**In-Service Training Programmes and its Impact on Classroom Practices: Exploring Attitudes of Teachers at Elementary Schools**

**Abstract**

This study explored the attitude of elementary school teachers about in-service teachers training programmes organized for elementary schools with reference to their educational qualifications, teaching & professional experiences, and gender. In addition, it aimed to study the performance of teachers who have received in-service training in terms of reflections of training inputs in classroom practices. Descriptive survey research design was adopted to conduct the study. Data were collected from 50 teachers from 20 elementary schools through an Attitude Scale and a Classroom Observation Schedule. Hypotheses were tested by employing test of significance between two means. The results revealed that attitudes of high-qualified and minimum-qualified elementary school teachers differ significantly. There was also significant difference in mean scores of attitudes towards in-service training programme between high-experienced (>10 years) and less-experienced (<10 years) teachers. Gender was not a determining factor in developing attitude among teachers towards in-service training. Besides, teachers those received in-service training were having better performance in classroom transactions as compared to those didn’t receive in-service training.

**Keywords**: attitude, elementary school teachers, in-service teachers’ training, performance in classroom practices.

**INTRODUCTION**

Professional development of teachers begins with pre-service and gets renewed through in-service training programmes or in-service teacher education. In-service teacher education updates the issues in the context of content, pedagogy, and evaluation. It orients teachers on integration of information and communication technologies in teaching learning practices. Both pre-service and in-service teachers’ trainings are inseparable in teacher education as well as school education system (National Policy on Education, 1986 & 1992). On the basis recommendations of NPE 1986, District Institutes of Education and Training (DIETs) were established in 1987 for on-site support to teachers. Thereafter, District Primary Education Program (DPEP) was initiated in 1995 for this purpose and started providing training through resource persons at block and cluster levels to support primary school teachers. The National Curriculum Framework of Teacher Education (NCFTE, 2009) stressed on up-gradation of knowledge and practice of teachers already working in schools.

The School and Mass Education Department, Government of Odisha, had organised in-service training programmes through OSEPA (erstwhile OPEPA and TE & SCERT under SSA). The State Project Office at the top and Cluster Resource Centres at the bottom organized the in-service trainings for elementary school teachers through ‘Samarthya- a scheme for in-service training for teachers’ and other similar programmes. It was a state-level integrated in-service training package in pedagogical concepts, content, theme, hard-spots and district specific need-based topics for in-service teachers, newly recruited teachers, under qualified teachers, head teachers, and teachers working at cluster and block.

**REVIEW OF PREVIOUS RESEARCH STUDIES**

On review of previous studies, it was found a mixed results in dispositions of teachers towards in-service trainings. As revealed, Mohanty (2014, 2014a, 2014b) reported that in-service training had significant positive effects, in favour of trained teachers, on the skills of introducing the lesson, particularly with reference to the use of various techniques rather than stating topics directly; and asking questions to link with testing previous knowledge of learners. The study also found a positive effect of in-service training on teachers having receiving in-service training as compared to untrained counterparts. Yadav (2012), Siddiqui (2014), Singh (2013) and Yadav & Bhardwaj (2013) reported a positive impact on classroom transactions pertaining to curricular activities, teaching skills, use of TLMs, teacher behaviors, classroom management, and skills of framing questions. Singh (2013) reported in-service training as useful for activity-based teaching, child-centered approach and subject enrichment. In addition, in-service training was found having positive impact on dropout rate and improvement of performance of teachers, particularly with reference to classroom transaction (Eswaran & Singh, 2008).

A study conducted at SSA, Tamil Nadu (2010-11) found almost all teachers gained clarity, confidence for planning and preparing an effective classroom interaction and motivation from in-service training. The content of training was appropriate but the programme did not have adequate involvement of teachers (Tiwari, 2009), lack of innovation, coordination, killed resource persons, evaluation strategies, post-training follow-up (Kapoor, 2009) as cited by Aarti & Vasanti (2017). Yigit (2008) found a positive attitude of teachers towards in-service training programme. Pathania (2007), cited in Aarti & Vasanti (2017), reported a positive attitude of teachers in terms of updating knowledge, improving teaching methods, solving classroom problems and developing professional competence among teachers. A negative disposition of primary school teachers towards in-service training programmes was reported by Sreedevi (2001) as it could not improve their creativity and instructional skills. A significant change was observed in perception of teachers due to in-service training (Jahangir, Saheen and Kazmi, 2012). Teachers were unwilling to attend in-service professional development programmes (Ozer, 2004). Gender did not have any role in achievement through in-service training (Joy & Manickam, 2002).

