		
7.	Watching video lessons in mobile phones is more **convenient**when compared to television	4.00	1.074	4.16		
	Mobility of Learning				62.331	0.000
8.	Mobile learning a good **alternate or supplemental** source to traditional learning	4.12	0.931	6.01		
9.	Mobile learning can bring **newopportunities** of learning.	3.96	1.018	5.55		
10.	Mobile phones or wireless devices can increase students **interest in learning**	4.00	0.963	5.66		
11.	Mobile learning helps in providing an **adaptive learning** environment	3.78	1.055	4.99		
12.	Mobile learning a good use in**self studyor individualized learning**.	4.10	0.894	5.92		
13.	Mobile learning as a **paperless** method of learning & teaching.	4.02	0.769	5.52		
14.	Using of mobile phones or wireless devices is **easy learning.**	3.93	0.895	5.32		
15.	**Positive impact** on the technology enabled learning system	3.94	0.918	5.22		
16.	Mobile learning technology is **affordable** for any one.	3.90	0.952	5.28		
17.	Mobile learning will help to adopt their **learning**	3.95	1.028	5.53		

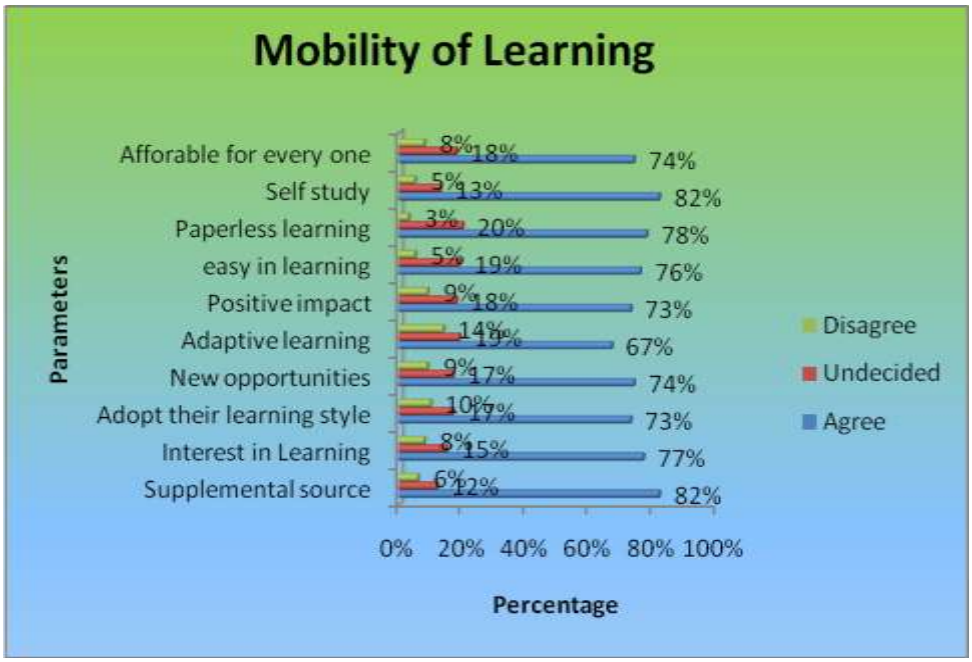
	style					
	Mobility of Learners				59.319	0.000
18.	Mobile phones or wireless devices are simple and **easy to get feedback** from learners and teachers	4.10	0.660	3.08		
19.	With usage of video in mobile learning **motivates** the students to learn	3.90	1.083	2.86		
20.	Mobile Learning is **easy to use**while travelling by bus/car/van/train.	4.19	0.858	3.36		
21.	Learners feel **convenient to carry** their data with them to almost all the places.	3.91	0.952	2.86		
22.	Learners can revise their lessons in an easy method through mobile learning system with **unlimited time and location.**	3.91	0.910	2.84		

In the above Table 1 seven parameters under mobility of technology, the students have assessed the effectiveness and the highest value of mean is mobile phones or a wireless devices is easy to communicate with teachers and other students mean is 4.18 and graph 1 represents 85% of students agree, 14% were undecided and use of mobile phones or wireless devices is easy in academic environment is the lowest mean value parameters mean is 3.73 and 69% of students were agree, 19% undecided and 12% disagree.

