

Development of a scale to measure Usage of mobile-phone among student-teachers

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Abstract

This paper explains the procedure of developing and validating a scale constructed by the authors to measure the usage of mobile phone in teaching-learning process of B.Ed. student-teachers. The scale has been constructed by using likert's method of summation to obtain a five point judgment on each item, after critical study related to mobile-phone usage. The scale includes three dimensions namely, Communication, Internet and Other Application. The pilot study had 46 items related to all the three dimensions mentioned above. The scale had good validity and reliability.

Key words: Usage of mobile phone, B.Ed. student -Teachers, Scale development.

Introduction:

Mobile learning received a lot of attention in recent years as a growing segment of the educational and instructional technology field. But what is mobile learning? provides one broad definition to get us started: "Mobile learning, or m-learning, can be any educational interaction delivered through mobile technology and accessed at a student's convenience from any location."

Mobile-Learning is often defined as learning that takes place with the help of portable electronic tools (Yi et, al, 2009). A portable device that supports learning may be freely moved, but learner is mostly stationary, even though they are using a mobile device. Although the device is mobile and portable, the learning as an event cannot be described as mobile. Moreover, when people access information via different tools, there is still much usability, compatibility and accessibility related questions that hinder seamless mobility and mobile-learning.

The use of wireless mobile technology such as PDAs, cellular phones, i-pods or ultra notebook computers in education and training is making learning more flexible where students can learn from anywhere and at anytime. Mobile- learning is novel in that it facilitates delivery of learning to the right person, at the right time, in the right place using portable electronic devices. In the near future, Mobile-learning will become a normal part of lifelong education and self-directed learning.

Mobile- learning through the use of wireless mobile technology allows anyone to access information and learning materials from anywhere and at anytime. As a result, learners have control of when they want to learn and from which location they want to learn. Also, all humans have the right to access learning materials and information to improve their quality of life regardless of where they live, their status, and their culture. Mobile - learning, through the use of mobile technology, will allow citizens of the world to access learning materials and information from anywhere and at anytime.

History of Mobile Phones:

Cells for mobile phone base station were invented in 1947 by Bell Labs Engineers at AT and T (American Telephone and Telegraph company) and further developed by bell labs during the 1960.

In 1945 the zero generation (0.G) of mobile telephone was introduced, OG mobile phones such as mobile telephone service were not cellular and so did not further hand over from base station to next and reuse of radio frequencies. It only involved a single powerful base station, covering a wide area and such phones effectively monopolize a channel over that whole area in use.

The next major step in mobile telephone is the analog telephone used in several satellite communication systems.

The first generation system started in 1979 with Japan, and all are analog and includes AMPS and N.M.T. The Second generation system started in Finland and all are digital and includes G.S.M., C.D.M.A., T.D.M.A. The third generation (3G) networks which are still being deployed, began in Japan in 2001, they are all digital and offer high speed data access in addition to voice services and include w-C.D.M.A.

Others are Benq, Siemens, Sagem, Toshiba etc. As the users moves around the network the mobile devices will “hand off” to various cell sites. Cell sites have relatively low power radio transmitter while broadcasts these presence and relay communication between the mobile handsets and the switch. The switch in turn connects the call to another subscriber of the same wireless service providers or to the public telephone network which includes the networks of other wireless carriers. The dialogue between the handset and the call site is a stream of digital data that include digitized audio. The technology that achieves this depends on the system which the mobile phone operation has adopted.

Features of mobile phone:

Mobile phones often have features beyond sending text messages and making voice calls including internet browsing, music (MP3) playback, menu recording, personal organize functions e-mail, instant messaging built in camera and ring tones, games, radio, push to talk, infrared and blue tooth connectivity, call registers, ability to watch streaming video or download video for later viewing video calling and serve as an wireless modern for a P.C. and soon will also serve as a console of sorts to online games and other high quality games. The largest categories of mobile services are music, picture downloads, video gaming, adult entertainment, gambling, video T.V. etc.

