EFFECTIVENESS OF VIDEO LESSONS USING MOBILE LEARNING FOR TECHNICAL TEACHERS

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ABSTRACT

This research study is used to measure the effectiveness of mobile learning from the engineering teachers and impact on video lesson in the field of teaching and learning education system. The survey were conducted from engineering circuit branch teachers of affiliated colleges and deemed universities in Chennai, India. The survey used for video lesson to teachers and questionnaire is used to evaluate the effectiveness of mobile learning system. The80 engineering faculty were used from Electronics and Communication and Electrical and Electronics, and Bio-Medical Engineering teachers. The teachers are Master's of Engineering and Technology, Doctor of Philosophy with their qualification, the video lesson used for this study is Electrocardiography, and the duration of the video lesson is 10 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 in leisure hours.

I. INTRODUCTION

Wireless Communication and Technology plays a major role in the field of manufacturing which can be integrated into mobile phones or wireless devices to provide text based, audio based, multimedia, web-based and video based material using any type of wireless network GSM, GPRS, Wi-Fi, Bluetooth, Wireless Application Protocol and Infrared. The devices are easilyavailable and accessible, network detectable anywhere at any time. Mobile learning is easy to access and highly useful for learners as it can be used at any time any place and reviewed till the learner is clear with the subject. Teacher's advice mobile learning is convenient and helps students to go through the subject.

Learning performance of students can be improved by providing right content at the right time and at the right place to the right devices and through the right network. Through mobile learning, watching the video significantly increases student knowledge of the subject area. Mobile learning environment relies heavily on video based material, which is displayed on a mobile device with a small screen, where the effectiveness of the learning experience willbe inhibited. While developing video based content for learning or teaching, presentations involve cost efficiency and quality. Any mobile learning system describes benefits to students and to improve their performance through the video based learning. The visual representation of a lecture on video usually gets more attention to any subject [Devinder Singh, 2006].

II.LITERATURE SURVEY

Paul Williams and Mary J. Granger (2008) have explained mobile learning is no longer a novelty. Thousands of post secondary education institutions and millions of workforce and distance education students worldwide consider m-learning as mainstream, pervasive, learning delivery mode. It is different and alternate approach to face-to-face, distance learning (D-learning) and Electronic learning (E-learning). A gap exists in the literature regarding the effectiveness of m-learning. It is important to evaluate this learning delivery mode against face-to-face learning. This study examines m-learning effectiveness vis-à-vis Face-to-face and investigates the extent to which students accept the delivery of learning conducted through this new paradigm. A quasi-experimental research design is proposed to determine the impact to m-learning on student performance and to uncover factors that influence user acceptance of m-learning. The study is a quasi-experimental non equivalent control group research design with control group (face-to-face) and treatment group (m-learning) population. The control group receives a face-to-face lecture, while the treatment group has unlimited access to an m-learning MP3 file recording of the face-to-face lecture. After the face-to-face lecture, the control group takes a pretest (quiz1) after a week of unlimited access to MP3 file; the treatment group also takes a pre-test (quiz1). Both groups will then have unlimited access to the MP3 file for one week, during next week, both groups will take part a post-test (quiz2). Seven sections of an undergraduate information systems required core course participated in this study. Course sections are paired – one control and one treatment group per pair. The remaining sections are randomly assigned to a control or treatment group. Survey data from the questionnaire, survey and quizzes are collected by the investigator. The investigator is the primary coder and is responsible for assessing coding consistencies, scale reliability, anomalies and for identifying outliers. Therefore, this study will have some practical applications and may also add to information systems theory [1].

Dr.Fahad N. Al-FAHAD (2009) has research study was to better understand and measure the students' attitudes and perceptions towards the effectiveness of mobile learning. The results of a survey of 186 undergraduate female students of Bachelor of Arts and Medicine (BA & MD) at Kind Saud University about their attitude and perceptions to the use of mobile technology in education. An analysis of the quantitative survey findings was presented focusing on the ramification for mobile learning practices in university learning and teaching environments. The survey was conducted in three groups in age range of 18-26 years. The questionnaire was developed in Arabic language. The author has attempted to determine that the technology can be optimally used to improve student retention at Bachelor of Art and Medicine programmed at King Saud University in Saudi Arabia. Result of this survey clearly indicate that offering mobile learning could be a method for improving retention of Arts and Medicine students, by enhancing their teaching and learning. The advantage of this technology is that it can be used anywhere, anytime and adopt their mobile learning systems with the aim of improving communication and enriching students' learning experiences in their open and distance learning [2].

Devinder Singh &Zaitun A.B. (2006) describes the educational opportunities of teaching in a real time wireless classroom using mobile devices. Conventional classroom learning has certain weaknesses. The author presented a

survey from two hundred undergraduate students on the problems faced in conventional classrooms. From the survey results, specific mobile learning applications are being developed for students and instructors. These applications could be used on a Pocket PC, notebook and mobile phone. The author provides a variety of instructional application such as classroom chat room, collaborative text editor, synchronization of power point slides, accessing to remote computing resources. The system allows the instructor to give on line assessments in class, which are graded instantly. Learning objects are proposed to keep track of learning activity effectively. Learning objects using ASP.NET together with XML. The questionnaires were distributed to find the weaknesses of conventional learning and the type of mobile learning applications that they would like to use in a classroom using a mobile device. This research provides an effective method of learning through the use of mobile learning in a wireless classroom. Lectures could monitor students' progress during classroom exercises. Students would be able to interact better with their lecturer during class [3].

III. METHODOLOGY

The main research study survey was conducted with 80engineering teachers of ECE, EEE and BME in affiliated and deemed universities. The educational video lessons for Electrocardigraphy (ECG) were used in the survey and it took 10 minutes. ECG is be used to measure the electrical activity produced by the person's heart.

