

The Impact of In-Service Teacher Training Conducted by Japan International Cooperation Agency on the Performance of Science Teachers Working in Islamabad

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Abstract

The present study has been designed to investigate the impact of in-service teacher training provided by Japan International Cooperation Agency (JICA) on the performance of science teachers. It has been conducted in the public sector schools run by Federal Directorate of Education in Islamabad capital territory. Science teachers who were trained by JICA and those who were untrained by JICA comprised the population of the present study. The sample size consisted of 90 JICA trained science teachers (45 urban, 45 rural; 41 male, 49 female) and 90 science teachers untrained by JICA (45 urban, 45 rural; 41 male, 49 female). Research instrument used was a questionnaire. The questions were developed in the light of the seven final indicators for the dimension of the performance taken from JICA report on student centered inquiry based (SCIB) in Pakistan, 2012. Science teachers' questionnaire consisted of 38 close ended questions. Pilot testing was done to determine the validity of the research instruments. Coefficient of alpha reliability for validated questionnaire had a value of .94 for science teachers. Data was collected, analyzed by mean, standard deviation, percentage and t-test. The study concluded that JICA trained science teachers perform better when compared with untrained JICA science teachers. The study recommends that such trainings may be conducted for all science teachers and at regular intervals to familiarize teachers with concepts and to make them skilled with inquiry-based method of teachings.

Keywords: In-service training, JICA, Performance, Science Teachers, Inquiry-based

Introduction

The key elements for the improvement of education are teachers and their effective teaching (Sanmons & Bakkam 2013). Guskey (2002) and Sarwar (2010) emphasized that central component for improving education is good quality professional development. These processes are systemic efforts to bring changes in beliefs, attitudes, and classroom practices of educators and academic achievements of students. Memon (2007) stated that professional improvement is an unceasing and alive process. It can be used to improve knowledge, experience and pedagogy of teachers. Nelson (1993) states as cited in Mehmood (2008, p.35) that continuous training of professional staff is much needed for three reasons. First reason is that educators and administrators can be kept aware of changes that are taking place in the content, theory and practice of instructional methods. Second reason is that those teachers who are new in the teaching field or who are new in an institution all needed much assistance. Third reason is that teachers and other professionals in education may have improper background preparation and in-service training may help to overcome such deficiencies.

Therefore, in-service training is a very important component of educational process for the professional development of educators. Through training teachers learn latest information and reinforce this knowledge and skills, and they get a chance of sharing new options that can improve their efficiency at work. Effective training can convey information to teacher; it can help them develop behaviors and skills that they can practice at their institutions. Focus of all teacher trainings is to strengthen their professional excellence.

Like other fields, lifelong learning has become very valuable in the field of education. As teachers are very important members of the education process, they need to develop themselves throughout their service. Teacher qualifications and skills can not only be developed by pre-service training rather it can be developed through the integration of pre-service and in-service training. Teacher training is usually a sequence of programs for teachers to support their development. These programs are planned situations which help teachers to provide themselves with latest knowledge and skills. In-service training in the modern world plays a pivotal and crucial role for the improvement of teaching. The purpose of in-service

training is not to enhance the competency of individuals only, but the aim is to transform the quality of teaching practice and ultimately school. In-service teacher training improves the overall performance of teachers. As stated by Sharif (1960), in-service training includes all learning experiences, activities and teaching techniques which are designed to increase professional abilities of teachers.

Role of in-service training has increased nowadays. In today's world it plays a vital role in refining quality of education. Teacher's role has also gained much importance in modern world. It is believed now that teacher play a critical role in teaching learning process, and it should be measured by using different techniques. There are many indicators which define good teacher and there are many indicators which determine performance of a teacher. These indicators indirectly measure the impact of a training program. All indicators have some standards regarding knowledge and skill of teachers. These capacities can be built up through in-service training. Pintrich & Schunk (2002) remark that trained teachers of an institution can develop their goals of teaching and they can develop plans for achieving those goals. According to Bockerts, Pitrich and Zeinder (2000), successful teachers use different strategies for helping students. Training work as an agent which improves the attributes of a teacher's broadness, his/her vision and redefines his/her role.

Therefore, the present study provides a platform for both Federal Directorate of Education and Japan International Cooperation Agency to reshape the new programs in the light of present study. It helps other donor agencies to compare their impact of their trainings with these ones. It also benefits future researchers.