Some researchers characterise mobile learning as an extension of e-learning. For instance, Kadirire (2009) defines m-learning as a form of e-Learning, which can take place anytime, anywhere with the help of a mobile communication device such as a mobile phone, a personal digital assistant (PDA), iPod or any such small portable device. But new mobile learning perspectives accept mobile-learning as a paradigm change. One of these perspective is the learner-centred perspective. It asserts that m-learning is any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning opportunities offered by mobile technologies (O'Malley et al, 2003). The other perspective focuses on individualism. According to this perspective, mobile-learning is defined as any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediating through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse (Wexler et al, 2008). There are some researchers who associate m-learning with ubiquitous learning as well (Kress, G. and Pachler, N. (2007) Finally, there are many different mobile-learning perspectives in the related literature. Each definitions focus on the different features such as mobile technologies, mobility, individualism, ubiquitous, or e-learning.

In Mobile learning there are three dimensions that are critically affecting the success of mobile -Learning as illustrated among the three dimensions, mobile phones have greater advantages in term of “location independence”. Mobile phones make it possible to gather and record information nearly everywhere Francke, E. & Weideman, M. (2007). They have the highest mobility inside or outside classrooms. The coverage of mobile phones allows teachers to engage in activities requiring ubiquitous tools. With respect to the dimension of “time independence”, mobile phones can also be used in asynchronous and synchronous learning. SMS and forum messages can be retrieved and sent to support asynchronous learning. Synchronous learning can be facilitated via in-class voting systems and interactive games on mobile phones. They can also be used as real-time assessment tools. The dimension of “meaningful content” is the most critical one. Without quality content, mobile-Learning will be meaningless. There are many factors adversely affecting the delivery of quality content using mobile phones. Slow processing speed, limited bandwidth, small form factor, limited memory and one-finger operation are some of them (Simon 2007).

Jagannath Dange (2012) found that, the maximum Number of Post graduate students use the mobile phone daily for an hour for personal communication, and Educational communication. The

male students' usage of mobile phone for Educational purpose is more than female students, The Science faculty students' usage of mobile phone for Educational purpose is more than Arts faculty students and the students of both Arts and Science faculties had the High awareness regarding the usage of mobile phone for Educational purpose.

So it is very essential to know the use of mobile phones in the teaching and learning situations. As there are no readymade tools to be used for the present research and there is a need to develop a usage tool for the assessment by the student-teachers, the authors decided to construct the new tool based on the selected components.

Instrument:

The first part of the scale is captioned by general information which includes the variables like gender and subject background. The second part of the scale was formed after reviewing many related studies done in the field of mobile assisted learning and usage of mobile phone in teaching learning process both in India and in other countries and following dimensions were selected.

1. **Communication :-** The mobile-phone Applications Like SMS, MMS, Voice-Messages, Chat, Voice Call, Video Call, Video Chatting, Etc.
2. **Internet:** The mobile-phone internet based useful for communication viz are E-Mail, Voice-Mail, Web-Search, Browser , Blog, Face Book, You Tube, Wi-Fi, Route Map, G P R S, Downloads, Etc.
3. **Other Applications :-** The Devices Which Are Used In The Teaching –Learning Process Like Voice Recorder, Calculator, Camera , To Do Notes/ Memo, Dictionary, Video, Video Recording, Etc.

Pilot Study:

After constructing the Scale usage of mobile phone a pilot test was conducted on random sample of 100 B.Ed. student-teachers in Shimoga district, Karnataka state, India. The test was conducted with a

view to find out the reliability and validity of the tool and also to eliminate the ambiguity so that student teachers do not have any difficulty in responding to the items in the usage of mobile-phone in teaching-learning process. Scoring was done on the five point scale as suggested by Edwards. Total score for each subject was calculated, the sum of the item credits represents the individual total score.

Scoring Procedure:

The scale was constructed by the use of likert's method of summation to get a five point Judgment on each item. Against each statement five alternative responses namely “ Always, Frequently, Sometime, Rarely and Never” were given. Weights of 5.4.3.2 and 1 were given for statements in the order of their usability. Thus if one chooses ‘Always’ response for a statement, s/he gets a score of ‘5’, If one chooses ‘Frequently’ response for a statement, s/he gets a score of ‘4’. If one chooses ‘Sometime’ response for a statement, s/he gets a score of ‘3’. If one chooses ‘Rarely’ response for a statement, s/he gets a score of ‘2’. If one chooses ‘Never’ response for a statement, s/he gets a score of ‘1’. An individual's score in this scale is the sum total of the scores for all the statement by the subject (Summated Ratings).

