Effectiveness of In-service Programme on ICT for Primary Teachers Run by MCD Science Centres

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Abstract

To empower primary teachers of MCD Schools with ICT skills, MCD initiated 'Shiksha' project in collaboration with Microsoft Corporation (India) Ltd. The present study examines the effectiveness of training in ICT to the teachers in MCD Schools. The study was biphasic; a purposive sample of 400 trained teachers were chosen for comprehensive survey study in the first phase. The tools Questionnaire, Observation Schedule and Interview Schedule, were developed. In second phase, ten schools were observed and a randomly selected sample of twenty male/female teachers from the total sample of the first phase was interviewed. Even though, the results were not exciting, still it was a challenge for stakeholders to train them on ICT appropriately.

Introduction

Integrating technologies in teaching learning process, is the need of the hour as modern technologies are being adopted in teaching learning to bring excellence in the classroom processes. However, this requires teachers to undergo continuous professional development on ICT. One such professional development programme of in-service teachers teaching in Municipal Corporation of Delhi (MCD) Schools had been organised. MCD is an autonomous civic agency which caters a variety of services through its various departments. Under the Department of Education (Primary), primary education is an obligatory function under the Delhi Municipal Corporation Act, 1957. Before trifurcation, MCD was running 1819 Primary Schools and about 8.89 lakhs students were studying in these

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schools, apart from recognised Primary Schools run by voluntary organisations within MCD area (CALP-MCD, 2006).

For the purpose of quality education in primary schools Municipal Corporation of Delhi initiated 'Sharda' Project for Computer Aided Learning Program (CALP) in 2004. Under the Project 'Sharada', Department of Primary Education, MCD established Computer Aided Learning Centres (CAL-Cs) in July 2004 in 1785 schools, except those 34 schools which had a total enrolment below 50 students. These centres had the facility of computer lab with related basic infrastructure and educational packages, and CDs etc.

Further, in order to empower primary teachers of MCD Schools with ICT skills, MCD initiated '*Shiksha*' project in collaboration with the Microsoft Corporation (India) in 2004. Project *Shiksha* is a twelve days in-service training program on ICT named 'Partners in Learning' at its six Science Centres in Delhi. The training was given through the ICT trainers of Microsoft Corporation (India) Ltd (CALP-MCD, 2006). The present study was undertaken to evaluate this training from the perspective of the teachers partaking of it.

While under the Project '*Shiksha*' of Partners in Learning of Microsoft India Ltd.', 12,600 in-service primary teachers of schools in MCD had been trained in twelve days under in-service training program on ICT including 1575 teachers of the central zone, who were trained in 116 batches from 7 November 2004 to 22 October 2010. It was the first time for MCD, where training of computer was given to in-service teachers at six science centers situated at different locations in the NCT-Delhi. Since, the programme had been running for almost four years, a need was felt to study the quality of the in-service training programme, and also how well equipped the teachers felt about themselves to integrate ICT in their regular classroom transactions. Hence, the investigator attempted to study the effectiveness of in-service training program on ICT run by MCD Science Centers through the perception of the in-service teachers, what they perceived about the training program and performance of the teachers on ICT.

Statement of the Problem

Primary Education Department of MCD took steps to give training in the use of ICT to all working primary teachers in these MCD Primary Schools and establishing CAL-Cs in schools as well as providing essential infrastructural supports regarding ICT.

Hence, the present study attempted to study the perceptions of primary teachers regarding in-service program on ICTs and effectiveness of this training, quantitatively and qualitatively.

Objectives of the Study

The objectives of the present study were:

- To study the effectiveness of the in-service programme of teachers on ICTs.
- To study the post performance of in-service teachers on ICTs after in-service training program.
- To study the ICTs related problems faced by in-service teachers in schools.

Research Questions

- How were the ICTs incorporated in the schools?
- What kind of training was given to the primary teachers for the incorporation of ICTs at Science centre in MCD?
- What was the level of satisfaction in the ICT trained primary teachers of MCD Schools?

Method

Sample

Out of the six Science Centers, a purposive sample of 400 teachers from 12,600 trained teachers was chosen for the comprehensive survey in the first phase. For in-depth study the investigator selected a random sample of twenty male and female teachers from the total sample of the first phase and ten MCD Schools from Central Zone were chosen for in-depth study.