Graph 1 Mobility of Technology

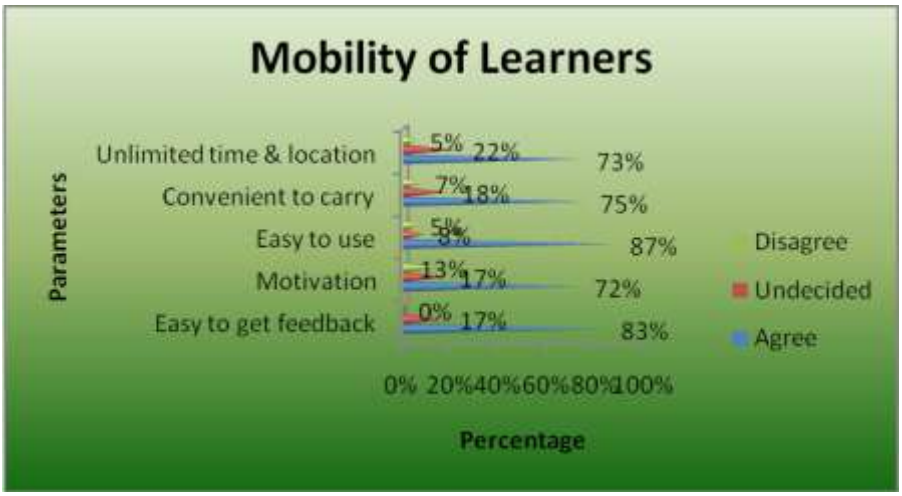


Graphy 2 Mobility of Learning



In the above graph 2 and table 1 shows that ten parameters under mobility of learning, the students have assessed the effectiveness and the highest value of mean 4.12 and graph 2 represents mobile learning is an alternate or supplemental source of learning and also agreed for 82% of students, undecided for 12% and 6% of students disagree and mobile learning can provide an adaptive learning environment mean value 3.78 is the lowest mean value and 67% of students are agree, 19% undecided and 14% disagree.

Graph 3 Mobility of Learners



In table 1 and graph 3 five parameters under mobility of learners, highest value of mean 4.19 mobile learning is easy to use while travelling by bus/car/van/train and87% of students agree, 8% of students are undecided and remain 5% disagree. The lowest mean value 3.90 for usage of video lesson in classroom motivates the students to learn 72% of students agree, 17% undecided and 13% disagree. It is concluded that under mobility of learners above 70% of students are agree all the parameters.

Table 2 Marks obtained by the students from control group, experimental group1 (e-learning) and experimental group2 (m-learning)

