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

**Abstract**

This study aimed to explore the attitude of elementary school teachers towards in-service training programmes organized for elementary schools with reference to their educational qualifications, teaching & length of professional teaching 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. Four number of null 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 who received in-service training had better performance in classroom transactions as compared to those who 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 teacher training are inseparable in teacher education as well as school education system (National Policy on Education, 1986 & 1992). Further, Nikhat & Khan (2017) agreed in a study that in-service training helps for improvement in quality of teaching. 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 Programme (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 enhancing knowledge and practice of teachers already working in schools. National Education Policy 2020 (NEP 2020) recommends for Continuous Professional Development (CPD) for teachers at least 50 hours every year for their self-improvement, to learn the latest innovations and advances in their professions, the latest pedagogies, and innovative assessment practices. The school heads should undergo similar modules to improve their own leadership and management skills.

The study was conducted to explore attitude of teachers towards in-service training organised by 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*- an erstwhile 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**

A mixed result on dispositions of teachers towards in-service trainings was found from the previous studies. 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 studies also found a positive effect of in-service training on teachers 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 Teaching Learning Materials (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 to have positive impact on dropout rate and improvement of performance of teachers, particularly with reference to classroom transaction (Eswaran & Singh, 2008). Mohanty & Dash (2021) reported that the in-service training had impact on developing knowledge, skills and professional attitude because of high quality of teaching materials for learning, and the language of the training package was easy to understand.

In 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. Tiwari (2009) found that the content of training as appropriate but the programme did not have adequate involvement of teachers. Kapoor (2009) as cited by Aarti & Vasanti (2017) reported some drawbacks of ins-service training such as lack of innovation, coordination, skilled resource persons, evaluation strategies, post-training follow-up. 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 et al., 2012). Ozer (2004) study showed that teachers were unwilling to attend in-service professional development programmes. The study of Joy & Manickam (2002) indicated that gender did not have any role in achievement through in-service training.

Devaraja & Aiholl (2019) found that gender has no role in developing attitude towards in-service training programmes whereas place of schools and teaching experience have impact on developing attitude towards in-service training programmes at primary schools. Singh & Sinha (2023) reported a positive impact of in-service teacher's training in developing teaching attitude among elementary school teachers.

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). Subrahmanian (2001) showed that teachers got positive impacts on their work efficiency in schools as a result of in-service training. If we go back, it was found from a study of Hendricks & Sloan (1981) that in-service training programme had little or no impact on the teachers' concerns or needs regarding mainstreaming. Msamba et al. (2023) reported that in-service training has effective impact on developing subject knowledge, general knowledge, and pedagogical content knowledge.

On the other hand, studies of Jamil at al. (2011) reported a significant correlation between the in-service training and performance of teachers in classroom practices. In spite of having a positive interest in teaching the teachers were dissatisfied with the on-going in-service training programmes because of lack of follow-up and monitoring (Schnackenberg et al. 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 at al. (2011) revealed positive effects of in-service training for academic betterment of secondary class students. It reported that trained teachers were significantly better than their untrained counterparts; and that the location of schools had an impact as schools situated in the rural belt were significantly better than the 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 attitude of teachers towards in-service training and its impact on classroom practices in the sample blocks of Odisha, research was conducted with the sponsorship of OPEPA (now OSEPA). The findings would be helpful in policy making, school administration, curriculum and textbook developers to take initiatives if so, required for effective in-service training programmes. The contents and pedagogical strategies suggested by the NCERT, New Delhi in its curriculum frameworks and textbooks need to be transacted effectively for the students. Based on the results of the study, new in-service training guidelines would be designed.

**Objectives of the Study**

1. To explore the attitude of elementary school teachers towards in-service teachers training programmes with reference to their educational qualifications.
2. To find out the attitude of elementary school teachers towards in-service teachers training programmes with reference to their length of professional teaching experience.
3. To explore the attitude of elementary school teachers towards in-service teachers training programmes with reference to gender.
4. To analyse the impact of in-service training on classroom practices of teachers based on their in-service training.

