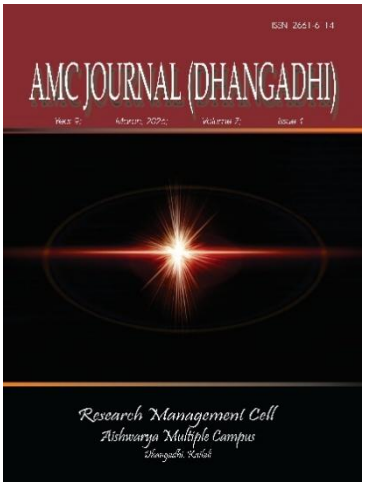
Exploring the principals' attitudes toward the impact of in-service teacher training in India



[1]K.M. Joshi, [2]Kinjal V. Ahir, [3*]Govinda Raj Upadhyay, [4]Ashutosh Priya, [5]Dharma Dev Bhatta

[1]Professor of Economics, Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar, Gujarat, India, Email: kmjoshi1972@gmail.com
[2] Professor of Economics, Sardar Patel University, Vallabh Vidyanagar,
Gujarat, India, Email: kinjalahir@gmail.com
[3]Assistant Professor of Economics, Aishwarya Multiple Campus, Dhangadhi, Kailali, Nepal (PhD Scholar (Economics), MJP Rohilkhand University, Bareilly, UP, India)
[4] Professor of Economics, Department of Regional Economics, MJP Rohilkhand University, Bareilly, UP, (India) Email: ashutoshpriyamjpru@gmail.com
[5]Professor of Economics, Aishwarya Multiple Campus, Dhangadhi, Kailali, Nepal (PhD Scholar (Economics), MJP Rohilkhand University, Bareilly, UP, India),
Email: bhattadharmadev71@gmail.com; [*]Corresponding Author megovinda@gmail.com

Article History:
Received: 12 December 2025; ***Revised:*** 28 December 2025; ***Accepted:*** 25 January 2026; ***Published Online:*** 12 March 2026

Abstract

This study examines secondary school principals' attitudes toward in-service teacher training and compares these attitudes across gender, age, and professional experience in India. Using a cross-sectional survey design, data were collected through a structured Likert-scale questionnaire administered to public and private school principals. Descriptive statistics, independent sample t-tests, and one-way ANOVA were employed for analysis. The findings indicate an overall above-average positive attitude toward in-service teacher training, with no statistically significant differences across gender, age groups, or years of experience. By incorporating principals' perspectives an area previously underexplored this study provides practical insights to inform the planning and improvement of in-service teacher training programs aimed at enhancing educational quality.

Keywords: *Principal, attitude, in-service, teacher-training, India*

Introduction

In-service teacher training (ISTT) is widely recognized as a cornerstone of continuous professional development and a critical mechanism for improving the quality of teaching and learning in schools. As educational systems confront rapidly changing curricular demands, diverse student needs, and evolving pedagogical expectations, the effectiveness of teachers has emerged as one of the most influential determinants of student achievement. Empirical evidence consistently indicates that teacher quality has a stronger impact on educational outcomes than structural or material inputs, underscoring the strategic importance of sustained professional development initiatives (Pennington, 1989; Okiror et al., 2017).

Within this context, school principals play a pivotal leadership role in shaping the success of in-service teacher training programs. Principals not only influence teachers' motivation to participate in professional development but also facilitate the transfer of training into classroom practice by fostering supportive institutional cultures. Effective ISTT equips teachers with updated knowledge, pedagogical skills, and adaptive competencies required to respond to increasingly complex and dynamic learning environments (Mercader & Gairín, 2020). Consequently, the quality of leadership support becomes a decisive factor in determining whether training initiatives translate into meaningful instructional improvement.

The impact of in-service teacher training is inherently multidimensional, extending beyond short-term skill acquisition to influence instructional practices, student engagement, and long-term professional growth (Hawley et al., 1984). High-quality training programs enhance teachers' capacity to engage students in academic learning, allocate instructional time effectively, and support learners' cognitive and personal development (Fraser et al., 2007). From an institutional perspective, continuous professional development represents a strategic investment that promotes innovation, instructional coherence, and a culture of lifelong learning among educators (Guskey, 2000; Penuel et al., 2007). These benefits further extend beyond individual classrooms, shaping broader educational trajectories and system-level quality improvement (Shewile & Dembélé, 2007).

Globally, education policy has shifted from an emphasis on access and expansion toward improving instructional quality and learning outcomes. In India, this transition is reflected in the institutional framework for teacher professional development led by the National Council of Educational Research and Training (NCERT), State Councils of Educational Research and Training (SCERTs), District Institutes of Education and Training (DIETs), and decentralized support structures such as Block Resource Centers (BRCs) and Cluster Resource Centers (CRCs). Complementing public efforts, private-sector organizations also play a growing role in the provision of ISTT. The National Education Policy (NEP) 2020 further reinforces this agenda by advocating classroom-centered, student-focused in-service training aligned with contemporary pedagogical goals (MHRD, 2020).

Despite the centrality of principals in implementing and sustaining effective teacher training, their attitudes toward ISTT have received limited empirical attention in the literature. Existing evaluations of in-service training programs have largely focused on teachers' perspectives or student outcomes, often overlooking the leadership dimension that mediates program effectiveness. Addressing this gap, the present study examines principals' attitudes toward in-service teacher training and explores variations across demographic and professional characteristics. By foregrounding principals' viewpoints, this research contributes to a more comprehensive understanding of leadership engagement in teacher professional development and offers evidence-based insights to inform the design and implementation of more effective in-service training programs.

Objective and Hypothesis

The primary objective of this study is to examine secondary school principals' attitudes toward in-service teacher training. Specifically, the study aims to analyze whether principals' attitudes differ based on gender, age, and years of administrative experience.

