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Impact of Constructivist Teaching Methods of Teaching Mathematics on Students' Achievement

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Abstract

This study aims to evaluate the effectiveness of constructivist teaching methods in secondary mathematics education in Nepal, with a focus on their impact on student achievement. The research examines the extent of constructivist teaching practices in Nepalese classrooms and their relationship with student performance. Data was collected through structured classroom observations, ensuring validity and reliability. The study reveals that while constructivist methods showed a positive correlation with student achievement, the implementation remains limited due to systemic constraints, such as curriculum rigidity and teacher training challenges. Comparative analysis across districts indicated no statistically significant differences between constructivist and traditional teaching approaches, suggesting the persistence of traditional teaching norms. The study found a moderate positive correlation between constructivist teaching practices and student academic performance, highlighting the potential benefits of student-centered learning methods. The findings emphasize the need for further research and educational reforms to fully integrate constructivist approaches in Nepal's mathematics classrooms.

Key Words: *Mathematics teachers; traditional method of teaching mathematics; constructivist method of teaching mathematics; students' achievement.*

Introduction

Constructivism is a learner-centered approach that emphasizes active knowledge construction rather than passive absorption (Piaget, 1950; Vygotsky, 1978). It underscores the role of prior knowledge, social interactions, and real-world applications in shaping learning outcomes (Bruner, 1966). In the field of mathematics education, constructivist teaching methods have emerged as a response to traditional rote learning approaches, advocating for active learning, collaborative engagement, and problem-solving strategies (Dewey, 1938).

Constructivist mathematics teaching fosters an environment where students engage in discussions, participate in problem-based learning, and develop conceptual understanding through guided discovery. Techniques such as collaborative learning, differentiated instruction, and manipulative use enhance student interaction with mathematical concepts (Jonassen, 1999). Unlike traditional instruction, where the teacher is the sole source of knowledge, constructivist methods encourage students to explore mathematical ideas, make connections, and construct their own understanding (Staub & Stern, 2002).

The increasing demand for student-centered pedagogical approaches has propelled the shift towards constructivist methods in mathematics classrooms. Research suggests

that these methods significantly improve student motivation, engagement, and academic performance (Hmelo-Silver, Duncan, & Chinn, 2007). However, despite their effectiveness, many educational institutions, especially in developing nations, continue to rely on lecture-based methods, often due to a lack of teacher training and resources (Bransford, Brown, & Cocking, 2000). This study explores the implementation of constructivist mathematics teaching in Nepal, assessing its impact on student achievement and the factors influencing its effectiveness in secondary schools.

Statement of the Problem

Mathematics education in many educational settings, including Nepal, remains dominated by traditional instructional practices, characterized by rote memorization and direct knowledge transmission (Chan & Elliott, 2004). Despite global advancements in pedagogical strategies, a significant gap persists in adopting constructivist teaching methods that emphasize active student participation, critical thinking, and problem-solving skills (Handal & Herrington, 2003).

One of the critical challenges is the resistance to pedagogical change among teachers. Many mathematics educators, shaped by traditional beliefs, continue to rely on direct instruction, perceiving it as the most efficient way to deliver content. Research highlights that teachers' instructional practices are often influenced by their beliefs, and unless these beliefs align with constructivist principles, meaningful change in classroom practice is unlikely (Mischo & Maab, 2013).

Additionally, the success of constructivist teaching heavily depends on factors such as teacher expertise, curriculum design, and student background. In resource-limited settings, inadequate training, lack of teaching materials, and large class sizes hinder the implementation of student-centered learning strategies (Windschitl, 2002). While empirical evidence supports the effectiveness of constructivist methods in enhancing student achievement, research in Nepalese classrooms remains scarce, raising questions about their practical applicability in different educational contexts (Staub & Stern, 2002).

This study aims to address these gaps by analyzing the status of constructivist mathematics teaching in Nepalese secondary schools and evaluating its impact on student achievement. Understanding these dynamics is essential for designing effective teacher training programs and curriculum reforms that can enhance learning outcomes in mathematics education.

Objectives of the Study

The aim of this study is to evaluate the effectiveness of constructivist teaching methods in mathematics education and their impact on student achievement. Other objectives include:

i. To analyze the extent to which constructivist teaching methods are applied in Nepalese secondary mathematics classrooms.

ii. To examine the relationship between constructivist teaching practices and student academic performance.