Similarly, in-service trainings were effective in change of school curriculum, methods of evaluation, class management and developing relationship with others, motivating teacher performance, developing teacher ethics and professional competencies of teachers (Raina, 2005). Teachers got positive impacts on their work efficiency in schools (Subrahmanian (2001). In-service training programme had little or no impact on the teachers' concerns or needs regarding mainstreaming (Hendricks & Sloan,1981).

On the other hand, studies of Jamil, Amer, Ali, Baloch, & Ayaz (2011) reported a significant correlation between the in-service training and performance of teachers in classroom practices. In spite of interest, teachers were dissatisfied with the on-going in-service training programmes because of a very little follow-ups and monitoring (Schnackenberg, Luik, Nisan, & Servant, 2001). In-service training programmes were not at all beneficial because of negligence in implementing effective English learning in schools Chirakkal (2000). There was a positive attitude towards in-service training that aims to improving teaching competencies of teachers (Thankamani, 1997). A positive impact was found in the study by Yadav (2012) that in terms of classroom transactions using various teaching skills, content, using TLMs, bringing improvement in teacher behaviors, curricular and co-curricular activities etc. in the states like Bihar, Odisha, Rajasthan, Uttar Pradesh, Maharashtra and West Bengal but no changes were marked in Meghalaya, Nagaland and Haryana. Similarly, the study by Naoreen, Arshad, Aslam, & Nausheen (2011) revealed positive effects of in-service training for academic betterment of secondary class students. It reported that trained teachers were significantly better than untrained counterparts; and place of schools had an impact that schools situated in rural belt were significantly better than urban belt schools.

From the findings of the above studies, pertaining to attitude of teachers towards in-service training; the benefits they received from such trainings; and their performance in classroom practices a mixed result was observed. To explore the ground reality in sampled blocks Odisha, a research study was conducted under the sponsorship OPEPA (now OSEPA). The study was conducted to explore the attitude of teachers about the quality of in-services training programme and the impact of such training programmes in the classroom practices and it would enable the policy makers, administrators, curriculum designers to take initiatives to develop, modify or reject the strategies being implemented in in-service trainings.

**Objectives of the Study**

1. To study the attitude of elementary school teachers towards in-service teachers training programmes with reference to their educational qualifications.
2. To study the attitude of elementary school teachers towards in-service teachers training programmes with reference to their years of teaching and professional experience.
3. To study the attitude of elementary school teachers towards in-service teachers training programmes with reference to gender.
4. To study the effect of in-service training on classroom practices with reference to teachers have who have received in-service training as per training needs and those who have not received such training as per their training needs.

**Hypotheses of the Study**

1. There is no significant difference in mean scores of attitudes towards in-service training programme between high-qualified and minimum-qualified elementary school teachers.
2. There is no significant difference in mean scores of attitudes towards in-service training programme between high-experienced and less-experienced elementary school teachers.
3. There is no significant difference in mean scores of attitudes towards in-service training programme between male and female teachers of elementary schools.
4. There are no significant differences in classroom performances between those have who have received in-service training as per training needs and those who have not received such training as per training needs.

**METHODOLOGY OF THE STUDY**

Descriptive survey research design was adopted for carrying out the study. A sample of 50 teachers from 20 elementary schools situated in Cuttack City and Salipur Block of Odisha were selected. Multi-stage and incidental sampling methods were followed for the selection of teachers.

Two numbers of tools were used for collection of data such as: *Tool-1:* *Attitude Scale for Teachers* having (3 Point Scale) for objective no. 1, 2 & 3 and hypotheses-1, 2 & 3. The dimensions covered in the tool were: planning and management of programme, venue/ schedule of training programme, duration and frequency of the training programme , learning materials/training package, quality of resource persons/trainers, approaches/ methods of transactions, contribution of training for development of knowledge & skills, evaluation at the completion of the training programme, feasibility of training inputs in the classroom transactions and students achievements, and follow-up mechanisms (academic support and monitoring). *Tool-2:* *Classroom Observation Schedule* was used for objective no. 4 and hypothesis-4. The tool covered the dimensions such as: Methods / approaches of teaching, Use of technology/ TLMs, Activities during Lesson, Scope for Interaction among pupils, Student participation in the classroom, Interaction among pupils, Students’ Attentiveness, Student’s assessment Process (CCE), and Classroom environment. Responses were gathered directly visiting the sites. Attitude of teachers towards in-service training programmes was collected from teachers and performance of such teachers in classroom were collected through classroom observation by the researcher and the paper was redesigned afterwards.

