Research Article

Enhancing Teaching Proficiency through Mobile Learning During School Experience Programme

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Abstract

Increase in the availability and accessibility of mobile phones has given the common man a medium for engagement, entertainment, learning and being connected to each other at the click of a button. A study was conducted to see the change in teaching proficiency of 2nd year student-teachers pursuing Diploma in Elementary Education - a pre-service teacher education programme in Delhi, India. The data was collected while the student-teachers were placed in schools for their School Experience Programme. The study was conducted on 30 student-teachers assigned in two experimental groups and one control group. Complete teaching sessions of student-teachers in experimental groups were recorded using the video recording feature of the mobile phones, and shared along with the feedback which was sent through SMS or WhatsApp feature of the phones. Further, teaching tips were also shared with one of the experimental groups. The results of the study indicated that teaching proficiency of student-teachers in the experimental groups have improved to a greater extent in comparison to their counterparts in the control group.

Keywords: ICT, mobile learning, pre-service teacher education, m-learning, supervision, teacher training

Introduction

Mobile technology is altering the way of living and it has begun to change the way of learning also. According to a report the mobile phone industry has grown worldwide with over 7.8 billion connections, with more than 5 billion unique subscribers, at a penetration rate of 66percent till 2017 (GSMA, 2018). In developing countries, unique subscriber penetration stands at 67percent. India had 87 connections for every 100 people in 2017 according to World Bank data.

Mobile learning is a powerful and pervasive knowledge delivery medium used by many with little guidance or training. Mobile devices are getting widely used for learning activities like recording information on the device through audio and video recorders, storing data, browsing the internet for various educational or personal purposes, sharing information in form of text, audio, video, exchanging movies and music through Bluetooth and apps like ShareIt, Google Drive, Social Media, thus improving links between the field and classroom. These are some of the ways to exploit the potential of mobile phones in learning (Mtega, Bernard,

Msungu & Sanare, 2012). Use of all these applications with the features of mobile i.e. mobility, accessibility and convenience results in improved engagement, motivation, competence, personal touch, confidence and communication of learners (Attewell et al., 2009).

Mobile Learning

Mobile learning is an emerging field and it is in its conceptualisation phase. It has been defined in technical terms keeping in mind its hardware and also based on its uses taking its mobility and contextualisation of the learning for rich learner experience (Ally, 2009). Literature is full of definitions of mobile learning, which focus on its various attributes or features. O'Malley et al. (2005) have defined mobile learning as

"Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of learning opportunities offered by mobile technologies."

It is "learning across multiple contexts, through social and content interactions, using personal electronic devices" Berge, Muilenburg and Crompton (2013).

There are various characteristics of mobile learning found in the literature (MoleNET, conferences, LSN education, MLearn conference) like ubiquitous, pervasive, personal, situated, contextual, bite-sized, spontaneous, portable, familiar etc. Ubiquity is available everywhere and is part of our environment, which is true in case of mobile technology as well. Then comes the term pervasive which means interaction between an individual and a device through which further interaction is possible to a number of connected devices i.e. mobile devices or other computing devices (Kukulska-Hulme and Traxler, 2005). Personal is the nature of this device in terms of ownership and also when an individual access the content for learning it is done keeping in mind the individual's requirements. Mobile devices deliver the learning -what, when and where the learner wants, which makes mobile learning a facilitator for personalised learning. Earlier the learning or formal education had been confined to the four walls of the classroom but today mobile devices have made a place for learning on the move and to the new settings or situations It can also be extended to field learning activities like learning of student teachers in real classrooms. This way mobile learning supports contextual and situated learning (Ally, 2009).

India, though, not behind in owning and using the portable technology for learning, lags significantly, when it comes to researches in m-learning, more so in the field of teacher education. To make any change visible in the field, it should, therefore, start with teacher education, a field which has impact on all fields. (Justice Verma Committee, 2012) also mentioned about the implications of extended reach of implementing educational technology in teacher education. (UNESCO, 2012) in its policy guidelines has mentioned that to fully exploit these mobile technologies in learning, training of teachers is required. It has been further emphasised that investment on training of teachers is

more important than investment in any kind of technology.