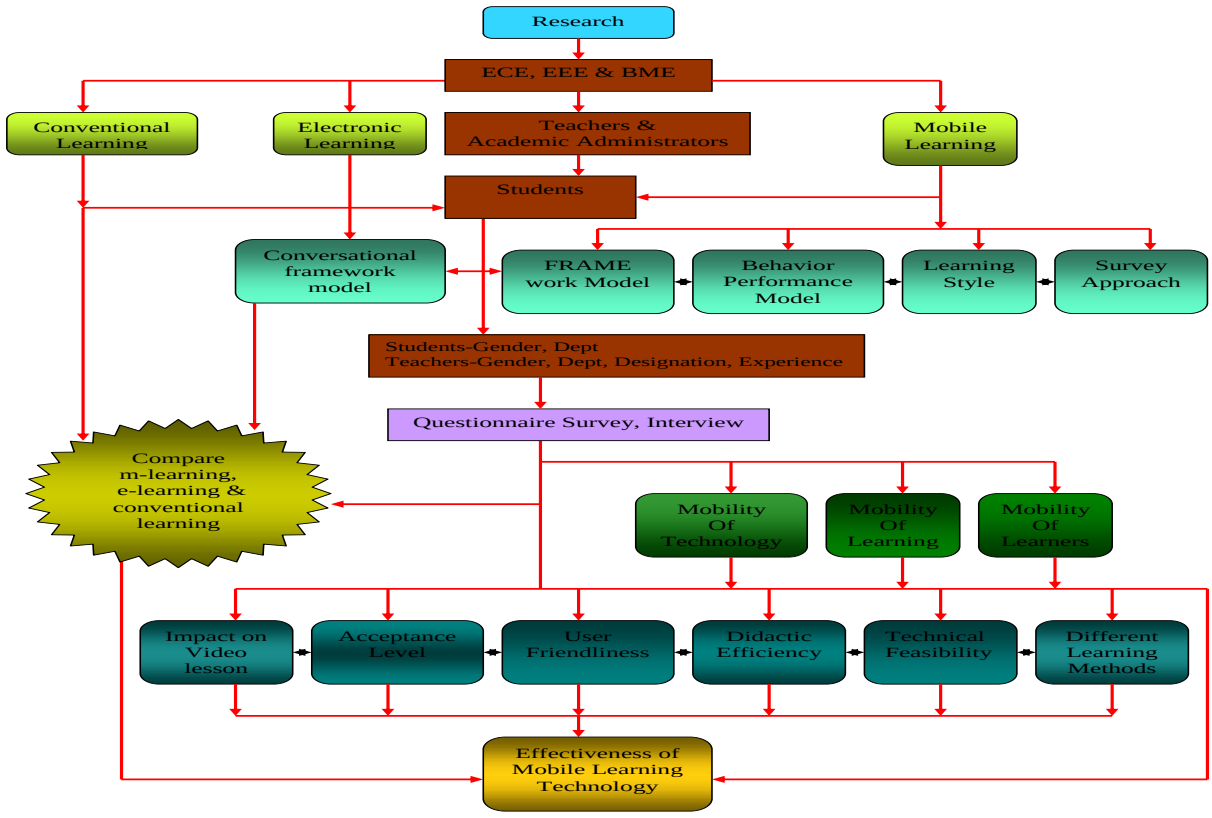


Figure 1 Methodology of Research Study – A Summary

This video lesson explains about the practical demonstration of the measurement of ECG with block diagram, practical demonstration and animation diagrams for heart functioning. The video lesson can be transferred to the teachers via Bluetooth technology and can be followed during their leisure hours. A questionnaire was developed and designed with 40 parameters to measure the effectiveness of mobile learning. A 5-point Likert scale with strongly agree, agree, undecided, disagree and strongly disagree was used from the main items. The study was conducted from engineering teachers from both genders. The questionnaire includes a covering letter and personal information sheet, distributed to participants during their free hours.

The main objectives are

1. Effectiveness of video lessons using mobile learning
2. Is mobile learning is effective than other learning methods
3. Is the acceptance of mobile learning in the education system

The first objective is that the teachers effectiveness of mobile learning was measured using 40 parameters, from this six parameters were used for different learning methods in education system and seven parameters were identified impact on video lesson in the field of education, and seven parameters identify the acceptance level of mobile learning and remaining parameters are indicate the mobile learning as user-friendly, didactic efficiency and technical feasibility of the mobile learning system.

IV RESULT AND DISCUSSION

The main motto of the analysis is to categorize, classify and summarize the collected data, which can be realized and interpreted to accomplish research objectives. The profiles of the teachers are presented in the annexure. The analysis of effectiveness of mobile learning technology survey parameters can be divided into the interaction experience in the mobile environment, the usage of video lesson in higher education and combination of learning methods in higher education, based on this important parameters can be classified into six categories [A.H,Muhamad Amin, A.K.Mahmud, A.I.Zainal Abidin and M.A.Rahman, 2006]. They are Impact on Video lesson, Acceptance Level, User-Friendliness, Didactic Efficiency, Technical Feasibility and Different Learning Methods.

Reliability of effectiveness of mobile learning derived andidentifying, to form Communalities by extraction method under Principal Component Analysis (PCA) that all parameters were analyzed with students; The data reduction can be done with the extraction method under principal component analysis and the results were collected from each parameter and analyzed. Another statistical analysis instrument is reliability coefficient. Cronhach's alpha (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). 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 Hypotheses can be derived Non-Parametric test by Friedman test of Mean Ranks.

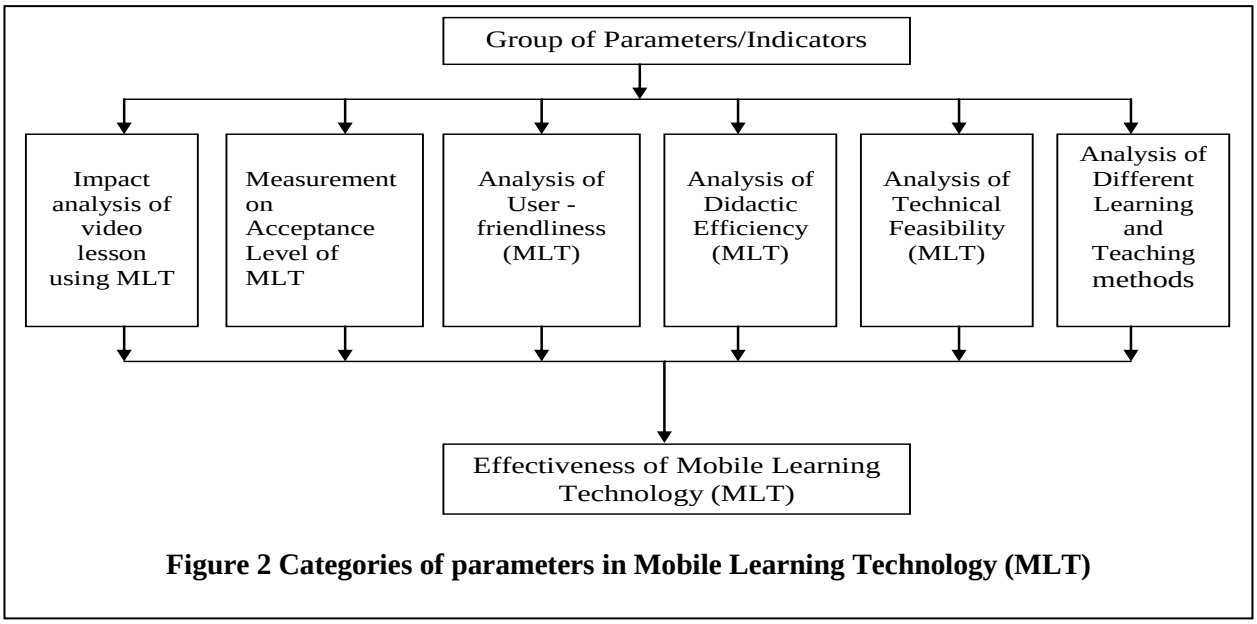


Figure 2 Categories of parameters in Mobile Learning Technology (MLT)

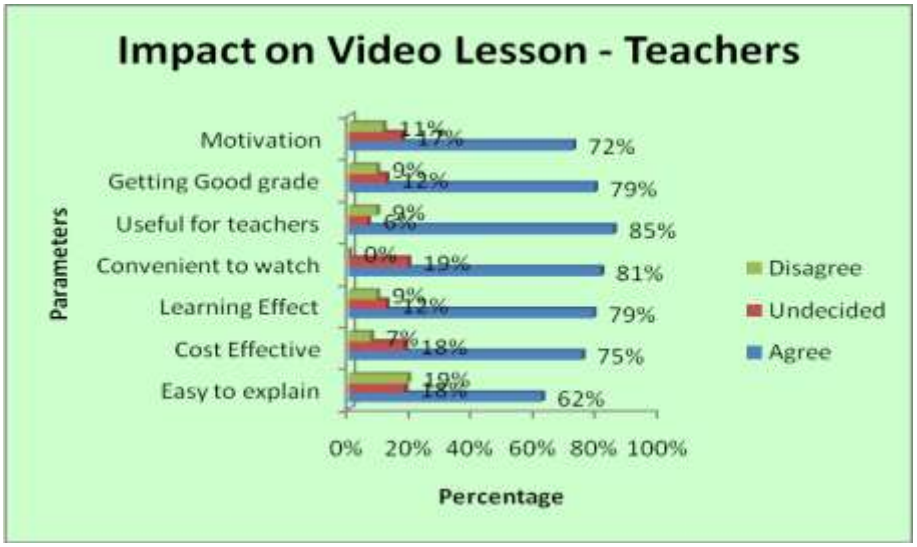
4.1 Impact analysis of video lessons

Table 1 Impact of video lessons

SL.No.	*PARAMETERS*	*Mean*	*SD*	*Mean Ranks*	*Chi-square value*	*P value*
Q3	**Use of video** lessons in classroom is **easy to explain** for learners.	3.56	1.210	3.44	18.120	0.006
Q8	Delivery of video lessons through mobile phones: **cost effective** when compared to other e-learning methods	3.89	0.914	3.96		
Q22	Watching video lessons can be increase **learning effect**	3.93	0.965	4.22		
Q28	Mobile Learning teaching vis-a-visstudent: help in getting**good grade**	3.91	0.917	4.04		
Q30	Use of video lesson in classroomvis-à-vis students while learning: a good **motivation** device	3.78	1.018	3.70		
Q32	Watching video lesson in mobile phones or wireless devices when compared television : **convenient**	4.08	0.671	4.42		
Q36	Video lesson vis-à-vis teachers:**useful in imparting**	3.99	0.934	4.22		