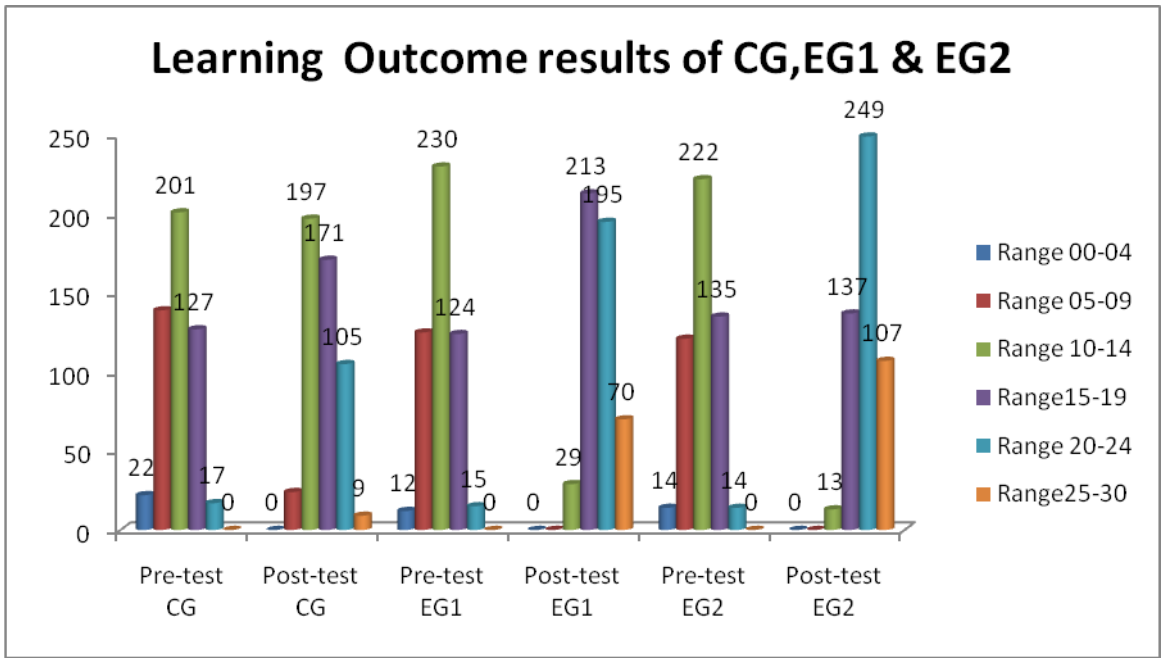
Scores	Pre-Test			Post-Test		
	CG frequency	EG1 frequency	EG2 frequency	CG frequency	EG1 frequency	EG2 frequency
00-04	22	12	14	0	0	0
05-09	139	125	121	24	0	0
10-14	201	230	222	197	29	13
15-19	127	124	135	171	213	137
20-24	17	15	14	105	195	249
25-30	0	0	0	9	70	107
Mean	11.71	11.94	12.03	16.07	19.77	21.55
SD	**3.563**	**3.431**	**3.513**	**3.77**	**3.956**	3.465

The results in table 2 is analyzed using t-test to measure the difference between groups using different learning methods and Cohen's d to determine effect size. The Cohen's d is used to measure the strength of the relationship between two variables. The effect size is more than 0.8 has the large effect size of Cohen's d for interpretation [Kotrlik& Williams, 2003]

Table 3 Paired t-test & Cohen's d value and significance for CG, EG1 & EG2

		Mean Diff.	't' value	Cohens' d value	Correlation	Effect size	Sig 2-tailed	Comments
Pair1	CG EG1	3.70	43.898	3.907	0.880	0.890	0.000	The results are significant, the use of mobile learning in education system is improved the students performance.
Pair 2	CG EG2	5.48	75.870	6.75	0.903	0.959	0.000	
Pair 3	EG1 EG2	1.78	29.748	2.648	0.943	0.798	0.000	

Graph 4 Students performance results of conventional learning, e-learning and m-learning



In this study, there are five hypotheses which are analyzed as follows:

1. Hypothesis 1: Pre-test scores between the three groups: Null Hypothesis (H01) – There is no significant difference in the pre-test scores between the Control group and experimental group. Table 1 indicates the test mean scores of control group 11.71; experimental group1 was 11.94 while the experimental group2 was 12.03. However, the significant (2tailed) value of p=0.542which is greaterthan (Alpha) α = 0.05. The result failed to reject the null hypothesis H01 and there is no significant difference in the pre-test scores of all three groups. Hence the null hypothesis 1 (H01) is accepted.
2. Hypothesis 2: Post-test scores between the two groups Null Hypothesis (H02) – There is no significant difference in the post test scores between the control group and experimental group1 and experimental group2. Table 1 indicates the test mean scores of control group were 16.07, experimental group1 (e-learning) mean score was 19.77 and the experimental group2 (m-learning) was 21.55. The mean score comparison shows that the experimental group1 and group2 achieved significantly more in the post-test compared to control group. However, the significant (2-tailed) value, p=0.000, is less than (Alpha) α = 0.05 which implies that H02 should be rejected. This means that there is a significant difference in the post test scores between the three groups; thus mobile learning is effective.
3. Hypothesis 3: The mobile learning of concept under Mobility of Technology: Null Hypothesis (H03): There is no significant difference between the mean ranks of parameters under mobility of technology assessed by the students. Friedman test for significant difference between the mean ranks of parameters is presented in Table 2, it can be arrived that in mobility of technology, since F value is 87.644 and P= 0.000 value is less than 0.01, the null hypothesis is rejected at 1% level of significance. Hence it is concluded that there is significant difference between mean ranks of parameters in mobility of technology with respect to the effectiveness of mobile learning technology. Based on mean ranks, it is inferred that, mobile devices and mobile communication technology is easy to communicate with teachers and other students 4.28 is the most

effective parameter on analysis of mobility of technology, followed by use of mobile phones is easy in academic environment 3.41 is the least effective parameter.

