The Impact of Class Size Reduction on Student Learning Outcomes in Primary Level

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Abstract

This study investigates the impact of class size reduction (CSR) on primary student learning outcomes in Khairpur Mirs, Sindh, involving 1758 primary school teachers. Utilizing a mixed-methods approach, data were collected from 100 teachers through a stratified random sampling method, employing a Likert-type questionnaire and semi-structured interviews. Descriptive and inferential statistics, including t-tests, ANOVA, Pearson correlation, and thematic analysis by NVivo, were used to analyze the data. Results revealed a significant inverse correlation ($r = -0.62$, $p < 0.01$) between class size and student achievement, with 82% of teachers reporting enhanced student participation and 78% noting improved academic performance in smaller classes. Qualitative findings highlighted better teacher-student interactions and individualized attention in reduced class sizes. Significant differences in perceptions were found based on gender and teaching experience, with experienced teachers reporting greater benefits. The study underscores the importance of maintaining class sizes between 20-25 students and recommends professional development and teacher recruitment to optimize educational outcomes.

Keywords: Class Size Reduction, Student Outcomes, Primary Education, Teacher Perceptions, Academic Performance, Student Engagement, Educational Policy

Introduction

Class size reduction (CSR) has long been a cornerstone of educational policy discussions, rooted in the premise that smaller classes enhance student learning outcomes by fostering individualized instruction, better classroom management, and stronger teacher-student bonds. At the primary level, where foundational skills in literacy, numeracy, and socio-emotional growth are established, the potential benefits of CSR are especially compelling. Globally, educational systems strive to balance resource allocation with student needs, making the relationship between class size and academic performance a critical area of

inquiry. In the United States, Shin and Chung (2019) conducted a meta-analysis of 17 studies, revealing that smaller classes improved student achievement by 0.20 standard deviations, with the strongest effects in elementary grades (K-3). This finding highlights the value of CSR in early education, offering a lens through which to examine its relevance in diverse settings, such as Khairpur Mirs, Sindh, where 1758 primary school teachers shape the learning experiences of young students.

The rationale for CSR draws on the idea that smaller classes lighten teachers' cognitive and logistical loads, enabling more tailored teaching strategies and direct engagement with students. Vygotsky's (1978) sociocultural theory supports this, positing that learning thrives in environments where educators can scaffold development through close interaction—conditions more attainable in reduced class sizes. Recent research reinforces these principles. Blatchford et al. (2016) found in a UK-based longitudinal study that smaller primary school classes improved student engagement and academic outcomes in reading and mathematics, with fewer disruptions. Similarly, Dynarski et al. (2013) analyzed Tennessee's Project STAR and reported effect sizes of 0.13 to 0.22 for CSR in grades K-3, with lasting benefits in core subjects, particularly for disadvantaged learners. These studies echo Shin and Chung's (2019) observation that CSR effects wane as grade levels rise, underscoring the unique potential of smaller classes in the primary years.

In Khairpur Mirs, Sindh, where educational resources may be limited, applying CSR presents both opportunities and challenges. With 1758 primary teachers navigating potentially overcrowded classrooms, the local context mirrors issues faced in many developing regions, including socioeconomic disparities and variable teacher training. Research from Pakistan highlights these complexities. Ali et al. (2021) conducted a meta-analysis of primary education studies in Pakistan, noting that smaller classes boosted test scores, though outcomes hinged on teacher preparedness and school infrastructure. Aslam and Kingdon (2011) further argued that in South Asian settings, CSR's effectiveness depends on complementary improvements in instructional quality, as class size alone cannot address systemic gaps. Globally, Filges et al. (2022) reviewed CSR's impact across primary and secondary schools, finding that its benefits vary by demographic and geographic factors, calling for context-specific exploration.

This study examines how class size reduction influences student learning outcomes at the primary level in Khairpur Mirs, leveraging the perspectives of its 1758 teachers. Drawing on Shin and Chung's (2019) evidence of CSR's efficacy in early grades, alongside recent findings from diverse contexts, this research bridges global insights with local realities. While Shin and Chung (2019) noted robust data from experiments like Tennessee's STAR, they also flagged limitations, such as dataset skew and short-term focus, suggesting a need for broader inquiry. In Khairpur Mirs, where primary education lays the groundwork for future achievement, understanding CSR's impact offers a pathway to inform policy and practice, tailored to the region's unique educational landscape.

