A Comparative Analysis on Achievements in Mathematics of Class 5 Students of Gainada Cluster of Odisha

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Abstract

This study investigates the gender-based disparities in mathematics achievement among class 5 students across various primary schools under Gainada cluster. The research aims to discern differences in academic performance between boys and girls students while considering the contextual influence of school environments. Utilizing a mixed-methods approach, quantitative data was collected through standardized mathematics assessments results, while qualitative insights were obtained through interviews and surveys with teachers. The findings indicate notable variations in mathematics achievement between male and female students across different schools. Factors such as teaching methodologies, classroom environments, and societal norms were found to impact these differences. While some schools demonstrated minimal gender gaps in mathematics achievement, others exhibited more pronounced disparities. The implications of these findings underscore the importance of addressing gender-based inequalities in mathematics education through tailored interventions and inclusive teaching practices. By understanding the specific challenges faced by male and female students in different school contexts, educators can implement targeted strategies to foster equitable learning environments. Further research is recommended to explore additional factors contributing to gender-based disparities in mathematics achievement and to develop comprehensive approaches for promoting academic success among all class 5 students.

Keywords: Achievements, Cluster, Mathematics, Achievement score, Gender, Proficiency.

INTRODUCTION

Mathematics achievement is a critical component of educational success, with implications for future academic and professional opportunities. However, research has consistently shown that disparities in mathematics achievement exist among students, influenced by various factors including gender and school contexts. Understanding these differences is essential for developing targeted interventions to promote equitable learning outcomes.In recent years, attention has increasingly turned towards examining the intersectionality of gender and school environments in shaping mathematics achievement. Class 5, a pivotal stage in a student's academic journey, provides a significant context for investigating these dynamics. At this stage, students are transitioning from foundational to more complex mathematical concepts, making it an opportune time to analyze achievement patterns and identify potential areas for intervention. This comparative analysis aims to explore the mathematics achievement

of class 5 students based on gender and school contexts. By examining both individual and contextual factors, this study seeks to uncover the nuanced interplay between gender dynamics and school environments in shaping mathematics performance. The significance of this research lies in its potential to inform evidence-based interventions aimed at addressing gender-based disparities in mathematics and achievement within specific school settings. By identifying effective strategies for promoting equitable learning outcomes, educators and policymakers can work towards creating inclusive environments where all students, regardless of gender, have the opportunity to thrive academically. This introduction sets the stage for a comprehensive examination of mathematics achievement among class 5 students, emphasizing the importance of considering gender and school contexts in understanding and addressing disparities in educational outcomes. Through rigorous analysis and interpretation of data, this study seeks to contribute to the ongoing efforts to promote equity and excellence in mathematics education for all students.

SIGNIFICANCE OF THE STUDY

The significance of the study on a comparative analysis of mathematics achievement among class 5 students By examining mathematics achievement across gender and school contexts of Gainada cluster. The study can identify and quantify existing disparities. Understanding the extent and nature of these differences is crucial for devising targeted interventions to address inequities in educational outcomes and The study contributes to the body of research on gender and education by providing empirical evidence of gender-based differences in mathematics achievement among class 5 students. the comparative analysis of mathematics achievement among class 5 students based on gender and schools is significant for its potential to drive positive change in educational practices, policies, and outcomes. By shedding light on the complex interplay of factors influencing mathematics achievement, the study offers valuable insights for fostering greater equity and excellence in mathematics education

LITERATURE REVIEW

Tsai and Walberg (1983). conducted a study and applied Walberg's theoretical model in a study of the mathematical learning of 13-year olds in which they investigated two dependent variables, mathematics achievement and attitude toward mathematics and indicated all factors had a significant (a = 0.05) positive association with mathematics achievement. While it was found to be a positive relationship between the independent variable and mathematical achievements.

Spiegel (2007). discuss the ways that the Mathematics Assessment Collaborative (MAC) – a program that replaces standardized tests with a "coordinated program of support and learning for teachers based on a common set of assessments given to students" (p.138) – impacted student success. This assessment considered five main ideas about mathematics per grade level, and, in place of tests, students had five tasks to complete. These tasks "require students to evaluate, optimize, design, plan, model, transform, generalize, justify, interpret, represent, estimate, and calculate their solutions" (Foster et al., 2007, p.139) through open, problem-based tasks. This exam was given to students in grades three, five, seven, and in algebra classes in 24 school districts.

Suh (2007). reinforces the idea that there is still a prevailing focus on procedural fluency in mathematics classrooms. Willing to change this scenario, she proposed five different classroom activities to elementary students focused on building on the five strands of mathematical proficiency.