Research Questions

Constructivist teaching methods emphasize active learning, critical thinking, and problem-solving, making them essential for effective mathematics education. However, their implementation in Nepalese secondary classrooms remains uncertain, influenced by traditional teaching norms and resource constraints. Understanding the extent of their adoption can provide insights into current instructional practices and areas for improvement. Additionally, constructivist approaches are believed to enhance student engagement and academic performance by fostering deeper conceptual understanding. Examining their impact in Nepalese classrooms can offer valuable evidence on their effectiveness, guiding educators and policymakers toward more student-centered teaching strategies in mathematics education.

i. To what extent is constructivist teaching method implemented in secondary mathematics classrooms in Nepal?

ii. What is the impact of constructivist teaching method on student engagement and academic performance?

Review of Related Literature

Lerman (1983) identifies two distinct approaches to mathematics instruction: the traditional and constructivist perspectives. The traditional approach emphasizes structured knowledge transmission, where teachers play a central role in delivering content, explaining concepts, and ensuring direct knowledge transfer (Chan & Elliott, 2004). In contrast, the constructivist approach views teaching as a facilitative process that encourages students to engage actively in reasoning and knowledge construction (Chan & Elliott, 2004). This shift in perspective highlights the importance of student engagement in learning rather than passive reception of information.

Building on this, Kuhs and Ball (1986, as cited in Thompson, 1992) propose four perspectives on mathematics teaching, including a learner-centered approach. This approach prioritizes student exploration, personal strategy development, and conceptual understanding, with teachers acting as facilitators rather than direct instructors. Here, students take an active role in their learning, while teachers provide guidance and support when necessary. Such an approach aligns with the broader constructivist philosophy that emphasizes critical thinking and independent knowledge construction.

Despite the pedagogical advantages of constructivist methods, their effectiveness depends on teachers' willingness to embrace educational reforms. Handal and Herrington (2003) argue that if educators maintain traditional beliefs, they may struggle to implement student-centered teaching strategies effectively. They stress that transforming teachers' beliefs is essential for meaningful educational change, as beliefs about teaching and learning are deeply ingrained and evolve gradually through experience and reflection.

The impact of teachers' instructional beliefs on student performance is well-documented. Mischo and Maab (2013) found that teachers who adopt constructivist approaches tend to foster higher student achievement levels. Their study suggests that when curriculum materials successfully shape teachers' perceptions, this influence extends to students' academic success. Similarly, Staub and Stern (2002) emphasize that educators who rely on direct transmission methods are generally less effective in fostering deep mathematical understanding compared to those who employ

constructivist approaches. Their findings reinforce the idea that student-centered instructional styles contribute more effectively to mathematical proficiency than traditional teacher-centered methods.

Herrera and Carballo (2010) further support the strong connection between teachers' beliefs and instructional practices. They emphasize the importance of aligning teaching methodologies with modern educational philosophies to enhance student learning outcomes.

While existing research highlights the relationship between instructional practices and student achievement, several gaps remain. First, there is limited empirical evidence on how teachers' beliefs evolve over time and what factors influence these changes. Most studies focus on contrasting traditional and constructivist perspectives, leaving little exploration of hybrid approaches that blend elements from both. Additionally, research rarely examines how institutional policies and cultural contexts shape teachers' pedagogical beliefs and classroom practices. Finally, there is a need for more longitudinal studies to assess the long-term impact of shifting teachers' beliefs on student performance and engagement, particularly in diverse educational settings such as Nepal.

Conceptual Framework

This study is based on constructivist learning theories that emphasize active engagement, social interaction, and real-world applications in knowledge acquisition (Vygotsky, 1978). The conceptual framework explores the relationship between instructional strategies, student engagement, and academic achievement within constructivist mathematics education.

Independent Variable: Constructivist teaching methods, including active learning, collaborative learning, and problem-based instruction (Piaget, 1950).

Dependent Variable: Student achievement, measured through academic performance indicators such as test scores, class participation, and conceptual understanding (Dewey, 1938).

Moderating Variables: Teacher expertise, curriculum design, and student background, which influence the effectiveness of constructivist teaching methods (Bruner, 1966).

The study acknowledges that the success of constructivist teaching depends on various external factors, including teacher beliefs, institutional policies, and available resources. Research suggests that a well-structured constructivist learning environment enhances student motivation and academic success, if educators receive adequate training and support (Jonassen, 1999). This study will assess the strength of constructivist teaching practices in Nepalese secondary schools, considering factors such as years of teaching experience, educational background, and regional differences in implementation.

