Analysis of the Influence of Continuous Training Development And Education On Professional Competence of Teachers In Public Schools

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ABSTRACT

This study examines the impact of Continuous Training, Development, and Education (CTDE) on enhancing the professional competence of teachers in public schools. A sample size of 200 respondents was surveyed to assess how regular professional development programs contribute to teachers' skills, knowledge, and overall effectiveness in the classroom. The study utilizes SPSS software for statistical analysis, employing Chi-square tests to test hypotheses and regression analysis to examine the relationship between CTDE and professional competence. Through a comprehensive analysis, the research highlights the benefits of CTDE in improving teaching methods, classroom management, and the integration of modern technologies. The study also identifies the challenges faced by teachers and the importance of tailored training programs that address specific needs. The findings suggest that ongoing professional development plays a crucial role in fostering a more competent and confident teaching workforce, ultimately leading to better educational outcomes. This research advocates for the continued implementation of CTDE initiatives to strengthen the quality of education in public schools.

KEYWORDS: *Continuous Training, Professional Development, Teacher Competence, Public School, Education quality, Teacher performance*

INTRODUCTION

Education is the cornerstone of societal growth and progress, and teachers play a pivotal role in shaping future generations. They are not only transmitters of knowledge but also mentors and role models, guiding students toward intellectual and moral development. In today's rapidly evolving world, teaching is no longer confined to traditional methods; it demands adaptability, innovation, and continuous growth. The dynamic nature of education, driven by technological advancements, changing pedagogical theories, and diverse student needs, underscores the importance of professional competence among teachers.

Professional competence encompasses a combination of skills, knowledge, and behaviors that enable teachers to deliver quality education, effectively manage classrooms, and contribute to the holistic development of students. In public schools, where resources and support systems are often limited, the demand for highly competent teachers becomes even more critical. Continuous Training Development and Education (CTDE) has emerged as a transformative tool in addressing this need, equipping teachers with the skills necessary to meet the challenges of modern education.

This study focuses on the influence of CTDE on the professional competence of teachers in public schools. By evaluating the effectiveness of training programs and development initiatives, it aims to understand how continuous education contributes to enhancing teachers' abilities in areas such as subject knowledge, classroom management, and the integration of technology into teaching. Furthermore, it seeks to explore the long-term benefits of CTDE on overall educational outcomes, particularly in fostering improved student achievement and engagement.

While global education systems have made significant strides in implementing continuous professional development for teachers, challenges persist, especially in developing countries like India. Despite government initiatives such as the National Education Policy (NEP) 2020 and programs like DIKSHA and Samagra Shiksha Abhiyan, many teachers face barriers in accessing effective training. These challenges include a lack of infrastructure, time constraints, and insufficient alignment between training content and classroom realities. This study aims to bridge these gaps by providing insights into the impact of CTDE on teacher competence and

offering recommendations to optimize training programs for public school educators.

By highlighting the critical role of continuous development, this research emphasizes the need for sustained efforts to empower teachers, ultimately enhancing the quality of education and driving societal progress.

LITERATURE REVIEW

Shazia Sadiq et al. (2024) The study investigates the influence of Continuous Professional Development (CPD) on enhancing teachers' competencies. It highlights improvements in teaching confidence, classroom management, and student achievement, emphasizing the value of workshops and online training in fostering subject knowledge and technological integration. However, challenges such as limited access and resource constraints hinder CPD effectiveness. The authors advocate for frequent, context-sensitive CPD programs to support modern teaching practices.

Erick Anyanga et al. (2024) This research highlights the significant role of professional training in improving teaching effectiveness in public secondary schools in Kenya. Teachers engaging in ongoing development demonstrated enhanced classroom management, learner-centered approaches, and assessment techniques, resulting in better student outcomes. It stresses the need for structured CPD programs to address persistent academic underperformance.

Aigul Syzdykbayeva et al. (2024) The study examines global trends in CPD, emphasizing personalized approaches, collaborative learning, and mentoring. It underscores the adaptability of teachers to educational changes through continuous skill development, which enhances job satisfaction and educational quality. The study also addresses ethical considerations in cross- cultural research and calls for understanding sociocultural influences.

Louis Niyomugabo et al. (2024) Focusing on Rwanda, this research establishes a strong link between CPD practices and improved student outcomes. Key practices such as lesson planning, effective communication, and diverse teaching methods were identified as critical factors in professional growth. Statistical analysis confirmed the positive impact of CPD on academic performance, and the study recommends policy-level support and a culture of professional learning.