Teacher Preparation in India

Teachers in India are prepared through Pre-service Teacher Education (PSTE) programmes and further trained through In-Service Teacher Training. Pre-service teacher education programme has components of theory as well as practicum. Practicum or School Experience Programme (SEP) is a field based programme. During the School Experience Programme, student-teachers go out of campus for practising the art of teaching in real classroom scenario in schools where their competencies are enhanced through the supervision by teacher educators.

National Commission on Education (1983-85) reported about the insufficient time and attention given to the supervision of the lessons during SEP. Supervisors, due to scarcity of time and physical distance, are not able to give required attention to student-teachers. Mobile learning can support field based learning, which generally suffers from lack of supervision by teacher educators

Mobile Learning and Teacher Preparation

In the age of mobiles, technology enabled supervision and feedback can be of great support to student-teachers. Videos of the teaching sessions can be recorded and shared by the student teachers with their supervisors and feedback by the supervisors can also be shared through mobile phones. It will reduce the need for face-to-face interaction and will help in overcoming the barriers of time and distance. This will also provide a platform for comparing the performance of student-teachers with previous performances and also with pre-determined standards. Besides, watching video recordings of their own teaching episodes by student-teachers themselves will give them the opportunities for self-evaluation of performance leading to increased motivation and reflection on their teaching.

It has emerged through studies that the members of the faculty with basic technology skills and expertise can use this technique to provide feedback. This has been termed as e-Coaching by Dieker et al. (2014). Video recordings proved to be very effective in developing teaching skills through microteaching. The recording of the micro teaching sessions help the supervisors, peer teachers to comment on the teaching and the student- teachers to observe their own complete teaching episode and evaluate their own performance as well as discuss the feedback with the small group to reach at desired levels of particular teaching skill's proficiency (Anthonia, 2014). Audio and video recording has been considered an objective way of self-evaluation by (Schwartz, 2017). Mobile devices today are providing an opportunity to test and use this technology for improving the Teacher Education.

Therefore the researcher tested the effectiveness of mobile learning with reference to the change in teaching proficiency of student-teachers teaching class 6-8 during their SEP

The following research questions were raised:

- How does the viewing of video recordings of teaching sessions and getting feedback on them through mobile phones affect the teaching proficiency of student-teachers?
- What are the effects of receiving teaching tips along with viewing videos of classroom teaching performance and getting feedback through mobile phones?
- Following hypotheses were formulated:
- Student-teachers in Experimental Group I will show higher gain scores on teaching proficiency as compared to student-teachers in the Experimental Group II.
- Student-teachers in Experimental Group I will show higher gain scores on teaching proficiency than student-teachers in the Control Group.
- Student-teachers in Experimental Group II will show higher gain scores on teaching proficiency than student-teachers in the Control Group.

Methodology

The sample for the study comprised of 30 student-teachers of second year Diploma in Elememtary Teacher Education (D.El.Ed) Programme-a pre-service teacher education programme offered by District Institute of Education and Training under SCERT Delhi, India. The Sample of the study was chosen using Random Sampling technique. Pre-test - Post-test Control Group experimental design was used to conduct the experiment. There were two Experimental Groups and one Control Group 9 (Table-1).

Table-1: Experimental Design at a Glance

Experimental Group I	Experimental Group II	Control Group
• Video recording of 5 complete teaching episodes of each student-teacher at periodic intervals • Sharing of recordings and showing it to student-teachers, • Giving a feedback through SMS / WhatsApp individual messages, • Providing Teaching Tips on all the working days during the first half session of school	• Video recording of 5 complete teaching episode of each student-teacher at periodic intervals • Sharing of recordings and showing it to student-teachers; • Giving feedback through SMS / WhatsApp individual messages	• Video recording of 5 complete teaching sessions as placebo (For Comparison) Note: Video recordings were not shared with student teachers

The experiment was conducted for all the three groups for a period of 6 weeks covering 25 days. The data was collected prior to the experiment for testing intelligence (Raven Advanced Progressive Matrices), Achievement (Class XII achievement scores), and Availability and User-friendliness of mobile phones (Self developed Check list). Pre-test and post-test of each

group was conducted for the dependent variable of the study 'teaching proficiency'.