Literature Review

In the opinion of Kazmi, Pervez and Mumtaz (2011), in-service training of teachers makes them more logical and systematic in their teaching. Johnson and Sloat (2006), states that in-service teacher training has a positive effect on the behaviors of teachers. Frederick, & Stephen, (2010) found that in-service training helps teachers to master the content areas of their respective subjects, to evaluation techniques and to acquire new management skills.

Samupwa (2008) conducted a study to view the effects of in-service training on the administrative skills of teachers and their behavior in the classroom. Results of his study showed that both classroom behavior of teachers and their administrative work had a significant change after that training. Farhana et al (2012) conducted a research study to view the influence of in-service teacher training on the performance of teachers. Their work showed that a significant difference was found in the responses of teachers before and after training. Jhonson and Sloat (2006) also conducted a research study. They found that positive behavior of teachers significantly increased at the end of training. Naveed et al (2013) conducted a study to view the impact of training on teaching methodology and research skills. Their study revealed that training program enhanced the professional skills of teachers. Mshila and Rhoda (2013) conducted a study on the impact of in-service training on the performance of teachers. Their study revealed that in-service training had a positive effect on the performance of teachers.

Many such studies show that professional development courses and in-service trainings enhance instructional skills and the content knowledge of teachers (Buczynski & Hansen, 2010; McDermott & DeWater, 2000; Stein et al., 1999; Loucks-Horsley et al., 1998; John Somers & Eva Sikorova, 2006; Carpenter, 1989; Griffin, 1986; Coladaric, 1984). Study of Ekpoh et al (2013), revealed that teachers who attend in-service training programs show better performance in their work regarding skills, knowledge of subject, teaching methods, evaluation of students and classroom management.

Alabi and Ige (2014), suggested that in-service education of teachers is needed because to handle the issues of admission demands, to improve curriculum, to handle the issues of unqualified teachers and to handle the poor performance of students in exams, to address the degrading quality of teaching. Oztaskin (2010) studied 200 social studies teachers to investigate their in-service training records. She reported that teachers needed in-service training for using materials, activity development, material development and on contemporary issues in their respective subjects. Khattak & Abbasi (2010) had a contradictory view. Their study revealed that in-service training is ineffective because trainees do not find proper resources at their workplaces, so they are unable to utilize it properly. Their study

emphasized that proper facilities may be provided to trainees for implementing their training course learning.

In Pakistan, new General science curriculum of 2006 is a very important measure taken by government to enhance the quality of science education. Science education is extremely important not only for individuals but also for the nation. It trains the minds of students to think. Its basic objective is to make individuals aware of realities of life, help in discovering hidden facts and provide them with skills to transform their ideas into realities. Responsibilities of science teachers are undoubtedly more than traditional thinking. He/she has to be prepared with qualities of mastery of subject matter, professional skills, and dedication to his/her profession. Thinking pattern of science teachers definitely affects the level of achievement. Improvement in the perception of teachers of their role enhances their quality of teaching.

The curriculum of 2006 for General science is student-centered and inquiry based (SCIB) learning. Being unfamiliar with the SCIB concept most of the teachers find it difficult to equip themselves with modern instructional skills recommended in curriculum. Therefore, many in-service trainings are conducted by Federal Directorate of Education Islamabad. Some trainings are sponsored by Canadian International Development Authority (CIDA), some by USAID, and some by Japan International Cooperation Authority (JICA). JICA is sponsoring many projects in Pakistan in the fields of education. The most important of these projects is promotion of students-centered and inquiry-based (SCIB) science education. The project was launched in 2009 on the request of the ministry of education of Pakistan to JICA. JICA dispatched its senior volunteers. The basic objective was to promote student centered inquiry based science education. Overall goal of the program was to prepare effective teacher training model for science teachers for SCIB.

In SCIB, teaching plans for science subjects are developed by Pakistani teachers under the supervision of JICA trainers. These teachers are nominated by education departments of all provinces. Workshops and seminars are conducted to train teachers, who later on train teachers in their areas. For the follow up training in pilot areas a "lesson study" is employed. Lesson with low cost or no cost material is

the basic theme of all training by JICA. Teaching through Easily Available Materials (TEAM) is also included in training. As Pakistan is a developing country, many schools in far-flung areas are not properly equipped with experimental materials. Training by JICA meets the needs of teachers in Pakistan. They can very well learn to utilize low cost and easily available materials in their surroundings to perform their experiments, and to make their lessons effective. Federal Directorate of Education Islamabad has conducted many in-service trainings through JICA to improve the standard of teaching and to change the perception of the teachers positively about the qualities of a good teacher. Keeping this in view, the researcher intended to evaluate the performance of science teachers working under federal directorate of education and was trained by Japan International Cooperation Agency (JICA).