Research Questions

The study is guided by the following research questions:

RQ1: Is there a significant difference in attitudes toward in-service teacher training between male and female principals?

RQ2: Do principals' attitudes toward in-service teacher training differ across age groups?

RQ3: Do principals' attitudes toward in-service teacher training vary according to years of administrative experience?

Hypotheses

Based on the research questions, the following null hypotheses were formulated and tested:

H1: There is no statistically significant difference in the mean attitude scores toward in-service teacher training between male and female principals.

H2: There is no statistically significant difference in the mean attitude scores toward in-service teacher training among principals from different age groups.

H3: There is no statistically significant difference in the mean attitude scores toward in-service teacher training among principals with different years of administrative experience.

Review of Literature

In-service teacher training (ISTT) is widely recognized as a continuous and essential component of teachers' professional development, enabling educators to adapt to changing curricular demands, pedagogical innovations, and diverse learner needs (Jennings & Frank, 2015; Cheng, 2016; Dreer et al., 2017; Livingston, 2016; Osamwonyi, 2016; Saleem, 2016). Given teachers' critical role in shaping student learning, continuous professional development has become indispensable in modern education systems (Essel et al., 2009; Saleem, 2016). However, despite extensive research on ISTT, principals' attitudes toward such training remain largely underexplored.

Research indicates that competencies acquired during pre-service training may become outdated over time, necessitating ongoing in-service training to meet evolving educational demands (Chuene, 1999; Cochran-Smith, 2004; Gilbert, 2005). Teachers enter ISTT programs with diverse beliefs and attitudes shaped by pre-service education, personal experiences, and professional contexts (Bullough & Baughman, 1997). Evaluating the effectiveness of ISTT is challenging, as most studies rely on teachers' self-reported implementation practices, which may overestimate actual classroom application (Halpin et al., 1990; Knapp, 2003; Flecknoe, 2000).

A substantial body of econometric research has examined the relationship between teacher training and student achievement (Hanushek, 1986). Several studies report positive effects of teacher training on student outcomes (Wayne & Youngs, 2003; Rice, 2003; Wilson et al., 2001; Clotfelter et al., 2006). However, findings regarding teacher experience are mixed, with some studies reporting no significant relationship (Aaronson et al., 2007; Betts et al., 2003) and others identifying positive associations (Clotfelter et al., 2007).

In-service training is considered a key mechanism for facilitating educational change and improving instructional quality (Boulton-Lewis et al., 2001). Scholars emphasize the need for alignment between pre-service education, induction, and in-service training to address curricular reforms and skill upgrading (Aspland & Brown, 1993; Iredale, 1996; Malone et al., 2000). The role of teacher educators in professional development has been widely discussed, particularly in developing contexts, alongside critiques of teacher education practices (OECD, 2005; Loughran, 2006; Mayer et al., 2011; Reichenberg et al., 2015; Berliner, 2000; Nieme, 2002). Core dimensions of professional development—pedagogy, knowledge, beliefs, experience, and teaching behaviour have also been extensively examined (Coronel et al., 2003; Chitpin, 2011; Hadar & Brody, 2012; Goodwin & Kosnik, 2013; Loughran, 2014).

The integration of Information and Communication Technologies (ICTs) into ISTT has gained increasing attention, as ICT enhances instructional delivery and professional learning (Hughes, 2005; Hew & Brush, 2007; Jagannath & Jobanputra, 2011; Naaz, 2020). Education systems are therefore expected to regularly update ISTT frameworks to support effective technology integration (Bhattacharjee & Deb, 2016). The growth of online professional development reflects this shift (Macià & García, 2016; Bragg et al., 2021; Dille & Røkenes, 2021). While online ISTT offers benefits such as flexibility, networking, and cost efficiency (Kim et al., 2017; Rets et al., 2020; Howard, 2021), concerns remain regarding individual needs, cultural diversity, and communication barriers (Jayatilleke et al., 2017; Zhang et al., 2016; Dille & Røkenes, 2021).

Empirical evidence suggests that teachers who participate in effective ISTT are better prepared to implement innovative instructional strategies, integrate new knowledge, and utilize technology (Sabri, 1997; Sokal & Sharma, 2014). Training approaches such as collaborative teaching, facilitator observation, professional learning communities, co-teaching, and participatory action research have been widely documented (Villa et al., 2013; Cavanagh, 2013; Morales, 2015). Nevertheless, scholars caution against overestimating training outcomes due to limitations in evaluation metrics and methodological rigor (Amadi, 2013; Zaslow, 2014; Newton, 2013; Lehiste, 2015). Despite these limitations, ISTT remains a key driver of teacher quality, professional motivation, and instructional effectiveness (Glickman, 1990; Bayar, 2014; Guskey, 2014; Zlatić et al., 2014; Borg, 2018).

Methods and Materials

Research Philosophy and Design

This study adopts a positivist research philosophy, employing a quantitative, cross-sectional survey design to examine principals' attitudes toward in-service teacher training and to test group differences based on gender, age, and administrative experience (Upadhyay et al. 2025). This approach is appropriate for hypothesis testing and statistical comparison of attitudes across predefined demographic categories.

Participants and Sampling: The study was conducted in India and involved 55 secondary school principals from public and private schools. Convenience sampling was used due to accessibility constraints. Participants' ages ranged from 30 to 60 years (M = 45.54, SD = 8.01) and were later categorized into three age groups: 30–40, 41–50, and 51–60 years, in line with the research objectives.

Data were collected using a structured questionnaire developed through consultation with school principals and teachers and informed by an extensive review of literature on in-service teacher training. The questionnaire comprised two sections: (i) demographic characteristics and (ii) principals' attitudes toward the professional impact of in-service teacher training.

