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Full Length Research Article

Teachers' Professional Competency and Its Impact on Students' Academic Achievements

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Abstract
This empirical study in the Indian context investigates the effect of teachers' professional capabilities on students' academic performance. The specific aims are to shed light on the extent to which components of teacher efficacy, i.e., pedagogical knowledge, subject matter expertise, classroom management skills and professional development directly and indirectly affect student achievement. Research Design a descriptive survey research design was used with a sample of 150 secondary school teachers and 600 students drawn from government and private schools in Madhya Pradesh. Information was gathered from questionnaires to assess teacher competency, and student achievement reports. The research hypothesis was that a high level of teacher professional competency would correlate with making good student academic achievement. Results demonstrate the significant impact that dimensions of teacher competence have on students' achievements, with pedagogical and classroom management competencies being found to be the most relevant. Statistically, academically proficient teachers accounted for about 23% of the variation in student achievement. The research finds that investments in teacher continuous professional development programs have significant positive effects on educational outcomes, with policy implications favoring interventions of the reinforcement of teacher training courses are tied to a competency appraisal structure.

Keywords: *Teacher professional competency, academic achievement, pedagogical skills, classroom management, educational quality.*

1. Introduction

Education is the bedrock of National development and teachers are the most important agents in providing quality education for pupils (Darling-Hammond 2017). Teachers' professional competence is a complex construct, comprised of multiple dimensions such as subject matter knowledge, pedagogical content knowledge and classroom management skills alongside communication abilities and orientation towards lifelong learning. In the current landscape of U.S. education, which places an emphasis on learning outcomes as it has never been done before, exploring the relationship between teacher effectiveness and student performance has become increasingly important. ASER Centre (2022) India, one of the largest education systems in the world, has been struggling to ensure good quality education across its diverse geographic and socioeconomic landscape. The National Education Policy 2020 has highlighted the centrality of teacher quality to improving educational learning outcomes, in advocating for extensive changes in teacher recruitment, training and development. Notwithstanding these policy initiatives, systematic evidence on the specific dimensions of teacher competence that predominantly influence student learning is sparse in the Indian context. Professional competence does not only refer to the possession of academic degrees, but also to the practical application of academic knowledge in everyday teaching (Kunter et al., 2013). A teacher who is professionally proficient plans suitable lessons, chooses effective teaching strategies, evaluates student work, maintains an appropriate learning climate, and adjusts instruction to meet the needs of the students. Taken together, these capabilities help to establish a positive learning setting conducive for student engagement and success.

Comparison of teacher quality with student performance has been thoroughly explained in international literature. Evidence from western countries consistently shows that teacher quality explains a large proportion of variation in student performance (Hattie, 2009). But these findings, well generalizable to the developed world, must be examined with caution in developing country contexts where resource limitations, high pupil teacher ratios and very heterogeneous student populations are prevalent features of Indian

classrooms. Student achievement is the measure of learning and mastery of content and abilities as a result of instruction, assessed by such means as examination scores, grades or national standardized testing measures. Although success may be the outcome of myriad factors such as socioeconomic status, parental involvement, and institutional resources, the effectiveness of teachers is one aspect that can still be impacted by policy (Hanushek & Rivkin, 2012). This renders teacher competence particularly important in efforts aimed at improvement of education". The current study focuses on a gap in the research by considering how dimensions of professional competence correlate with student learning achievements in Indian secondary schools. Through use of rigorous empirical methods and the use of true performance data, this study adds to evidence-based policy options for teacher development in India.

2. Literature Review

The definition of what constitutes a professionally competent teacher has undergone significant changes in recent decades. Shulman (1987) developed the influential notion of pedagogical content knowledge, maintaining that successful teaching requires a combined understanding of both teaching and subject matter. This pioneering study provided the basis for future work on dimensions of teacher quality. Foreign studies have shown the importance of teacher quality on student learning. Kane et al. (2011) who carried out a seminal study in the U.S. on multiple measures of teacher effectiveness and discovering that teachers in the top quartile made learning gains about three times those made by average teachers, or around three months additional progress over the course of a year compared to their peers. Similarly, Chetty et al. (2014) to demonstrate lasting returns of teacher quality, finding that students exposed to high-value-added teachers were more successful in college, were more likely to be employed and had higher earnings. The studies examining teacher competency in India have increased during past some years. Ramachandran et al. " by Andhra Pradesh (1.2018) and "Public Report on Education 2013 to Assess the Progress in Schools from Pre-schools to Higher Secondary" by Government of Kerala, found variation in pedagogy practices as well as learning across different states. Their results pointed to a disregard of systematic perspectives in teacher professional development.