Statistics such as descriptive (Mean, SD) and inferential techniques (t-test) to find significance difference between two means) were employed to test the null hypotheses. Qualitative description was used for supplementation of the analysis.

**RESULTS**

**Attitude of Teachers towards In-Service Training Programmes**

The responses on attitude of the elementary school teachers towards in-service trainings were collected with the help of an attitude scale and was assessed quantitatively with reference to qualification, professional teaching experience, and gender. The results are presented under table-1.

***Attitude of Teachers with reference to Qualification***

Table-1: Test of significance of difference between mean attitude score of high-qualified and minimum-qualified teachers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Categories of teachers** | **N** | **Mean** | **SD** | **SED** | **df** | **t-ratio** | **Remarks** |
| High-Qualified (Graduation/ PG/Ph.D. with B.Ed./M.Ed.) | 32 | 28 | 6 | 1.996 | 48 | 4.0071 | significant at 0.01 level (p<0.01) |
| Minimum-Qualified Teachers (Intermediate with CT/ D.El.Ed./ B.Ed.) | 18 | 36 | 8 |

From the table-1, it is evident that the obtained t-value (4.0071) found greater than the table value (2.69) at 0.01 level of significance with df=48. Hence, the null hypothesis formulated “There is no significant difference in mean scores of attitudes towards in-service training programme between high-qualified and minimum-qualified elementary school teachers” stands rejected. It is interpreted that, there is significant difference in mean scores of attitudes towards in-service training programme between high-qualified and minimum-qualified elementary school teachers. The conclusion is derived from the above table that high-qualified teacher are having less performance in the attitude scale in comparison to minimum-qualified elementary school teachers. The attitude of high-qualified elementary school teachers is having unfavourable attitude towards in-service training as it does not cater the actual needs of such teacher.

***Attitude of Teachers with reference to Professional and Teaching Experience***

Table-2: Test of significance of difference between mean attitude score of high-experienced and less-experienced elementary school teachers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Categories of teachers** | **N** | **Mean** | **SD** | **SED** | **df** | **t-ratio** | **Remarks** |
| High-Experienced Elementary School Teachers (more than 10 years) | 22 | 30 | 4 | 1.487 | 48 | 2.6896 | Significant at 0.01 level (p<0.01) |
| Less-Experienced Elementary School Teachers (less than 10 year) | 28 | 34 | 6 |

The table 2 reveals that the obtained t-value (2.6896) is greater than the table value at 0.01 level of significance (2.68) with df =48. Hence the t-value is statistically significant. The null hypothesis formulated “There is no significant difference in mean scores of attitudes towards in-service training programme between high-experienced and less-experienced elementary school teachers” is rejected. It is interpreted that, there is significant difference in mean scores of attitudes towards in-service training programme between high-experienced and less-experienced elementary school teachers. It is concluded that high-experienced teacher is having more performance in the attitude scale in comparison to less-experienced elementary school teachers. High-experienced teachers are found to be more satisfied with the in-service training.

***Attitude of Teachers with reference to their Gender***

Table-3: Test of significance of difference between mean attitude score of male and female teachers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Categories of teachers** | **N** | **Mean** | **SD** | **SED** | **df** | **t-ratio** | **Remarks** |
| Male elementary school teachers | 30 | 36 | 4 | 1.412 | 48 | 1.4167 | Not significant at 0.05 level (p>0.01) |
| Female elementary school teachers | 20 | 34 | 6 |

The table 3 reveals that the obtained t-value (1.4167) is smaller than the table value at 0.05 level of significance (2.01) with df =48. Hence the t-value is not statistically significant. The null hypothesis formulated “There is no significant difference in mean scores of attitudes towards in-service training programme between male and female teachers of elementary schools” is retained or accepted. It is interpreted that, there is no significant difference in mean scores of attitudes towards in-service training programme between male and female elementary school teachers. The conclusion is derived from the above table that male teachers are having same performance in the attitude scale in comparison to female teachers. Gender does not play any significant role for developing difference in attitude towards in-service training. Both male and female teachers are found to be same in attitude towards in-service training although their performance is average in the attitude scale.