Videos of teaching sessions were recorded and shared with student-teachers in person and also through the Google Drive, and feedback on these recorded teaching sessions and teaching tips were given through SMS or WhatsApp individual messages. Mobile phones were used to record and share the videos, feedback and teaching tips messages. Teaching tips were small pieces of information (one-liners) based on the principles and maxims of teaching, teaching competencies and aspects covered in the observation scale. These were created by researchers and were validated by experts. These tips were sent to experimental group I to reinforce the aspects of effective teaching.

Feedback in the form of comments was also sent to all the student teachers of treatment groups through SMS messages. Feedback covering all the aspects of teaching proficiency schedule was also sent through SMS/WhatsApp individual messages. The feedback had instructive, corrective and encouraging comments as suggested by (Scheeler, 2008).

Teaching Proficiency observation schedule developed and validated (Singh, 2013) was used to observe and rate the teaching proficiency of student-teachers during SEP. The schedule comprised of different aspects of teaching behaviour as follows: Planning for Instruction; Mastery of Content Matter; Communication Skills; Instructional Skills; Use of relevant Approach based on Constructivist Paradigm; Use Teaching-learning material; Nature of Student Teacher Interaction; Classroom Environment; Handling Classroom Diversity needs of students; Using appropriate technology in the classroom.; Undertaking Assessment; and Teacher Dynamism. The schedule had content validity an inter rater consistency r=.84.

The data was analysed both quantitatively and qualitatively. The obtained quantitative data was analyzed using Gain Scores (Post test scores - Pre test scores) and applying one-tailed t-test of differences between two measures for each individual (Walker and Lev, 1965) for studying the effect of m-learning on the identified parameters. It was supplemented by the qualitative analysis of the data related to perception of student-teachers obtained through questionnaire and Focus Group Discussion.

Analysis and Results

Prior to the experiment, availability and user-friendliness of mobile phones was checked with the sample. Data showed 100percent availability of mobile phones in all the groups. It was found from the data that all the student-teachers irrespective of their social category, sex, and age had mobile phones. They all had phone with advanced features (Video camera and internet connectivity for apps, etc.) and the groups were found to be equal before the experiment in terms of the user friendliness of mobile phones.

It was also found that the three groups were similar on the criteria of age, sex and social category and were not

likely to influence the results of the experiment. The groups were also found to be equal on Intelligence, achievement and teaching proficiency prior to the experiment.

With a view to study the effectiveness of Experimental Groups I and II vis-a-vis the Control Group, mean gain scores were first computed through a difference in post-test mean scores and pre-test mean scores for all the three groups under study. Overall comparisons were then made using't' test using difference method. The gain scores of all the groups were analysed using mean, SD and t values were calculated (Table 2)

Table- 2: Teaching Proficiency Gain scores

Groups	N	Mean (Pre Test)	Mean (Post Test)	Mean Gain	t value	df	Significance Level
Experimental Group I	11	37.36	58.72	21.36			
Experimental Group II	10	37.7	59.1	21.4			at .025= 4.30 Significant
The Control Group	9	40.556	50.11	9.56	4.44	2	

Table-2 shows that the mean gain difference is significant at 0.025 level. Mean gains show the difference amongst the groups, Experimental Group I and II did not show difference in means whereas difference between Experimental Groups and the Control Group is high.

This has been further verified through the analysis of groups in pairs in table-3.

Table- 3: Teaching Proficiency - Pair Wise Gain scores

Groups	N	Total Scores	Mean	SD	t value	df	Significance Level
Experimental Group I	11	235	21.36	9.036	0.01	19	at .025= 2.09
Experimental Group II	10	214	21.4	7.198			Not significant
Experimental Group I	11	235	21.36	9.036	3.6	18	at .025= 2.10
The Control Group	9	86	9.56	7.019			significant
Experimental Group II	10	214	21.4	7.198	3.6	17	at .025= 2.11
The Control Group	9	86	9.56	7.019			significant

The means of the Experimental Group I , II and control group were 21.36 , 21.4and 9.56 respectively The value of t was found to be significant at 0.025 level at df 18 and 17 and the difference was not significant at 0.025 level and at df 19. Hence, two directional hypotheses were accepted and one was rejected as Experimental Group I and II did not differ on t value. The effectiveness of watching of one's own video and feedback in the form of comments sent through SMS/WhatsApp individual messages for improving teaching proficiency was thus established.