Freund (2011). sought to understand teachers' approaches when teaching for mathematical proficiency

in an urban school context. The author discussed how teachers engaged in problem based teaching to develop mathematical proficiency. The teachers in the study were filmed teaching lessons about algebraic thinking after attending a professional development seminar. Productive disposition was excluded from this study as it was deemed too difficult to measure. Based on the lessons taught and on whole class and small group discussions, the researcher observed each student's mathematical proficiency on a scale from 1-5 to determine if the student was "proficient strong, proficient-limited, non-proficient-strong, non-proficient-limited, and no rating-none"(Freund,2011,p.49).

Khairani and Nordin (2011). created a mathematical proficiency test to assess the development and relationship between conceptual understanding, procedural fluency, and strategic competence of 588 14-year-old students. These three strands were chosen apart from the remaining two (productive disposition and adaptive reasoning) as Khairani and Nordin argue that the excluded strands are not yet mature enough to assess and that conceptual understanding,

procedural fluency, and strategic competence are easier to assess using a "standardized achievement test" (p.35). The test was structured in the following manner: 50% of the test focused on conceptual understanding, 32% of the test focused on procedural fluency, and 18% focused on strategic competence. The topics covered on the test were "Linear Equation, Algebraic Expressions II, Ratios, Rates, and Proportions I, and Coordinates and Circles I" (Khairani & Nordin, 2011, p.37)

Winheller et al. (2013). also concluded that "[a]mong New Zealand elementary students, enhanced liking of mathematics resulted in worse mathematics performance, while among high-school students liking mathematics was irrelevant to performance" (pp. 65-66) thus identifying students' "liking of" or "interest in" mathematics as a poor indicator of future mathematics proficiency.

OBJECTIVES OF THE STUDY

The objectives of this study

1. To compare the achievement scores in mathematics between boys and girls students of class 5 in half yearly examinations.
2. To compare achievements scores in mathematics of class 5 students among different schools under same cluster.
3. To summarise and give the suggestive measures regarding in the improvement in mathematical achievement.

METHODOLOGY
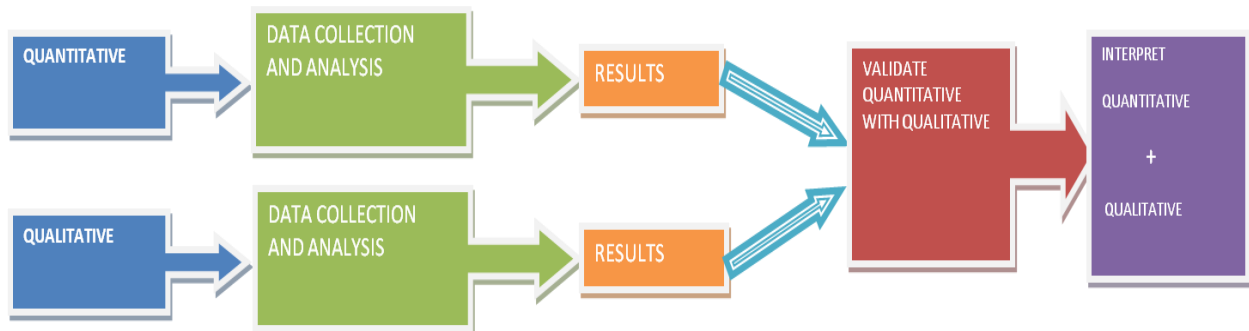
The proposed study is mixed-methods approach, where quantitative data was collected through standardized mathematics assessments which have been done by schools in half yearly examination results, while qualitative insights were obtained through questionnaire with teachers.

- For this proposed study the investigator used random probability sampling techniques in which purposive sampling technique was used for data collection.
- Students of class 5 students were as sample for this study.

DATA COLLECTION PROCEDURE

Data collection is a systematic process in which the investigator is collecting the data for their research work. To fulfil the research objectives investigator follow certain systematic procedure for the collection of data. Data collection is not a one day work , it takes much more time to collect relevant data that is useful for research work. So the investigator follow certain steps in data collection.

For this proposed study the investigator has followed certain systematic steps and procedure for data collection. The data collection procedure are of the following.

1. The investigator requested the Principal of different government primary school to grant permission to carry out the study on to check the status of mathematical proficiency of class 5 students.
2. After got the permission from the Principal of different government primary school, the investigator was collected the achievement scores in mathematics of class 5 students in their half yearly examinations.
3. After collecting all the required data then the investigator used appropriate procedure to analyse data and draw the inference from these data.

STATISTICAL TECHNIQUE USED

For this proposed study the investigator had used descriptive statistics for data analysis and interpretation.

