



Perception of Teachers Towards Innovative Pedagogical Practices for Developing Foundational Literacy and Numeracy among Elementary Students in Sundargarh District, Odisha

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Abstract

This study explores elementary school teachers' perceptions of innovative pedagogical practices aimed at enhancing foundational literacy and numeracy (FLN) in Sundargarh district, Odisha. Recognizing the central role of FLN in early education and the emphasis placed on it by the National Education Policy (NEP) 2020. The research investigates how teachers perceive, interpret and implement several innovative approaches to enhance the efficacies within the foundational stage. The study is quantitative in nature and employs Descriptive Survey design. Further, a purposive selection of Rourkela city was followed by stratified random sampling of 80 elementary teachers across gender and institution type to ensure balanced representation and enhance the validity of the findings. Data were collected using a structured perception scale and analysed through descriptive and inferential statistics. Results indicate a generally favourable perception of innovative pedagogical practices, with institutional type showing a significant influence, while gender had no statistically significant effect. Despite a positive inclination towards innovation, teachers reported challenges such as infrastructural gaps, lack of training and access to resources. The study underscores the need for targeted professional development and institutional support offering insights for policymakers and educators to strengthen teacher capacity and embed innovation into daily pedagogical practices.

Keywords: Innovative Pedagogy, Foundational Literacy & Numeracy, Teacher Perception
Elementary Education, NEP 2020, Odisha

Introduction

In an increasingly interconnected and competitive world, the role of education has become more critical than ever in preparing learners to meet the demands of the 21st century. Today's educational landscape calls for more than

just the transmission of textbook knowledge; it requires the cultivation of higher-order thinking skills, creativity, self-reliance, and adaptability. This paradigm shift in educational goals necessitates a rethinking of pedagogical practices. Traditional, teacher-centred methods, often rooted in rote memorization and passive absorption of content, are gradually being replaced by more dynamic, learner-centric approaches that prioritize need, interests, abilities, engagement, conceptual understanding and skill development. Pedagogy, broadly defined as the art and science of teaching, involves a deliberate and reflective practice of designing learning experiences that are meaningful, inclusive, and transformative. It draws from educational theories, empirical research, and classroom realities to ensure that teaching practices are aligned with students' cognitive, emotional, and social needs (Subramani & Iyyappan, 2018). Effective pedagogy not only facilitates knowledge acquisition but also nurtures critical thinking, collaboration, problem-solving, and lifelong learning skills competencies essential in today's fast-changing environments (Jumanovich & Eshboevna, 2019). In this context, innovative pedagogical approaches have emerged as powerful tools for enhancing learning outcomes. These include a wide array of strategies such as constructivism, flipped classrooms, inquiry-based learning, gamification, art-integrated, blended learning, hands-on learning, project-based methods and activity-based learning among others. Such practices move away from passive learning and foster an environment where students actively construct knowledge through exploration, collaboration, and real-world application. The infusion of technology in education has further amplified this shift, creating opportunities for interactive, personalized, and multimodal learning experiences.

The significance of innovative pedagogy becomes even more pronounced in the context of Foundational Literacy and Numeracy (FLN) the ability to read, write, and perform basic arithmetic operations. These foundational skills, typically developed during the early years of education, form the bedrock of all future academic achievement and are critical for lifelong success. Recognizing this, the National Education Policy (NEP) 2020 in India emphasizes FLN as a national priority and advocates for engaging, inclusive, and competency-based teaching practices to address the varied learning needs of young children. However, implementing such reforms at the classroom level largely depends on the perceptions, attitudes, and readiness of teachers. Educators are not merely deliverers of content but agents of change who interpret and adapt policies within their unique contexts. Their openness to adopt innovative strategies, understanding of pedagogy, and confidence in using new methodologies significantly affect the quality of education imparted. It is, therefore, essential to understand how teachers perceive innovative pedagogy and what factors support or hinder its effective integration.

This study focuses on examining the perceptions of elementary school teachers in the Sundargarh district of Odisha regarding the use of innovative pedagogical practices for developing foundational literacy and numeracy. By investigating the strategies employed, the challenges faced, and the perception held by teachers, the research aims to generate practical insights that can inform policy implementation, curriculum design, and teacher training initiatives. Ultimately, the study aspires to contribute toward improving the overall quality of elementary education and ensuring that every child acquires the fundamental skills necessary to thrive in the modern world.