**Hypotheses of the Study**

1. The mean attitude scores obtained on in-service training of elementary school teachers do not differ significantly with reference to teachers’ professional qualifications.
2. Professional teaching experience of elementary school teachers does not have any impact on attitudes towards in-service training.
3. Gender has no significant impact on attitude towards in-service training of elementary school teachers.
4. In-service training of elementary school teachers has no impact on classroom practices.

**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 through multi-stage and incidental sampling methods.

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, and classroom environment. Responses were gathered directly visiting the schools. 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 the 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 is greater than the table value (2.69) at 0.01 level of significance with df=48. Hence, the null hypothesis formulated as ‘the mean attitude scores obtained on in-service training of elementary school teachers do not differ significantly with reference to teachers’ professional qualifications’, stands rejected. Therefore, 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 teachers have less performance in the attitude scale in comparison to minimum-qualified elementary school teachers. The attitude of teacher with high qualifications do not have a favourable attitude towards in-service training because of quality of resource persons, training packages/modules, content in training, less focus on need-based training, duration of training etc.

***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 as ‘professional teaching experience of elementary school teachers does not have any impact on attitudes towards in-service training’ is rejected. Although, the null hypothesis is rejected but the significance difference is not of so high. The Mean of less qualified teachers is higher than that of their counterparts. It may be concluded, that, the length (years) of professional teaching experience has a role in developing attitudinal dispositions among the teachers.

***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 as ‘gender has no significant impact on attitude towards in-service training of elementary school teachers’ 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 derived from the above table is that male teachers have similar performance in the attitude scale in comparison to female teachers. Gender does not play any significant role in developing difference in attitude towards in-service training.

**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 as ‘in-service training of elementary school teachers has no impact on classroom practices’ is rejected. This means, there is significant difference in performances in classroom transaction of teachers based on their in-service training. The conclusion derived from the above table is that trained teachers have 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**

It was found that the high-qualified (Graduates/PG/Ph.D. with B.Ed. or M.Ed.) teachers have 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.

Professional teaching experience also plays a significant role for developing attitude towards in-service training programme. Here, as found, there was a significant difference in the 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 have better attitude performance in comparison to the 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 et al. (2012), & Raina, (2005). The study also observed that both male and female teachers were 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 et al. (2011).

Trained teachers (those who have received in-service training) have better performance in classroom transaction as compared to untrained teachers with reference to various activities in the classroom transactions. The results revealed, were consistent with the studies of Mohanty (2014, 2014a, & 2014b) where it was reported that in-service training had significant positive effects in favour of trained teachers on various aspects of classroom practices. The findings from the study by SSA, Tamil Nadu (2010-11); Hendricks and Sloan (1981), Eswaran & Singh (2008); Jamil et al. (2011); Yadav, (2012); & Naoreen et al. 2011) 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 the 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 the improvement of attitude of teachers towards in-service training programme. In-service training for the elementary school teachers needs to be made compulsory for all untrained teachers. Special care should be taken in the 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 etc. 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 as this creates a negative attitude among the trainees (teachers). It discourages/ de-motivates the senior and/ or trained teachers to attend training programmes. External Resource Persons should 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 teacher 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 should be created to ensure the implementation of training at school level. Need based training programme should 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 of experiences.

**Conflict of Interest**

There is no conflict of interest in the publication of this paper. 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 identities, their views etc. No harm was made to any individual during the collection of data and reporting.

**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

**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. Retrieved from: <https://www.worldwidejournals.com/paripex/recent_issues_pdf/2017/August/perceptions-about-the-inservice-training-programme-ssa-among-primary-school-teachers-in-kotagiri-block-the-nilgiris-district_August_2017_8279636281_9612192.pdf>

Chirakkal, F. (2000). *Difficulties experienced by school teachers in teaching English*. [Master's thesis, Mahatma Gandhi University, Kottayam].

Devaraja, Y., & Aiholli, V. D. (2019). Attitude towards in-service training programmes of primary school teachers in Shivamogga district. *Review of Research, 8* (8), 1-4. <https://oldror.lbp.world/UploadedData/10324.pdf>

Eswaran, S., & Singh, Ajit (2008). *A study of effectiveness of in-service education of teachers*. All India Primary Teachers’ Federation. Retrieved from: <https://download.ei-ie.org/Docs/WebDepot/AIPTF_India_Effectiveness%20of%20Iin-Service%20Training_08_EFAIDS.pdf> .