4. Hypothesis 4: The mobile learning concept of mobility of learning: Null Hypothesis (H04) – There is no significant difference between the mean ranks of parameters in mobility of learning assessed by the students. Friedman test for significant difference between the mean ranks of parameters in mobility of learning is presented in Table 2, it is arrived that the analysis of mobility of learning, since F value is 62.331 P=0.000 value is less than 0.01, the null hypothesis is rejected at 1% level of significance. Hence it is concluded that there is significant difference between mean ranks of parameters in mobility of learning with respect to the effectiveness of mobile learning technology. Based on mean ranks, it is concluded that mobile learning is the alternate or additional or supplemental source of learning mean ranks is 6.01 is the most effective parameter and mobile learning to provide adaptive learning environment is the least effective parameter under mobility of learning.
5. Hypothesis 4: The mobile learning concept of mobility of learners: Null Hypothesis (H05) – There is no significant difference between the mean ranks of parameters in mobility of learners assessed by the students. Friedman test for significant difference between the mean ranks of parameters in mobility of learners is presented in Table 2, it is arrived that the analysis of mobility of learning, since F value is 59.319 P=0.000 value is less than 0.01, the null hypothesis is rejected at 1% level of significance. Hence it is concluded that there is significant difference between mean ranks of parameters in mobility of learners with respect to the effectiveness of mobile learning technology. Based on mean ranks, it is concluded that mobile learning is easy to use at the time of travelling by bus/car/van/train mean ranks is 3.36 is the most effective parameter and the learners can revise their lessons in an easy method through mobile learning system with the unlimited time & location mean rank 2.84 is the least effective parameter under mobility of learners..

Reliability of effectiveness of mobile learning derived with three categories, identifying and to form Communalities by extraction method under Principal Component Analysis (PCA) by following this method all the parameters were analyzed with students, the data reduction can be done with the extraction method under principal component analysis results were collected from each parameter and analyzed. Another statistical analysis instrument is reliability coefficient. Cronhach'salpha (Cronbach.1951) to estimate the scale of consistency among items in the group (Hair, Anderson, Tatham& Black, 1998). The Cronbach's alpha is generally acceded upon the level of 0.70, albeit it is acceptable at 0.60 in exploratory research (Hair et al., 1998). A reliability analysis using Cronbach's Alpha was conducted to estimate the reliability of the parameters under each category. Cronbach's alpha coefficients were calculated for each multi-parameter variable.In the cluster validation via Exploratory factor analysis (EFA) was performed, Principal Component Analysis (PCA) with Varimax Rotation (Kaiser Normalization) was employed. To ensure that factor loadings were accounting for at least 10% of the variance in the overall model, the criteria of Eigen values greater than > 1 and factor loadings of [.3] and greater were employed. The results are presented in table 4.Although it was anticipated a priori that the 22 parameters would load onto the 3 variables identified, only three areas. The parameters that loaded onto each area and determined and represented by: 1) Mobility of Technology 2) Mobility of Learning and 3) Mobility of Learners. The results of this study can be explained in Table 4 gives the results of extracted

communalities of all the variables. It shows the proportion of the variance of a variable explained by the common factors

Mobility of Technology: In the mobility of technology components were characterized by seven parameters with factor loadings ranging from 0.494 – 0.653. The parameters commonalities are described in the table 4 ,

Technology: User-friendly, easy to communicate, watching video lesson is convenient in mobile phones and convenient to access information anywhere, anytime, on any device.