A cross-sectional study was conducted in India to assess the attitudes of secondary school principals towards the professional impact of in-service training for teachers. A 3-page questionnaire was distributed to 55 principals, with questions grouped into two categories: demographic characteristics of principals, and attitudes on the impact of in-service teacher training. The questionnaire was developed in consultancy with principals and teachers, incorporating insights gained from a comprehensive literature review on in-service teacher training. This collaborative approach ensured that the tool effectively addresses the needs and perspectives of educators. Convenience sampling was used to collect the data. The first part of the questionnaire collected demographic information and the second part was the attitude of principals assessed by 25 questions that included closed and open-ended questions. The 22 close-ended answers were evaluated by a 5-point Likert rating scale ranging from strongly agree (score 1) to strongly disagree (score 5). The questions on attitude towards in-service training were centered on voluntary participation, influence on teachers' personality, relevance to school administration, impact on the adoption of new methods and ICT, and academic achievement of the school. The survey questions on attitude also addressed pre-service shortcomings, evaluation of training, and state policies regarding training. The suggestions and other observations were studied in open-ended questions that discussed problems associated with training and ways to improve. The reliability coefficient was accessed by Cronbach alpha of 0.65 for attitude.

Statistical Analysis

All the data from the filled-in questionnaires were collected and coded for each parameter to examine the principals' responses. The principals' ages ranged from 30 to 60 years, with a mean of 45.54 years and a standard deviation of 8.01. However, the variable "Age Group" was later categorized into three groups: 30-40, 41-50, and 51-60. The principals' answers were compared to identify the impact given their age, gender, and years of administrative experience as a principal on their responses. Scientific methods were used for the analysis of the Likert scale (Sulivan & Artino, 2013; Norman, 2010).

Descriptive statistics (mean and standard deviation) were used to describe principals' overall scores on attitude. Categorical data were represented as frequencies. The principals' attitude towards in-service training scores based on gender was analyzed using a t-test for comparison of mean scores of male and female principals. Similarly, the principal's attitude score based on age group and years of experience was analyzed using one-way ANOVA to compare mean scores. $P \leq 0.05$ was considered statistically significant. Data analyses were performed using the jamovi 2.3.28 for the Windows version.

Results

Demographic Characteristics

A total of 55 secondary school principals participated in the study. The mean age of respondents was 45.54 years (SD = 8.01), with the majority belonging to the 41–50 years age group. Of the participants, 36 (65.45%) were male and 19 (34.55%) were female. Regarding administrative experience, 49.09%

of principals had 6–10 years of experience, followed by 27.27% with 11–20 years and 23.64% with 0–5 years of experience (Table 1)..

Table 1: Demographic Profile of the Respondents

Characteristics	Values (mean ± SD/n (%)
Male	36 (65.45%)
Female	19 (34.55%)
Experience	
0-5	13 (23.64%)
6-10	27 (49.09%)
11-20	15 (27.27%)
Age Group	
30-40	16 (29.09%)
41-50	22 (40%)
51-60	17 (30.91%)

Gender Differences in Attitudes toward ISTT

An independent samples t-test was conducted to examine differences in attitudes toward in-service teacher training between male and female principals. The analysis revealed no statistically significant difference in overall attitude scores between male principals (M = 2.79, SD = 0.41) and female principals (M = 2.74, SD = 0.28), $t(42) = -0.31$, $p = 0.379$ (Table 2). The effect size was small (Cohen's $d = 0.14$), indicating negligible practical difference. Across all individual attitude items, none of the gender-based comparisons reached statistical significance ($p > 0.05$), supporting H01.

Age-Based Differences in Attitudes toward ISTT

A one-way ANOVA was performed to assess whether principals' attitudes toward ISTT differed across age groups (30–40, 41–50, and 51–60 years). The results showed no significant difference in overall attitude scores among the three age groups, $F(2, 63) = 1.06$, $p = 0.353$. Mean attitude scores were comparable across groups: 30–40 years (M = 2.48, SD = 0.37), 41–50 years (M = 2.64, SD = 0.31), and 51–60 years (M = 2.87, SD = 0.40). The effect size was small (Cohen's $d = 0.13$), confirming H02.

Experience-Based Differences in Attitudes toward ISTT

To examine differences based on years of administrative experience, a one-way ANOVA was conducted comparing principals with 0–5, 6–10, and 11–20 years of experience. The analysis indicated no statistically significant difference in overall attitude scores across experience groups, $F(2, 63) = 0.18$, $p = 0.836$ (Table 4). Mean scores were closely aligned: 0–5 years (M = 2.70, SD = 0.32), 6–10 years (M = 2.78, SD = 0.37), and 11–20 years (M = 2.81, SD = 0.41). The effect size was negligible (Cohen's $d = 0.03$), supporting H03.

This study represents the independent sample t-test for mean scores of male and female principals' attitudes toward in-service teacher training. The significance value for all factors is more than 0.05. There was no significant difference in the attitude scores for male principals (M=2.79, SD=0.409) and female principals (M=2.74, SD=0.279) conditions; t (42) = -0.310, p = 0.379. The effect size, measured by Cohen's d, was d = 0.143, indicating a small effect. These results suggest that there is no significant difference in the mean attitude scores of male and female principals toward in-service teacher training.