Hendricks, I., & Sloan, C. A. (1981). *A study of the impact of an in-service program on the concerns and needs of secondary teachers toward mainstreaming*.

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: [https://www.researchgate.net/publication/311820222\_In\_Service\_Training\_A\_Contributory\_Factor\_Influencing\_Teachers'\_Performance](https://www.researchgate.net/publication/311820222_In_Service_Training_A_Contributory_Factor_Influencing_Teachers%27_Performance).

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), 1-14.

Joy, H.B.H., & Manickam, L.S. (2002). Computer assisted instruction: attitudes of teachers and the correlates. *Perspectives in Education, 18*(4), 235-242. <https://www.researchgate.net/publication/341313844>

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. [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, II* (XI), 1264-1274. Retrieved from: <https://www.srjis.com/issues_data/38>

Mohanty, S.P. (2014b). In-Service Training at Elementary School Level: Impact on Classroom Practices. *Learning Community, 5*(1), 33-42. Retrived from: <https://ndpublisher.in/admin/issues/LCV5N1d.pdf>

Mohanty, S. P. & Dash, K. R. (2021). Programme management and teaching learning materials for in-service training: an exploration at elementary school level in Odisha. *i-manager's Journal on School Educational Technology, 17*(2), 16-22. <https://doi.org/10.26634/jsch.17.2.18257>

Msamba, E.M., Msuya, E.A., & Anangisye, W.A.L. (2023). The impact of in-service education and training on teachers’ learning: perspectives from English foreign language teachers in Tanzania. *Education Research International*, DOI: <https://doi.org/10.1155/2023/6135444>

Naoreen, B., Aslam, S., Arshad, M., & Nausheen, R. (2011). Impact of in-service teacher training on students’ learning achievement in mathematics. In *International Conference on Social Science and Humanity, IPEDR* (Vol. 5, pp. 168-174).

Nikhat & Khan, Z.N. (2017). Attitude of teachers towards in-service training for the improvement in quality of teaching at school level. *International Education & Research Journal, 3*(8). 73-75. <https://ierj.in/journal/index.php/ierj/article/view/1284>

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. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=967839767746fc94a3e39e29d51f3cbed993a4da>

Raina, M.S.P. (2005). Opinion of secondary school teachers on the effectiveness of in-service training in enhancing professional competency. [Master's thesis, University of Calicut, Calicut].

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. <https://doi.org/10.1076/edre.7.2.137.3865>

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. <https://www.worldwidejournals.com/paripex/recent_issues_pdf/2014/January/January_2014_1389962596_6c3bb_76.pdf>

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.<http://cdn.tridz.in/s3fs-public/In-Service%20Teachers%20Training%20Research%20Report%20August%202015.pdf>

Singh, S., & Sinha, A.R. (2023). A study of the effectiveness of in-service teachers training for developing teaching attitude among elementary school teachers of Vaishali district. *Journal of Emerging Technologies and Innovative Research, 10* (3), 212-219. <https://www.jetir.org/papers/JETIR2303632.pdf>

Sreedevi, M. (2001). *Attitude of primary school teachers towards the training programmes of the newly revised curriculum.* [Master's thesis, Mahatma Gandhi University, Kottayarn].

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

Subrahmanian, T. (2001). *The impact of DIETs on the work efficiency of primary school teachers of Kerala State.* [Doctoral dissertation, University of Calicut, Calicut].

Thankamani, N.I. (1997). *An assessment of the training programme provided for lower primary school teachers by block resource centres of Wayanad District*. [Master’s thesis, University of Calicut, Calicut].

Tiwari, G.N. (2009). *Evolving competency-based curriculum in science education for in-service primary school teachers*. [Master’s 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) NCERT. <https://ncert.nic.in/dte/pdf/IITT_Classroom_2012.pdf>

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). 69-75.

\*\*\*