By examining the interplay between instructional strategies and student learning outcomes, this research will contribute to ongoing discussions on improving mathematics education through evidence-based pedagogical reforms

Research Methodology

The research methodology employed in this study is a quantitative survey design, focusing on secondary level mathematics teachers across various districts in Nepal. The target population for the study included all secondary-level mathematics teachers

in Nepal, with a specific focus on those working in community schools. The study sample consisted of mathematics teachers from four districts: Chitwan, Makawanpur, Gorkha, and Parsa. A total of 168 mathematics teachers were selected from 81 schools within these districts, representing a broad range of educational contexts and teaching environments.

Data Collection of the Study

The study employed a systematic data collection procedure to assess mathematics teachers' classroom practices through direct observation. Initially, permission was obtained from the District Education Offices and respective schools. The researcher visited each selected school, secured approval from the Head Teacher or Principal, and observed the mathematics teachers' classroom teaching. A structured observation form was used to document instructional practices, distinguishing between traditional and constructivist teaching approaches. The observation was conducted once per teacher, with notes recorded for further refinement of the form. To ensure validity, content validity methods (conceptual and operational definitions) were applied. Criterion-related validity was established through pilot observations of 23 teachers, yielding a correlation coefficient of 0.81 with the questionnaire scores. Reliability was confirmed using Cronbach's alpha, calculated at 0.863, indicating strong internal consistency. This rigorous process ensured that the observation form was both valid and reliable for assessing classroom practices.

Data Analysis Procedure of the Study

The collected data were analyzed using statistical techniques to examine the relationship between instructional practices and student achievement. The mean scores of teachers' constructivist and traditional classroom activities were computed, followed by a comparison using a t-test to determine significant differences. Additionally, correlation and regression analyses were conducted, with constructivist teaching approaches as the independent variable and students' achievement (based on GPA) as the dependent variable. The correlation analysis measured the strength of association between teaching practices and student outcomes, while the regression analysis assessed the predictive influence of constructivist teaching on academic performance. The t-test for correlation further validated the findings, ensuring statistical rigor. This analytical approach provided a comprehensive understanding of how different teaching methods impact student learning outcomes, reinforcing the study’s reliability and validity in evaluating the effectiveness of constructivist pedagogy in mathematics education.

Ethical Considerations

This study was conducted with a strong commitment to ethical research principles, ensuring the rights and well-being of all participants were respected. Before collecting any data, informed consent was obtained from teachers, students, and school administrators, emphasizing their voluntary participation. To protect privacy, all responses were coded, and collected data was securely stored, guaranteeing confidentiality and anonymity. Participants were reassured that their information would be used strictly for academic purposes. The research also followed ethical guidelines for classroom observations, ensuring minimal disruption to teaching and learning. Additionally, necessary approvals were secured from educational authorities, and careful measures were taken to reduce potential biases in data collection and analysis.

The researchers followed ethical guidelines by ensuring participants' information remained unchanged and obtaining consent from both the participants and relevant authorities. To maintain the study's credibility, they used well-established tools and techniques. The questionnaire was carefully validated through content and construct validity checks, while its reliability was confirmed using Cronbach's alpha and test-retest methods. These steps ensured the research met the ethical standards expected in social science studies.

Analysis of Quantitative Data and Interpretation of the Result

An observation form was systematically utilized to assess and evaluate the classroom practices of mathematics teachers, focusing on their instructional strategies, student engagement, and overall effectiveness in delivering mathematical concepts. Additionally, student achievement was measured by analyzing their Grade Point Average (GPA) in the Secondary Education Examination (SEE), providing a quantifiable indicator of their academic performance. This approach ensured a comprehensive understanding of both teaching methodologies and student learning outcomes, offering valuable insights into the relationship between classroom practices and student success in mathematics.

Comparison of Classroom Practice

Classroom practices in mathematics education can be broadly categorized into constructivist and traditional teaching methods. Constructivist teaching emphasizes student-centered learning, where students actively engage in constructing their own knowledge through inquiry and collaboration. In contrast, traditional teaching relies on direct instruction, where teachers deliver content, and students passively receive information. A comparative analysis of mathematics teachers' performance across different districts in Nepal including Chitwan, Gorkha, Makawanpur, and Parsa, provides insight into the impact of these two pedagogical approaches. The study measured teachers' classroom performance using mean scores, z-values, and P-values to determine the significance of differences in teaching methods.