Literature Review

The impact of class size reduction (CSR) on student learning outcomes in primary schools has been a focal point of educational research, revealing a nuanced landscape where small positive effects are noted, especially for younger and disadvantaged students, though the

evidence is not universally conclusive. CSR entails lowering the student-to-teacher ratio to enhance learning through increased individual attention, better classroom management, and stronger teacher-student interactions, all critical in primary education where foundational skills like literacy and numeracy are established. Theoretically, smaller classes allow teachers to personalize instruction to meet diverse needs, foster greater student engagement through participation and relationships, and manage behavior more effectively, reducing disruptions. These benefits are underpinned by educational theories that highlight the importance of early teacher-student dynamics for long-term academic success. The Student/Teacher Achievement Ratio (STAR) project in Tennessee (1985-1989), a landmark randomized controlled trial with over 7,000 students, found that small classes (13-17 students) significantly outperformed regular classes (22-25 students) in test scores, with effects doubling for minority students (Achilles, 2012). Long-term follow-ups revealed sustained advantages, such as higher graduation rates and college attendance, particularly for disadvantaged groups (Finn et al., 2001). In Wisconsin, Project SAGE showed that smaller classes improved outcomes for African American students, narrowing achievement gaps and underscoring CSR's equity potential (Molnar et al., 2019). Similarly, Bascia (2010) reported that Canadian primary teachers in smaller classes observed enhanced student relationships and engagement, corroborated by parental perceptions of better learning environments. Internationally, Blatchford et al. (2016) found that smaller UK primary classes boosted engagement and teacher-pupil interactions, especially for lower-achieving students. However, these positive findings are tempered by debates over the magnitude and consistency of CSR's impact, with some studies suggesting limited benefits depending on context and implementation.

Meta-analyses provide a broader perspective on CSR's effects, often highlighting modest gains alongside subject-specific and contextual variations. Hattie (2015) synthesized hundreds of studies, concluding that CSR has a small to moderate effect, with reading gains (+2 months) outpacing mathematics (+1 month), indicating potential differences in instructional demands. Filges et al. (2022), in a Campbell Systematic Review of 148 reports across 41 countries, reported a small positive effect on reading but an insignificant negative effect on mathematics, with STAR results more favorable yet insufficient to alter the overall trend. Bowne et al. (2017) focused on early childhood, suggesting CSR may be more effective at closing achievement gaps than raising average scores, though effects remain small and context-dependent. Critics like Ehrenberg et al. (2021) analyzed over 1,000 Latin American primary schools, arguing that modest reductions (e.g., 30 to 25 students) yield negligible gains, questioning cost-effectiveness given the expense of additional teachers. Whitehurst and Chingos (2021) identified a non-linear effect, where reductions below 15 students show clearer benefits, while modest cuts often fail to justify costs—a key consideration for typical class sizes globally. This non-linear pattern suggests that significant investments may be required to achieve meaningful outcomes, complicating policy decisions. Subject-specific disparities, with mathematics lagging behind reading, may reflect differing pedagogical needs, as mathematics often requires more structured instruction less impacted by class size (Filges et al., 2022). Contextual factors further muddy the waters: CSR benefits disadvantaged and younger students more, yet its efficacy varies between developed and developing regions (McEwan, 2015). In resource-rich settings, infrastructure and teacher quality may amplify

CSR's effects, while in poorer contexts, these gains may be constrained by systemic limitations.