The findings of the study are consistent

with the findings of (Kong, Shroff and Hung, 2009) who mentioned in their study on a system of web based classroom video recording for self-evaluation and reflection that self-reflection on one's own performance is very critical for practicing teachers to bring quality in teaching. Video based technology was considered beneficial in making detailed self-reflection. Similarly (Wu & Kao, 2008) used web based video recording using video streaming technology to support pre service trainee teachers in peer assessment. Video recording was considered useful by the participants. Hundred percent trainees watched their own video of teaching sessions and sixty one percent watched it several times and watching their own videos helped them in self-analysis. (Ferry, 2009) used mobile phones with pre service teachers and reported that PSTs used mobile devices for video recording or for digital camera for capturing their teaching episodes which showed their impactful teaching sessions and it was the most successful use reported in the findings of the study. (Savas, 2012), reported that self-video recorded lessons through cell/ mobile phones used during micro teaching lessons had both advantages and challenges. The benefits stated in study were: video recording give a chance for objective self-evaluation through watching and correcting mistakes, it also helped in increasing self-confidence, improving communications and lesson plan.

'Teaching Tips' the added intervention given to Experimental Group I in comparison to Experimental Group II did not have any significant effect on the teaching proficiency of student-teachers.

Intervention given to the Experimental Group I and II led to the enhancement of teaching proficiency among student-teachers more than the conventional method of giving feedback (control group) without the use of mobile learning.

Perception of Student –teachers towards M-Learning

A questionnaire consisting of a few open ended questions was administered to the student-teachers to gain an insight into the findings of the study and focus group discussions were conducted to probe deeper into the mindset of student-teachers about the use of mobile technology during SEP.

Results of the questionnaire filled by student-teachers showed agreement on the usefulness of video recording. Use of mobile technology had many benefits but a few problems were also reported by student-teachers.

Benefits of Video Recording & Getting Feedback through Mobile Phones

After the post-test, a questionnaire was administered to know the perception of student teachers about the benefits of using mobile technology during SEP. The data were analysed and categorised on the basis of responses received. Majority of student-teachers mentioned that it helped in the improvement of their teaching as a whole.

SEP is a phase of real classroom experiences and helps student-teachers to practice this art of teaching and

improve as well as polish their skills. But the student-teachers mentioned that it gave them more chances of improvement as they could see themselves while teaching. Student-Teachers found it useful in improving their teaching and overall teaching learning process.

Confidence plays an important role in performing any activity, the same applies to teaching. Handling a class of 35-40 students is a difficult task only a confident and well prepared teacher can do that. A large number of student-teachers admitted that watching their own performances helped them in improving their confidence. In the words of one of the students – teachers, "I can see my weak areas like ineffective explanation. It is also helpful in improving the confidence level; I can say this because I have improved a lot." M-learning helped them in improving their communication skills, improving their lesson plans, maintaining the classroom discipline and also in getting immediate feedback.

Watching videos of teaching sessions helped the student-teachers in understanding the aspects that needed to be improved upon. The student-teachers said that they could see their teaching episodes again and again. It helped them in self-evaluation and reflection; they could identify their weak areas and tried to improve upon them. In the words of one of the student-teachers, "It helped me in regulating the speed with which I used to speak in the class while interacting with the students."

Self-evaluation is important and can be beneficial in increasing reflection of student-teachers. (Savas, 2012) also reported that video recording helped in increasing the self confidence amongst pre-service teachers, improving speaking skills as they could see and listen to their own pronunciation and also in organising their lesson plans meaningfully. Video recording allows for self-evaluation and correcting mistakes as the student teachers can evaluate their own work objectively and also know the weak points. (Cooper, 2015) had similar findings for video recording of teaching sessions. It was mentioned that digital natives should actively engage with technology for self-awareness, self-evaluation and self-development of their performance.

Feedback is an important component of the school experience programme, and feedback on the recorded teaching sessions were also sent through SMS or WhatsApp individual messages through mobile phones.

The student-teachers reported that it helped them in understanding their teaching better. They reported that feedback received in the form of SMS/ WhatsApp was useful to them as they could read it while watching the videos of their performance and pinpoint the weak and strong aspects. It helped them to evaluate their own performance.