- 'Watching the video in mobile phones is convenient in place of television 4.08 highest mean
- 'Video lesson is more useful for teachers to teach the subject in the classroom 85% of teachers agree, 9% disagree and 6% of teachers undecided – highest percentage represented in graph 1
- Use of video lesson in classroom is easy to explain for students mean is 3.56 least mean and 62% of teachers agree, 18% undecided and 19% of teachers disagreeit has agree least percentage of teachers.
- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 1 Percentage of each parameters under impact analysis on video lesson



4.2 Measurement on Acceptance level

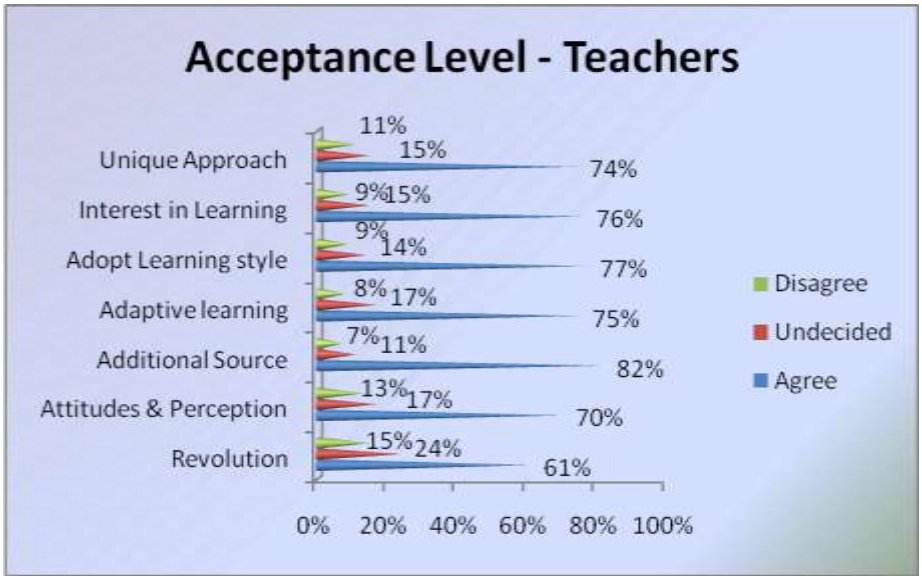
Table 2 Acceptance level

SL.No.	PARAMETERS	Mean	SD	Mean Ranks	Chi-Square Value	P value
Q12	Mobile Learning Technology is a **revolution** in e-learning to effectively build and deliver the content	3.58	1.077	3.41	17.139	0.009
Q14	Mobile Learning Technology in education system is more effective to measure the students' **attitudes and perception**	3.75	1.049	3.91		
Q15	Mobile Learning Technology is the **additional orsupplemental source** of learning.	3.99	0.907	4.10		
Q23	Mobile Learning technology to provide **adaptive** learning environment	3.88	0.946	4.01		
Q26	Mobile Learning technology can help the student to **adopt their learning style**	3.99	1.013	4.49		
Q27	Mobile phones or wireless devices help in increasing the students **interest in learning**	3.89	0.968	4.16		
Q29	Mobile Learning Technology has become a **unique approach** in providing content delivery.	3.84	1.084	3.94		

- 'Mobile learning technology is the alternate or supplemental source of learning and mobile learning can help the student to adopt their learning style' – highest mean is 3.99 and 82% of teachers agree, 11% undecided and 7% disagree – highest percentage parameter represented in graph 2.
- 'Mobile learning is a revolution in e-learning to effectively build and deliver the content mean is 3.58 and 61% of teachers agree, 24% undecided and 15% disagree

- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 2 Percentage of parameters under measurement on Acceptance Level



4.3 Analysis of User Friendliness

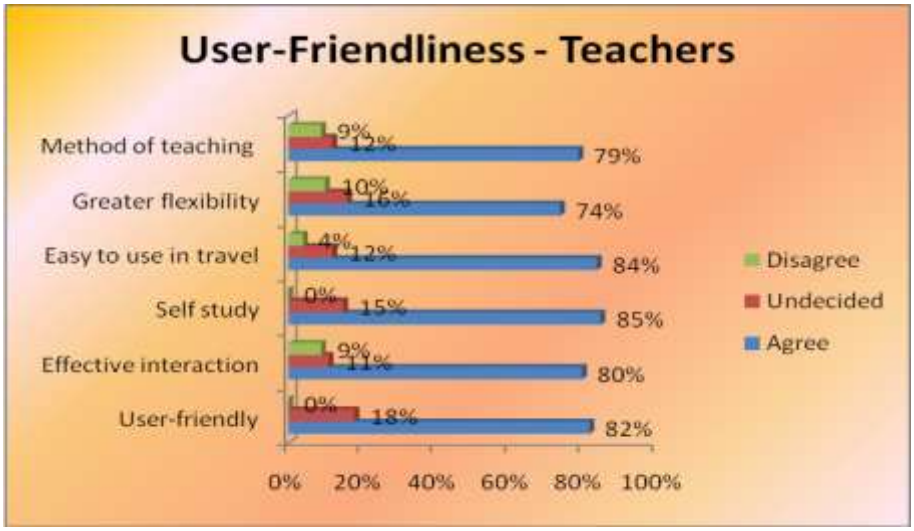
Table 3 User Friendliness

SL.No.	*PARAMETERS*	*Mean*	*SD*	*Mean Ranks*	*Chi-square value*	*P value*
Q5	Mobile Learning Technology is **User-friendly**	4.20	0.719	3.89	27.365	0.000
Q9	**Effective interaction** with students in the mobile Learning Technology	3.95	1.005	3.37		
Q11	Mobile Learning Technology can be used for **self study or individualized learning**	4.21	0.688	3.85		
Q25	Mobile Learning Technology is **easy to use**while travelling by bus/car/van/train	4.19	0.797	3.80		
Q34	Mobile Learning Technology is the **greater flexibility** in where and when learning needs.	3.81	0.969	3.06		
Q38	Mobile learning technology as one **method of teaching and learning**.	3.83	0.897	3.03		

- 'Mobile learning can be used for self study or individualized learning' - Highest mean value is 4.21 and also agree for 85% of teachers, 15% undecided – highest percentage parameter represented in graph 3.
- 'Mobile learning technology is the greater flexibility in where and when learning needs'least mean value is 3.81 and 74% of teachers agree, 16% undecided and 10% of teachers disagree.

- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 3 Percentage of parameters under User-Friendliness



4.4 Analysis of Didactic Efficiency

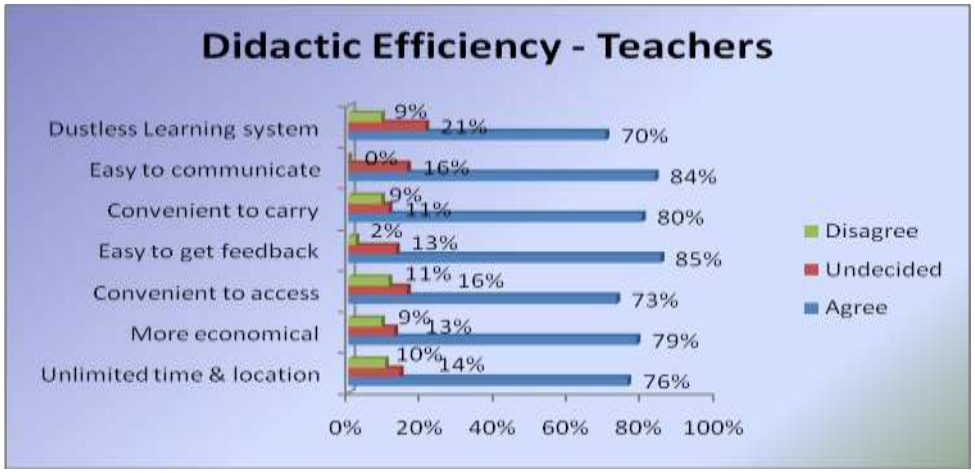
Table 4 Didactic Efficiency

SL.No.	*PARAMETERS*	*Mean*	*SD*	*Mean Ranks*	*Chi-Square*	*P value*
Q13	Mobile Learning Technology represents user's continuous access to network resources **without limitation of timeand location**.	3.91	1.081	4.02	17.872	0.007
Q20	Mobile learning technology is **more economical** in terms of design and delivery of content.	3.93	0.965	4.06		
Q21	Mobile Learning Technology is **convenient to access** information anywhere, at any time, any network, any data on any wireless device.	3.84	1.061	3.73		
Q24	Mobile phones or wireless devices are simple and **easy to get feedback** from learners and teachers	4.14	0.725	4.48		
Q33	Users **convenient to carry** their data with them to almost all the places.	3.85	0.901	3.73		
Q35	Mobile phones or a wireless device is **easy to communicate** with students and other teachers.	4.16	0.683	4.40		
Q40	Mobile Learning Technology is used to support the end of the **dustless learning** system	3.76	0.945	3.59		

- 'Mobile phones or a wireless device is easy to communicate with students and other teachers' - highest value of mean is 4.16
- 'Mobile learning is used to support the end of the dustless learning system'Least mean value is 3.76
- 'Mobile phones or wireless devices are simple and easyto get feedback from learners and teachers', Highest percentage - 85% of teachers agree that 2% disagree and 13% undecided represented in graph 4.