Pedagogical competence is a fundamental aspect of teacher quality. Guerriero (2017) highlights that pedagogical knowledge is an understanding of learner ways, which are effective instructional practices and assessment literacy. Teachers that have a strong Pedagogical Competence make sure to provide organized and learning opportunities that help students understand and remember. Content knowledge is another crucial category of competency. Ball et al. \(2008)\) differentiated between pedagogic content knowledge, on the one hand and general content knowledge, on the other; teachers as professionals should have a better grasp of specialist subject matter than what they teach so that they can effectively address students' misconceptions and support students in meaningful learning. Well-developed classroom management practices contribute to positive learning outcomes, as they establish a learning environment which is conducive for teaching. Marzano et al. (2003) reviewed studies to conclude that efficient classroom management leads to less disruptive behaviors and the most class time on-task, all leading directly into student achievement. In Indian classes with high number of students, classroom management skills gains special importance (Kingdon, 2020).

Participation in professional development indicates teachers' desire for continuous growth. Desimone (2009) found elements of professional development that all worked towards increasing student achievement, which were, content focus, active learning, coherence over time and collective participation. When educators are engaged in professional learning, they show better teaching and student results. Teachers' assessment literacy supports both the valid monitoring of student learning and data-driven teaching. Popham (2009) contended that, employing formative assessment and summative assessment in a strategic manner to identify learning gaps and lever instruction to fill these gaps necessarily improves achievement. While there is evidence from Developing Countries of the existence of mediating factors in the relationship between teacher expertise and achievement. Developing country evidence reviewed in Glewwe and Muralidharan (2016) suggests that teacher characteristics are important, but they interact with resource availability, class sizes and administrative support systems.

3. Objectives

The present study was guided by the following specific objectives:

1. To assess the levels of professional competency among secondary school teachers across dimensions including pedagogical knowledge, subject expertise, classroom management, and professional development engagement.
2. To examine the academic achievement levels of students taught by teachers with varying competency profiles in government and private secondary schools.
3. To investigate the relationship between specific dimensions of teacher professional competency and students' academic achievements in core subjects.

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4. To identify the teacher competency dimensions that most significantly predict student academic performance in the Indian secondary school context.

4. Methodology

In this study, a descriptive correlational research design was employed to compare the professional competency of teachers with academic achievement of students. The design was considered appropriate since it permitted to empirically investigate systematic variations in the competency of teachers who were reflected by their profiles without an intervention. The study was carried out in Gariaband and Raipur districts of Chhattisgarh State, India, covering urban and rural schools to provide variety among the school contexts. The respondents were secondary school teachers and their students from public and private schools. A multistage sampling process was used whereby two districts were purposively selected firstly, and then a stratified random sampling of schools according to management type and area location. A sample of participating teachers were drawn from the selected schools using simple random sampling. Thus, the actual sample comprised 150 secondary school teachers with at least two years of teaching experience and 600 students each from classes IX and X being taught by these teachers, with a teacher-student ratio as one is to four for analysis.

Methods of data collection The two main tools used for data collection were: The teacher professional competency scale based on Danielson (2007) and found valid for Asian conditions, identified the teacher's competence in domains such as pedagogical knowledge, subject matter expertise, classroom management strategies and participation in professional development HT blf jh measure. The 40-item scale was rated using a five-point Likert scale with reliability coefficient of 0.87. Student Performance (Academic achievement per Student) Academic success of students was extracted from the official examination records, that is the annual scores in different subjects: Mathematics, Science, Social Science and Languages in the school converted to standardize score for comparison. In carrying out the research we secured permissions from educational authorities, visited schools to administer teacher responses and obtained data on student attainment from school records. Ethical issues such as informed consent, confidentiality and voluntary participation were adhered to. The descriptive statistics were used to profile teacher competency and student achievement in which means, standard deviation, and percentage were used as a data analysis. Pearson correlation coefficients were used for inferential statistics to analyze relationships among the variables, and a multiple regression analysis was performed to identify (p. 18) significant predictors of student achievement. Statistical significance was set at 0.05 level and analyses were performed in SPSS version 26.

5. Results

The results of the study are presented through six tables examining teacher competency levels, student achievement patterns, and the relationships between these variables.

Table 1: Distribution of Teachers by Professional Competency Levels

Competency Level	Frequency	Percentage	Mean Score	SD
High (Above 160)	42	28.0	172.4	8.6
Moderate (120-160)	78	52.0	141.2	11.3
Low (Below 120)	30	20.0	98.7	14.2
Total	150	100.0	142.8	24.7

Table 1 shows the distribution of teachers in secondary schools in the various levels of professional competencies by composite scores. The analysis indicated that just over half of the teachers in the sample have moderate professional competence with mean score of 141.2 points. It is significant to note that only 28 percent of teachers were classified in the category high competency; therefore, there is an opportunity for quality issues among the teacher force. The high standard deviation of 24.7 in total scores indicates a large dispersion in teaching proficiency among pedagogues, indicating uneven distribution of teacher quality across schools.