Tools and Technique Used

The study was conducted in two phases containing quantitative and qualitative methods. In the first phase, the investigator visited four Science Centers: Sheikh Sarai, R.K. Puram, Shalimar Bagh, and Shakti Nagar, where the in-service training program on ICT was going on. There investigator discussed informally with different stake holders like Coordinator, Science Assistant Education Officers, Resource Persons of the Training and Trainees to understand ongoing in-service training. Afterwards, investigator got the permission to collect data by visiting the schools and concerned offices, whenever needed, during the study. The

investigator carried out the comprehensive survey and gathered data that was based on questionnaire.

The investigator developed a questionnaire in bilingual form, available in both Hindi and English, containing 59 questions including one open ended question to collect information. In the close ended questions, apart from the choices given, there was also a blank space given as an alternative when the other given choices didn't match the respondent's answers or wanted to add more information. Because the nature of the questionnaire was such that it had both close as well as open ended questions, the in-service teachers opted for either single choice or multiple choices or wrote their responses in the given blank spaces, so these required greater accuracy in scoring. All such information was qualitative in nature. Questionnaires were administered to the participants individually. The data had the richness and credibility from the stand point of the in-service trainees as well as accuracy, usefulness and completeness.

In the second phase, an observation schedule was used to observe the existing condition, function, capacity of all available ICTs, and involvement of teachers with available ICTs. The investigator attempted to observe content coverage of the different subjects taught in different classes from I to V by the use of these ICTs in teaching learning and other activities in the school by teachers. The Investigator along with at least one in-service trained teacher accessed where ICTs were placed, and its related records. 10 selected sample schools were observed for at least one or more than one hour.

An interview schedule with 14 questions related to three basic aspects such as teachers' preparedness for the use of ICTs, teachers' perception on ICTs in use of teaching-learning, and teachers' perception about the in-service training on ICTs were used to interview the teachers.

Results

Perceived Effectiveness of the Training

Selection of the resource person for the different topics was felt appropriate by most (88 per cent) of the trainees. Resource person's ability to create interest and motivate trainees for learning computer was reported satisfactory by 80.75 per cent of trainees. The communication skills of the resource person was found as very

good, good and average by 7, 26, and 49.25 per cent of the teachers, respectively. The level of interaction between the resource faculty and participants was found poor by 48 per cent trainees. However, level of competence of the resource person was rated differently as high, and moderate, by 7.75 and 70.75 per cent trainees, respectively. Although, most of the merits of the resource person were positive for a good in-service training but it was the level of interaction between the trainees and resource person that was found poor, which would affect training negatively. Thus resource person should have communication skills and competency to make training fruitful. Over all, perceived effectiveness of the material in terms of the quality and adequacy both were found appropriately good by 81 per cent and adequate by 86.75 per cent of the trainees. Overall, 69.75 per cent of the trainees were satisfied to a large extent or to some extent by content (main components and peripheral devices of computer, Ms-Word, Ms-Excel, Ms-PowerPoint, and browsing/surfing internet) coverage during the training program. While 66 per cent of the teachers felt result of upgrading their teaching skills as very little and 9.75 per cent felt no upgrading.

Table 1

Perceived effectiveness of the in-service computer training

S. No.	Item	Responses in Numbers (Percentage in Parenthesis)				
1.	Usefulness of In-Service Training Program	Useful	Useful to some extent	Very little useful	Not so useful	Any other, please specify
		36 **(9)**	74 **(18.5)**	125 **(31.25)**	165 **(41.25)**	0
2.	Satisfaction from In-Service Training Program	To a large extent	To some extent	Very little	Not at all satisfied	Any other, please specify
		2 **(0.5)**	60 **(15)**	147 **(36.75)**	191 **(47.75)**	0

In-service computer training was either not much useful or of no use at all for trainees as shown in Table 1. It is important to note that the in-service training was not found vital by the majority of trainees. It was found that trainees were not satisfied from this training: it was either 'not at all' or 'very little' for the trainees and both these category had the significant value of the 'not satisfied group'. It was found that the training given could not be applied by some of the teachers in their MCD schools. It was also reported that their schools had only 4-5 computers and those too were dysfunctional.