Research Methodology

The nature of the study was survey; quantitative methods were used in this research. JICA trained science teachers were compared with untrained JICA. The study was conducted in Islamabad model schools run by Federal Directorate of Education Islamabad.

Population

Population of the present study was one thousand eight hundred and sixty three science teachers. One hundred science teachers were trained by JICA in Islamabad while one thousand seven hundred and sixty three untrained JICA).

Table 1: Population

Islamabad model secondary schools	Science Teachers (Trained by JICA)	Science Teachers (Untrained JICA)
164	100	1763

Sample of the Research

Those institutions were selected where JICA trained teachers were working. In Islamabad model schools, JICA trained 90 science teachers were available. They were selected as sample, 90 science teachers which were untrained JICA were selected through random sampling technique.

Table 2: Detail of Science teachers' sample

Locality	Urban		Rural		Total
Gender	Male	Female	Male	Female	
Science Teachers (Trained by JICA)	16	29	25	20	90
Science Teachers (untrained JICA)	16	29	25	20	90
Total	32	58	50	40	180

Table 2 indicates that:

- 90 Science Teachers trained by JICA (all available) were selected which comprised of 16 male, 29 female from urban; 25 male and 20 female from rural area.
- 90 Science Teachers which were untrained (JICA) were selected randomly from the schools which comprised of 16 male, 29 female from urban; 25 male and 20 female from rural area.

Tool of Research

A self-developed questionnaire was used for science teachers. Questionnaire was designed on five point rating scale i.e. 5 = Always, 4 = Often, 3 = Sometimes, 2=Rarely and 1 = Never. The questions were developed in the light of the seven final indicators for the dimension of the Performance taken from JICA (2012) report. Final version of the tool was developed after pilot testing.

Validity and Reliability

Three experts checked the validity of the questionnaire. To calculate the reliability of the tool Cronbach's alpha reliability test was used. On the rating scale of the science teachers (all having 7 indicators of the Performance) the Coefficient of Alpha Reliability α was .94. As the value was above .70, it was acceptable.

Data Collection

Respective schools were personally visited by the researcher for collection of data. After data collection, it was entered in Statistical Package for Social Sciences program of computer. Data was interpreted. Standard deviation, percentage and mean were calculated for each variable. Significance difference between mean score values of the responses was tested by applying t-test at 0.05.

Data Analysis and Interpretation

Table 3: Comparison of science teachers' opinion scores on lesson planning & preparation subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Lesson planning & preparation	Trained by JICA	90	28.10	1.60	7.08	2.03	.000
	Untrained (JICA)	90	26.06	2.20			

Table 3 shows that there exists a significant difference between opinions of science teachers trained by JICA and untrained (JICA) regarding lesson planning & preparation. Science teachers trained by JICA favored lesson planning & preparation. The mean difference between the two is 2.03 which is a significant difference statistically as p-value .000 < .05.

Table 4: Comparison of science teachers' opinion scores on designing & using student centered activities subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Designing & using student centered Activities	Trained by JICA	90	20.31	2.17	4.97	1.60	.000
	Untrained (JICA)	90	18.71	2.13			

Table 4 shows that there exists a significant difference between opinions of science teachers trained by JICA and untrained (JICA) regarding designing and using student centered activities. Science teachers trained by JICA favored designing and using student centered activities. The mean difference between the two is 1.60 which is a significant difference statistically as p-value .000 < .05.

Table 5: Comparison of science teachers' opinion scores on designing & using questions subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Designing & using questions	Trained by JICA	90	11.58	1.43	-0.15	-0.03	.874
	Untrained (JICA)	90	11.62	1.37			

Table 5 shows that there exists no significant difference between opinions of science teachers trained by JICA and untrained (JICA) regarding designing and using inquiry based questions. Both have equal preference for designing and using inquiry based questions. The mean difference between the two is -0.03 which is not significant difference statistically as p-value .874 > .05.

Table 6: Comparison of science teachers' opinion scores on Students' participation subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Students' Participation	Trained by JICA	90	22.87	1.62	2.31	0.67	.022
	Untrained (JICA)	90	22.20	2.24			

Table 6 shows that there exists a significant difference of opinions between science teachers trained by JICA and untrained (JICA) regarding students' participation in activities. Science teachers trained by JICA favored students' participation in activities. The mean difference between the two is 0.67 which is a significant difference statistically as p-value .022 < .05.