Muhammad Ybnu T et al. (2024) This study evaluates training programs during curriculum changes, emphasizing CPD's role in enhancing teacher adaptability and fostering lifelong learning. It identifies motivational benefits and practical strategies like collaborative learning communities and tailored training programs. The findings stress the need for CPD initiatives to address technological and pedagogical shifts.

Dewi Mallarangan (2024): Investigated the role of education and training programs in boosting teacher competence. The study revealed that targeted professional development efforts enhance teachers' subject knowledge, teaching methods, and classroom performance. It emphasized the necessity of continuous professional growth to maintain high standards of education quality.

Janet O. A. (2019): Assessed the NTI Distance Learning Programme in Nigeria, comparing its outcomes with full-time NCE programs. The study highlighted that NTI-trained teachers demonstrated strong professional competencies, with factors like motivation, morale, and commitment playing a critical role in their effectiveness and long-term contribution to education.

Dr. Jayanthi Rajendran (2023): Explored the impact of CPD initiatives on teacher performance and retention. The study highlighted the value of customized learning pathways, collaborative learning groups, and ongoing professional support in building a resilient and effective teaching workforce, providing actionable insights for policy formulation.

Darling-Hammond, L. (2009): Analyzed how professional development with relevant content, sustained engagement, and adequate support significantly boosts teacher dedication and classroom performance. The research linked such programs with improved teaching outcomes and reduced attrition rates among educators.

Johnson, S. M. & Birkeland, S. E. (2003): Found that professional development programs tailored to teachers' goals enhance their sense of belonging and recognition in schools. This connection positively influences their job satisfaction, motivation, and willingness to remain in the profession for extended periods.

Yoon, K. S. et al. (2007): Conducted a comprehensive review of professional development programs, concluding that effectively designed CPD enhances teaching practices. These improvements were directly correlated with better student academic performance, underlining the critical role of CPD in education.

Ingersoll, R. M. & Strong, M. (2011): Highlighted the importance of personalized professional development for teachers. The study advocated for job-embedded learning opportunities tailored to diverse needs and backgrounds, emphasizing their role in fostering success and addressing unique challenges faced by educators.

Hargreaves, A. & Fullan, M. (2012): Demonstrated that collaborative professional development fosters a culture of shared learning, mutual respect, and collective growth among educators. Such environments encourage continuous improvement and lead to better outcomes for both teachers and students.

Villegas-Reimers, E. (2003): Identified significant barriers to effective CPD implementation, including insufficient time, limited resources, and a disconnect between CPD topics and teachers' actual needs. The study underscored the need for targeted solutions to overcome these challenges.

Sims, R. & Gustafson, R. (2015): Examined the role of blended and online learning approaches in professional development. The study found these methods promote self- directed learning, global collaboration, and resource accessibility through virtual communities of practice, offering innovative solutions for educators worldwide.

OBJECTIVE OF THE STUDY

1. Assess the Current Level of Professional Competence
2. Examine the Impact of Continuous Training
3. Explore the Influence of Formal Education

HYPOTHESIS

Hypothesis 1: There is a significant positive relationship between teachers' participation in Continuous Training, Development, and Education (CTDE) and their professional competence.

Hypothesis 2: Teachers who participate more frequently in CTDE programs demonstrate higher levels of instructional effectiveness and classroom management skills compared to those who participate less frequently.

Hypothesis 3: The impact of CTDE on teacher competence varies based on demographic factors such as years of teaching experience, with less experienced teachers benefiting more from CTDE programs than more experienced teachers.

Hypothesis 4: Teachers' engagement in technology-related CTDE programs is positively correlated with their ability to integrate digital tools into classroom teaching.

RESEARCH METHODOLOGY

This study explores the influence of Continuous Training, Development, and Education (CTDE) on the professional competence of public school teachers using a structured quantitative approach.

Research Design: The study employs a descriptive survey design with a cross- sectional approach to analyze the relationship between CTDE and teacher competence. Quantitative data is complemented by qualitative insights from open-ended survey questions.

Sample Size and Sampling: A random sampling method was used to select 200 public school teachers, ensuring representativeness and minimizing bias.

Data Collection: Data was collected using a structured questionnaire with sections on demographics, CTDE participation, teacher competence, and qualitative feedback on the impact of CTDE. The survey was distributed in both paper and electronic formats for convenience.