- 'Mobile Learning Technology is used to support the end of the **dustless learning** system' – Lowest percentage - 70% of teachers agree, 9% disagree and 21% undecided.
- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 4 Percentage of parameters under Didactic Efficiency



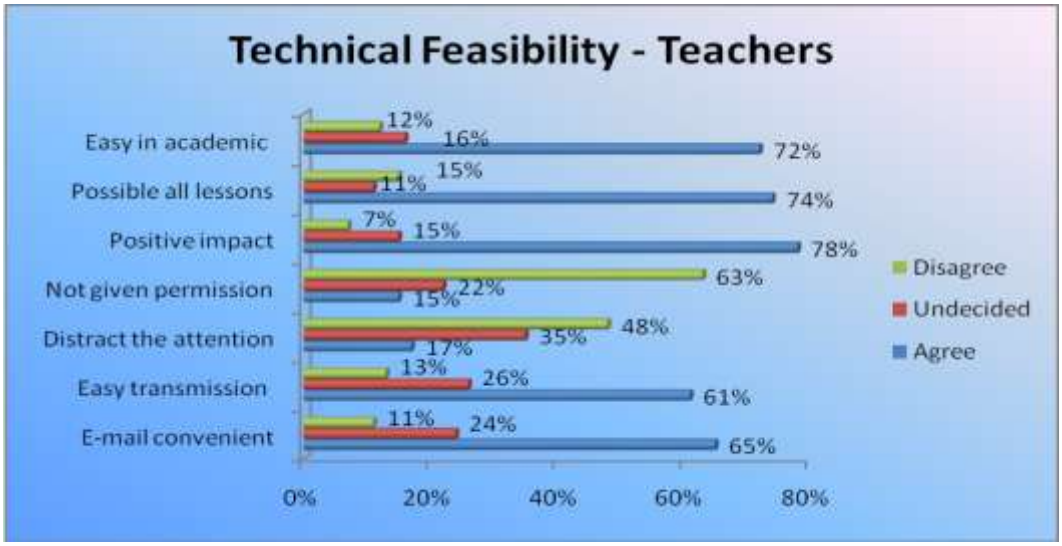
4.5 Analysis of Technical Feasibility

Table 5 Technical Feasibility

SL.No.	*PARAMETERS*	*Mean*	*SD*	*Mean Ranks*	*Chi-Square value*	*P value*
Q6	Sending assignments through **e-mail isconvenient** when compared to conventional system.	3.65	0.995	3.87	17.886	0.007
Q7	**Transmitting** videos in mobile phones is easy than television, web etc	3.68	1.041	3.90		
Q16	Usage of mobile phones in classroom will **distract** the students' attention	3.46	1.147	3.49		
Q17	Administrators / Management will **notgive permission** to use mobile phones in classroom	3.56	1.123	3.74		
Q18	**Positive impact** on the technology enabled learning system.	4.00	0.955	4.56		
Q37	Mobile Learning is **possible for all the lessons**	3.80	1.195	4.26		
Q39	Use of mobile phones or wireless devices is easy **in academic** environment	3.79	1.087	4.19		

- 'Positive impact on the technology enabled learning system' highest mean is 4.00 and 78% of teachers agree, 15% undecided and 7% disagree – highest parameter represented in graph 5
- 'Usage of mobile phones in classroom will distract the students attention' is the least mean value is 3.46 and 48% of teachers disagree, 35% undecided and only 17% of teachers agree.
- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 5 Percentage of parameters under Analysis of Technical Feasibility



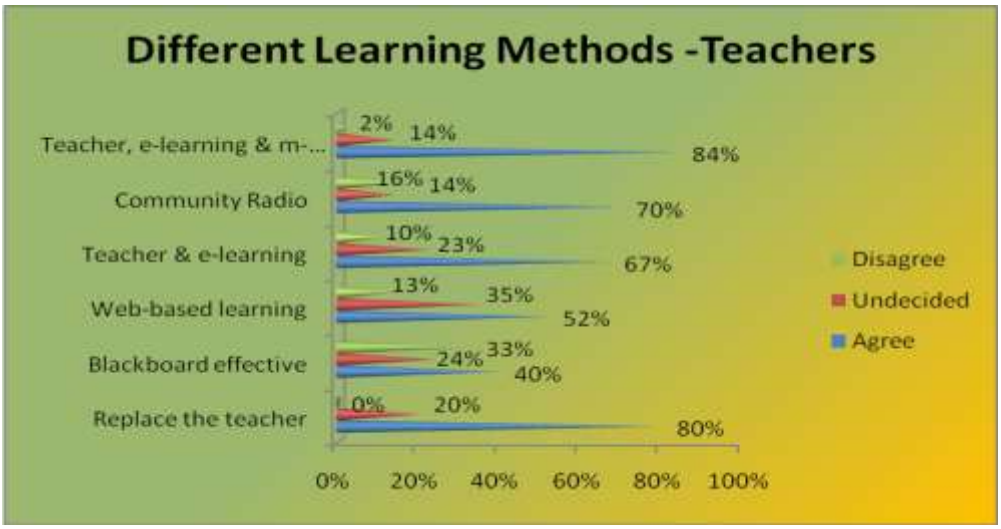
4.6 Analysis of Different Learning Methods

Table 6 Analysis of Different Learning Methods

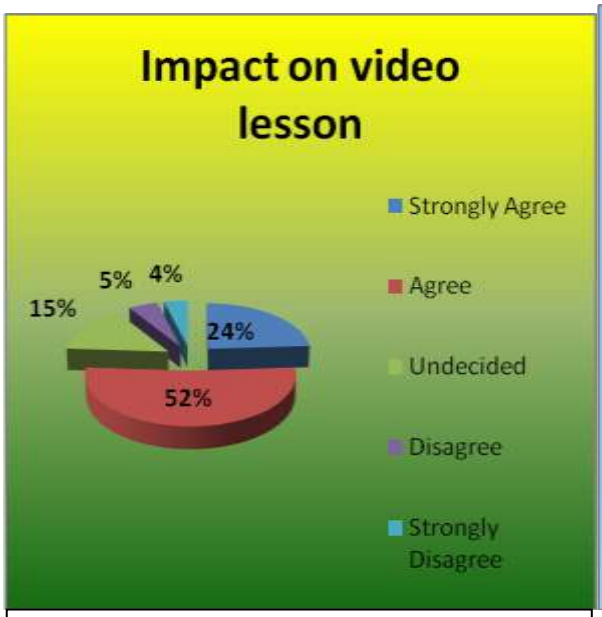
SL.No.	*PARAMETERS*	*Mean*	*SD*	*Mean Ranks*	*Chi-square value*	*P value*
Q1	No Technology can **replace the teacher**	4.18	0.742	4.29	88.794	0.000
Q2	Teacher would prefer to **use blackboard is effective** than other methods of learning	3.11	1.232	2.31		
Q4	Learning through **web** is interesting than other learning methods	3.54	1.006	3.06		
Q10	Learning with **teacher centered and e-learning**	3.80	1.024	3.43		
Q19	Learning through **teacher centered with technology enabled learning** i.e. e-learning and m-learning is suitable for students	3.75	1.119	3.61		
Q31	**Community radio** can also be used for learning the subject	4.21	0.774	4.29		