Table 7: Comparison of science teachers' opinion scores on preparation of materials subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Preparation of Materials	Trained by JICA	90	21.98	2.08	14.78	4.32	.000
	Untrained (JICA)	90	17.66	1.82			

Table 7 shows that a significant difference of opinions exists between science teachers trained by JICA and untrained (JICA) regarding preparation of materials. Science teachers trained by JICA favored preparation of materials. The mean difference between the two is 4.32 which is a significant difference statistically as p-value $.000 < .05$.

Table 8: Comparison of science teachers' opinion scores on inquiry based attitude development subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Inquiry based Attitude Development	Trained by JICA	90	30.22	2.32	0.07	0.04	.938
	Untrained (JICA)	90	30.18	3.30			

Table 8 shows that there exists no significant difference of opinions between science teachers trained by JICA and untrained (JICA) regarding inquiry based attitude development. Science teachers trained by JICA and untrained (JICA) have equal preference regarding inquiry based attitude development. The mean difference between the two is 0.03 which is not significant difference statistically as p-value $.938 > .05$.

Table 9: Comparison of science teachers' opinion scores on Assessment subscale of their performance scale for teachers trained by JICA and untrained teachers.

Dimension of Performance	Science Teacher	N	M	SD	t	Mean Difference	P
Assessment	Trained by JICA	90	15.83	1.10	0.60	0.11	.543
	Untrained (JICA)	90	15.72	1.33			

Table 9 shows that there exists no significant difference of opinions between science teachers trained by JICA and untrained (JICA) regarding assessment. Science teachers trained by JICA and untrained (JICA) have equal preference regarding assessment. The mean difference between the two is 0.11 which is not significant difference statistically as p-value .543>.05.

Discussion

Finding of the present study show that JICA trained teachers show better performance. These findings are supported by the findings of another study conducted by Angrist & Lavy (2001), who studied the impact of in-service teacher training on the performance of teachers and found a positive relationship between both. Hussain (2004) also found that in-service trained teachers performed better than those who did not receive such training. Kazmi, Mumtaz & Pervez (2011), found that in-service teachers training makes teacher more logical and systematic in their teaching style.

Yadav, B. & Bhardwaj, P. (2013), studied the Impact of In-service teacher training on classroom transactions. Their findings state that teacher gained more skill to handle classroom issues and clarity and confidence in their interactions within classroom. Kayani, Azhar, Morris and Kayani (2011), suggested that rigorous in-service teacher training can significantly enhance the capacities of teachers and their professional development. Spafford, Goody, and Jacob (2002) have also concluded after their study that training either short term or long term have

positive impact on the overall classroom performance of teachers. Shaikh, Junejo, and Goopang (2008), after their research work concluded that teacher training was helpful for developing professional skills and teaching performance of teachers.

Participation in student centered activities is the area where few respondents declared JICA trained science teachers better. JICA trained teachers deal large number of students in a period of forty-five minutes. Participation of all students is difficult to be ensured. In the same way development of inquiry-based attitude is the area where JICA trained teachers showed very few significant differences. Packed schedule, large size classes are few reasons which can be seen in the same context. No significant difference in the area of assessment has been reported between JICA trained science teachers and not JICA trained science teachers. This examination system is based on the evaluation of knowledge domain of educational objectives. So, they do not focus on the assessment of other domains of educational objectives. The present study also indicates that all science teachers require further in-service training. Amna et al (2016), concluded that science teachers need in-service training to widen their knowledge and to acquire more skills.

Conclusions

The conclusions of the present study are as follows:

1. Science teachers trained by JICA show better performance in lesson planning & preparation designing and using student centered activities
2. Students' participation in activities
3. Preparation of materials
4. While Science teachers trained by JICA and untrained (JICA) show equal performance regarding:
5. Designing and using inquiry-based questions
6. Inquiry based attitude development
7. Assessment

Recommendations

1. As JICA trained teachers show better performance, it is recommended that such trainings may be conducted for all science teachers at regular intervals.
2. The results of the present study showed impacts of in-service training on the performance of science teachers in public schools. Such studies may be carried out in private sector to investigate their training system and its impact.
3. Research may further be conducted on science teachers at primary school level to assess the impact of in-service training on their performance proposing measures to improve the performance further.
4. The study included only one type of tool i.e. questionnaire. Further study may also be conducted using observations, interviews or experiments to get a better view of impact.

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