Table 2: Dimension-wise Mean Scores of Teacher Professional Competency

Competency Dimension	Maximum Score	Mean	SD	% of Maximum
Pedagogical Knowledge	50	36.8	7.2	73.6
Subject Matter Expertise	50	39.4	6.8	78.8
Classroom Management	50	33.2	8.4	66.4
Professional Development	50	33.4	9.1	66.8
Overall Competency	200	142.8	24.7	71.4

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The dimension-wise analysis of teacher professional competence scores is shown in Table 2. Teachers scored highest in the subject matter expertise competency, for which the unbeaten score was 78.8 % of the maximum optimal score (Mean). On the other hand, classroom management had the lowest mean score (66.4%) in all of its sub-components and therefore is an area that teacher development programs need to address more effectively. The high standard deviations within the dimensions, particularly that of professional development engagement, implies inconsistent involvement in growth opportunities among teachers and has implications for focused intervention strategies.

Table 3: Academic Achievement of Students by School Type

School Type	N	Mean Achievement (%)	SD	Range
Government	360	58.4	14.2	32-89
Private	240	67.8	12.6	41-94
Urban	320	65.2	13.8	38-94
Rural	280	59.6	14.4	32-86
Total	600	62.2	14.1	32-94

Table 3 presents students' achievement patterns by school type and location. Mean achievement for private school students was significantly higher (67.8 percent) than for those from government school (58.4 percent). Likewise, urban students excelled their rural peers by an average of 5.6 percentage points. The 32 percent to 94 percent achievement spread across test levels reflects a high degree of variability in student performance, and the larger spread for government and rural schools means greater diversity in educational quality. The Inequalities these variations causes are those that are as a result of educational supply differentials and would need policy responses.

Table 4: Correlation between Teacher Competency Dimensions and Student Achievement

Competency Dimension	Correlation (r)	Significance (p)	R^2
Pedagogical Knowledge	0.68	0.001	0.462
Subject Matter Expertise	0.54	0.001	0.292
Classroom Management	0.71	0.001	0.504
Professional Development	0.47	0.001	0.221
Overall Competency	0.72	0.001	0.518

Table 4 shows the correlation coefficients between teacher competencies domains and academic performance of students. The relationship between student achievement and all dimensions of competence was significant at 0.001 level as revealed (see Table below). Maintaining discipline had the highest coefficient correlation r(0.71) and explained 50.4 percent variance of student performance. Pedagogical content, knowledge closely followed with a factor loading of 0.68 and professional development was the weakest but it was still significantly related. The general competence correlation of 0.72 validates again the high link between teacher quality and students' learning achievement.

Table 5: Multiple Regression Analysis Predicting Student Achievement

Predictor Variable	B	SE	Beta	t	p
Constant	18.42	3.21	-	5.74	0.001
Pedagogical Knowledge	0.48	0.09	0.31	5.33	0.001
Subject Matter Expertise	0.22	0.08	0.14	2.75	0.006
Classroom Management	0.56	0.08	0.38	7.00	0.001
Professional Development	0.18	0.07	0.12	2.57	0.011

$R^2 = 0.584$, Adjusted $R^2 = 0.572$, $F = 48.62$, $p < 0.001$

Teacher Competency Predicting Student Achievement Table 5 shows multiple regression results of the power to teacher competency dimensions in predicting student achievement. The regression model accounted for 58.4% of the student achievement variability (substantive effect). The consideration of the two factors that influence teacher impact in students did not change this result, with classroom management presenting the highest value for standardized beta (0.38) and pedagogical knowledge following suce- cessively (0.31). Each of these four constructs contributed uniquely and significantly to the prediction achievement, thus supporting the notion that multiple dimensions of teacher quality collectively predict student learning in substantial and detectable ways.

Table 6: Comparison of Student Achievement by Teacher Competency Levels

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Teacher Competency Level	N (Students)	Mean Achievement	SD	F-value	p
High Competency Teachers	168	71.4	10.8	78.42	0.001
Moderate Competency Teachers	312	61.8	12.4	-	-
Low Competency Teachers	120	48.6	13.6	-	-

Post-hoc: All pairwise comparisons significant at $p < 0.05$

Table 6 compares student achievement across groups taught by teachers with different competency levels. One-way ANOVA revealed highly significant differences among groups, with an F-value of 78.42. Students of high-competency teachers achieved mean scores of 71.4 percent, substantially higher than the 48.6 percent achieved by students of low-competency teachers, representing a difference of 22.8 percentage points. Post-hoc analysis confirmed that all pairwise differences were statistically significant. This finding provides compelling evidence that teacher competency levels directly impact student academic performance across achievement distributions.