- Learning through teacher centered with technology enabled learning i.e. e-learning and m-learning is suitable for students the highest value of mean is 4.21 and 84% of teachers are agree, 14% undecided and remaining 2% disagree- highest percentage of parameter represented in graph 6
- Least mean value 3.11 of parameter is 'teacher would prefer to use blackboard is effective than other methods of learning' and 40% of teachers agree and 33% disagree and 24% undecided
- Null – Hypothesis is rejected – Hence it is concluded that there is a significant difference between mean ranks of parameters P value is less than 0.01 at 1% significance

Graph 6 Percentage of parameters under Analysis of Different learning methods

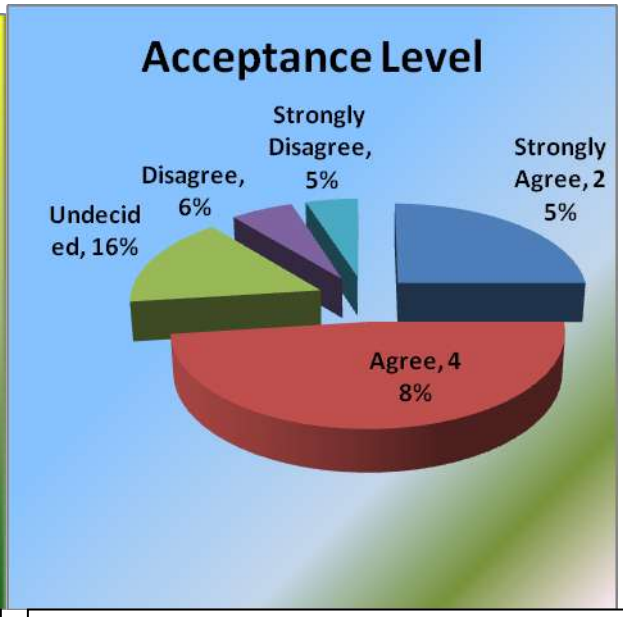


Graph 7 Responses of impact on video lessons



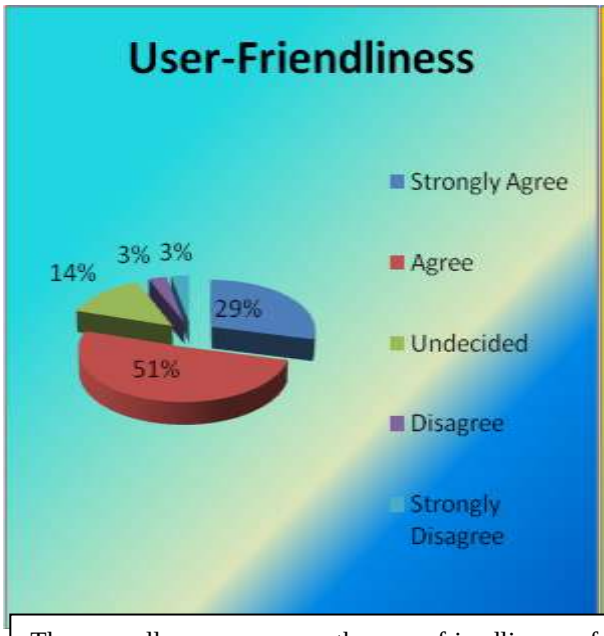
The overall response on the impact analysis of video lessons using mobile learning technology, 24% of overall teachers strongly agree and 52% of teachers agree and 15% of teachers undecided, 5% and 4% of teachers disagree and strongly disagree.

Graph 8 Responses on Acceptance level



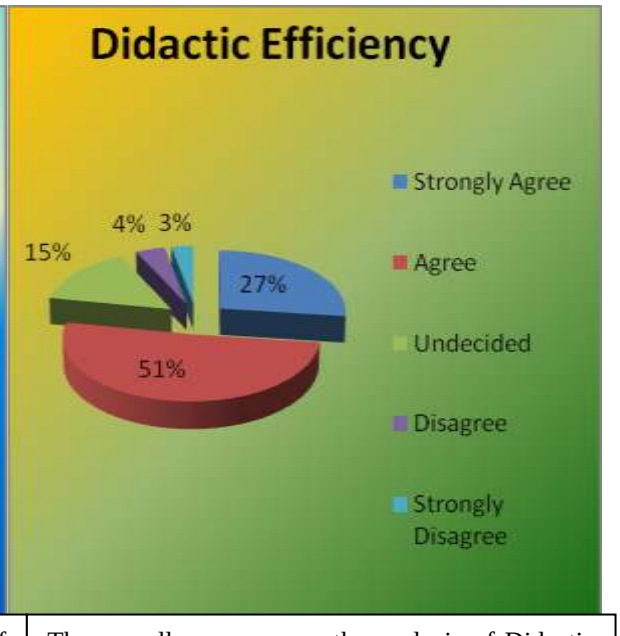
The overall responses measurement on acceptance level of mobile learning technology, 25% of overall teachers strongly agree and 48% of teachers agree and 16% of teachers undecided and 6% and 5% of teachers disagree and strongly disagree.

Graph 9 Responses on User Friendliness



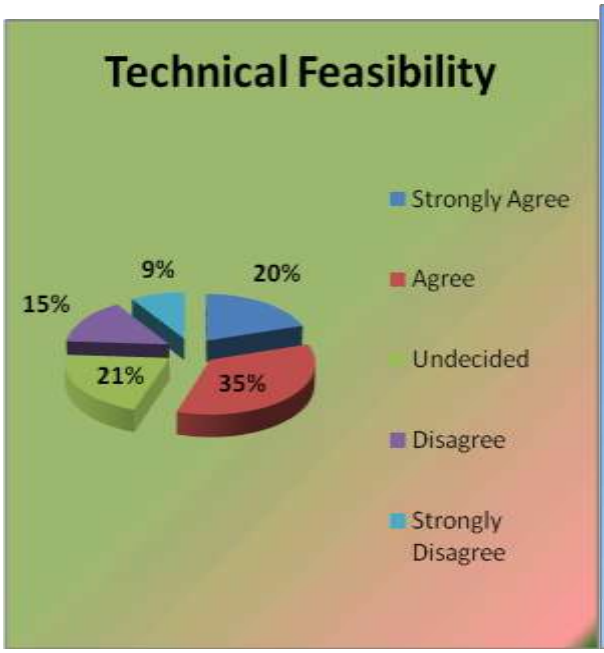
The overall responses on the user-friendliness of mobile learning technology, 29% of overall teachers strongly agree and 51% of teachers agree and 14% of teachers undecided and 3% and 3% of teachers disagree and strongly disagree.

Graph 10 Responses on the Didactic Efficiency



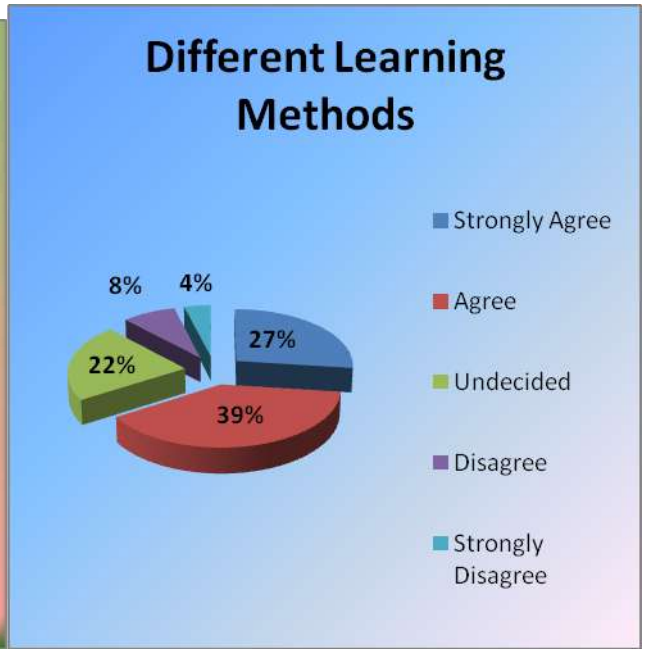
The overall responses on the analysis of Didactic Efficiency on mobile learning technology, 27% of overall teachers strongly agree and 51% of teachers agree and 15% of teachers undecided and 4% and 3% of teachers disagree and strongly disagree.