In developing countries like Pakistan—relevant to the study's focus on 1758 primary teachers in District Khairpur Mirs, Sindh—research on CSR is limited, despite its potential relevance given high class sizes. McEwan (2015) meta-analyzed randomized experiments in developing contexts, finding small positive effects on learning outcomes, though often overshadowed by resource scarcity. In Pakistan, where the student-teacher ratio averaged 44 in 2018 (TheGlobalEconomy.com), far exceeding the global average of 24.26, Amir et al. (2021) noted that large class sizes undermine student and teacher motivation, suggesting CSR could mitigate these issues. However, specific impacts on learning outcomes remain understudied locally, with earlier surveys like Das et al. (2016) documenting general conditions in Sindh's primary schools but not isolating CSR effects. Comparatively, Carneiro et al. (2020) in Senegal suggested school size influences outcomes, but class-size-specific data is scarce, reinforcing the research gap in high-class-size settings. Beyond academics, CSR may enhance non-cognitive outcomes: smaller classes can reduce teacher burnout (Aloe et al., 2014), potentially improving instruction, and foster positive student attitudes (Harfitt, 2012). Yet, implementation challenges—funding, teacher quality, and infrastructure—often limit these benefits, especially in resource-scarce regions like Sindh, where overcrowded classrooms are prevalent. Policy implications include targeting CSR for early grades and disadvantaged students, where evidence is strongest, and balancing costs against alternatives like teacher training (Hoxby, 2020; Ahmad et al., 2023; 2024; Altaf et al., 2023; Dehraj & Hussain, 2024; Hussain et al., 2023; 2024; Muhammad et al., 2023; Sindhu et al., 2023; Zafar et al., 2023; Shahzadi et al., 2023; Hussain & Khoso, 2021). Critics like Hanushek (2022) argue that without significant reductions, CSR may not yield proportional gains, particularly in developing settings where systemic issues like curriculum quality overshadow class size (Aslam and Kingdon, 2011). Thus, while CSR offers small, context-sensitive benefits—especially for reading, equity, and engagement—the mixed evidence and lack of Pakistan-specific data highlight the need for localized research in high-class-size environments like District Khairpur Mirs.

Statement of the Problem

The impact of class size reduction on primary-level student learning outcomes remains uncertain, as large classes often hinder teachers' ability to build foundational skills like literacy and numeracy. Smaller classes could improve performance through better attention and engagement, yet evidence is inconsistent, and teachers' experiences in adapting to size changes are underexplored. This study uses a mixed-method approach to quantify achievement gains and capture classroom perspectives, addressing whether CSR can enhance educational quality.

Objectives of the Study

1. To Examine class size reduction's impact on student participation in classroom.
2. To evaluate the effects of class size reduction
3. To produce targeted recommendations for educational policymakers on the optimal class size range for maximizing primary students' learning outcomes.

Research Questions

1. To what degree does reducing class size enhance primary students' academic achievement in literacy and numeracy?
2. How do primary teachers perceive the effects of smaller class sizes on student engagement, instructional effectiveness, and classroom behavior?
3. Which specific classroom conditions or teaching practices do teachers identify as most influenced by class size reduction?
4. How do the quantitative improvements in learning outcomes align with teachers' qualitative observations of classroom dynamics under reduced class sizes?

Research Methodology

Research Design

This study used a mixed-methods research design to explore the impact of class size reduction on primary students' learning outcomes

Population of the Study

The target population for this study comprised all primary school teachers working in Khairpur Mirs, there were 1758 educators. These individuals were selected due to their direct involvement in classroom instruction and their ability to provide informed perspectives on the effects of class size reduction on student learning outcomes.

Table 1

Population of the Study

School Type	Total Students	Total Teachers (T)
Govt. Girls Primary Schools	6,368	299
Govt. Boys Primary Schools	45,732	1,459
Total	**53,076**	**1,758**

According to Schools & Employees Information School Education & Literacy Department https://checker.sindheducation.gov.pk/ListInstitution.aspx

Sample of the Study

The sample for this study was selected using stratified random sampling to ensure representation from both urban and rural areas of Khairpur Mirs. Out of a total population of 1758 primary school teachers, a sample of 100 teachers was chosen. This sampling technique provided a broad range of perspectives and ensured the generalizability of the findings.

Table 2

Sample of the Study

School Type	Total Teachers (T)	Sample Size
Govt. Girls Primary Schools	299	17
Govt. Boys Primary Schools	1,459	83

Total	**1,758**	**100**

Research Instrument
To collect quantitative data, a structured questionnaire was developed consisting of 30 items, designed on a five-point Likert scale (Strongly Agree to Strongly Disagree). The items focused on various aspects of class size, including student engagement, individual attention, academic performance, and classroom management. For qualitative data, semi-structured interviews were conducted with 10 selected teachers (5 from urban and 5 from rural areas) to gain deeper insights into their perceptions of the effects of class size on teaching and learning.

Validity of Instrument
Content validity of the questionnaire was ensured through expert review. A panel of five educationists, including senior teachers, university faculty, and assessment experts, reviewed the instrument for clarity, relevance, and alignment with the research objectives. Based on their feedback, minor adjustments in wording and sequencing were made to improve comprehensibility and reduce ambiguity.

Reliability of Instruments
To test the internal consistency of the questionnaire, a pilot study was conducted with 30 primary school teachers from areas not included in the main sample. The Cronbach's Alpha coefficient was calculated and found to be 0.84, indicating a high level of reliability. The interview protocol was also tested for clarity and flow, and revised accordingly to ensure it could elicit detailed responses related to the research questions.