**Performance of Elementary School Teachers in Classroom Practices**

The performance of elementary school teachers was observed through a classroom observation schedule. The schedule carried a rating for each item pertaining to the dimensions of classroom activities such as: methods / approaches of teaching; use of technology/ TLMs; Activities during lesson; scope for interaction among pupils; student participation in the classroom; interaction among pupils; students’ attentiveness; student’s assessment process and classroom environment. Hence, the performance of teachers was compared between the teachers received training and the teachers not received training.

Table-4: Test of significance of difference between mean performance score of trained and un-trained elementary school teachers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Classes** | **N** | **Mean** | **SD** | **SED** | **df** | **t-ratio** | **Remarks** |
| Classes of Teachers who have received in-service training as per training needs | 14 | 94 | 8.50 | 2.964 | 24 | 7.4232 | Significant at 0.01 level (p<0.01) |
| Classes of Teachers who have not received in-service training as per training needs | 12 | 72 | 6.20 |

The table 4 reveals that the obtained t-value (7.4232) is greater than the table value at 0.01 level of significance (2.80) with df =24. Hence, the t-value is statistically significant. The null hypothesis formulated “There is no significant differences in classroom performances between those who have received in-service training as per training needs and those who have not received in-service training as per training needs” is rejected. It is interpreted that, there is significant difference in mean scores of performances in classroom transaction of trained and untrained elementary school teachers. The conclusion is derived from the above table that trained teachers are having better performance in classroom transaction as compared to untrained teachers with reference to various activities.

**MAJOR FINDINGS**

1. There is significant difference in mean scores of attitudes towards in-service training programme between high-qualified and minimum-qualified elementary school teachers (N1=32, M1=28; N2=18, M2=36; t=4.0071, Significant at 0.01 level).
2. There is significant difference in mean scores of attitudes towards in-service training programme between high-experienced and less-experienced elementary school teachers (N1=22, M2=30; N2=28, M2=34; t=1.6896; significant at 0.01 level).
3. It is found from the analysis that there is no significant difference in mean scores of attitudes towards in-servic**e** training programme between male and female elementary school teachers (N1=30, M1=36; N2=20, M2=34, t=1.412, not-significant at 0.05 level).
4. The results reveal that there is significant difference in mean scores of performances in classroom transaction of in-service trained and untrained elementary school teachers (N1=14, M1=94; N2=12, M2=72, t=7.4232, significant at 0.01 level).

**DISCUSSION**

From the study it was found that the high-qualified (Graduation/PG/Ph.D. with B.Ed. or M.Ed.) teachers were having unfavourable attitude towards in-service training as it did not cater the actual needs of such teachers. There was a significant difference in mean scores of attitudes towards in-service training programme between high-qualified and minimum-qualified (Intermediate and CT/D.El.Ed./ B.Ed.) elementary school teachers. These findings are consistent with the findings of Ozer (2004), Sreedevi (2001), Tiwari (2009), Kapoor (2009). It means qualification plays a vital factor for developing dispositions towards any academic programme based on the quality contents, training needs and management of programme.

Teaching experience also plays a significant role for developing attitude towards in-service training programme. Here, as found, there was significant difference in mean scores of attitudes towards in-service training programme between high-experienced (more than 10 years) and less-experienced (less than 10 years) elementary school teachers. The high-experienced teachers were having better attitude performance in comparison to less-experienced teachers. Hence, high-experienced teachers were more satisfied with the in-service training they receive from time to time which was consistent with the findings of Mohanty (2014), Yigit (2008) Pathania (2007), Jahangir, Saheen and Kazmi (2012), & Raina, (2005). It was also observed that both male and female teachers found to be same in attitude towards in-service training although their performance was average in the attitude scale. Gender was not a factor for development of attitude towards in-servic**e** training programme as in case of Manickam (2002) & Naoreen, Arshad, Aslam, & Nausheen (2011).