Graph 11 Responses on Technical Feasibility



The overall responses of the analysis of Technical Feasibility on mobile learning technology, overall 10% of teachers strongly agree and 35% of teachers agree and 21% of teachers undecided and 15% and 9% of students disagree and strongly disagree.

Graph 12 Responses on Different Learning Methods



The overall responses of the analysis of Different Learning Methods, overall 27% of teachers strongly agree and 39% of teachers agree and 22% undecided and 8% and 4% of teachers disagree and strongly disagree.

The mean of the scores assigned by all the teachers for each parameter gives parameter wise effectiveness score. The total score for effectiveness of each category was computed by adding the scores of all the parameters in the particular category. The percentage of effectiveness of each category was calculated by using the following formula:

$$\text{Percentage of Effectiveness} = \frac{\text{Total Score assigned}}{\text{Maximum possible score}} \times 100$$

Where,

1) The maximum possible score = (Number of parameters under each category) X (Maximum mean score that can be obtained for a parameter)

2) Maximum mean score that can be obtained for a parameter is 5.

Table 7 Data on the Effectiveness of Mobile Learning Technology as assessed by Teachers.

S.No.		***Parameter wise Effectiveness***							***Effectiveness***		
									Total Score	***Max. possible score***	***%***
1.	Impact of video lesson	**C1.1**	**C1.2**	**C1.3**	**C1.4**	**C1.5**	**C1.6**	**C1.7**			
		3.56	3.89	3.93	3.91	3.78	4.08	3.99	27.05	35	78
2.	Acceptance Level	**C2.1**	**C2.2**	**C2.3**	**C2.4**	**C2.5**	**C2.6**	**C2.7**			
		3.58	3.75	3.99	3.88	3.99	3.89	3.84	26.92	35	77
3.	User-friendliness	**C3.1**	**C3.2**	**C3.3**	**C3.4**	**C3.5**	**C3.6**				
		4.20	3.95	4.21	4.19	3.81	3.83		24.19	30	81
4.	Didactic Efficiency	**C4.1**	**C4.2**	**C4.3**	**C4.4**	**C4.5**	**C4.6**	C4.7			
		3.91	3.93	3.84	4.14	3.85	4.16	3.76	27.59	35	79
5.	Technical feasibility	**C5.1**	**C5.2**	**C5.3**	**C5.4**	**C5.5**	**C5.6**	**C5.7**			
		3.65	3.68	3.46	3.56	4.00	3.80	3.79	25.94	35	74
6.	Different Learning Methods	**C6.1**	**C6.2**	**C6.3**	**C6.4**	**C6.5**	**C6.6**				
		4.18	3.11	3.54	3.80	3.75	4.21		22.59	30	75

The graph 13 indicates the percentage of effectiveness of the six categories of mobile learning technology as assessed by the teachers ranges from 74% to 81% and based on the assessments of teachers, it can be concluded that User-Friendliness (81%) is the most effective learning category, followed by Didactic Efficiency (79%), Impact on video lesson (78%) and - Acceptance Level (77%), Different Learning Methods (75%) and Technical Feasibility (74%).of mobile learning technology.

4.7 Reliability Analysis

The results are presented in table 8 Although it was anticipated a priori that the 40 parameters would load onto the 6 variables identified, The parameters that loaded onto and determined and represented by: 1) Impact on Video Lesson 2) Acceptance Level 3) User-Friendliness 4) Didactic Efficiency 5) Technical Feasibility and 6) Different Learning

Methods. The results of this study can be explained in Table 8gives the results of extracted communalities of all the variables. It shows the proportion of the variance of a variable explained by the common factors.

Graph 13 Effectiveness of Mobile Learning Technology as assessed by teachers.

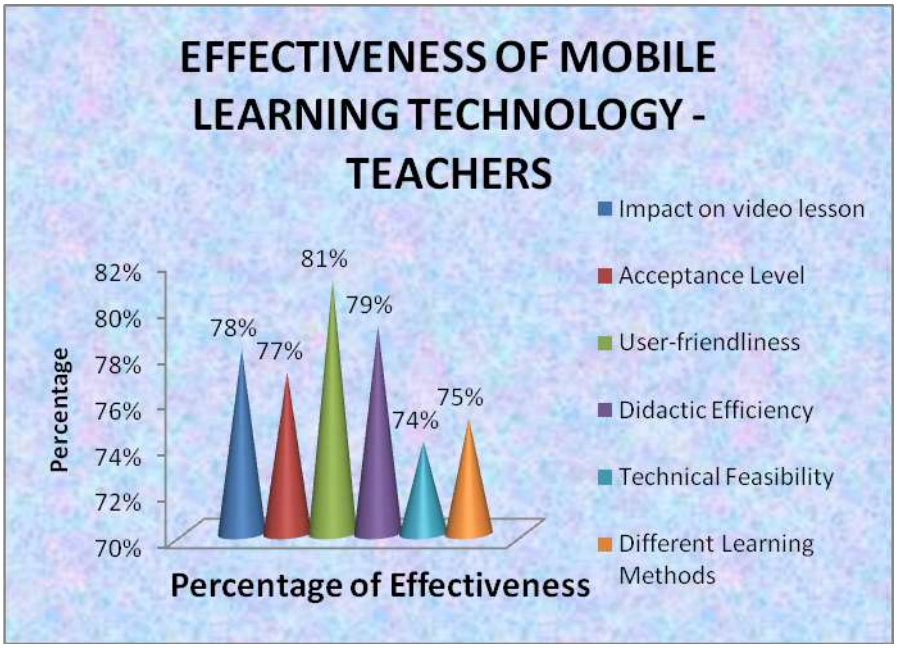


Table 8 Communalities (Extraction Method: Principal Component Analysis), Rotated Component Matrix and Cronbach's Alpha of Mobile Learning

	Communalities Principal Component Analysis		*Rotated Component Matrix and Cronbach's Alpha of Mobile Learning Technology*			
	Initial	***Extraction***		***Component***		
				1	2	3
			Impact on video lesson	0.781		
Q30	1.000	0.886	Motivation	0.941		
Q28	1.000	0.794	Good grade	0.891		
Q36	1.000	0.763	Useful for teachers	0.870		
Q32	1.000	0.662	Convenient to watch	0.809		
Q22	1.000	0.429	Learning Effect	0.595		
Q3	1.000	0.693	Easy to explain		0.827	
Q8	1.000	0.636	Cost effective		0.775	
			Cronbach's Alpha	0.884	0.486	
			Acceptance Level	0.780		
Q29	1.000	0.627	Unique Approach	0.792		
Q14		0.613	Attitude & Perception	0.767		
Q23	1.000	0.547	Adaptive learning	0.738		
Q12	1.000	0.667	Revolution	0.704		
Q26	1.000	0.535	Adopt their Learning style	0.682		
Q15	1.000	0.749	Alternate source of learning		0.860	
Q2	1.000	0.693	Interest in learning		0.828	
			Cronbach's Alpha	0.809	0.682	

			User-friendliness	0.776		
Q11	1.000	0.726	Self study	0.785		
Q9	1.000	0.498	Effective interaction	0.705		
Q34	1.000	0.412	Greater flexibility	0.632		
Q25	1.000	0.679	Easy to use in travel	0.630	0.531	
Q38	1.000	0.864	Teaching & Learning		0.928	
Q5	1.000	0.842	User-friendly		0.819	
			Cronbach's Alpha	0.710	0.780	
			Didactic Efficiency	0.732		
Q28	1.000	0.715	Unlimited time & location	0.845		
Q21	1.000	0.690	Convenient to access	0.830		
Q13	1.000	0.581	More economical	0.755		
Q17	1.000	0.580	Easy to get feedback	0.755		
Q40	1.000	0.463	Dustless classroom	0.610		
Q39	1.000	0.688	Convenient to carry		0.812	
Q35	1.000	0.754	Easy to communicate		0.862	
			Cronbach's Alpha	0.821	0.622	
			Technical Feasibility	0.720		
Q7	1.000	0.854	Easy Transmission	0.850		
Q16	1.000	0.733	Distract students attention	0.848		
Q39	1.000	0.505	Easy in academic	0.700		
Q17	1.000	0.690	Not give permission	0.564		0.568
Q37	1.000	0.789	Possible for all the lessons			0.874
Q18	1.000	0.799	Positive impact		0.716	
Q6	1.000	0.784	E-mail is convenient		0.851	
			Cronbach's Alpha	0.770	0.571	0.406
			Different Learning Methods	0.800		
Q16	1.000	0.877	Blackboard	0.908		
Q26	1.000	0.794	Community Radio	0.843		
Q6	1.000	0.692	Replace teacher	0.820		
Q15	1.000	0.683	Web is interest	0.704		
Q14	1.000	0.480	Teacher & e-learning		0.644	
Q25	1.000	0.774	Teacher centered with e- & m-learning		0.880	
			Cronbach's Alpha	0.868	0.473	

From table 8 under impact on video lesson,

- " Watching the video lesson can be increased the learning effect" has the least percentage (43.0%) of variance
- "Usage of video lesson in classroom motivates the students to learn" has the highest variation (88.6%)
- Factor analysis loaded seven questionnaire statements into two components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.781.
- The first component alpha value is 0.884 has high internal consistency of component. The alpha value of the second factor is 0.486 it has poor consistency with other parameters.