Table 2:

One-way ANOVA for comparison of mean scores of principals' attitudes toward in-service teacher training across three age groups

	30-40 N=16		41-50 N=22		51-60 N=17			
Factors	M	SD	M	SD	M	SD	F	P
Teachers participate in ISTT voluntarily	2.69	1.25	3.05	1.43	2.88	1.36	0.321	0.727
ISTT is an integral part of the profession	1.75	0.447	1.77	0.973	1.88	0.993	0.116	0.891
ISTT increases confidence among teachers	2.88	1.31	2.23	1.31	2.71	1.1	1.405	0.255
ISTT improves interpersonal skills	2.63	1.15	2.18	0.795	2.82	1.07	2.147	0.127
ISTT helps teachers with time management	2.63	1.15	2.18	0.795	2.82	1.07	2.147	0.127
Teachers discuss ISTT learning with the principal	2.69	1.4	1.5	0.512	2	0.866	7.236	0.002
ISTT facilitates school administration	2.25	0.931	2.77	1.19	2.82	1.07	1.438	0.247
ISTT participation increases motivation at work	3.25	1.13	2.64	1.09	2.76	1.25	1.386	0.259
ISTT addresses pre-service training shortcomings to some extent	2.56	0.727	2.5	0.74	2.29	0.686	0.645	0.529
ISTT implements state education policies only	3.75	1.06	3.73	1.08	4.18	0.809	1.141	0.327
ISTT impacts personal development negatively	4.19	0.75	3.95	0.722	3.76	0.903	1.183	0.314

	30-40 N=16		41-50 N=22		51-60 N=17			
Factors	M	SD	M	SD	M	SD	F	P
Female and male teachers show equal impact of ISTT	3.44	1.15	3.36	1.26	3	1.12	0.67	0.516
Teachers with less experience show more enthusiasm for ISST	2.63	1.15	2.18	0.795	2.82	1.07	2.147	0.127
ISTT gives a sense of ownership and responsibility to some extent	2.25	0.775	2.14	0.64	2.18	0.529	0.142	0.868
ISTT provides a platform for collective brainstorming for effective earning	2.94	0.998	2.27	0.985	3.18	1.42	3.324	0.044
ISTT leads to innovative methods of teaching	2.38	1.2	2.68	0.995	2.82	1.13	0.716	0.494
ISTT influences ICT use in teaching only partially	3.63	1.02	3.27	1.16	3.65	1.41	0.599	0.553
ISTT enhances content delivery	3.13	1.26	2.64	1.26	2.41	0.87	1.654	0.201
ISTT promotes knowledge on choice and use of effective teaching methods	2.38	1.02	2.68	1.13	2.71	1.16	0.466	0.63
School management facilitates the implementation of ISTT learning	2.44	1.09	1.77	0.752	2.59	1.28	3.47	0.038
ISTT learnings are evaluated in school to some extent	3.06	1.06	3	1.15	3.35	1.22	0.487	0.617
ISTT has little impact on academic achievement	3.25	0.775	3.5	1.19	3.53	1.07	0.363	0.697

Table 2 compares the mean scores of principals of three different age groups regarding attitudes toward in-service teacher training. The mean scores and standard deviation for each age group were: 30-40 (M=2.48, SD=0.370), 41-50 (M=2.64, SD=0.31), and 51-60 (M=2.87, SD=0.40). We conducted a one-way ANOVA to compare the means of the three groups. A one-way ANOVA revealed no significant difference in the mean scores of principals of different age groups, $F(2,63) = 1.06$, $p = 0.353$. The effect size, measured by Cohen's d, was $d = 0.128$, indicating a small effect.

The mean scores of principals with different years of administrative experience about attitudes toward in-service training across 22 factors. The mean scores and standard deviation of the different years of administrative experience as a principal are as follows: 0-5 years (M=2.70, SD=0.32), 6-10 years (M=2.78, SD=0.37), and 11-20 years (M=2.81, SD=0.41). We conducted a one-way ANOVA to compare the means of the three groups. A one-way ANOVA revealed no significant difference in the

mean scores of principals' attitudes with different years of experience, F (2,63) = 0.179, p =0.836. The effect size, measured by Cohen's d, was d =0.034, indicating a small effect.

Discussion

This study examined secondary school principals' attitudes toward the professional impact of in-service teacher training and explored how different attitudinal dimensions interact. The findings indicate an overwhelmingly positive perception, with 89% of principals identifying in-service training as an essential component of the teaching profession. This aligns with evidence that structured professional development enhances pedagogical effectiveness, teacher–learner communication, and the adoption of effective instructional practices (OECD, 2019; Manso et al., 2019).

Consistent with prior research, principals perceived in-service training as a catalyst for positive changes in teachers' beliefs, attitudes, and instructional practices, ultimately improving student learning outcomes (Guskey, 2002; Day & Sachs, 2004; Avalos, 2011). Although principals strongly endorsed professional development, participation was not always voluntary. Younger principals (30–40 years) and those with less administrative experience were more supportive of voluntary participation, while barriers such as work–family conflict, compulsory attendance, lengthy programs, and dissatisfaction with prior training were reported—findings echoed in earlier studies (Damianidou, 2021; Slan-Jerusalim & Chen, 2009; Karagiorgi & Symeou, 2007).

Gender emerged as a meaningful factor influencing attitudes toward training. In line with earlier evidence, female teachers were perceived to benefit more from in-service training and demonstrated more favorable professional attitudes (Bozdogan et al., 2007; Capa & Cil, 2000; Fazilet, 2014). Principals also highlighted the role of training in enhancing teachers' personal and professional development, reinforcing the view that professional growth is an ongoing, reflective process shaped by experience and openness to change (Bredson, 2003; Segon & Booth, 2010; Cross & Papadopoulos, 2001; Nastasa & Cazan, 2013).

The integration of ICT and innovative teaching methods was another critical outcome. While principals acknowledged limitations in teachers' technological competencies particularly among senior teachers most believed that in-service training effectively promotes ICT adoption and pedagogical innovation. This supports existing literature emphasizing the transformative role of technology-oriented professional development in modern classrooms (Chavis & Kim, 2015; Spazak, 2013; Afshari et al., 2009).