Trained teachers (those have received in-service training) were having better performance in classroom transaction as compared to untrained teachers (those have not received in-service training) with reference to various activities in the classroom transactions. The results revealed in the study were consistent with the studies of Mohanty (2014, 2014a, & 2014b) where it was reported in-service training had significant positive effects in favour of trained teachers on various aspects of classroom practices and SSA, Tamil Nadu (2010-11), Hendricks and Sloan (1981), Eswaran & Singh (2008); Jamil, Amer, Ali, Baloch & Ayaz (2011); Yadav, (2012); & Naoreen, Arshad, Aslam, & Nausheen (2011). These results indicate that in-service teacher training has a significant effect not only on the skill of teachers in introducing lesson through various techniques and asking questions on previous knowledge at the time of introducing the lesson but also in case of use of TLMs, students’ participation, teachers’ response and treatment/ pupil-teacher interaction, students’ attentiveness, activities during lesson / scope for interaction among pupils, student evaluation and textbook usage etc.

**CONCLUSION AND SUGGESTIONS**

Based on the findings of the study, some overall suggestions can be given as concluding remarks for Improvement of attitude of teachers towards in-service training programme. In-service training for the elementary school teachers needs to be compulsory for all untrained teachers. Special care should be taken in selection of resource persons (trainers) in terms of their efficiency in content knowledge, mastery over subject, leadership quality, innovative ideas in teaching learning process, knowledge on recent developments in the field of educational technology and its pedagogical significance. The Resource Persons (RPs) must be efficient in speaking and have clarity in their expression, so that a positive attitude can be developed among the teachers. Modern ICT tools like computers with internet connectivity, LCD projectors should be used for presentation of information which may bring more clarity and understanding among the trainees, so that a positive attitude can be developed among the teachers. Engagement of untrained and/or less experienced teachers as RPs should be avoided. This situation creates a negative attitude among the trainees (teachers), further it discourages/de-motivates the senior and/or trained teachers to attend training programme. External Resource Persons be invited to facilitate group discussion and sharing. The resource persons (RPs) for in-service training should be hired from colleges with Education subject, may be training colleges for some pedagogical training and teachers from reputed liberal colleges/universities for more comprehensive themes-based lectures and other research based pedagogical trainings. The training materials should essentially contain learning objectives, in-text evaluation exercises and list of additional reading materials or material resources so as to help teachers supplement and/or substantiate their understanding of training in puts. The training materials should not follow prescriptive approach in the matter of pedagogy and/or decision-making process. These instead should perpetuate constructivist approach allowing freedom to the trainees in these matters. Appropriate monitoring and follow-up mechanism be created to ensure the implementation of training at school level. Need based training programme to be organized but not for mass teachers. The teachers should be allowed to visit other schools (CBSE pattern schools, Saraswati Vidya Mandir schools etc.) for sharing experiences.

**Conflict of Interest**

There is no conflict of interest in publication of this paper in your reputed journal. The study has been converted to a research paper with expertise of another researcher, so necessary acknowledgement is given to her as a co-author of the paper. The paper could not be published earlier because of some other assignments. However, it is now ready for publication.

**Ethical Aspect**

The ethical committee permission is not required in this study since the data were gathered before 2020 sponsored under a small-scale research project by erstwhile OPEPA, Bhubaneswar, Odisha, India. Complete confidentiality was maintained about the informant’s identity, their views etc. No harm was made to any individual during collection of data and reporting.

**References**

Aarti, J., & Vasanthi, S. (2017). Perceptions about the in-service training programme among primary school teachers in Kotagiri block, the Nilgiris district. *Paripex-Indian Journal of Research, 6*(8), 592-597. Available at https://www. worldwidejournals.com/.

Chirakkal, F. (2000). *Difficulties experienced by school teachers in teaching English*. (Unpublished M.Ed. Dissertation) School of Pedagogical Sciences, Mahatma Gandhi University, Kottayam.

Eswaran, S., & Singh, Ajit (2008). *A study of effectiveness of in-service education of teachers*. All India Primary Teachers’ Federation. Retrieved from download.ei-ie.org/.../AIPTF\_India\_ Effectiveness% 20of% 20Iin- Service.

Hendricks, I., & Sloan, C.A. (1981). *A study of the impact of an inservive program on the concerns and needs of secondary teachers toward mainstreaming*. (ERIC Document Reproduction Service, No. ED 243265).

Jahangir, S.F., Saheen, N. & Kazmi, S.F. (2012). In service training: a contributory factor influencing teachers’ performance. *International Journal of Academic Research in Progressive Education and Development 1*, (1), 31-38. Retrieved From http://www. hrmars. com/ admin/ pics /577.pdf.

Jamil, A., Amer, A.M., Ali, U., Baloch, J. R. & Ayaz, M. (2011). Effects of in-service training in meliorating teachers’ performance at secondary level. *International Journal of Academic Research, 3*(2).