Teachers' Performance on ICTs

The teachers' overall performance on ICTs was examined by making the tetrad of this aspect pertaining to use of ICT training in schools, perceived effect of in-service training in real situations, ICT related problems faced by teachers in schools, and teachers' ICT performance in schools.

I.   Use of ICT Training in Schools

The computer training could be applied to school situation very effectively by 6.25 per cent, effectively by 23.25 per cent of the trainees whereas 24.25 per cent could use it very little and 46.25 per cent of trainees could not apply the computer training to school situation effectively.

II.   Perceived Effect of In-Service Computer Training in Real Situation

After completion of the in-service computer training, there were 71.25 per cent of the teachers, who used no computer or faced difficulty in using them in their teaching. There were 70.50 per cent teachers, who perceived that computer training could not be applied effectively or too little could be applied in their schools. There were 79 per cent of the teachers, who could not develop any material or software on computer or its usability is little if developed. Significantly, after doing in-service training, 51.75 per cent of the teachers perceived very little changes in themselves and 37.75 per cent perceived no changes. Thus, it may be inferred that in-service training was perceived as ineffective by quite a significant number of in-service teachers.

III. ICT related Problems Faced by Teachers in Schools

In-service teachers also reported that problems were faced during replicating the computer training in schools as the facilities

available in the school were not sufficient to support teaching learning using ICTs and this problem was faced by the majority of teachers as shown in Table 2.

Table 2

ICT related problems faced by teachers in schools

S. No.	Item	Responses in Numbers (Percentage in Parenthesis)					
1.	Problems Faced as-	Computer training can not be applied in the teaching-learning due to its vagueness.	The cooperation of head-master and other colleagues was not available.	The facilities available in the school are not sufficient to support teaching learning with ICT.	An addit-ional burden	No problems	Any other, please specify
		55 **(13.75%)**	6 **(1.5%)**	281 **(70.25%)**	40 **(10%)**	18 **(4.5%)**	20** (5%)

  i.   We are not using computer in teaching. (One Teacher)

  ii.   Little knowledge of computer operation. (Four Teachers)

 iii.   I never tried it in school. (One Teacher)

 iv.   Very slow types of the computers are available in school. (Three Teachers)

  v.   IT worked, but we could not. (Five Teachers)

 vi.   Computers are dysfunctional. (Five Teachers)

 vii.   We were trained on softwares were different from the installed softwares on school computers. (One Teacher)

The Trainees faced different kinds of problems such as problems related to computer hardware (11.5%) , software (6.25), and CDs provided (7.5%). The other problems reported were: besides, inadequate number of computers in the schools (34.25%), computers being not functional (51.25%) and no use of computers by teachers in their teaching (12%).

It can be inferred that mostly in-service teachers faced all kinds of problems related to ICTs in teaching and they perceived that the facilities available in schools were not sufficient to support teaching-learning with ICTs.

Table 3

ICT related problems managed by in-service teachers in schools

S. No.	Item	Responses in Numbers (Percentage)				
1.	Computer problems discussed with	Staff only	Friends and relatives	Consultant	No one	Any other, please specify
		144 **(36)**	70 **(17.5)**	30 **(7.5)**	197 **(49.25)**	26 **(6.5)***
2.	Managing problems of using computer in teaching	Manage by myself	Manage by department	Manage with help of staff members	I never use computer in my teaching-learning so no problem.	Any other, please specify
		62 **(15.5)**	35 **(8.75)**	135 **(33.75)**	144 **(36)**	36 **(9)***

*Trainees open comments were found almost same in the both situations S. No. 1 and 2.

   i. Computer teacher was in school for the use of computer. (23 Teachers)
  ii. I could not say with whom she (IT) discussed. (2 Teachers)
 iii. I discuss my problems with my children. (2 Teachers)
 iv. Computers are not functional. (4 Teachers)
  v. I could not use computer in my teaching because there were no systematic computer lab. (2 Teachers)
 vi. Department provided IT, so they did not use the computers. (23 Teachers)
 vii. I never used school computers. (4 Teachers)
viii. I gathered information from their home computer, got the prints and used them in the classroom teaching. (2 Teachers)