Principals also emphasized the importance of training evaluation, noting improvements in teachers' self-evaluation practices and student assessment. However, systematic evaluation of training outcomes remained limited, despite its recognized importance for sustainable professional development (King, 2014; Borg, 2018). Less experienced and female principals demonstrated greater enthusiasm for applying and evaluating training outcomes.

Finally, principals strongly associated in-service teacher training with improved academic achievement. By fostering reflective practice, student-centered instruction, and professional conduct, such training contributes to classroom environments conducive to learning and academic success (Hopkins & Stern, 1996; Kazmi et al., 2011; Johnson & Sloat, 1980; Linnenbrink & Pintrich, 2002).

Conclusion

Principals must recognize that to improve the quality of education and provide students with the best possible learning experiences, investing in the professional development of teachers through in-service training is essential. Teachers are the backbone of our education system, and the impact of investing in their continuing education is directly reflected in their effectiveness in the classroom. In-service training offers teachers the opportunity to enhance their teaching techniques, incorporate innovative technologies, and address the unique needs of their students. It fosters a culture of continuous learning that motivates teachers to stay up-to-date with the latest developments in their field. Effective strategies should be implemented to cater to the needs of both educators and learners. The training should be personalized and tailored to meet the specific requirements of the teachers. Principals should employ a multi-layered evaluation mechanism to ensure that the training achieves its desired goal of teaching-learning improvement. Principals need to prioritize the ongoing development of teachers to enhance the quality of education and provide students with the best possible learning experiences.

Authors' Contributions

K.M. Joshi conceptualized the study and provided overall academic supervision. **Kinjal V. Ahir** contributed to the research design, literature review, and methodological refinement. **Govinda Raj Upadhyay** (Corresponding Author) conducted statistical analysis and prepared the initial draft of the manuscript. Professor **Ashutosh Priya** guided data interpretation and critically reviewed the manuscript to enhance its academic rigor and policy relevance. **Dharma Dev Bhatta** assisted in data validation, and manuscript editing. All authors read and approved the final manuscript and take responsibility for its content.

References

Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the Chicago Public High Schools. *Journal of Labor Economics, 25*(1), 95–135. http://dx.doi.org/10.1086/508733

Afshari, M., Bakar, K. A., Luan, W. S., Samah, B. A., & Fooi, F. S. (2009). Factors affecting teachers' use of information and communication technology. *International Journal of Instruction, 2*(1), 77-104. http://eric.ed.gov/?id=ED524156

Amadi, M. N. (2013). In-service training and professional development of teachers in Nigeria: Through open and distance education. Paper presented at the Annual Meeting of the Bulgarian Comparative Education Society (11th, Plovdiv, Bulgaria, May 14–17, 2013).

Aspland, R., & Brown, G. (1993). Keeping teaching professional. In Bridges, D., & Kerry, T. (Eds.) *Developing teachers professionally: reflections for initial and in-service trainers*, Routledge.

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and Teacher Education, 27*(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007

Bayar, A. (2014). The components of effective professional development activities in terms of teachers' perspective. *International Online Journal of Educational Sciences, 6*(2), 319–327. http://dx.doi.org/10.15345/iojes.2014.02.006

Berliner, D. C. (2000). A personal response to those who bash teacher education. *Journal of Teacher Education*, *51*(5), 358–371. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=090e5ba8fd97ee109c88431bcfde99d5119f6e86

Betts, J. R., Andrew, C. Z., & Lorien, A. R. (2003). Determinants of student achievement: New evidence from San Diego. Public Policy Institute of California, San Diego. https://www.ppic.org/wp-content/uploads/content/pubs/report/R_803JBR.pdf

Bhattacharjee, B., & Deb, K. (2016). Role of ICT in 21st Century's Teacher Education. *International Journal of education and Information Studies*, *6*(1), 1-6. https://www.ripublication.com/ijeis16/ijeisv6n1_01.pdf

Borg, S. (2018). Evaluating the Impact of Professional Development. *RELC Journal*, *49*(2), 195-216. https://doi.org/10.1177/0033688218784371

Boulton-Lewis G. M., Smith D. J. H., McCrindle A. R., Burnett P. C., & Campbell K. J. (2001). Secondary teachers' conceptions of teaching and learning. *Learning and Instruction, 11*(1) 35-51. https://doi.org/10.1016/S0959-4752(00)00014-1

Bozdogan, A. E., Aydin, D., & Yildirim, K. (2007). Teachers attitudes towards teaching profession. *Kirsehir Journal of Education, 8*(2), 83-97.

Bragg, L. A., Walsh, C., & Heyeres, M. (2021). Successful design and delivery of online professional development for teachers: A systematic review of the literature. *Computers and Education*, 166. https://doi.org/10.1016/j.compedu .

Bredson, P. V. (2003). *Design for Learning,* Thousand Oaks, SAGE.

Bullough, R. V. Jr., & Baughman, K. (1997). *First-year teacher' eight years later: An inquiry into teacher development*, Teachers College Press, New York.

Capa, Y., & Cil, N. (2000). Teachers' attitudes towards teaching profession: An investigation of different variables. *Hacettepe University Journal of Education, 18*, 69-73.

Cavanagh, S. (2013, June 11). Rapid rise seen in use of digital tools for PD. *Education Week. https://www.edweek.org/teaching-learning/rapid-rise-seen-in-use-of-digital-tools-for-pd/2013/06*

Chavis, K., & Kim, K. (2015). Technology integration preparation and professional development of preservice teachers. In Rutledge, D., & Slykhuis, D. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2015,* Association for the Advancement of Computing in Education (AACE), Chesapeake, VA, 2247-2254.