Problems faced during Video Recording of Teaching Sessions

Student-Teachers reported certain problems which they faced during video recording sessions. A few student-teachers highlighted the problem of indiscipline in class or distraction of students from studies while recording.

They mentioned that,

- "It is difficult to maintain discipline in classroom when recording is done, Students get hyperactive".
- "When we record videos the students look at the mobile phones and class becomes indisciplined".
- When we record videos the students get conscious and become silent and do not respond to the questions."
- Students create lot of noise, the whole class gets messed up, Children get excited that their picture will come in the cameras".

The data revealed that video recording created excitement among the students which disturbed conventional maintenance of discipline which ultimately made student-teachers nervous as it could have direct implications on their evaluation.

A few student-teachers expressed their concern about the quality of mobile phone video recording.

All the student-teachers had a mobile phone with camera with different technical specifications. Some of the phones had camera of resolution of about two mega pixels only. This resolution was meant for viewing the video on mobile phones and was not clear enough for big screens like laptop or TV.

A few student- teachers reported about the nervousness they felt while video recording.

They said:

- "Sometimes students ask such questions which are not easy to answer. In this situation it increases the hesitation level of teacher".
- "Teacher can become nervous, if someone watches the video recording of the other, the person may get discouraged and lose confidence".

Though video recording was new exposure for student-teachers which even made them nervous but a continuous exposure helped them to overcome the nervousness. (Savas, 2012) also reported similar challenges of video recording that it made student teachers nervous and created problem of time for recoding videos.

One student teacher also reported that it was not easy to understand the messages, or abbreviations used, and there were chances of misunderstanding the feedback given.

However, a substantial number of student-teachers found m-learning quite useful foe developing teaching proficiency.

Suggestions given by stdent-teachers

Student-teachers mentioned about some problems while using mobile learning and suggested ways to improve the same. One problem of being nervous was recorded and it was suggested that nervousness happens initially, if recording is done regularly then it gives confidence and nervousness vanishes. For the problem of indiscipline and unavailability of a person to record they suggested that students get excited when they see recording happening for the first time, but when it becomes a practise they may

themselves start ignoring it. It was also mentioned that some in-built recording feature or hidden camera can be used like webcam. Problem of low quality of mobile camera was also mentioned and the suggestions of using each-others phone was given.

Problem of misunderstanding of messages, non- availability of phone or internet was also reported and it was suggested that feedback given should be discussed periodically in addition to SMS or written feedback to avoid any miscommunication.

They also suggested that video recording should become a regular feature of teacher preparation programme, whether it is during internship in schools, or practice in institution in micro teaching and simulated teaching sessions. It helps in developing the teaching competence.

Conclusions

Mobile phones are the device of everyone without any boundaries and everyone is familiar with their basic uses of calling, messaging, clicking pictures, recording videos and many are aware of its advanced features and handling new apps as well. Mobile learning should be used to enhance teaching proficiency of student teachers during school experience programme.

The results of this research study have indicated that m-learning helped the student teachers in self-evaluation and self-improvement. Through this they could see their teaching episodes and got the chance to identify their own weak areas and improve upon them with the help of supervisor's comments shared through SMs/WhatsApp. They could watch their recordings again and again as well as compare their new performance with the earlier one objectively. They could relate the feedback comments with their performance in the recorded episode. Video recording feature of mobile phones can be employed or any other technical instrument can be used for video recording of the teaching sessions and it can be directly shared with the supervisor through Google Drive to get a more comprehensive feedback. Data on the mobile phones will help supervisors to deploy the saved travelling time more productively. (Cooper, 2015) developed Lesson Observation On-line (Evidence Portfolio) platform (LOOP) and tested it during teacher experience programme in real classrooms. It was planned to create an alternative to traditional system of observation by visiting the school. The study reported that "The LOOP is not only feasible but achievable."

The purpose here is not to perfect the teaching abilities of student-teachers but to give them a chance to adapt themselves to the needs of the classroom and video recording can give a chance to see the classroom from the point of view of an outsider and understand the dynamics of the classroom.

It is recommended that the video recording of teaching sessions and online feedback should be used for strengthening the SEP and making it more effective in enhancing teaching proficiency of prospective teachers. Teacher educators shall be facilitated for supervision to improve its quality

as well as increase the number of and giving online feedback.
observations by viewing the recordings

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