Table 1 *Comparison between constructivist vs traditional activities of teaching mathematics*

Areas	Constructivist Mean	Traditional Mean	N	z-value	P-value	Remarks
Chitwan	5.72	5.38	54	1.2038	0.2287	IS
Gorkha	5.95	5.05	31	1.9180	0.0551	IS
Makawanpur	5.64	5.36	44	0.6445	0.5193	IS
Parsa	5.44	5.56	39	-0.2496	0.8029	IS
Nepal	5.68	5.32	168	1.6586	0.0972	IS

In Chitwan district, the mean performance score for teachers employing constructivist methods was 5.72, whereas for traditional methods, it was 5.38. Although constructivist teaching yielded a higher mean score, the P-value (0.2287) was greater than the 0.05 significance level. This indicates that the difference in performance between the two methods is not statistically significant. The results suggest that despite teachers' engagement in constructivist activities, their classroom practices still

align closely with traditional methods. This highlights a gap between teachers' espoused beliefs in constructivism and their actual classroom practices.

A similar trend was observed in Gorkha district, where the mean score for constructivist teaching was 5.95, compared to 5.05 for traditional methods. The z-value (1.9180) and P-value (0.0551) again indicate that the difference is not statistically significant. The findings suggest that while constructivist methods appear to enhance teacher performance, they are not sufficiently distinct from traditional methods to yield a significant difference. The results imply that teachers may be implementing constructivist techniques in a limited capacity or within a traditional framework, preventing a complete shift towards student-centered learning.

The results from Makawanpur district further reinforce this observation. The mean score for constructivist teaching was 5.64, compared to 5.36 for traditional methods, with a P-value of 0.5193, indicating no significant difference. Despite constructivist methods demonstrating a slight advantage, teachers' enacted beliefs and instructional approaches remain similar across both methods. This finding suggests that the integration of constructivist activities may not be deeply embedded in classroom practice, potentially due to systemic constraints such as curriculum structure, assessment policies, or teachers' familiarity with student-centered pedagogies.

In Parsa district, an interesting reversal was observed, where the mean score for traditional teaching (5.56) slightly exceeded that of constructivist teaching (5.44). The z-value (-0.2496) and P-value (0.8029) confirm no statistically significant difference. This suggests that traditional methods continue to be dominant, potentially due to cultural or institutional preferences for teacher-centered instruction. The findings indicate that the shift toward constructivist teaching is not fully realized, with traditional methods still playing a significant role in shaping mathematics instruction.

On a national level, the aggregate mean scores for constructivist and traditional teaching were 5.68 and 5.32, respectively, with a P-value of 0.0972. While the constructivist approach had a higher mean score, the lack of statistical significance suggests that teachers' classroom practices remain similar across both methodologies. This trend implies that while there is growing interest in constructivist teaching, actual classroom enactment continues to be influenced by traditional instructional norms. Future research should explore the factors limiting the full implementation of constructivist activities, such as teacher training, resource availability, and policy support, to enhance student-centered learning in mathematics education.

Relationship between Classroom Practice and Student Achievement

The relationship between classroom practice and student achievement is a critical area of inquiry in educational research. Based on statistical analysis, it is evident that the constructivist method of teaching mathematics has a moderate positive correlation with student achievement. The correlation coefficient of 0.5868 suggests a meaningful association between these two variables, as indicated by Rumsey's (2011) rule of thumb. Furthermore, regression analysis demonstrates that student achievement increases by 0.0178 units for every one-unit increase in constructivist teaching practices. The significance of this finding is further reinforced by a p-value of 0.0000, which is well below the threshold of 0.05, confirming the statistical reliability of the relationship. These results substantiate the argument that constructivist teaching methodologies positively influence students' academic success in secondary-level mathematics education in Nepal.

Table 2 *The relationship between teachers' classroom practice based on the constructivist method of teaching mathematics and students' achievements*

Correlation Coefficient	Number	Regression Coefficient	Intercept	t-value	P-value	Remarks
0.5868	81	19.3288	5.9835	6.4413	0.0000	S

Beyond classroom practices, the role of teachers' belief systems in shaping student achievement has also been explored. The correlation coefficient between teachers' beliefs and student achievement is 0.3061, indicating a low but positive relationship. The coefficient of determination (9.37%) suggests that approximately 10% of student achievement can be attributed to teachers' beliefs. Although this association is statistically significant, it highlights that other factors play a more substantial role in influencing student performance. The p-value remains below 0.05, reinforcing the validity of this connection. This finding underscores the complexity of educational outcomes, where multiple variables interplay to determine students' academic success.