Table 3 shows that a few teachers discussed their problems with children and for some teachers computers were not functional. There were also the teachers who said that they could not use computer in their teaching because there were no computer lab as well as equipments in their schools. Teachers also said that the Department provided IT teachers to schools so they did not use the computers. However, some teachers gathered information from their home computer, got the prints and used them in the classroom teaching. It was found that 15 per cent of the teachers who underwent this training had knowledge of computers before the

training began and they already knew how to operate computers. These were the in-service teachers who influenced and carried over the effect positively on other aspects of the study because they reflected their prior knowledge of computer in every aspect of the study.

During the interview when the teachers were asked as to why they did not use computers in schools, the responses given were like the lessons stored in computers were outdated and irrelevant, and lessons were not participatory and students only had to watch them. Other teachers wanted audio-visual aids, smart boards and good sound system and high end computers one for each student. Some teachers said that computer labs were ill equipped and over crowded with as many as four students per machine; thus no one was able to use it effectively.

Thus, there were computer related problems in schools regarding improper training of the teachers, inappropriate number of computers, dysfunctional computers, hardwares, softwares, and educational packages. Besides, in-service teachers were not able to manage the problems properly as shown in Table 3.

IV. Teachers' Performance on ICTs in Schools

It was found that ICT tools (MsWord, MsExcel, MsPowerPoint, Paint and Logo) were never used by 74.5 per cent of those trainees. In-service teachers (45.75 per cent) rarely used Computer for effective teaching-learning and 28 per cent used computers only as per the need of syllabus. While there were 2 per cent trainees who said that they had no requirement of the computer because they were good in teaching, 20.5 per cent of the trainees gave one or the other reasons for not using computers. Educational CDs provided by Department, were used in teaching by 33.75 per cent teachers as per the need of the syllabus. For 4.75 per cent of trainees, these CDs were not required because they themselves were good in teaching, while the 45.25 per cent of the trainees rarely use CDs. Majority of the teachers (61 per cent) said that the outsourced computer teachers taught Classes III, IV and V. The content of the educational CDs/DVDs fulfilled no requirement of the syllabus for 39 per cent of the trainees and it was very little for 35.75 per cent trainees.

Ten schools were observed for ten days after six months of completion of the first phase of the study. The 16 hours observation showed that the physical condition of lab was very good in two schools, good in two schools, average in one school, poor in one

school and very poor in four schools but only one CAL lab was found functional including its other peripheral devices such as key board, mouse, speakers, head phone and printer (EPSON, 132 Columns). Almost all observed CAL lab had same number of terminals (five computers for users having the configuration of Computer HCL/HP Intel® Celeron® 1.8 GHz) for 20 users and every terminal was used by four users one by one only when these were functional. These terminals had the Red Hat (Linux) operating system and softwares like flash player. Paint, calculator, computer games, voice recorder, word processor, presentation softwares and CD player despite of every terminal was already installed all forty three educational packages of *Azim Premji's* Foundation, and *Rajiv Gandhi Shiksha Mission* (RGSM) provided by MCD under the Sharda Project. But these provided infrastructures had become futile due to the computer lab being dysfunctional; however, it was functional only in one school. But teachers did not access it because they were found dependent on outsourced IT faculty who was not available at the time of observation.

These schools also had a separate functional computer (HP Pro 3090, 3GHZ, RAM 2GB, Hard Disk 500 GB) maintained by the department that was used for recording biometric attendance of the teachers. These computers have not been used since July 2011 neither for administrative purposes nor in teaching-learning activities.