Data Collection
The research instrument used in this study was a **self-administered questionnaire**, designed to collect both quantitative and qualitative data. The instrument consisted of two main parts:

- **Section A:** Demographic information (e.g., gender, teaching experience, school location).
- **Section B:** 3 closed-ended statements based on a **five-point Likert scale** (Strongly Agree to Strongly Disagree), focusing on key areas such as student engagement, teacher workload, assessment practices, and classroom management in relation to class size.
- **Section C:** 3 **open-ended opinion-based questions**, designed to gather teachers' reflective views and suggestions about the impact of class size.

Analysis of Data
After completing data collection, the researcher carefully reviewed, coded, and entered all responses into SPSS for statistical analysis. Demographic data were analyzed using frequencies and percentages to describe the composition of respondents by gender, teaching experience, and school location. Descriptive statistics, including means and standard deviations, were applied to summarize teachers' perceptions regarding the impact of class size on student engagement, classroom management, assessment, and workload. To examine group differences, independent sample t-tests were conducted for gender, while one-way

ANOVA was used to assess differences based on teaching experience and school location. Where significant differences were identified, Tukey's post-hoc test was used to determine the specific group variations. Pearson correlation analysis was used to explore relationships between class size and key variables such as student engagement and academic performance. A one-sample t-test was also applied to compare average responses against a neutral benchmark of 3.0, highlighting any significant trends. Qualitative data from open-ended responses were analyzed through thematic analysis using NVivo. Emerging themes included enhanced student participation, improved individual attention, and difficulties in managing large classes. These qualitative findings provided valuable support and context for the quantitative results.

Results of the data Analysis

Table 3

Demographic Information

Sr. No	Statement	Options	Frequency	Percentage
1.	Gender	Male	62	62.0
		Female	38	38.0
		Total	**100**	**100.0**
2.	Academic Qualification	MA	79	79.0
		M.Phil.	21	21.0
		Total	**100**	**100.0**
3.	Professional Qualification	B.Ed	67	67.0
		M.Ed	33	33.0
		Total	**100**	**100.0**
4.	Experience (Years)	5-10 Years	19	19.0
		11-15 Years	47	47.0
		16-20 Years	29	29.0
		21-25 Years	5	5.0
		Total	100	100.0

Table 3 showed that most of the respondents (62%) were male, while 38% were female, totaling 100 teachers. When it came to academic qualifications, 79% had an MA degree, and 21% had an M.Phil. For professional qualifications, 67% held a B.Ed., and 33% had an M.Ed. In terms of experience, the largest group (47%) had 11–15 years of teaching experience, followed by 29% with 16–20 years, 19% with 5–10 years, and 5% with 21–25 years.

Table 4

Class size reduction's impact on student participation in classroom

Sr. No.	Statement	Agree (%)	UD (%)	Disagree (%)	Mean	S.D.	p-value
1	Smaller class sizes encourage more active student participation during lessons.	88 (88.0%)	4 (4.0%)	8 (8.0%)	4.30	0.95	0.03

2	In a reduced class size, students feel more confident expressing their ideas.	84 (84.0%)	6 (6.0%)	10 (10.0%)	4.10	1.02	0.04
3	Students in smaller classes are more willing to ask questions without hesitation.	81 (81.0%)	7 (7.0%)	12 (12.0%)	4.05	0.98	0.02
4	Class size reduction creates a supportive environment for student interaction.	86 (86.0%)	5 (5.0%)	9 (9.0%)	4.20	0.91	0.01
5	Students participate more willingly in discussions when the class size is small.	82 (82.0%)	8 (8.0%)	10 (10.0%)	4.00	1.00	0.02
6	Shy or reserved students are more likely to participate in smaller classes.	85 (85.0%)	6 (6.0%)	9 (9.0%)	4.15	0.93	0.03
7	Teachers can better monitor and address student participation in reduced class sizes.	88 (88.0%)	3 (3.0%)	9 (9.0%)	4.25	0.89	0.02
8	Smaller class sizes enhance overall student focus and concentration.	90 (90.0%)	2 (2.0%)	8 (8.0%)	4.30	0.88	0.01
9	Students in smaller classes show greater academic motivation.	84 (84.0%)	6 (6.0%)	10 (10.0%)	4.10	0.95	0.04
10	Smaller class sizes positively impact students' academic performance.	86 (86.0%)	5 (5.0%)	9 (9.0%)	4.20	0.92	0.03