Literature Review

The existing body of literature strongly underscores the growing importance of innovative pedagogical approaches and foundational literacy and numeracy (FLN) in elementary education, especially in the context of 21st-century learning demands. Multiple national and international studies have established the need to move away from traditional, content-heavy, teacher-centred instruction toward more engaging, student-centric, and adaptable teaching methodologies. Scholars such as Dixit (2024) and Pandey et al. (2023) emphasize the critical role of constructivist, inquiry-based, and technology-enabled pedagogies in catering to diverse learning needs and improving educational outcomes. These approaches foster not only academic achievement but also skills like critical thinking, collaboration, and creativity. Jagannath (2023) and Diddi & Nirappel (2023) present practical models demonstrating the positive impact of ICT integration, hands-on learning, and real-world applications in enhancing learner engagement and comprehension. Furthermore, outcome-based education frameworks discussed by Srivastava and Agnihotri (2022) suggest that aligning teaching with well-defined learning outcomes leads to improved instructional effectiveness.

Teacher perception has emerged as a critical factor in the successful implementation of innovative pedagogy. Studies by Sure and Oral (2021) and Karolčík and Marková (2023) reveal that while educators are generally open to adopting new methods, their ability to do so is often limited by systemic constraints such as lack of resources, insufficient training, and curriculum overload. Bradbeer et al. (2019) highlight that although innovative learning environments can positively shift teacher mindsets, external factors such as rigid assessment systems often restrict their practical application. These findings point to the urgent need for supportive policies, ongoing professional development, and infrastructural investment to enable sustainable pedagogical transformation.

Simultaneously, the literature emphasizes the foundational role of early literacy and numeracy skills in shaping long-term academic and life success. According to Sharma (2024) and Bashir and Jan (2023), FLN is not only an educational necessity but also a national development priority as per the National Education Policy (NEP) 2020. Several studies, including those by Shashidhara et al. (2024) and Kumar et al. (2023), demonstrate the influence of factors like parental involvement, home environment, and school type on FLN outcomes. Strategies such as activity-based learning, storytelling, differentiated instruction, digital tools, and project-based methods have been found effective in promoting foundational skills, particularly in linguistically and socio-economically diverse classrooms (Vansdadiya & Vasoya, 2023; Nonik et al., 2024). These evidence-based practices are particularly critical in addressing early learning deficits, reducing dropout rates, and fostering equitable education.

Objective

To study the perception of teachers towards innovative pedagogical practices for developing foundational literacy and numeracy.

Hypothesis

Ho1. There exists no significant difference in perception of teachers towards innovative pedagogical practices for developing foundational literacy and numeracy among elementary students with respect to gender i.e. male & female.

Ho2. There exists no significant difference in perception of teachers towards innovative pedagogical practices for developing foundational literacy and numeracy among elementary students with respect to the type of institution i.e. public & private.

Data and Methodology

This study adopted a descriptive survey design to explore elementary teachers' perceptions and practices regarding innovative pedagogical approaches for developing foundational literacy and numeracy (FLN). The population comprised all elementary teachers working across Sundargarh district, Odisha.

Purposive Sampling technique was used to select the city in Sundargarh i.e., Rourkela and a sample of 80 teachers was selected using stratified random technique including 40 male and 40 female teachers, equally representing public and private schools. To ensure fair representation, Rourkela city was purposively selected due to its diverse educational landscape and urban context. Within Rourkela, schools and teachers were chosen using stratified random sampling, ensuring balanced representation across gender and type of institution.

Data Collection and Analysis

The data for the study was collected using a self-constructed tool designed specifically for elementary teachers. The tool consisted of a perception scale with 25 items, aimed at capturing teachers' perceptions related to innovative pedagogical methods for developing foundational literacy and numeracy. Additionally, a 10-item dichotomous questionnaire (Yes/No) was included, allowing space for respondents to provide suitable answers.

To ensure the tool's effectiveness, it underwent a rigorous validation process by experts ensuring face validity after which the reliability of the tool was established through Cronbach's Alpha, which yielded a coefficient of 0.91, indicating high internal consistency.

After validation, the tool was administered to the selected sample of teachers.

Analysis

To analyse the data and test the hypotheses formulated for the study, a combination of descriptive and inferential statistical techniques was employed. The study being quantitative in nature, and the data collected through numerical methods were most suitable for deriving meaningful conclusions.