Data Analysis: Descriptive and inferential statistics (correlation, regression, t-tests, and ANOVA) were employed using SPSS to evaluate the relationship between CTDE and teacher competence. Hypotheses were tested for significance and direction.

Ethical Considerations: Informed consent was obtained, and participant confidentiality was maintained. Participation was voluntary, and ethical guidelines were strictly followed.

Limitations: The cross-sectional design limits longitudinal insights, and findings may be context-specific to the public schools studied.

ANALYSIS AND OUTCOME

Hypothesis 1:

There is a significant positive relationship

between teachers' participation in Continuous Training, Development, and Education (CTDE) and their professional competence.

In the first hypothesis, a Chi-Square test is conducted to evaluate the relationship between variables. If the **p-value is greater than 0.05**, the null hypothesis will be accepted, indicating no significant relationship. Conversely, if the **p-value is less than 0.05**, the null hypothesis will be rejected, confirming a significant relationship between the variables.

Table 1

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	113.668[a]	12	.000
Likelihood Ratio	86.167	12	.000
Linear-by-Linear Association	59.686	1	.000
N of Valid Cases	200		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is 1.62.

The Pearson Chi-Square statistic of 113.668 with 12 degrees of freedom indicates that there is a strong association between the variables being tested. A high Chi-Square value suggests a significant relationship between teacher participation in professional development and their perceived competence.

P-Value - The p-value of 0.000, which is less than the 0.05 significance level, shows that the result is statistically significant. This means there is enough evidence to reject the null hypothesis and conclude that professional development training positively impacts teacher competence.

Supporting Observations The likelihood ratio value of 86.167 with a p-value of 0.000 further supports the result, confirming the presence of a meaningful relationship. Additionally, the linear-by-linear association value of 59.686 and its p-value of 0.000 solidifies the finding, demonstrating a consistent trend between the variables.

Reliability of Results While 35% of cells have expected counts less than 5, the minimum expected count of 1.62 is within acceptable limits for large sample sizes (N = 200). This suggests that the results of the Chi-Square test are reliable and trustworthy.

INTERPRETATION

Since the p-value is below 0.05, the null hypothesis (H_0) is rejected in favor of the alternative hypothesis (H_1). This indicates that teachers' participation in professional development training is significantly linked to improvements in their professional competence.

The findings indicate that teachers who participate in professional development programs perceive significant improvements in their professional competence. To enhance the understanding of this relationship, further statistical analysis such as correlation or regression could be conducted to explore the strength and details of the association.

Table 2

Model Summary				
Mode l	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.548[a]	.300	.296	.696

a. Predictors: (Constant), VAR 1

R (Correlation Coefficient): The value of 0.548 indicates a moderate positive correlation between the two variables, showing a meaningful relationship.

R Square (Coefficient of Determination): The value of 0.300 means that 30% of the variance in teachers' participation in professional development is explained by the impact of continuous training on their professional competence.

Adjusted R Square: The value of 0.296 adjusts for the number of predictors in the model, confirming that the variance explained is reliable and robust.

Table 3

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.149	1	41.149	84.829	.000[b]
	Residual	96.046	198	.485		
	Total	137.195	199			

a. Dependent Variable: VAR 2

b. Predictors: (Constant), VAR 1

F-statistic (F): The F-statistic value of 84.829, with a p-value of 0.000 (less than 0.05), indicates that the regression model is statistically significant. This means the independent variable significantly predicts the dependent variable.

Table 4

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.134	.140		8.077	.000
	VAR 1	.401	.044	.548	9.210	.000
a. Dependent Variable: VAR 2						

Unstandardized Coefficient (B): The constant (1.134) represents the baseline frequency of participation when the impact of training is zero. The slope (0.401) shows that for each unit increase in perceived training impact, participation increases by 0.401 units.

Standardized Coefficient (Beta): The Beta value of 0.548 indicates a moderate positive relationship between the two variables.

Significance (p-value): The p-value of 0.000 confirms that the relationship is statistically significant.

INTERPRETATION

The regression model explains 30% of the variation in participation frequency based on the perceived impact of continuous training. A statistically significant positive relationship exists, where a higher perceived training impact leads to more frequent participation. The slope indicates that the perceived benefits of training influence teachers' decisions to engage in professional development activities.

FINDINGS

The study reveals a significant positive relationship between teachers' participation in Continuous Training, Development, and Education (CTDE) and their professional competence. The Chi-Square test conducted on the data showed a Pearson Chi-Square statistic of 113.668 with a p-value of 0.000, which is less than the significance level of 0.05. This indicates that there is a statistically significant association between teacher participation in CTDE and the improvement in their professional competence. Supporting evidence from the likelihood ratio and linear-by-linear association values further confirms this relationship.