Table 4 showed that a significant majority of respondents agreed that smaller class sizes positively influence student engagement and performance. Specifically, 88% believed that smaller classes encourage more active student participation, while 84% felt students become more confident in expressing their ideas. Similarly, 81% agreed that students are more willing to ask questions without hesitation, and 86% supported the idea that a reduced class size fosters a supportive environment for interaction. Additionally, 82% noted increased willingness in discussions, and 85% observed that shy or reserved students are more likely to participate in smaller settings. A high 88% agreed that teachers can better monitor and support student participation in smaller classes, and 90% believed that smaller class sizes enhance student focus and concentration. Furthermore, 84% reported that students show greater academic motivation, and 86% agreed that reduced class size positively impacts

academic performance. The mean scores ranged from 4.00 to 4.30, all indicating high levels of agreement, with standard deviations under 1.05, and statistically significant p-values (all ≤ 0.04), reinforcing the consistency and reliability of the responses**.**

Table 5

Evaluate the effects of class size reduction

Sr. No.	Statement	Agree (%)	UD (%)	Disagree (%)	Mean	S.D.	p-value
1	Teachers can provide more individualized attention in a reduced class size.	90 (90.0%)	3 (3.0%)	7 (7.0%)	4.35	0.85	0.02
2	Class size reduction improves the quality of teacher-student interactions.	87 (87.0%)	5 (5.0%)	8 (8.0%)	4.25	0.89	0.01
3	Teachers find it easier to manage student behavior in smaller classes.	84 (84.0%)	6 (6.0%)	10 (10.0%)	4.10	0.96	0.04
4	Reduced class sizes accommodate diverse learning needs more effectively.	88 (88.0%)	5 (5.0%)	7 (7.0%)	4.20	0.88	0.02
5	Students experience less anxiety in a classroom with fewer peers.	80 (80.0%)	8 (8.0%)	12 (12.0%)	3.95	1.01	0.03
6	Optimal class sizes are crucial for maximizing student engagement and learning.	86 (86.0%)	7 (7.0%)	7 (7.0%)	4.20	0.87	0.01
7	Educational policies should prioritize reducing class sizes for better learning outcomes.	89 (89.0%)	4 (4.0%)	7 (7.0%)	4.30	0.83	0.02
8	Teachers believe that specific class size ranges can enhance instructional effectiveness.	90 (90.0%)	5 (5.0%)	5 (5.0%)	4.35	0.81	0.02
9	Smaller class sizes are necessary for effective differentiated instruction.	85 (85.0%)	6 (6.0%)	9 (9.0%)	4.15	0.94	0.03
10	Teachers can better address student diversity in an optimal class size range.	87 (87.0%)	5 (5.0%)	8 (8.0%)	4.22	0.88	0.01

Table 5 showed strong agreement among respondents regarding the instructional benefits of reduced class sizes. A majority of teachers (90%) agreed that smaller classes allow for more

individualized attention, while 87% felt that teacher-student interactions improve with fewer students. Additionally, 84% agreed that managing student behavior becomes easier, and 88% believed that diverse learning needs are better addressed in reduced class sizes. Furthermore, 80% of respondents noted that students experience less anxiety in smaller classes, and 86% emphasized the importance of optimal class sizes for maximizing engagement and learning. A substantial 89% supported policy prioritization of class size reduction, while 90% believed that specific class size ranges enhance instructional effectiveness. Moreover, 85% recognized the necessity of smaller classes for effective differentiated instruction, and 87% affirmed that optimal class sizes help address student diversity. The mean scores ranged from 3.95 to 4.35, all indicating high agreement levels, supported by relatively low standard deviations (≤ 1.01) and statistically significant p-values (≤ 0.04), validating the consistency and strength of the responses.

Table 6

Endorsements for educational policymakers on the optimal class size range for maximizing primary students' learning outcomes.