- "Mobile phones offers more privacy than other learning devices" has the least percentage (49.4%) of variance
- "Mobilephonesare convenient to access information anywhere, at anytime on any network" has the highest variation (65.3%)
- The internal consistency represented by coefficient alpha, of all items is as much as 0.674.
- Mobile learning result provides confidence statistical results extracted only one component.

Mobility of Learning: In the mobility of learning components were characterized by fifteen parameters with factor loadings ranging from 0.461 - 0.745. The parameters commonalities are described in the table 4

Learning: Mobile learning will bring new opportunities in learning, mobile learning is paperless method of learning, it is also additional or supplemental source of learning and it can be used for self study.

- "Mobile learning technology will bring new opportunities of learning" has the least percentage (46.1%) of variance that can be predicted
- "Mobile learning to provide adaptive learning environment" has the highest variation (74.5%)
- Cronbach's alpha from reliability analysis of the data,the internal consistency, represented by coefficient alpha, of all items is as much as 0.702
- Factor analysis loaded ten questionnaire statements into three components. . The alpha value of first factor is 0.718, second factor is 0.579 and the third component of alpha value of third factor 0.553

Mobility of Learners: In the mobility of learners components were characterized by twelve parameters with factor loadings ranging from 0.512 – 0.782. The parameters commonalities are described in the table 4

Learners: Using video lessons in mobile phones motivates the students to learn, usage of video unlimited time and location, user's convenient to carry their data, and easy to use in education system.

- "mobile phones / wireless devices are simple and easy to get feedback from the learners and teachers" has the least percentage (51.2%) of variance that can be predicted
- "With usage of video lesson in classroom motivates the students to learn" has the highest variation (78.2%)
- Cronbach's alpha from reliability analysis of the data, represented by coefficient alpha, of all items is as much as 0.638.

- Factor analysis loaded five questionnaire statements into two components. The alpha value of the first factor is 0.689 and the second factor is 0.603.

The overall reliability of the mobile learning student's instrument is Cronbach's Alpha value is 0.857 it has high internal consistency of the system.

Table 4 Communalities (Extraction Method: Principal Component Analysis), Rotated Component Matrix and Cronbach's Alpha of Mobile Learning

	Communalities Principal Component Analysis		***Rotated Component Matrix and Cronbach's Alpha of Mobile Learning Technology***			
	Initial	***Extraction***		***Component***		
				1	*2*	*3*
			Mobility of Technology	***0.674***		
Q18	1.000	0.544	Easy in academic	0.494		
Q40	1.000	0.623	Easy to Communicate	0.725		
Q13	1.000	0.653	Convenient to access	0.568		
Q23	1.000	0.494	More privacy	0.703		
Q10	1.000	0.523	Greater Flexibility	0.723		
Q32	1.000	0.633	User-Friendly	0.603		
Q22	1.000	0.526	Convenient to watch	0.725		
			Cronbach's Alpha	***0.674***		
			Mobility of Learning	***0.702***		
Q4	1.000	0.603	Self study	0.775		
Q3	1.000	0.598	Additional source of learning	0.767		
Q24	1.000	0.461	New opportunities	0.674		
Q9	1.000	0.463	Interest in learning	0.616		
Q17	1.000	0.379	Affordable	0.446		0.419
Q37	1.000	0.650	Paperless method		0.741	
Q27	1.000	0.561	Positive impact		0.730	
Q34	1.000	0.471	Easy in learning		0.594	
Q38	1.000	0.745	Adaptive learning			0.863
Q19	1.000	0.611	Adopt their learning style			0.596
			Cronbach's Alpha	***0.718***	***0.579***	***0.553***
			Mobility of Learners	***0.638***		
Q28	1.000	0.686	Unlimited time & Location	0.807		
Q21	1.000	0.545	Convenient to carry	0.729		
Q39	1.000	0.512	Easy to get feedback	0.670		

Q29	1.000	0.649	Easy to use	0.609	0.528	
Q31	1.000	0.782	Motivation		0.884	
			Cronbach's Alpha	***0.689***	***0.603***	
			Overall Reliability (Cronbach's Alpha)	***0.857***		

V.CONCLUSION

This paper presented the research study survey from 506 undergraduate engineering students of ECE, EEE and BME on the effectiveness of mobile learning. From the above results it is concluded that there is a significant difference between the mobile learning, electronic learning and conventional learning. From the parameters or indicators to the concept of mobility in mobile learning using video lessons in education system is easy to understand the concept of the subject. For future research, to develop the mobile learning management system and evaluate the system with students using the video lesson implemented into the wireless devices.