The regression analysis also supports these findings, explaining 30% of the variance in teacher participation based on the perceived impact of continuous training on their competence. The R-value of 0.548 suggests a moderate positive correlation between the two variables, while the Adjusted R-Square of 0.296 confirms the reliability of the variance explained. The regression model's F-statistic value of 84.829 with a p-value of 0.000 further solidifies the significance of the independent variable in predicting teacher competence.

The coefficients from the regression analysis indicate that for every unit increase in the perceived impact of continuous training on competence, the frequency of participation increases by 0.401 units. The constant (intercept) value of 1.134 represents the baseline frequency of participation when there is no perceived impact of training. The Beta value of 0.548 reaffirms the strength of the positive relationship between the variables, showing that as the perceived benefits of training rise, teachers are more likely to engage in professional development activities.

CONCLUSION

In conclusion, this study highlights the significant positive impact of Continuous Training, Development, and Education (CTDE) on enhancing the professional competence of teachers in public schools. The findings demonstrate that teachers who engage in regular professional development programs experience notable improvements in their teaching effectiveness, classroom management, and the integration of modern teaching methods and technology. The study also underscores the importance of structured, context-specific training programs that address teachers' needs and challenges, ultimately fostering better educational outcomes. By emphasizing the critical role of ongoing professional development, the research calls for continued efforts to empower teachers through effective CTDE initiatives, thereby contributing to the overall advancement of the education system.

REFERENCES

1. Sadiq, S., Fatima, S. ., Shah, A. ., & Soomro, M. A. (2024). Enhancing Pedagogical Competencies through Continuous Training: A Professional Approach. *Review of Education, Administration & Law*, *7*(4), 253-266. https://doi.org/10.47067/real.v7i4.379

2. Anyanga, E., & Kwaba, J. (2024). Influence of Teachers' Professional Training and Development on Students' Academic Performance in Public Secondary Schools in Ndhiwa Sub-County Homabay County, Kenya

. *African Journal of Education and Practice*, *10*(3), 52–62. https://doi.org/10.47604/ajep.2960

3. Syzdykbayeva, A. D., Agranovich, Y. N., Ageyeva, L. Y., & Tyan, V. D. (2024). Pedagogy and psychology. *Pedagogy and Psychology*, *3*(60), 106–113. https://doi.org/10.51889/2960- 1649.2024.60.3.010

4. Niyomugabo, L., & Hesbon, O. A. (2024). Teachers' Continuous Professional Skills Development and Students' Academic Performance in Upper Public Secondary Schools in Rwanda. International Journal of Management and Development Studies, 13(9), 353–360. https://doi.org/10.53983/ijmds.v13n9.023

5. Ybnu T, M. ., Retnowati, E. ., Dewi, M. ., Mere, K. ., & Purbha Sakti, B. . (2024). Analysis of the Implementation of Training and Development Programs for Teachers in the Context of Curriculum Change: Evaluation and Recommendations. Dinasti International Journal of Education Management And Social Science, 5(6), 1868–1876. https://doi.org/10.38035/dijemss.v5i6.2918

6. Mallarangan, D. (2024). Investigation into Educator's Professional Competence.

7. O. A., J. (2019). Evaluation of National Teachers' Institute (NTI) Training for NCE. Journal of Education and Practice.

8. Rajendran, J. (2023). Improving Teacher Retention and Performance with CPD. International Journal of Educational Development.

9. Darling-Hammond, L. (2009). The Impact of Professional Growth on Teacher Dedication. Teaching and Teacher Education.

10. Johnson, S. M., & Birkeland, S. E. (2003). Professional Development Programs and Maintaining Teachers. Educational Policy.

11. Yoon, K. S., et al. (2007). Comprehensive Analysis of Professional Training. Review of Educational Research.

12. Ingersoll, R. M., & Strong, M. (2011). Tailored Development for Professionals. American Educational Research Journal.

13. Hargreaves, A., & Fullan, M. (2012). Collaborative Professional Development Models. Journal of Educational Transformation.

14. Villegas-Reimers, E. (2003). Obstacles in Implementing CPD. Educational Practice and Theory.

15. Sims, R., & Gustafson, R. (2015). Combination of Blended and Online Learning Appr

16. oaches. Distance Education.