Cheng, E. W. (2016). Maintaining the transfer of in-service teachers' training in the workplace. *Educational Psychology, 36*(3), 444-460. http://dx.doi.org/10.1080/01443410.2015.1011608

Chitpin, S. (2011). Can mentoring and reflection cause change in teaching practice? A professional development journey of a Canadian teacher educator. *Professional Development in Education, 37*(2), 225-240. http://dx.doi.org/10.1080/19415257.2010.531625

Chuene, K., Lubben, F., & Newson, G. (1999). The views of pre-service and novice teachers on mathematics teaching in South Africa related to their educational experience. *Educational Research, 41*(1), 23-34. https://doi.org/10.1080/0013188990410103

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2006). Teacher-Student Matching and the Assessment of Teacher Effectiveness. *Journal of Human Resources, 41*(4), 778-820. https://econpapers.repec.org/article/uwpjhriss/v_3a41_3ay_3a2006_3ai_3a4_3ap778-820.htm

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). *Teacher credentials and student achievement in high school: a cross-subject analysis with student fixed effects*. CALDER Working Paper No. 11, Washington DC.

Cochran-Smith, M. (2004). Defining the outcomes of teacher education: What's social justice got to do with it? *Asia-Pacific Journal of Teacher Education, 32*(3), 194-212. http://dx.doi.org/10.1080/1359866042000295370

Coronel, J., Carrasco, M., Fernandez, M., & Gonzalez, S. (2003). Qualities of collaboration, professional development and teaching improvement: An experience in the university context. *Journal of Education for Teaching: International Research and Pedagogy*, *29*(2), 125-147. http://dx.doi.org/10.1080/0260747032000092620

Cross, M. C., & Papadopoulos, L. (2001). *Becoming a therapist: a manual for personal and professional development*, Brunner-Routledge.

Damianidou, E. (2021). Obligatory professional training for in-service teachers: Worthy time or a waste of time? *European Journal of Teacher Education, 47*(1), 1-18. http://dx.doi.org/10.1080/02619768.2021.1961734

Day, C., & Sachs, J. (2004). *International Handbook on the Continuing Professional Development of Teachers*, Open University Press, Maidenhead, UK.

MHRD (2020). *National Education Policy 2020*. Ministry of Human Resource Development, Government of India, New Delhi.

Dille, K. B., & Røkenes, F. M. (2021). Teachers' professional development in formal online communities: A scoping review. *Teaching and Teacher Education, 105*(2). https://doi.org/10.1016/j.tate.2021.103431

Dreer, B., Dietrich, J., & Kracke, B. (2017). From in-service teacher development to school improvement: Factors of learning transfer in teacher education. *Teacher Development, 21*(2), 208-224.

Eristi, S. D., Kurt, A. A. & Dindar, M. (2012). Teachers' views about effective use of technology in classrooms. *Turkish Online Journal of Qualitative Inquiry, 3*(2), 30-41.

Essel, R., Badu, E., Owusu-Boateng, W., & Saah, A. A. (2009). In-service training: an essential element in the professional development of teachers. *Malaysian Journal of Distance Education, 11*(2), 55-64. http://mjde.usm.my/vol11_2_2009/mjde11_2_4.pdf

Fazilet, T. (2014). Analyzing the attitudes of teachers towards in-service trainings according to various variables. *Procedia - Social and Behavioral Sciences, 116*, 884-887.

Flecknoe, M. (2000). Can continuing professional development for teachers be shown to raise pupils achievement? *Journal of In-Service Education, 26*(3), 437–457. http://dx.doi.org/10.1080/13674580000200144

Fraser, C., Kennedy, A., Reid, L., & McKinney, S. (2007). Teachers' continuing professional development: Contested concepts, understandings and models. *Journal of In-Service Education, 33*(2), 153-169.

Gilbert, L. (2005). What helps beginning teachers? *Educational Leadership, 62*(8), 36-39.

Glickman, C. D. (1990). *Supervision of instruction: A development approach.* (2nd ed.). Prentice Hall Inc., London.

Goodwin, A. L., & Kosnik, C. (2013). Quality teacher educators = quality teachers? Conceptualizing essential domains of knowledge for those who teach teachers. *Teacher development: teacher education futures*, *17*(3), 334-346.

Guskey, T. R. (2000). *Evaluating Professional Development.* Corwin Press.

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and teaching: Theory and practice*, *8*(3/4), 381–391. http://dx.doi.org/10.1080/135406002100000512

Guskey, T. R. (2014). Planning professional learning. *Educational, School, and Counseling Psychology Faculty Publications, 71*(8), 10-16.

Hadar, L. L., & Brody, D. L. (2012). The interaction between group processes and personal professional trajectories in a professional development community for teacher educators. *Journal of Teacher Education, 64*(2), 145-161. https://doi.org/10.1177/0022487112466898

Halpin, D., Croll, P., & Redman, K. (1990). Teachers' perceptions of the effects of in-service education. *British Educational Research Journal, 16*(2), 163–177. https://www.jstor.org/stable/1500847

Hanushek, E. A. (1986). The Economics of schooling: Production and efficiency in public schools. *Journal of Economic Literature*, *24*(3), 1141-1177. https://www.jstor.org/stable/2725865

Hawley, W. D., Rosenholtz, S. J., Goodstein, H., & Hasselbring, T. (1984). Good schools: What research says about improving student achievement. *Peabody Journal of Education, 61*(4), 1-178. https://eric.ed.gov/?id=EJ314588

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Education Technology Research Development, 55*, 223–252. https://doi.org/10.1007/s11423-006-9022-5

Hopkins, D., & Stern, D. (1996). Quality teachers, quality schools: International perspectives and policy implications. *Teaching and teacher education, 12*(5), 501-517. https://doi.org/10.1016/0742-051X(95)00055-O.