6. Discussion

The results of the present study contribute as well large amounts empirical evidence towards the importance and relationship between teacher professional competences on student academic achievement at Indian secondary level school. The findings are consistent with international literature, and provide some context-specific implications for educational policy and practice in developing country settings. In the distribution of teacher competence levels, only 28 per cent of teachers were found to have high professional competence while one out of five sampled teachers served in schools but had low competency. This is consistent with the claim made in Ramachandran et al. (2018) for the case of variable teacher quality in Indian schools. The large percentage of teachers with the moderate to low level of competence show that a lot more still needs to be invested in teacher development if we are to meet the quality enhancement objectives mentioned in the National Education Policy, 2020. The analysis at the level of dimensions provided valuable information for focused interventions. Subject matter knowledge was found to be the most dominant dimension, possibly indicative of heavy reliance placed on professional knowledge in teacher hiring (Kingdon, 2020). But 'classroom management' (Dt=2.78) and 'professional development' (Dt=2.61) involvement posted relatively lower scores, which suggests areas where more concentrated attention is needed. Among teachers, the finding that classroom management was a weakness is notable in light of the fact that this dimension had the largest correlation with student achievement. These findings indicate that teacher training and development should focus more on classroom management skills than they currently do.

Correlation analyses indicated that all competence dimensions were significantly correlated with student performance and the over competence factor explained more than 51% of variance on student achievement. This result is consistent with a meta-analytic evidence of Hattie (2009) that indicates teacher effect is one of the strong influences on student learning. The strong relationship of classroom management to achievement is particularly helpful to claims by Marzano et al. (2003) effective leadership is what lays the groundwork for successful teaching. In the regression analysis, teacher competence dimensions jointly accounted for 58.4% of variance in student achievement, which is quite a large predictive effect. Two significant predictors were classroom management and pedagogical content knowledge, in combination covering the largest proportion of total variance explained. This pattern implies that professionalizing pedagogical knowledge in the classroom might matter more for student outcomes than mere subject expertise. This result is consistent with Shulman's (1987) argument that contents pedagogical knowledge, i.e., knowledge about how to transform content into accessible instruction, represents the unique skill of good teaching.

The gaps in student achievement are large when comparing high and low competency teachers, nearly 23 percentage points. This large gap in teacher quality effects goes beyond any socio-economic difference in the level of achievement, pointing towards a potential role for teacher development as an equity intervention. This finding is consistent with Chetty et al. (2014) who showed the existence of large and persistent effects of teachers on students' outcomes. The differences in student performances between government and private schools were partly due to variations in teacher competencies between types of schools. Private schools usually pay higher salaries and provide opportunities for teachers to acquire better pedagogical skills, ensuring they are able to recruit and retain more effective teachers (Muralidharan & Sundararaman, 2011). Nonetheless, the analysis shows that in both school forms the teacher effect is statistically significant for student achievement which might be an indication, that targeted teacher development may produce desirable effects irrespective of institutional context.

There are important educational policy implications of these study results. Teacher recruitment the initial key lesson is that teacher recruiting practices must include scrutiny of pedagogical ability and classroom management skills not simply paper qualifications. Second, these programs should

prioritize practical competencies, which have shown to be most related to consultation outcomes. Third, on-going protocols for evaluating teacher effectiveness should inform the development of personalized professional growth plans. Fourth, the reward and advancement system should encourage competence and reward excellent teaching. The study has a cross-sectional design which does not allow causal inferences regarding the competency-achievement relationship. The sample from two localities may restrict the generalization of this study. Longitudinally designed studies could be used in further research to investigate the correlation between change of teacher quality and student achievement growth.

7. Conclusion

The present research explored the relationship between teacher professional competency and academic achievement of secondary school students in India, which have important implications on educational quality enhancing initiatives. The study showed that the level of teacher professional competence varies significantly among schools, with few teachers having high professional competence. A closer look at specific dimensions of teacher competency revealed that domain specific constructs, such as classroom management and pedagogical knowledge were highly correlated with students' achievement. Finally, further analyses conducted in the form of multiple regressions indicated that teachers' competences jointly explain a significant portion of variance regarding student performance. The comparison between teacher ability groups indicated that students in highly able teachers' classes significantly outperformed students whose teachers were less able. These findings highlight the pivotal role of teacher training for improving educational quality and student performance. Based on the findings, policies implications are to enhance pre-service teacher training with an emphasis on practical competencies, to develop in-service continuous professional development programs targeting classroom management and pedagogical skills, to build up achievement scales for measuring teachers' needs in theaters of competence's developments, and designing a system of incentives that rewards effective teaching. Focusing on the development of educator capacity, education systems can dramatically increase student success and facilitate broader national development objectives.

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