From table 8 under acceptance level,

- "Mobile learning can help the student to adopt their learning style" has the least percentage (53.5%) of variance

- "Mobile learning is the additional or supplemental source of learning" has the highest variation (74.9%)
- Cronbach's alpha from reliability analysis of the data. Factor analysis loaded seven questionnaire statements into two components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.780.
- The first component represents the most contributory element to mobile learning. Alpha value of this factor is 0.809 representing a high internal consistency of this component. The alpha value of the second factor is 0.682 consistency of the component.

From Table 8 under user-friendliness,

- "mobile learning is the greater flexibility where and when explanation needs" has the least percentage (41.2%) of variance
- "Mobile learning as one method of teaching & learning" has the highest variation (86.4%)
- Cronbach's alpha from reliability analysis of the data, factor analysis loaded six questionnaire statements into two components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.776.
- The alpha value of the first factor is 0.710 is also high consistency of the component.
- The second component represents the most contributory element to mobile learning. Alpha value of this factor is 0.780 representing a high consistency of this component.

From Table 8 under didactic efficiency,

- "mobile learning is used to support the end of the dustless classroom learning system" has the least percentage (46.3%) of variance
- 'Mobile phones or wireless devices are simple and easy to communicate with teachers and students' has the highest variation (75.4%)
- Cronbach's alpha from reliability analysis of the data, factor analysis loaded seven questionnaire statements into two components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.732.
- The first component represents the most contributory element to mobile learning. Alpha value of this factor is 0.821 representing a high internal consistency of this component. T
- The alpha value of the second factor is 0.622 is consistency of the component.

From Table 8 under technical feasibility,

- "Use of mobile phone is easy in academic environment" has the least percentage (50.5%) of variance
- 'Transmitting videos in mobile devices is easy than other modes' has the highest variation (85.4%)

- Cronbach's alpha from reliability analysis of the data, factor analysis loaded seven questionnaire statements into three components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.720.
- The first factor has high consistency alpha value is 0.770,
- The second component alpha factor is 0.571 and third component alpha value is 0.406 is quite low owing the component only items are extracted.

From Table 8 under different learning methods,

- "Learning with teacher and e-learning" has the least percentage (48%) of variance
- 'Teacher would prefer to use blackboard is effective than other methods of learning" has the highest variation (87.7%)
- Cronbach's alpha from reliability analysis of the data,factor analysis loaded six questionnaire statements into two components. The internal consistency, represented by coefficient alpha, of all items is as much as 0.800.
- The first component represents the most contributory element to mobile learning. Alpha value of this factor is 0.868 representing a high internal consistency of this component.
- The alpha value of the second factor is 0.473 which is low owing to the very limited number of items (2 items).

The overall reliability of parameter factor of Cronbach's Alpha value is 0.864 it has high internal consistency.

Table 9 Cronbach's Alpha of Mobile Learning

S.L.No.	***Categories***	***Cronbach's Alpha***
1.	Impact on video lesson on MLT	0.781
2.	Acceptance Level of MLT	0.784
3.	User-Friendliness of MLT	0.770
4.	Didactic Efficiency of MLT	0.704
5.	Technical Feasibility of MLT	0.720
6.	Different Learning Methods	0.800
	Overall Reliability	**0.864**

- **Correlation Analysis**

  Correlation analysis of teachers' assessments on effectiveness of six categories of Mobile Learning Technology is presented in Table 10

Table 10 Correlation Analysis on the Effectiveness of Mobile Learning Technology as assessed by the Teachers

Type of Category	*Category 1 Impact on video lesson*	*Category 2 Acceptance Level*	*Category 3 User Friendliness*	*Category 4 Didactic Efficiency*	*Category 5 Technical Feasibility*	*Category 6 Different Teaching Methods*
Category 1 Impact on video lesson	1.000	0.287**	0.404**	0.402**	0.326**	0.186
Category 2 Acceptance Level	0	1.000	0.273*	0.402**	0.139	0.035
Category 3 User Friendliness	0	0	1.000	0.246*	0.131	0.075
Category 4 Didactic Efficiency	0	0	0	1.000	0.122	0.266
Category 5 Technical Feasibility	0	0	0	0	1.000	0.306**
Category 6 Different Learning Methods	0	0	0	0	0	1.000

Note: ** Correlation is significant at the 0.01 level (2-tailed)
*** Correlation is significant at the 0.05 level (2-tailed)**

The strength of a relationship between two groups is indicated by the absolute value of the correlation coefficient. The correlation coefficient between Category 1 and Category 3 has a high absolute value of 0.404. **Therefore, the relationship between Category 1 (Impact on Video Lesson) and Category 3 (User- friendliness) is stronger than the relationship between other groups.** The correlation between Category 3 and Category 4 has a low absolute value of 0.246. **Therefore, the relationship between Category 3 (User-friendliness) and Category 4 (Didactic Efficiency) is weaker than the relationship between other groups of mobile learning technology. The category 5 has uncorrelated with category 2 to category 4 and the category 6 has uncorrelated with category 1 to category 4,**

V. CONCLUSION

This paper presented after conducting main research study and survey from 80 engineering teachers of ECE, EEE and BME on the effectiveness of mobile learning. From the above results it is concluded that the most effective parameter is mobile learning which is alternate or supplemental source of learning for students, adopt their students learning style mobile learning is convenient for self-study or individualized learning. Mobile phones or wireless devices are easy to use while travelling by bus/car/van/train and easy to communicate with other teachers and students. From the parameters or indicators to the 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.

REFERENCES

[1] Devinder Singh & Zaitun A.B.,"Mobile Learning In Wireless Classrooms", Malaysian Online Journal of Instructional Technology (MOJIT), August 2006, ISSN: 1823-1144Vol.3, No.2, Pages 26-42.

[2] Paul Williams and Mary J. Granger, "Effectiveness and Acceptance of Mobile Learning", Proceedings of the AIS SIG-ED IAIM 2008 conference.

[3] Dr.Fahad N. Al-FAHAD, "Students' Attitudes and Perceptions towards the Effectiveness of Mobile learning in King Saud University", The Turkish Online Journal of Educational Technology – TOJET April 2009 ISSN: 1303-6521 volume 8 Issue 2 Article 10.

[4] Mohamed Osman M.El-Hussein and Johannes C.Cronje, "Defining Mobile Learning in the Higher education Landscape", Journal of Educational Technology and Society, 13(3),12-21.