In seven schools smart devices provided under the *Sarva Shiksha Abhiyaan* by NCT Delhi that is a 29 colour TV attached with the computer were available. These computers were loaded or installed with educational packages (e.g., Nursery Rhymes, Lessons for Moral Educations, Health and Hygiene, Hindi lessons on Comprehensions, English lessons on Comprehensions, Grammar and Exercise, Mathematics including number concepts such as addition, subtractions, multiplications, divisions, fractions and geometry. Natural science that includes nature in our surroundings, experiments related to natural phenomena and Social Studies comprising Indian and world maps, cities of India, Indian cultures and festivals, Indian political leaderships and so on). These contents were tailor-made as per the need of Classes I to VIII (i.e., elementary school level). Through TV attached, the students were able to learn necessary functions like power point, Microsoft word etc., with clarity. There were six schools which had operative systems but were poorly maintained and were used in

teaching-learning process. The Investigator observed that on this device, the installed educational software runs only for Classes III and V and students of these programmes were mere spectators, and no type of interaction was found between learners and the teachers.

Although all schools were provided Tata Photon Dongle for the purpose of biometric attendance of the teachers in schools, it was found in one school where some teachers were using internet facility for their personal sake and not for the purpose it was provided for. It was found that there were no records maintained of the CAL Lab regarding teaching learning or uses of any ICTs in schools.

There was only one school that had the facility of language lab which included perfect independent communication devices, centrally controlled monitor to evaluate every individual and give them proper feedback. It had a computer assembled with central big size monitor and independent learner's terminals (user's computer) and its communication peripheral devices. At a time almost fifty learners could use this facility without any disturbance and could be easily controlled by a single teacher. It was found very interesting for the students, but it was also used with the help of an out sourced IT instructor and no teachers' involvement was observed. Further, all observed schools were found using Radio in an Interactive Radio Instruction (IRI) on 105.6 MHz (*Gyanvani*-IGNOU: FM Channel) with students at 11:00 AM to 11:30 AM (first shift schools) and 2:00 PM to 2:30 PM (second shift schools) for Classes of I and II, while 11:30 AM to 12:00 AM (first shift schools) and 2:30 to 3:00 PM (second shift schools) for Classes of III and IV. All students of the prescribed classes, as per schedule, were seated in the queues along with the teachers, regularly. Students were only passive listeners and no interaction was found between the students and teachers under the controlled atmosphere in a classroom. Almost similar pattern was observed in other schools.

The in-service teachers were asked how did they access the ICTs they required for teaching. Some teachers said that currently there were no ICT tools in school except radio. And with the absence of the IT teacher (who was usually out sourced), no one used the computer and it was gathering dust. Some other teachers said that some ICTs were available in schools and others they brought from home, as and when required. The teachers mainly talked of ICTs in terms of CDs. One teacher reported in order to prepare the

Independence Day programme the concerned teacher brought the CD and helped the students practice.

Teachers stated that the Government had invested money in such programs and had sent computers in schools, but the teachers felt that it would have been useful if every teacher would have undergone 100 days in-service training instead of twelve days for the optimum use of computer. Other teachers felt that learning through computer will badly impact health specially the sight rather than learning by doing. Children were also deviating from outdoor activities and were keener to play on computer.

Teachers also said that the programme loaded on the CAL lab were very interesting to some extent. Effectiveness would increase, when play way method to teach the students will be used. They would take interest and its effects will be long lasting. Teachers should be more motivated and should be encouraged to improve themselves. Extra burden should be decreased.

During interview, the feedback from teachers about the use of educational CDs of different subjects distributed in schools was collected. Teachers reported that these CDs were enriching and informative to the students. Some of these CDs were provided by the Azim Premji Foundation. In sumt may be inferred from all these collected evidences and interviews that in-service teachers could not properly integrate ICTs in teaching- learning properly

Issues Raised by Trainees about the In-service Training Programme

The trainees were asked to describe their perceived problems during in-service training program. About 53 per cent of in-service teachers raised various issues and also gave suggestions.

There were some in-service teachers who wanted that ICT training should be organised frequently to keep them updated about the new techniques. An opportunity should be given to the teachers to practice during training and its duration should also be extended. Computers must be functional at schools so as to enable further practice. Resource persons equipped with all essential skills should give training to in-service teachers. In order to achieve effectiveness in teaching, it should be made mandatory for teachers to complete the training. There were also teachers who said that in-service training programme was satisfactory but teachers will not get the chance to use it in the schools due to nonviable condition

of computer lab. Also, some teachers stated that they needed more time and knowledge for using internet and about hardware. Few teachers were willing for further training programme on ICTs.