Table 1: Descriptive statistical representation of the Perception of Teachers towards innovative pedagogy for developing FLN.

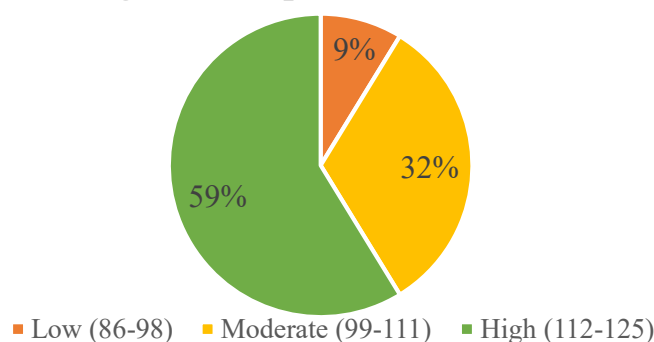
Total Number of Elementary Teachers	Mean	SD	Range
80	113	10.7	39

The descriptive statistics presented in Table 1 highlight the overall perception of elementary teachers towards innovative pedagogy for developing Foundational Literacy and Numeracy (FLN). Out of 80 respondents, the mean score was 113, indicating a generally positive attitude towards innovative teaching methods. The standard deviation of 10.7 reflects a moderate level of variation in responses, suggesting that while many teachers share a favourable view, some differ in their perceptions. The range of 39 points to noticeable differences between the highest and lowest scores, possibly influenced by factors such as access to resources, training, or institutional support. Overall, the findings suggest a strong but varied inclination among teachers towards embracing innovative practices for enhancing FLN.

Table 2: Perception level of Teachers towards innovative pedagogy for developing FLN.

Sl. No.	Perception	No. of Teachers
1	Unfavourable (86-98)	7
2	Moderate (99-111)	26
3	Favourable (112-125)	47
	Total	80

The above table presents the distribution of teachers based on their perception levels towards innovative pedagogy for developing FLN. Out of 80 teachers, 47 (59%) showed a favourable perception, 26 (32%) had a moderate perception, and only 7 (9%) exhibited an unfavourable perception. This indicates that a majority of teachers view innovative pedagogical practices positively, though a small portion remains neutral or critical.

Fig. 1: Perception level of teachers

The above figure illustrates the distribution of elementary teachers' perception levels regarding innovative pedagogical practices for foundational literacy and numeracy. The data reveal that a majority (**59%**) of the teachers exhibit a high level of perception (scores between 112–125), indicating **strong awareness and**

acceptance of innovative methods. A moderate perception level (99–111) is seen in **32%** of the participants, suggesting a **fair understanding but possible gaps in implementation or confidence**. Only **9%** of the teachers fall in the low perception category (86–98), pointing to **minimal awareness or resistance toward pedagogical innovations**. This distribution highlights a generally positive orientation among teachers in the selected sample, with potential for capacity building in the moderate and low segments.

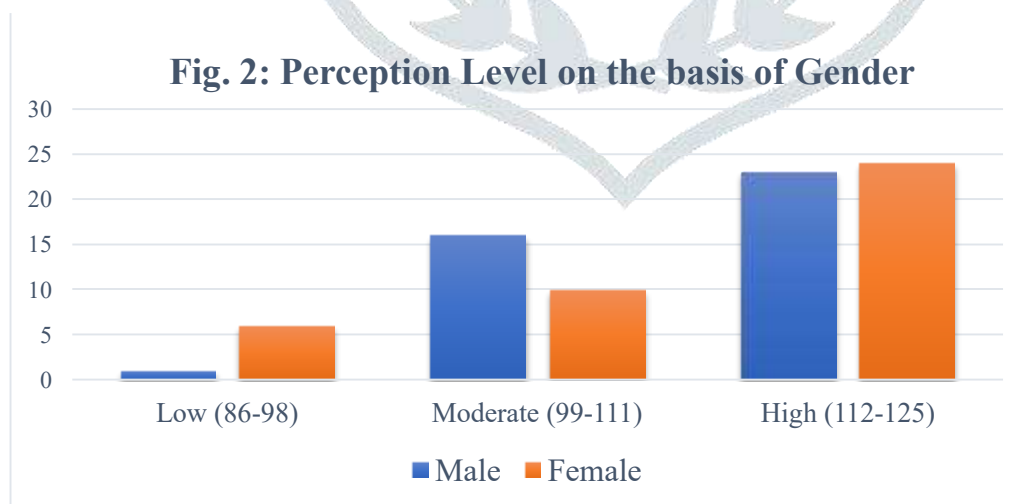
Hypothesis Testing

Ho1. There exists no significant difference in perception of teachers towards innovative pedagogical practices for developing foundational literacy and numeracy among elementary students with respect to gender i.e., male & female.