[5] Cronbach, I.J (1951), Coefficienct alpha and the internal structure of test. Psychometrical, 16,297-334

[6] Hair., I.F. Anderson, R.E. Tatham, R.L. & Black, W.C., (1998). Multivariate Data Analysis. 5th ed. Upper Saddle River, New Jersey: Prentice-Hall

[7] Luvai F. Motiwalla, "Mobile learning: A framework and Evaluation", Computer & Education 49 (2007) 581-596 available online at www.sciencedirect.com

[8] John Traxler, 'Defining Mobile Learning', International Conference Mobile Learning (IADIS) 2005

[9] Edward J. Cherian and Paul Williams, "Mobile Learning: The Beginning of the End of Classroom Learning", Proceedings of the World Congress on Engineering and Computer Science 2008, WCECS 2008, October 22-24, 2008, San Francisco, USA

[10] Maniar,N. E.Bennett, S. Hand and G.Allan (2008) " The effect of mobile phone screen size on video based learning" Journal of software, Vol 3(4) April 2008 p51-61

Table 9 Teachers Descriptive frequency Statistics **ANNEXURE - I**

	Parameters	SA %	A %	Un %	D %	SD %	Mean	SD
Q1	No Technology can **replace the teacher**	30 (38%)	34 (42%)	16 (20%)	0	0	4.18	0.742
Q2	Teacher would prefer to use **blackboard is effective** than other methods of learning	11 (14%)	23 (29%)	19 (24%)	18 (22%)	9 (11%)	3.11	1.232
Q3	Usage of video lesson in classroom is **easy to explain** for students	18 (22%)	32 (40%)	14 (18%)	9 (11%)	7 (9%)	3.56	1.210

Q4	Learning through **web** is interesting than other learning methods	14 (17%)	28 (35%)	28 (35%)	7 (9%)	3 (4%)	3.54	1.006
Q5	Mobile Learning Technology is **User-friendly**	30 (37%)	36 (45%)	14 (18%)	0	0	4.20	0.719
Q6	Sending assignments through **e-mail isconvenient** when compared to conventional system.	13 (16%)	39 (49%)	19 (24%)	5 (6%)	4 (5%)	3.65	0.995
Q7	**Transmitting** videos in mobile phones is easy than television	18 (22%)	31 (39%)	21 (26%)	7 (9%)	3 (4%)	3.68	1.041
Q8	Delivery of video lessons through mobile phones is **cost effective** when compared to other e-learning methods like web or television	19 (24%)	41 (51%)	14 (18%)	4 (5%)	2 (3%)	3.89	0.914
Q9	**Effective interaction** with students in the mobile Learning Technology	23 (29%)	41 (51%)	9 (11%)	3 (4%)	4 (5%)	3.95	1.005
Q10	Learning with **teacher and e-learning**	21 (26%)	33 (41%)	18 (23%)	5 (6%)	3 (4%)	3.80	1.024
Q11	Mobile Learning Technology can be used for **self study** or individualized learning	29 (36%)	39 (49%)	12 (15%)	0	0	4.21	0.688
Q12	Mobile Learning Technology is a **revolution** in e-learning to effectively build and deliver the content	14 (17%)	35 (44%)	19 (24%)	7 (9%)	5 (6%)	3.58	1.077
Q13	Mobile Learning Technology represents user's continuous access to network resources **without limitation of timeand location**.	25 (31%)	36 (45%)	11 (14%)	3 (4%)	5 (6%)	3.91	1.081
Q14	Mobile Learning Technology in education system is more effective to measure the students' **attitudes and perception**	18 (22%)	38 (48%)	14 (17%)	6 (8%)	4 (5%)	3.75	1.049
Q15	Mobile Learning Technology is the **additional orsupplemental source** of learning.	22 (28%)	43 (54%)	9 11%)	4 (5%)	2 (2%)	3.99	0.907
Q16	Usage of mobile phones in classroom will **distract** the students' attention	5 (6%)	9 (11%)	28 (35%)	20 (25%)	18 (23%)	3.46	1.147
Q17	Administrators/ Management will **not give permission** to use mobile phones in classroom	7 (9%)	5 (6%)	18 (23%)	36 (45%)	14 (17%)	3.56	1.123
Q18	**Positive impact** on the technology enabled learning system.	26 (33%)	36 (45%)	12 (15%)	4 (5%)	2 (2%)	4.00	0.955
Q19	**Community radio** can also be used for learning the subject	21 (26%)	35 (44%)	11 (14%)	9 (11%)	4 (5%)	3.75	1.119
Q20	Mobile learning technology is **more economical** in terms of design and delivery of content.	21 (26%)	42 (52%)	10 (13%)	4 (5%)	3 (4%)	3.93	0.965
Q21	Mobile Learning Technology is **convenient** to access information anywhere, at any time , any network, any data on any wireless device	22 (28%)	36 (45%)	13 (16%)	5 (6%)	4 (5%)	3.84	1.061
	Watching the video lesson can	21	42	10	4	3		

Q22	increased the **learning effect**	(26%)	(52%)	(13%)	(5%)	(4%)	3.93	0.965
Q23	Mobile Learning Technology to provide **adaptive learning environment**	19 (24%)	41 (51%)	14 (17%)	3 (4%)	3 (4%)	3.88	0.946
Q24	Mobile phones or wireless devices are simple and **easy to get feedback** from learners and teachers	25 (31%)	43 (54%)	10 (13%)	2 (2%)	0	4.14	0.725
Q25	Mobile Learning Technology is **easy to use** at the time of travelling by bus/car/van/train	31 (39%)	36 (45%)	10 (12%)	3 (4%)	0	4.19	0.797
Q26	Mobile Learning technology can help the student to **adopt their learning style**	27 (34%)	35 (44%)	11 (14%)	4 (5%)	3 (4%)	3.99	1.013
Q27	Mobile phones or wireless devices help in increasing the students **interest in learning**	20 (25%)	41 (51%)	12 (15%)	4 (5%)	3 (4%)	3.89	0.968
Q28	Mobile Learning Technology will help the student for getting **good grade**	19 (24%)	44 (55%)	10 (13%)	5 (6%)	2 (3%)	3.91	0.917
Q29	Mobile Learning Technology has become a **unique approach** in providing content delivery	22 (28%)	37 (46%)	12 (15%)	4 (5%	5 (6%)	3.84	1.084
Q30	Usage of video in classroom **motivates** the students to learn.	17 (21%)	41 (51%)	13 (16%)	5 (6%)	4 (5%)	3.78	1.018
Q31	Combination of **teacher centered with technology enabled learning i.e. e-learning and m-learning** is more suitable for students	32 (40%)	35 (44%)	11 (14%)	2 (2%)	0	4.21	0.774
Q32	Watching video lessons in mobile phones is **convenient** when compared to television	21 (26%)	44 (55%)	15 (19%)	0	0	4.08	0.671
Q33	User's **convenient to carry** their data with them to almost all the places	14 (18%)	50 (62%)	9 (11%)	4 (5%)	3 (4%)	3.85	0.901
Q34	Mobile Learning technology is the **greater flexibility** where and when explanation needs	17 (21%)	42 (53%)	13 (16%)	5 (6%)	3 (4%)	3.81	0.969
Q35	Mobile phones or a wireless device is **easy to communicate** with students and other teachers.	26 (32%)	41 (51%)	13 (16%)	0	0	4.16	0.683
Q36	Video lesson is **useful for the teachers** to teach the subject	21 (26%)	47 (59%)	5 (6%)	4 (5%)	3 (4%)	3.99	0.934
Q37	Mobile Learning is **possible for all the lessons**	24 (30%)	35 (44%)	9 (11%)	5 (6%)	7 (9%)	3.80	1.195
Q38	Mobile learning technology as one method of **teaching and learning.**	13 (16%)	50 (63%)	10 (12%)	4 (5%)	3 (4%)	3.83	0.897
Q39	Use of mobile phones or wireless devices is **easy in academic** environment	20 (25%)	38 (48%)	12 (15%)	5 (6%)	5 (6%)	3.79	1.087
Q40	Mobile Learning Technology is used to support the **end of the dustless classroom** learning system	15 (19%)	41 (51%)	17 (21%)	4 (5%)	3 (4%)	3.76	0.945

Table 10 Profile of the Teachers **ANNEXURE - II**

	Profile	Frequency	Percentage (%)
Gender	Male	35	44%
	Female	45	56%
	Total	80	100%
Academic Qualification	Master Degree	50	63%
	Doctoral Degree	30	37%
	Total	80	100%
Age Group	18-24 years	3	4%
	25-27 years	18	23%
	28-32 years	30	37%
	33-45 years	24	30%
	Above 45 years	5	6%
Teaching Experience	0-5 years	21	26%
	6-10 years	39	49%
	11-15 years	15	19%
	16-20 years	5	6%
Designation	Professor	35	44%
	Associate Professor	27	34%
	Assistant Professor	18	22%
	Total	80	100%
Department	Electronics and Communication Engineering	38	47%
	Electrical and Electronics Engineering	27	34%
	Bio Medical Engineering	15	19%
	Total	80	100%
Type of Management	Affiliated Colleges	50	63%
	Deemed University	30	37%
	Total	80	100%