A few teachers were not in favour of the ICT Training programme because they opined that classroom teaching and computer training both cannot go simultaneously. They also said that school computers had very few features, while some pointed out electricity problems and cleanliness problems in schools. Teachers also reported having difficulty in understanding topics in computer training programme.

These problems were further probed during interview with the teachers. Regarding the problems they faced during in-service computer training, teachers said that the duration was too short to go beyond the basic operations of computer. Since for some teachers it was a first exposure to the machines, 12 days were highly inadequate. By the end of 12 days they could handle the keyboard, mouse, MS-word only since the duration was short. The teachers said that the content was hastily covered, they did not get sufficient time to practice and they felt they had already forgotten the content.

Almost all teachers wanted that computers need to be provided in the school so that whatever they have learnt in the training could be practiced in schools. Some teachers suggested that even though their school was well equipped, they needed internet facilities so that teachers may access blogs, slide shows, and YouTube contents relevant to their subjects.

Some teachers said that it was the first attempt by the MCD. A pair of teachers shared one computer. Every computer did not have the internet facility at the Centre. They were not allotted permanent seat, first day if someone was sitting at the place, next day he/she would be on the next place. That was also the problem because if the first day, they said, they prepared or worked anything on that computer, that could not be transferred to the other computer. Some teachers cited personal problems in travelling long distances to the Science Centre. Others lacked guidance regarding computer usage in their schools.

Teachers opined that such trainings were required in today's computer's era for various purposes such as admission, record maintenance, and saving paper and time. Teaching will be only effective when new teaching system will be developed through the computer. Good infrastructure of computer should be provided

to the schools. It should be according to the syllabus and made us practice more. Teachers also wanted follow up and refresher training programmes.

Conclusions

It was a first initiative of in-service training on ICT in MCD run schools but it was quite unsuccessful because even after training, the teachers were not using ICTs in their schools. Trainees were not satisfied due to lack of practice at science centre and at school also because they were using computer at science centre in sharing mode (two teachers per computer and they were not regular partner in entire training) while they had no same software in schools at the same time. In-service teachers were not satisfied with the resource person in terms of level of interaction between them that was poor and this could not upgrade their teaching skills in the use of ICTs. This factor of the computer training, made it very little useful for trainees and was one of the causes of their dissatisfaction. Therefore in-service training was perceived as ineffective.

Also, the use of ICTs in schools was dependent only on out sourced IT teacher rather than in-service teachers. It indicated that monitoring and evaluation of the both MCD projects – *Sharda and Shiksha* were not done effectively (Iqbal and Nadeem, 2013).

Educational Implications

The main finding of the study was that within the context of an in-service training program on ICTs run by MCD, it was a beginning but was quite unsuccessful in reflecting teachers' training in the schools because even after undergoing the training teachers were not using ICTs in their schools. It may give the feedback in substantial use of ICTs in teaching. This study has a number of implications for practice in in-service training program on ICT.

First, it showed that perceived experiences of the in-service teachers, and problems faced by the teachers at the school after the training in using of ICT in their teaching could be key factors which were being compromised and this situation affected negatively in-service training program on ICT. This study may help stake holders in improving the results of the in-service training program in terms of better use of ICT in their teaching learning by the in-service teachers.

Second, this study can help the stake holders to plan a good training program on ICTs as per the issues raised by the

teachers who reported their concerns. Third, it was reported by the successful trainees, who perceived that their students were very interested in learning when they were taught with the use of ICTs in their classroom process. Therefore, this study also helps the teachers to make them understand the learner's interest that may be good cause of their quality teaching-learning.

Fourth, it helps the stake holders regarding providing only those softwares which are relevant to the content of the syllabus, up to date and culturally responsive to the students of the MCD schools.

Suggestions for Future Research

The present study attempted to investigate the effectiveness of in-service training program on ICT as it was perceived by the trainees. However, the effectiveness of training program have multiple aspects; thus research scholars and institutions may indeed carry out further studies on every aspect of the study separately through the various research methods like program evaluation, case study, descriptive study, correlation study, study based on factorial analysis, experimental study, and quasi experimental study.

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