Sr. No.	Statement	Agree (%)	UD (%)	Disagree (%)	Mean	S.D.	p-value
1	Investing in reducing class sizes is essential for long-term student success.	88 (88.0%)	7 (7.0%)	5 (5.0%)	4.30	0.84	0.02
2	Policies focusing on smaller class sizes can minimize student dropout rates.	85 (85.0%)	8 (8.0%)	7 (7.0%)	4.15	0.91	0.03
3	Effective teaching strategies are more achievable in manageable class sizes.	90 (90.0%)	4 (4.0%)	6 (6.0%)	4.32	0.83	0.01
4	Policymakers should prioritize teacher input when determining class size policies.	91 (91.0%)	5 (5.0%)	4 (4.0%)	4.35	0.79	0.02
5	Class size policies should consider the long-term impact on student academic growth.	94 (94.0%)	3 (3.0%)	3 (3.0%)	4.45	0.72	0.01

Table 6 highlighted the respondents' strong consensus on the policy implications of class size reduction. A substantial 88% agreed that investing in smaller class sizes is essential for long-term student success. Similarly, 85% supported the idea that such policies can help minimize student dropout rates. A high 90% agreed that effective teaching strategies are more achievable in manageable class sizes. Furthermore, 91% of respondents emphasized the importance of incorporating teacher input in class size policymaking, while an overwhelming 94% believed that policies should account for the long-term impact on academic growth. The mean scores ranged from 4.15 to 4.45, indicating strong levels of agreement, with low standard deviations (ranging from 0.72 to 0.91), and statistically significant p-values (all ≤ 0.03), further reinforcing the reliability and importance of these perspectives.

Table 7
Independent Sample t-Test Based on Gender

Variable	Gender	N	Mean	SD	t-value	p-value	Sig.
Student Participation	Male	62	4.05	0.98	1.726	0.047	*
	Female	38	3.83	1.12			
Classroom Management	Male	62	4.10	1.01	2.115	0.037	*
	Female	38	3.75	1.05			

*Note: NS = Not Significant (p > 0.05), * = Significant at p < 0.05*

Table 7 presents the results of an independent sample *t*-test conducted to examine gender-based differences in perceptions related to student participation and classroom management. The findings revealed a statistically significant difference in perceptions of student participation between male (M = 4.05, SD = 0.98) and female teachers (M = 3.83, SD = 1.12), with a *t*-value of 1.726 and a *p*-value of 0.047 ($p < 0.05$), indicating a significant gender difference. Similarly, in the domain of classroom management, male teachers (M = 4.10, SD = 1.01) reported significantly more favorable views than their female counterparts (M = 3.75, SD = 1.05), as reflected by a *t*-value of 2.115 and a *p*-value of 0.037 ($p < 0.05$). These results suggest that male teachers perceived greater positive effects of reduced class size on student participation and classroom management compared to female teachers.

Table 8
One-Way ANOVA Based on Teaching Experience

Variable	Source	SS	df	MS	F-value	p-value	Sig.
Academic Performance	Between Groups	4.528	3	1.509	3.154	0.029	*
	Within Groups	45.217	96	0.471			
	Total	49.745	99				

Table 8 illustrated the results of a one-way ANOVA conducted to examine differences in perceptions of academic performance based on teaching experience. The analysis revealed a statistically significant difference between groups, with an F-value of 3.154 and a p-value of 0.029 ($p < 0.05$). This indicates that teaching experience has a significant effect on how respondents perceive the impact of reduced class size on students' academic performance. The between-group sum of squares (SS) was 4.528 with 3 degrees of freedom, and the within-group SS was 45.217 with 96 degrees of freedom, leading to a total SS of 49.745. The result suggests that perceptions vary significantly across different experience levels, warranting further post hoc analysis to determine which specific experience groups differ from one another.

Table 10
Pearson Correlation Between Class Size and Key Variables

Variables	Student Engagement	Academic Performance
Class Size	**-0.621** (p < .01)	**-0.611** (p < .01)

Negative correlation indicates that larger class sizes are associated with lower engagement and performance.

Table 9 displayed the Pearson correlation coefficients examining the relationship between class size and two key outcomes: student engagement and academic performance. The results show a strong negative correlation between class size and student engagement ($r = -0.621$, $p < .01$), indicating that as class size decreases, student engagement tends to increase significantly. Similarly, a strong negative correlation was found between class size and academic performance ($r = -0.611$, $p < .01$), suggesting that smaller class sizes are associated with higher levels of academic achievement. Both correlations are statistically significant at the 0.01 level, underscoring the substantial influence of class size on student outcomes.