Table 3: Perception level on the basis of Gender

Sl. No	Perception	Female	Male
1	Unfavourable (86-98)	6 (15%)	1 (2.5%)
2	Moderate (99-111)	10 (25%)	16 (40%)
3	Favourable (112-125)	24 (60%)	23 (57.5%)

The above table depicts that both male (57.5%) and female (60%) teachers predominantly hold favourable perceptions. However, a relatively higher percentage of male (40%) teachers fall into the moderate category, while female teachers show a slightly stronger leaning toward a favourable outlook. The low percentage of unfavourable perception among males (2.5%) is notable compared to females (15%), suggesting generally positive attitudes across genders, with slight differences in perception distribution.



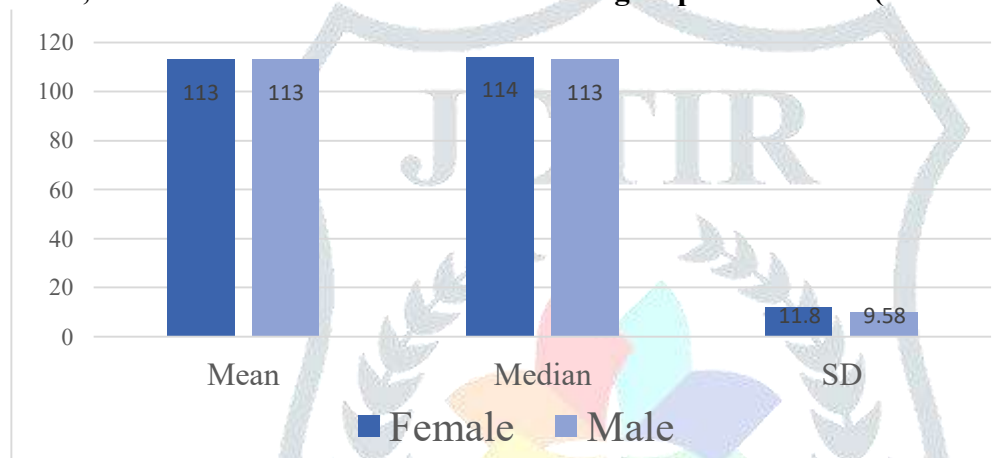
However, to determine the above analysis we turn to the inferential analysis.

In order to test hypothesis, the Mann-Whitney U test was applied (cause the data does not follow a normal distribution but variance is equal across groups).

Table 4: Perception of teachers towards innovative pedagogy for developing FLN on the basis of gender.

Gender	N	Mean	Median	SD	u- value	p- value	Remark
Female	40	113	114	11.8	771	0.781	No significant at 0.05 level
Male	40	113	113	9.58			

It is evident from above table that, the data did not follow a normal distribution as assessed by Shapiro Wilk test ($p = <.001$) but Levene's test exhibited equal variance ($p = 0.167$), so the non-parametric test was deemed appropriate. The results revealed **no significant difference** between female ($M = 113$, $Md = 114$, $SD = 11.8$) and male ($M = 113$, $Md = 113$, $SD = 9.58$) teachers, with a U-value of 771 and a p-value of 0.781 ($p > 0.05$). Thus, **gender does not appear to influence perception significantly** in this context.