Howard, Natalie-Jane (2021). Barriers and drivers in online micro-course professional development: Navigating issues of teacher identity and agency. *Teaching and Teacher Education, 105*. https://doi.org/10.1016/j.tate.2021.103397

Hughes, J. (2005). The role of teacher knowledge and learning experiences in forming technology-integrated pedagogy. *Journal of Technology and Teacher Education, 13*(2), 277–302. https://www.learntechlib.org/primary/p/26105/

Iredale, R. (1996). The significance of teacher education for international development. In Brock C. (Ed.) *Global Perspectives on Teacher Education*, 9-18.

Jagannath, S., & Jobanputra, R. (2011). Facilitating active learning in distance education: an experience from India. 3rd International Congress on Engineering Education: Rethinking Engineering Education, The Way Forward, ICEED 2011, 24–27. https://doi.org/10.1109/ICEED.2011.6235353

Jayatilleke, B. G., Kulasekara, G. U., Kumarasinha, M. B., & Gunawardena, C. N. (2017). Implementing the first cross-border professional development online course through international E-mentoring: Reflections and perspectives. *Open Praxis*, *9*(1), 31-44. https://doi.org/10.5944/openpraxis.9.1.461

Jennings, P. A., & Frank, J. L. (2015). Inservice preparation for educators. In Durlak, J., Domotrovich, C. E., Weissberg, R., & Gullotta, T. P. (Eds.) *Handbook of Social and Emotional Learning*, The Guilford Press. 422-438.

Johnson, J. L., & Sloat, K. (1980). Teacher training effects: real or illusory? *Psychology in the Schools, 17*(1), 109- 114. https://eric.ed.gov/?id=EJ217304

Karagiorgi, Y., & Symeou, L. (2007). Teachers' in-service training needs in Cyprus. *European Journal of Teacher Education, 30*(2), 175–194. https://doi:10.1080/02619760701275487

Kazmi, S. F., Pervez, T., & Mumtaz, S. (2011). In-service teacher training in Pakistani schools and Total Quality Management (TQM). *Interdisciplinary Journal of Contemporary Research in Business, 2*, 238-248.

Kim, M. K., Xie, K., & Cheng, S. L. (2017). Building teacher competency for digital content evaluation. *Teaching and Teacher Education, 66*, 309–324. https://doi.org/10.1016/j.tate.2017.05.006

King, F. (2014). Evaluating the impact of teacher professional development: An evidence-based framework. *Professional Development in Education, 40*(1), 89–111. https://doi.org/10.1080/19415257.2013.823099

Knapp, M. S. (2003). Professional development as a policy pathway. In Floden, R. E. (Ed.) *Review of research in education, 27,* 109–157, American Educational Research Association, Washington, DC.

Lehiste, P. (2015). The impact of a professional development program on in-service teachers' TPACK: A study from Estonia. *Problems of Education in the 21st Century*, *66*(1), 18-28. http://dx.doi.org/10.33225/pec/15.66.18

Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an enabler for academic success. *School Psychology Review, 31*(3), 313-327. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=abd55fce50cb61333252e6f30a6f03179c5f72e1

Livingston, K. (2016). Teacher education's role in educational change. *European Journal of Teacher Education*, *39*(1), 1–4, https://doi.org/10.1080/02619768.2016.1135531

Loughran, J. J. (2006). *Developing a pedagogy of teacher education: Understanding teaching and learning about teaching.* 1st Ed. Routledge. https://doi.org/10.4324/9780203019672

Loughran, J. (2014). Professionally developing as a teacher educator. *Journal of Teacher Education, 65*(4), 271-283. https://doi.org/10.1177/0022487114533386

Macià, M., & García, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. *Teaching and Teacher Education, 55*, 291–307. https://doi.org/10.1016/j.tate.2016.01.021

Malone, D. M., Straka, E., & Logan, K. R. (2000). Professional development in early intervention: Creating effective inservice training opportunities. *Infants and Young Children, 12*(4), 53-62.

Manso, J., Matarranz, M., & Valle, J. M. (2019). Experiences and Reflections on the Initial Training of Secondary Education Teachers: Challenges and Alternatives. *Monograph, 23*(3), 15-33. https://doi.org/10.30827/profesorado.v23i3.9697

Mayer, D., Mitchell, J., Santoro, N., & White, S. (2011). Teacher educators and "accidental" careers in academe: An Australian perspective. *Journal of Education for Teaching, 37*(3), 247-260. https://doi.org/10.1080/02607476.2011.588011

Mercader, C., & Gairin, J. (2020). University teachers' perception of barriers to the use of digital technologies: The importance of the academic discipline. *International Journal of Educational Technology in Higher Education, 17*(1), 4-14. https://doi.org/10.1186/s41239-020-0182-x

Morales, M. P. E. (2015). Participation Action Research (PAR) cum Action Research (AR) in teacher professional development: A literature review. *International Journal of Research in Education and Science, 2*(1), 156–165. http://dx.doi.org/10.21890/ijres.01395

Naaz, I. (2020). Innovations in Open and Distance Learning (ODL), distance education and educational technology. In Husain, A. & Bahuguna, R. P. (Eds.), 338-344, Maktaba Jamia Ltd..

Nastasa, L. E., & Cazan, A. (2013). Personal and professional development of beginner psychologists. *Procedia - Social and Behavioral Sciences, 84*, 781 – 785. http://dx.doi.org/10.1016/j.sbspro.2013.06.646

Norman, G. (2010). Likert scales, level of measurement and the "laws" of statistics. *Advances in Health Science Education, 15*, 625-632. http://dx.doi.org/10.1007/s10459-010-9222-y

Newton, M. (2013). Styles and strategies of evaluating INSET. In Burgess, R., Connor, J., Galloway, S., Morrison, M., & Newton, M. (Eds.), *Implementing in-service education and training (2nd ed.)*, Routledge.