Joy, H.B.H., & Manickam, L.S. (2002). Computer assisted instruction: attitudes of teachers and the correlates. *Perspectives in Education, 18*(4), 235-242.

MoE, GoI (2020). National Education Policy, 2020. New Delhi. Government of India

Mohanty, S.P. (2014). Quality of in-service training programme for the elementary school teachers of Odisha. Unpublished Ph.D. Dissertation, Ravenshaw University, Odisha, India.

Mohanty, S.P. (2014a). In-service training spells its impact on classroom practices: observation of some significant variables at elementary school level. *Scholarly Research Journal for Interdisciplinary Studies, VOL. II* (XI), 1264-1274.

Mohanty, S.P. (2014b). In-Service Training at Elementary School Level: Impact on Classroom Practices. *Learning Community, 5*(1), 33-42.

Naoreen, B., Arshad, M., Aslam, S. & Nausheen, R. (2011).*Impact of in - service teacher training on students’ learning achievement in mathematics*. International Conference on Social Science and Humanity IPEDR vol.5 (2011) Singapore: IACSIT Press. Retrieved from www.ipedr.com/ vol5/ no2/ 38- H10124.pdf on date: 14.03.2012.

Ozer, B. (2004). In-service training of teachers in Turkey at the beginning of the 2000s. *Journal of In-service Education, 30*(1), 89-100.

Raina, M.S.P. (2005). Opinion of secondary school teachers on the effectiveness of in-service training in enhancing professional competency. (Unpublished M.Ed. Dissertation), University of Calicut, Calicut. Retrieved from http:// shodhganga. inflibnet.ac.in/ bitstream/10603/1546/18/18 \_chapter %202.pdf.

Schnackenberg, H.L., Luik, K., Nisan, Y.C & Servant, C. (2001). A case study of needs assessment in teacher in-service development. *Educational Research and Evaluation, 7*(2-3), 137-160. Retrieved from http://www.tandfonline .com /doi/ abs/ 10.1076 /edre.7.2.137.3865#preview.

Siddiqui, T. (2014). Impact of in-service teachers’ trainings- a study of four districts in Uttar Pradesh. *Indian Journal of Research, 3* (1), 81-83.

Singh, D. (2013). Impact of in-service teacher training program under SSA in educational block of district Bhojpur. *International Journal of Arts Commerce & Literature, 1* (11), 441-450.

Sreedevi, M. (2001). *Attitude of primary school teachers towards the training programmes of the newly revised curriculum.* (Unpublished M.Ed. Dissertation). School of Pedagogical Sciences. Mahatma Gandhi University, Kottayarn. Retrieved from http://shodhganga. inflibnet.ac.in/ bitstream/ 10603/ 1546/ 18/18 \_chapter % 202.pdf.

SSA-Tamil Nadu (2010-11). *In-service teacher training*. Retrieved from http://www.ssa. tn.nic.in/Docu /In-service%20teacher% 20training%20 % 202011 % 20 proof .pdf

Subrahmanian, T. (2001). *The impact of DIETs on the work efficiency of primary school teachers of Kerala State.* (Doctoral Thesis), Department of Education. Calicut University. Retrieved from http://shodhganga. inflibnet.ac.in/ bitstream/1 0603/ 1546/ 18/18 \_chapter % 202.pdf.

Thankamani, N.I. (1997). *An assessment of the training programme provided for lower primary school teachers by block resource centres of Wayanad District*. (Unpublished M.Ed. (Technology) Dissertation). University of Calicut. Retrieved from http://shodhganga. inflibnet.ac.in/ bitstream/10603/1546/18/18 \_chapter %202.pdf.

Tiwari, G.N. (2009). *Evolving competency-based curriculum in science education for in-service primary school teachers*. (Unpublished Thesis) University of Allahabad, Allahabad.

Yadav, B., & Bhardwaj, P. (2013). Impact of in-service teacher education programs on class room transactions. *Educationia Confab, 2*(6), 8-16.

Yadav, S.K. (2012). *Impact of in-service teacher training on classroom transaction*. (A set of four books). New Delhi: NCERT.

Yigit, N. (2008). A study on evaluation of effectiveness of an in-service training (inset) source about the use of instructional technologies and material development, World Applied *Sciences Journal, 4* (1).

\*\*\*