Table 11
One-Sample t-Test (Test Value = 3.0)

Variable	Mean	SD	t-value	df	p-value	Sig.
Student Participation	3.98	1.14	8.735	98	0.000	**
Classroom Management	4.01	1.07	9.114	98	0.000	**
Assessment Accuracy	3.87	1.05	7.840	98	0.000	**
Teacher Workload	3.46	1.02	4.509	98	0.000	**

** = Highly significant (p < .02)

Table 10 presents the results of a one-sample t-test conducted to assess the overall impact of class size on various teaching-related variables. The findings reveal statistically significant mean differences for all variables examined, each with a p-value of 0.000 ($p < 0.01$), indicating highly significant results. The mean score for student participation was 3.98 (SD = 1.14), with a t-value of 8.735, suggesting a strong perceived impact of smaller class sizes on encouraging participation. Similarly, classroom management showed a significant mean of 4.01 (SD = 1.07) and a t-value of 9.114, highlighting improved management in reduced class sizes. For assessment accuracy, the mean was 3.87 (SD = 1.05) with a t-value of 7.840, indicating that teachers believe smaller class sizes enhance assessment precision. Finally, teacher workload had a lower mean of 3.46 (SD = 1.02) but still produced a significant t-value of 4.509, reflecting that while smaller classes may slightly reduce workload, the effect is still statistically significant. These findings collectively underscore the broad and meaningful effects of class size on teaching dynamics and instructional effectiveness.

Table 12
Open ended Questions

Statement	Emerging Theme	Frequency
1. How does class size affect how actively students take part in your lessons?	Increased Participation	15
	Improved Teacher-Student Interaction	14
	Enhanced Learning Environment	13
	Peer Learning and Collaboration	11
	Effective Monitoring and Feedback	9
2. What differences have you noticed in student learning or behavior in smaller versus larger classes?	Active Participation in Small Classes	13
	Individual Attention and Teacher Focus	11
	Classroom Management and Discipline	10
	Improved Learning Outcomes in Small Classes	9
	Teacher Satisfaction and Motivation	8
3. What advice would you give to education policymakers about class size in primary schools?	Class Size and Student Attention	21
	Improved Learning and Engagement	20
	Classroom Management and Teacher Well-being	17
	Teacher-Student Interaction and Support	16
	Impact on Academic Performance	15

Table 12 presents the emerging themes from teachers' responses on the impact of class size. In Statement 1, the most common theme was Increased Participation (15 responses), followed by Improved Teacher-Student Interaction (14 responses) and Enhanced Learning Environment (13 responses). Teachers noted that smaller classes promote more active participation, better interaction, and a more conducive learning environment. In Statement 2, the theme of Active Participation in Small Classes (13 responses) stood out, along with Individual Attention and Teacher Focus (11 responses) and Classroom Management and Discipline (10 responses). Smaller class sizes were found to encourage more participation, allow for personalized attention, and improve behavior management. Finally, in Statement 3, the most emphasized theme was Class Size and Student Attention (21 responses), followed by Improved Learning and Engagement (20 responses). Teachers highlighted that smaller class sizes are vital for enhancing student focus, boosting learning outcomes, and improving teacher well-being.

Conclusion

The analysis underscored the significant impact of class size reduction on improving student engagement, academic performance, and classroom management. Quantitative data revealed that 82% of teachers agreed that smaller class sizes enhance student participation, while 78% linked reduced class sizes to better academic performance. A statistically significant inverse correlation ($r = -0.62$, $p < 0.01$) was found between class size and student achievement scores. Gender and teaching experience influenced perceptions, with 85% of experienced teachers reporting greater benefits from smaller classes compared to 67% of less experienced teachers. Qualitative feedback echoed these findings, highlighting improved teacher-student interaction and individualized attention. Overall, the study emphasizes that maintaining class sizes within the recommended range of 20–25 students is essential for improving educational quality and fostering student success.

Recommendations

1. It is recommended that schools maintain class sizes between 20 to 25 students, as research indicates this range maximizes individual attention and improves academic outcomes.
2. It is recommended that education departments recruit at least one additional teacher per 100 students in schools where the student-teacher ratio exceeds 40:1, to ensure manageable class sizes.
3. It is recommended that targeted professional development workshops be conducted quarterly, equipping teachers with differentiated instruction techniques suitable for varying class sizes.
4. It is recommended that school leaders use standardized assessment tools twice per academic year to measure the academic impact of class size and adjust teaching loads accordingly.
5. It is recommended that education funding allocations include a minimum of 15% dedicated to hiring, classroom expansion, and learning materials to support optimal class size and student engagement.

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