Nieme, H. (2002). Active learning-A cultural change needed in teacher education and schools. *Teaching and Teacher Education, 18*(7), 763–780. https://doi.org/10.1016/S0742-051X(02)00042-2

OECD (2005). *Teachers matter. Attracting, developing and retaining affective teachers,* OECD Publications.

OECD (2019). *Teachers and School Leaders as Lifelong Learners*, TALIS 2018 Results (Vol. I), OECD Publishing.

Okiror, J. J., Geoff, H., & Winterbottom, M. (2017). Towards in-service training needs of secondary school agriculture teachers in a paradigm shift to outcome-based education in Uganda. *Journal of Agricultural Education and Extension, 23*(5), 415–426. https://doi.org/10.1080/1389224X.2017.1338593

Osamwonyi, E. F. (2016). In-service education of teachers: Overview, problems and the way forward. *Journal of Education and Practice, 7*(26), 83-87. https://files.eric.ed.gov/fulltext/EJ1115837.pdf

Pennington, M. C. (1989). Faculty development for language programs. In Johnson, R. K. (Ed.), *The second language curriculum*, 91-110, Cambridge University Press.

Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal*, *44*(4), 921–958. https://doi.org/10.3102/0002831207308221

Reichenberg, R., Avissar, G., & Sagee, R. (2015). I owe to my tutor much of my professional development: Looking at the benefits of tutoring as perceived by the tutees. *Professional Development in Education, 41*(1), 40-56. https://doi.org/10.1080/19415257.2013.866974

Rets, I., Rienties, B., & Lewis, T. (2020). Transforming pre-service teacher education through virtual exchange: A mixed methods analysis of perceived TPACK development. *Interactive Learning Environments*, Advance online publication. https://doi.org/10.1080/10494820.2020.1826983

Rice, J. K. (2003). *Teacher Quality: understanding the effectiveness of teacher attributes.* ERIC.

Sabri, S. K. (1997). In-service teacher training programmes: The case of Palestine. *Journal of In-service Education*, 23(1), 113–118. https://doi.org/10.1080/13674589700200006

Saiti, A., & Saitis, C. (2006). In-service training for teachers who work in full-day schools: Evidence from Greece. *European Journal of Teacher Education, 29*(4), 455-470. http://dx.doi.org/10.1080/02619760600944779

Saleem, Z. (2016). Role of in-service teacher training in the professional development of prospective teachers. *Information and Knowledge Management, 6*(8), 53-60. https://core.ac.uk/reader/234672360

Segon, M., & Booth, C. (2010). Teaching ethics: Embedding ethics or stand-alone subjects in MBA programs. *The Australian Journal of Professional and Applied Ethics, 11*(1 & 2), 155-165.

Shewile, J., & Dembélé, M. (2007). *Global perspectives on teacher learning: Improving policy and practice,* International Institute for Educational Planning, UNESCO.

Slan-Jerusalim, R., & Chen, C. P. (2009). Work-family Conflict and Career Development Theories: A Search for Helping Strategies. *Journal of Counselling and Development, 87*(4), 492–499. http://dx.doi.org/10.1002/j.1556-6678.2009.tb00134.x

Sokal, L., & Sharma, U. (2014). Canadian in-service teachers' concerns, efficacy, and attitudes about inclusive teaching. *Exceptionality Education International, 23*(1), 59-71. http://dx.doi.org/10.5206/eei.v23i1.7704

Spazak, L. (2013). *Secondary preservice teachers' perception of preparedness to integrate technology* (Order No. 3558231), available from ProQuest Dissertations and Theses Global, 1348684152.

Sulivan, G. M., & Artino, A. R. Jr. (2013). Analyzing and Interpreting data from Likert-Type scales. *Journal of Graduate Medical College, 5*(4), 541-542. http://dx.doi.org/10.4300/JGME5-4-18

Upadhyay, G. R., Priya, A., Khadka, U., & Prasad, B. (2025). Household Willingness to Pay for Solid Waste Management in Dhangadhi Sub-Metropolitan City, Nepal. *Shiv Shakti International Journal of Multidisciplinary and Academic Research, 13*(6).

Villa, R., Thousand, J., & Nevin, A. (2013), *A guide to co-teaching: New lessons and strategies to facilitate student learning* (3rd ed.), Corwin Press, Thousand Oaks, California.

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains. *Review of Educational Research, 73*, 89-122. http://dx.doi.org/10.3102/00346543073001089

Wilson, S., Robert, E. F., & Joan, F. M. (2001). *Teacher preparation research: Current knowledge, gaps, and recommendations.* Center for the Study of Teaching and Policy, Seattle.

Zaslow, M. (2014). General features of effective professional development. In Ginsburg, H., Hyson, M., & Woods, T. (Eds.), *Preparing early childhood educators to teach math*, 97–115, Brookes Publishing.

Zhang, Z., Li, J., Liu, F., & Miao, Z. (2016). Hong Kong and Canadian students experiencing a new participatory culture: A teacher professional training project undergirded by new media literacies. *Teaching and Teacher Education, 59*, pp.146–158. https://doi.org/10.1016/j.tate.2016.05.017

Zlatić, L., Bjekić, D., Marinković, S., & Bojović, M. (2014). Development of teacher communication competence. *Procedia-Social and Behavioral Sciences, 116*, 606– 610. https://doi.org/10.1016/j.sbspro.2014.01.265