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APPENDIX –I

Part-I

ELECTRO CARDIO GRAPHY

(Pre-Test)

Multiple Choice

Choose the correct answer, write in the provided box or fill in the blanks

1. Which instrument is used to record the electrical activity of the heart?

a. EMG b) EEG c. ECG d. PCG [ ]

2. Electro retina graph is used for recording the change in potential when light falls on the -------

a. Chest b. Eye c. Hear d. Nose [ ]

3. Sphygmomanometer is used to measure the blood pressure

a. True b. False [ ]

4. The normal person's blood pressure is----------

a. 120/80 b. 110/70 c. 100/60 d.140/100 [ ]

5. From the blood pressure meter 'when hear the sound' is called

a. Diastolic B.P b. Systolic B.P c. Congenital B.P d. Acquired B.P [ ]

6. What are the parts of the stethoscope?

a. Auricles & Ventricles b. Systolic & Diastolic

c. Ischemia & Angina d. Chest piece & Ear Piece [ ]

7. ---------- is the acoustic medical device

a. SMM b. Blood pressure meter c. Stethoscope d. ECG [ ]

8. Stethoscope is used to listen heart sounds and lungs sounds

a. True b. False [ ]

9. Major component of ECG machine ----------

a. Sensors & recorders b. Pen motor & recorders

c. Sensors & Pen motor d. Pen motor & Chart transport motor [ ]

10. ---------- is to record the electrical activity of the heart in the ECG paper

a. Sensor b. Electrode c. Recorder d. None of these [ ]

11. In ECG, the current's measurement is divided into different parts

a. QRS & T b. P & T c. P, QRS d. P, QRS & T [ ]

12. Recovery wave is represented by ----------

a. P wave b. T wave c. R wave d. S wave [ ]

13. Heart is made up of pure ----------

a. Blood b. muscles c. water d. none [ ]

14. The top chambers represented by ----------

a. Ventricles b. atria c. Auricles d. septum [ ]

15. Where the purification of the blood will taking place?

a. Lungs b. Muscles c. Septum c. None [ ]

16. Which functional block in the ECG machine gets the signal?

a. Preamplifier b. Power amplifier c. Lead Selector switch d. all the above [ ]

17. The output of the power amplifier is fed to the --------- motor

a. bridge b. Chart c. Pen d. Frequency selector [ ]

18. How many stages of differential amplifier are used in the preamplifier?

a. 2or 3 b. 3 or 4 c. 2 or 4 none [ ]

19. Which block the stabilizing effect will occur?

a. Power amplifier b. pre amplifier c. Pen motor d. none [ ]

20. Which type of power amplifier is used in the ECG machine?

a. Push pull b. pull/push c. Class A d. None [ ]

21. Which affects the heart disease to the human?

a. High cholesterol b. High Blood Pressure c. Diabetes d. all the above [ ]

22. The heart disease affecting the human is called

a. Congenital b. Acquired c. myocardial infarction d. all the above [ ]

23. What are the symptoms of the heart diseases for the human?

a. Stomach pain b. Chest pain c. vomiting d. Giddiness [ ]

24. How to identify the acquired heart disease

a. Congenital b. myocardial infarction c. rheumatic fever d. angina [ ]

25. Which type of disease will affect the carrying mother?

a. Infarction b. Epilepsy c. Fever d. Heart attack [ ]

26. When the supply of the blood flow is completely cut off it creates

a. Minor attack b. Ischemia c. Infarction d. Chest pain [ ]

27. CPR stands for

a. Percutaneous coronary intervention b. Phonocardiograph

c. Cardiopulmonary resuscitation d. Cardiovascular disease [ ]

28. How to prevent the heart disease

a. Good food habit b. Good exercising habit

c. Change healthy life habit d. All the above [ ]