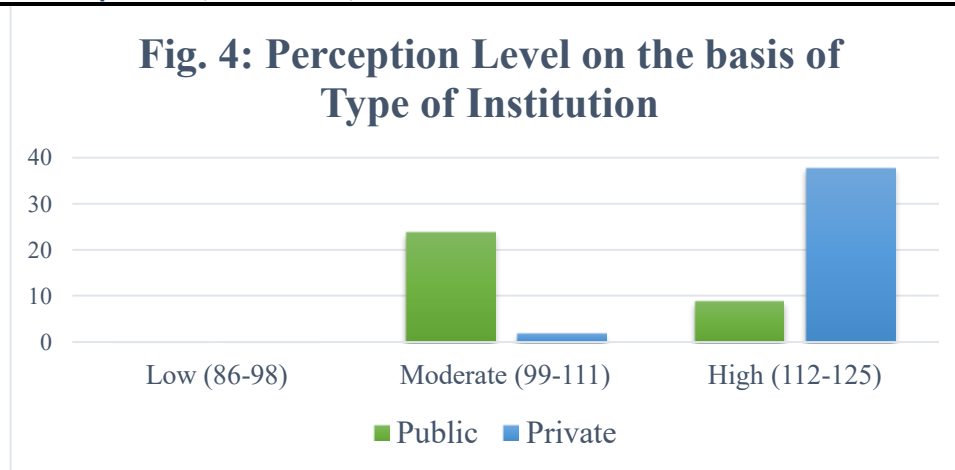
Fig. 3: Mean, Median & Standard Deviation of two groups i.e. Gender (male & female)

Ho2. There exists no significant difference in perception of teachers towards innovative pedagogical practices for developing foundational literacy and numeracy among elementary students with respect to the type of institution i.e., public & private.

Table 5: Perception level on the basis of Type of Institution

Sl. No	Perception	Public	Private
1	Unfavourable (86-98)	7 (17.5%)	0 (0%)
2	Moderate (99-111)	24 (60%)	2 (5%)
3	Favourable (112-125)	9 (22.5%)	38 (95%)

Table 5, illustrate the perception levels of teachers toward innovative pedagogy for developing FLN, categorized by type of institution. The data reveal a stark contrast: 95% of private school teachers demonstrate a favourable perception compared to only 22.5% in public schools. Additionally, while 60% of public-school teachers fall into the moderate category, only 5% of private school teachers do. Unfavourable perceptions are present only in public institutions (17.5%) and entirely absent in private ones. This clearly indicates that **teachers in private institutions possess significantly more positive perceptions** toward innovative pedagogical practices than their public counterparts, suggesting **potential differences in institutional support, exposure, or implementation of such pedagogies**.



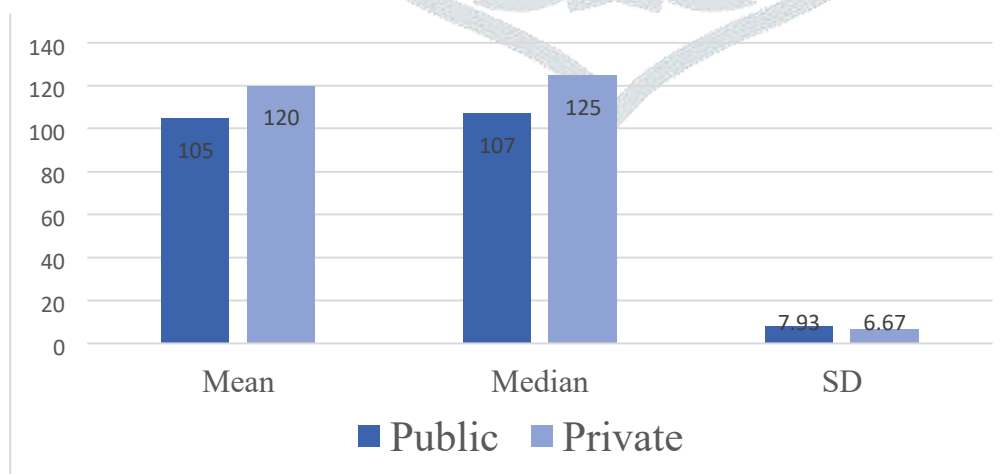
In order to test hypothesis, the Mann-Whitney U test was applied (cause the data does not follow a normal distribution but variance is equal across groups).

Table 6: Perception of teachers towards innovative pedagogy for developing FLN on the basis of type of institution.

Type of institution	N	Mean	Median	SD	u- value	p- value	Remark
Public	40	105	107	7.93	96.0	<.001	Significant at 0.05 level
Private	40	120	125	6.67			

It is evident from above table that, the Mann-Whitney U test result ($U = 96.0$, $p < .001$) indicates a **significant difference** in teachers' perception towards innovative pedagogy for developing FLN based on the **type of institution**. Teachers from **private institutions** demonstrated significantly **higher perceptions** ($M = 120$, $Md = 125$) compared to those from **public institutions** ($M = 105$, $Md = 107$). This leads to rejection of the null hypothesis, confirming that the type of institution has a **statistically significant impact** on teachers' perception.