The moderate correlation between constructivist teaching practices and student achievement suggests the effectiveness of engaging, student-centered methodologies in mathematics education. Constructivist approaches, which emphasize active learning, problem-solving, and conceptual understanding, appear to enhance student performance. This relationship is particularly relevant for secondary education in Nepal, where traditional rote-learning methods have often dominated. The positive correlation supports the need for pedagogical reforms that prioritize student interaction, inquiry-based learning, and practical application of mathematical concepts. The findings suggest that educational policies should promote constructivist strategies to improve learning outcomes at the secondary level.

Despite the significant relationship between constructivist teaching and student achievement, the lower correlation with teachers' belief systems suggests that other influential factors warrant further investigation. Elements such as students' socio-economic background, access to learning resources, parental involvement, and classroom environment may play crucial roles in shaping academic success. Future research should aim to identify and quantify these variables to develop a more comprehensive understanding of the determinants of student achievement. This study highlights the importance of an evidence-based approach to educational improvement, advocating for further exploration into the multifaceted influences on student learning outcomes.

Summary and Findings of the Study

The relationship between classroom practice and student achievement is a critical area of inquiry in educational research. Based on statistical analysis, it is evident that the constructivist method of teaching mathematics has a moderate positive correlation with student achievement. The correlation coefficient of 0.5868 suggests a meaningful association between these two variables, as indicated by Rumsey's (2011) rule of thumb. Furthermore, regression analysis demonstrates that student achievement increases by 0.0178 units for every one-unit increase in constructivist teaching practices. The significance of this finding is further reinforced by a p-value of 0.0000, which is well below the threshold of 0.05, confirming the statistical reliability of the

relationship. These results substantiate the argument that constructivist teaching methodologies positively influence students' academic success in secondary-level mathematics education in Nepal. The findings of the study were as follows:

i. A moderate positive correlation (0.5868) exists between constructivist teaching practices and student achievement, suggesting a meaningful relationship.

ii. Regression analysis indicates that student achievement increases by 0.0178 units for each additional unit of constructivist teaching practice, reinforcing its impact.

iii. Teachers' belief systems show a lower correlation (0.3061) with student achievement, implying that other factors significantly influence learning outcomes.

iv. Comparative analysis across districts in Nepal revealed no statistically significant difference between constructivist and traditional teaching methods, suggesting that classroom practices still align with traditional instruction.

v. National-level analysis indicates a growing interest in constructivist methods, yet traditional instructional norms remain dominant, highlighting the need for systemic changes to support active learning approaches.

The findings highlight the complex interplay between teaching methodologies and student achievement. While constructivist teaching has demonstrated a positive impact, its full implementation remains limited due to systemic and institutional constraints. Teachers' beliefs, though statistically significant, play a smaller role in determining academic success, emphasizing the need for further exploration into additional influencing factors such as socio-economic conditions, resource availability, and educational policies. Future research should focus on addressing these barriers to fully integrate student-centered learning methodologies and enhance overall educational outcomes in Nepal.

Discussion of Results

The findings of this study provide valuable insights into the relationship between classroom practices and student achievement in mathematics education at the secondary level in Nepal. The comparative analysis of constructivist and traditional teaching methods across various districts reveals that while constructivist approaches yielded slightly higher mean scores, the differences were not statistically significant. This outcome suggests that despite an increasing interest in student-centered learning, traditional instructional norms still persist in classroom settings. As noted by Vygotsky (1978), constructivist teaching emphasizes active engagement and knowledge construction; however, its effective implementation requires comprehensive teacher training and structural support, which may be lacking in the Nepalese educational context. The findings align with Piaget's (1952) constructivist theory, which posits that meaningful learning occurs through experiential interactions, yet its translation into practice remains inconsistent.