29. To prevent the acquired heart disease take the

a. High green foods b. High fiber diet

c. High oil foods d. High rice foods [ ]

30. 'Basic Life Support' program is conducted all over the world to prevent the heart attack

a. True b. False [ ]

ELECTRO CARDIO GRAPHY

(Post-Test)

Multiple Choice

Choose the correct answer, write in the provided box or fill in the blanks

1. Which instrument is used for recording the electrical activity of the brain?

a. EMG b. EEG c. ECG d. PCG [ ]

2. Electrocardiography is to find the ---------- diseases

a. Brain b. Kidney c. Heart d. Chest [ ]

3. Sphygmomanometer is used in conjunction with a stethoscope

a. True b. False [ ]

4. Disappearance of the sound in the SMM is called as --------

a. Systolic B.P b. Diastolic B.P. c. Congenital B.P d. Acquired B.P [ ]

5. SMM consists of an ---------- and ---------

a. Sensors and Electrodes b. Inflatable cuff and mercury manometer

c. recorder and sensor d. None of these [ ]

6. The Stethoscope is used to listen / hear the

a. Heart sounds b. Brain sounds

c. Muscles sound d. Each beat of heart cycle [ ]

7. ----------instrument is used to listen the intestines and blood flow in arteries and veins

a. SMM b. Stethoscope c. Blood pressure meter d. None of these [ ]

8. Stethoscope is used to listen the animal heart sounds

a. True b. False [ ]

9. Which component is pickup the electrical potentials from the patient's body

a. Electrodes b. Wires c. Lead selector switch d. Clips [ ]

10. How to fix the electrodes in the patient's body

a. Clips b. paste c. Gel d. None [ ]

11. The P wave represents activation of the ----------

a. Ventricles b. Auricles c. Atria d. Septum [ ]

12. ---------- represents the electrical current moving through the heart during heart beat.
a. ECG b. EEG c. EMG d. ERG [ ]
13. Heart consists of ---------- chambers
a. 2 b. 3 c. 4 d. 5 [ ]
14. The bottom chambers represented by ----------
a. Ventricles b. Atria c. Auricles d. Septum [ ]
15. Organs are separated by a thick valve is called:
a. Muscles b. Chambers c. Septum d. Auricles [ ]
16. ------- is Frequency selective network which provides necessary damping of the pen motor.
a. L network b. C network c. R network d. RC network [ ]
17. The auxiliary circuit includes a ---------- for the chart drive motor
a. Pen motor b. Preamplifier c. Speed control circuit d. Power amplifier [ ]
18. Which block has the large negative current feedback effect?
a. Preamplifier b. Power amplifier c. Lead selective network d.none [ ]
19. Which block is the writing device on the ECG paper?
a. Power amplifier b. Pen motor c. Auxiliary circuit d.none [ ]
20. Auxiliary circuit provides a -------- volt calibration signal
a. 1mv b. 2mv c.3mv d. 4mv [ ]
21. Which block has speed control drive motor?
a. Auxiliary circuit b. Chart transport motor c. Pen motor d. none [ ]
22. Which affects the heart disease to the human?
a. High cholesterol b. High Blood Pressure c. Diabetes d. all the above [ ]
23. The heart disease which affects the human is called
a. Congenital b. Acquired c. myocardial infarction d. all the above [ ]
24. What are the symptoms for the heart diseases to the human?
a. Stomach pain b. Chest pain c. vomiting d. Giddiness [ ]
25. How to identify the acquired heart disease
a. Congenital b. myocardial infarction c. rheumatic fever d. angina [ ]
26. Which type of disease will affect the carrying mother?
a. Infarction b. Epilepsy c. Fever d. Heart attack [ ]
27. When the supply of the blood flow is completely cut off it creates
a. Minor attack b. Ischemia c. Infarction d. Chest pain [ ]
28. How to prevent the heart disease
a. Good food habit b. Good exercising habit
c. Change healthy life habit d. All the above [ ]
29. To prevent the acquired heart disease takes
a. High green foods b. High fiber diet c. High oil foods d. High rice foods [ ]
30. 'Basic Life Support' program is conducting the all over the world to prevent the heart attack
a. True b. False [ ]