Fig. 5: Mean, Median & Standard Deviation of two groups i.e. Type of Institution (public & private)



Results and Findings

The study sought to examine elementary teachers' perceptions of innovative pedagogical practices aimed at developing foundational literacy and numeracy (FLN) among students in Sundargarh district, Odisha. The

findings are structured around descriptive statistics, perception level distribution, and hypothesis testing across gender and institutional type.

1. General Perception of Teachers Toward Innovative Pedagogical Practices

The analysis revealed a mean perception score of 113 (SD = 10.7) among the 80 surveyed elementary school teachers, suggesting an overall favourable disposition towards innovative pedagogical practices. With 59% of respondents falling into the "favourable" category (scores between 112–125), and only 9% categorized as "unfavourable" (scores between 86–98), the data indicate strong support for pedagogical innovation among the majority of participants. This portrays growing receptiveness among educators to adopt innovative learning and methodologies, particularly in the context of NEP 2020 mandates.

2. Variability in Perception and Capacity-Building Opportunities

Despite the largely positive outlook, the presence of moderate (32%) and unfavourable (9%) perception scores highlights the existence of attitudinal and systemic disparities. This variation may stem from inconsistent access to training, digital infrastructure, or institutional encouragement. This emphasizes the major role of systemic support in enabling pedagogical transformation. These findings suggest a pressing need for targeted capacity-building interventions aimed at teachers with moderate or low perception levels, thereby closing the implementation gap and ensuring equitable professional development.

3. Gender-Based Analysis of Perception

An inferential analysis using the Mann-Whitney U test revealed no statistically significant difference in perception based on gender ($U = 771$, $p = 0.781$). Both male and female teachers shared nearly identical mean perception scores ($M = 113$), reaffirming the neutrality of gender in shaping pedagogical outlooks within this cohort. This depicts that the factor gender holds an equal level of cerebral intelligence.

4. Institutional Type as a Determinant of Perception

In sharp contrast, the type of institution emerged as a statistically significant determinant of teacher perception ($U = 96.0$, $p < 0.001$). Private school teachers reported substantially higher perception scores ($M = 120$, $Md = 125$) compared to their public-school counterparts ($M = 105$, $Md = 107$). Notably, 95% of private school teachers demonstrated a favourable perception, while only 22.5% of public-school teachers did the same. Moreover, all instances of moderate to unfavourable perception (60%-17.5%) were concentrated in public schools.

The public-private divide points to a systemic imbalance in professional support, access, exposure and infrastructure, calling for policy-level interventions to equip public school teachers with the tools, training, and autonomy needed to embrace innovation.

Conclusion

The study offers significant insights into how elementary school teachers in Sundargarh district perceive innovative pedagogical practices in the context of foundational literacy and numeracy (FLN). The findings affirm

that the majority of teachers, across both public and private institutions, recognize the value of learner-centric, experiential, and inquiry-based methods in early education. However, a marked difference emerged between private and public-school teachers, with the former displaying considerably higher levels of favourable perception highlighting the role of institutional culture, professional exposure, and systemic support in shaping pedagogical mindsets. Interestingly, gender did not significantly influence teachers' perceptions, suggesting that both male and female educators equally acknowledge the importance of innovation in early education. This finding supports the premise that pedagogical awareness and commitment are more deeply influenced by professional conditions than by demographic variables (Subramani & Iyyappan, 2018).

Nonetheless, the study also reveals areas of concern particularly among public school teachers where moderate to unfavourable perceptions persist. These gaps underscore the urgent need for structured professional development, policy-level reforms, and resource allocation to democratize access to training and tools that facilitate innovative instruction. As NEP 2020 places FLN at the heart of India's educational future, equipping all teachers irrespective of institutional affiliation with the confidence and competence to implement dynamic teaching strategies is imperative.

By highlighting both the promise and the challenges of pedagogical innovation, this research contributes to the discourse on educational equity and quality. It advocates for a holistic and inclusive strategy that empowers teachers not merely as implementers of policy but as cocreators of a more responsive and effective foundational education system.

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