The district-level comparison indicates that in Chitwan, Gorkha, and Makawanpur, constructivist teaching methods resulted in marginally higher mean scores, though not significantly different from traditional approaches. Interestingly, in Parsa, traditional teaching exhibited a slightly higher mean score, highlighting potential cultural or institutional preferences for teacher-centered methodologies. These trends reflect

previous studies by Ernest (1991) and Cobb (1994), which argue that teachers' epistemological beliefs significantly influence their pedagogical choices. The persistence of traditional instructional methods, despite the apparent benefits of constructivist teaching, suggests that external constraints, such as curriculum rigidity and assessment pressures, may hinder a complete pedagogical shift (Bruner, 1996).

The correlation analysis further reinforces the positive association between constructivist practices and student achievement, with a correlation coefficient of 0.5868 indicating a moderate relationship. This supports the argument that student-centered teaching enhances learning outcomes, as emphasized in prior research by Hattie (2009), who found that active learning strategies significantly impact academic performance. Moreover, regression analysis confirms that student achievement increases by 0.0178 units for every additional unit of constructivist instruction, underscoring the pedagogical effectiveness of this approach. However, the relatively low correlation between teachers' belief systems and student achievement (0.3061) suggests that while instructional attitudes are important, other factors—such as socio-economic status, resource availability, and parental involvement—play a more substantial role in determining student success (Darling-Hammond, 2000).

Overall, the results suggest that while constructivist teaching methodologies have the potential to enhance student learning outcomes, their implementation remains constrained by systemic challenges. The study underscores the necessity of targeted teacher training programs, policy interventions, and resource allocations to facilitate a broader transition toward student-centered learning in Nepalese mathematics education. Future research should explore additional variables affecting student achievement, including school infrastructure, community engagement, and digital learning opportunities, to develop a more comprehensive framework for improving mathematics education in secondary schools.

Conclusions

These findings of this study underscore the intricate relationship between classroom practices and student achievement in secondary-level mathematics education in Nepal. While constructivist teaching methodologies demonstrated a moderate positive correlation with student performance, their full-scale implementation remains constrained by systemic challenges. The comparative analysis across districts revealed that, despite constructivist teaching yielding slightly higher mean scores, the differences were not statistically significant, suggesting a persistent reliance on traditional instructional methods. Furthermore, the study highlights that while teachers' beliefs about constructivist teaching play a role in shaping student outcomes, other influential factors such as socio-economic conditions, resource availability, and institutional support must be considered. These findings indicate the need for comprehensive educational reforms, including targeted teacher training and policy initiatives that encourage active, student-centered learning. Moving forward, efforts should focus on bridging the gap between theoretical constructivist principles and actual classroom practices to enhance overall mathematics education and student success in Nepal.

Implication

The study's findings have significant implications for educational policies, teacher training programs, and classroom practices in Nepalese secondary mathematics education. First, the moderate positive correlation between constructivist teaching and

student achievement suggests the need for educational institutions and policymakers to prioritize constructivist methodologies in curriculum design and pedagogical training. Teacher preparation programs should emphasize student-centered learning strategies and provide practical exposure to implementing constructivist principles effectively within diverse classroom settings.

Second, the absence of statistically significant differences between constructivist and traditional teaching methods implies that traditional instructional norms continue to dominate classroom practices. This highlights the necessity for systemic changes in assessment and curriculum design. Current examination structures often emphasize rote learning, which may discourage teachers from fully adopting constructivist approaches. Revising assessment frameworks to include problem-solving and inquiry-based tasks could incentivize teachers to integrate student-centered learning techniques more effectively.

Third, the findings suggest that teacher beliefs about constructivist pedagogy have a limited impact on student achievement compared to other factors such as socio-economic status and resource availability. This calls for a holistic approach to educational reform that considers not only teacher training but also the broader learning environment. Schools should be equipped with adequate resources, including instructional materials and technological tools, to support interactive and participatory learning experiences.

Fourth, district-level variations in teaching practices indicate that localized interventions are necessary to address context-specific challenges in implementing constructivist teaching. For instance, Parsa district exhibited a preference for traditional methods, suggesting that cultural and institutional factors may shape pedagogical choices. Conducting region-specific teacher development programs that align with local educational contexts could help facilitate a smoother transition toward student-centered instruction.

Lastly, the study reinforces the importance of ongoing research to further explore the barriers to constructivist teaching adoption. Future studies should investigate additional factors such as parental involvement, school leadership, and community engagement in shaping effective teaching methodologies. By addressing these variables, stakeholders can develop a more comprehensive strategy for improving mathematics education outcomes and fostering a more engaging and effective learning environment for students in Nepal.

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