Item Analysis:

Cronbach's Alpha was used to assess the degree of internal consistency among all sets of items, and then the task value was calculated. Items with 'r' values less than 0.30 were rejected, According to (De Vaus 2004) , anything less than 0.30 is a weak correlation for item analysis purposes. As many as 46 statements having the 'r' value greater than 0.30 were chosen, in order to form the final scale. The higher the score in this scale grater will be the usage of mobile-phone.

The following table-1 shows the accepted items by the Cronbach's Alpha reliability test.

Table-1. Usage of mobile phone: Item Wise Analysis.

Sl. No	Items	Corrected item total correlation	Items Accepted
1.	SMS	.307	Accepted
2.	MMS	.505	Accepted
3.	Voice-messages	.578	Accepted
4.	Chat	.307	Accepted
5.	Voice call	.340	Accepted
6.	Video call	.651	Accepted
7.	Group sms	.323	Accepted
8.	Video chatting	.480	Accepted
9.	E-mail	.492	Accepted
10.	Voice-mail	.648	Accepted
11.	Web-search	.487	Accepted
12.	Browser	.627	Accepted
13.	Blog	.512	Accepted
14.	Face book	.486	Accepted
15.	You tube	.506	Accepted
16.	Wi-fi	.670	Accepted
17.	Route map	.660	Accepted
18.	G P R S	.613	Accepted
19.	Locating places	.487	Accepted
20.	Downloads	.436	Accepted
21.	News	.468	Accepted
22.	Mobile-television	.509	Accepted
23.	Radio	.325	Accepted
24.	Voice recorder	.357	Accepted
25.	Documents	.386	Accepted
26.	Converter	.329	Accepted
27.	Calculator	.532	Accepted
28.	Alarm	.377	Accepted
29.	Camera	.572	Accepted
30.	Mobile games	.378	Accepted
31.	Calendar	.408	Accepted
32.	Stop watch	.430	Accepted
33.	To do notes/ memo	.497	Accepted
34.	Time/date	.308	Accepted
35.	Reminders	.358	Accepted
36.	Dictionary	.474	Accepted
37.	Video	.354	Accepted
38.	Video recording	.582	Accepted
39.	Security	.453	Accepted
40.	Graphics	.674	Accepted
41.	Movies	.618	Accepted
42.	Audio	.452	Accepted
43.	Audio recording	.449	Accepted
44.	X-print	.533	Accepted
45.	Voice search	.477	Accepted
46.	Bluetooth	.462	Accepted

Table-2. Usage of mobile phone Item: Total Reliability Statistics.

Number of Items	Cronbach's Alpha
46	.931

The above Table-2 Shows the Cronbach's alpha reliability score 0.931 for total items in usage of mobile phone tool.

Table-3.Dimension-Total Statistics

No	Dimensions	Cronbach's Alpha.
1	Communication	.797
2	Internet	.810
3	Other application	.774

The above Table -3 Shows dimension wise Cronbach's alpha reliability scores.

Reliability and Validity:

The scale had the universe of content as it included statements from all the selected domains usage of mobile-phone in teaching-learning process namely communication, internet and other applications. Due weight ages was given to all the domains while selecting items. The scale had 46 items representing the universe of content, hence it had face validity. It also had construct validity as items were selected having the 'r' values more than 0.30 (De Vaus 2004), the scale was given to experts in the field of education and they agreed that the items in the scale were relevant to the objective of the study hence it had also content validity. The reliability test was found to be 0.797 for Communication, 0.810 for Internet and 0.774 for the other application for the dimensions, for the entire items 0.931 by the use of Cranach's alpha reliability formula.

Conclusion:

The scale to measure the usage of mobile phone developed and validated by the authors can be used to study use of mobile applications in teaching learning process of B.Ed. student-teachers to find out and analyze various factors associated, so that necessary steps can be taken to create environment in which the emphasis can be given to enhance the usage of mobile phone the mobile assisted learning by student-teachers in their teaching and learning process.

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