RESEARCH FINDINGS

After the completion of the study the investigator summarises the findings of the study. It represents its conclusion regarding the status of mathematical proficiency & achievements among class 5 students on the basis of gender and schools . it also give different strategies & suggestions for the improvements in mathematics.

1. COMPARISION OF MATHEMATICAL ACHIEVEMENTS AMONG CLASS BOYS & GIRLS STUDENTS

Mathematics plays an important roll in our lives because it increases the mental ability and reasoning capacity and also it helps a lot in day to day life. After analysing all the data collected from 4 government primary schools of Gainada cluster, the investigator used descriptive statistics to find the central tendency score like mean scores, mode & scores in percentage of all, boys & girls students of class 5 in mathematics. It was concluded that

- Mean achievements scores in mathematics of boys is 28.16 and mean scores of girls in mathematics is 28.66. it is concluded that the mean score of girl in 0.50 more than the mean score of boys.
- It is quite evident that achievement scores in mathematics of girl is slightly more than boys scores.

Overall score analysis

- 0.16% students scores 100% mark in half yearly examinations from 4 different schools.
- 16.8% students scores between 80%-90% mark in half yearly examination from 4 different schools.
- 8.8% students scores between 70%-80% mark in half yearly examination from 4 different schools.

- 9.6% students scores between 60%-70% mark in half yearly examination from 4 different schools.
- 21.6% students scores above 50%-60% mark in half yearly examination from 4 different schools
- 36% students scores below 50% mark in half yearly examination from 4 different schools.

It is concluded that 36% students scored below 50% mark in mathematics in half yearly examination. It is not good for the students ,so teachers must look into this & give appropriate interventions to the students to increase the scores in mathematics.

2. COMPARISION OF MATHEMATICAL ACHIEVEMENTS AMONG DIFFRENT SCHOOLS STUDENTS UNDER GAINADA CLUSTER

After analysed all the data collected regarding the scores of class 5 students in mathematics from 4 government primary school i.e Hatabaradihi government Upper primary school, Govt. P S Jayantpur, Gainada primary school, Satyanarayan dev govt. Primary School, Hatabaradihi. The statistical analysis of mathematics scores shows that

- Among 4 schools the students of Hatabaradihi Upper primary school in mathematics have scored magnificently as compared to other 3 schools.The mean scores of Hatabaradihi Upper primary school is 41.40 with mode 40 which is so impressive.
- The maximum students of Hatabaradihi Upper primary schoo have scored above mark 40 marks out of 50 marks which is really a positive sign for the students achievements as well as efforts of teachers in teaching mathematics.
- All the students of Hatabaradihi Upper primary school have scored 70% above marks. No student has secured below 70% of marks.
- From Rest of 3 schools, 2 schools, the students of class5 of Gainada primary school & Satyanarayandev govt. Primary schools, hatabaradihi have mean scores are 26.72 & 26.70 respectively. It shows that the scores obtained by students are good but some students have scored below 50% of mark which should be addressed by the teachers why some students have been securing below 50% of mark? The issues regarding this must be addressed by the school heads & teachers to take remedial measures in improvement in mathematics of class 5 students.
- Among 4 schools of Gainada cluster , the achievements scores in mathematics of class 5 students of Govt. Primary school , jayantpur, the maximum students have scored below 50% of mark in mathematics, this is not a good academic sign for the school & few students have scored above 50% of mark. No students have been scored above 60% of mark. It is really a great concern for the teachers as well as for the schools. So that the teachers of this school should be aware & take necessary remedial measures so that the student will score good marks in mathematics in near future.

3. SUGGESTION FOR IMPRROVEMENTS IN MATHEMATICS

To increase low mathematics achievements among class 5 students, consider the following suggestions and interventions:

A. **Diagnostic Assessment :** Conduct diagnostic assessments to identify specific areas of weakness among students. This will help in targeting interventions effectively

B. **Differentiated Instruction**: Implement differentiated instruction to cater to diverse learning needs. Provide extra support, resources, and alternative teaching methods for struggling students.

C. **Hands-On Activities:** Incorporate hands-on activities, manipulatives, and real-life examples to make math concepts more tangible and engaging for students.

D. **Peer Tutoring**: Organize peer tutoring sessions where stronger students can help their peers understand difficult concepts. This not only benefits struggling students but also reinforces learning for the tutors.

E. **Small Group Instruction:** Offer small group instruction sessions to provide personalized attention and support to students who need it most.

F. **Technology Integration:** Utilize educational technology resources such as math apps, online tutorials, and interactive whiteboards to reinforce learning and make math more interactive.

G. **Regular Feedback and Monitoring**: Provide regular feedback on students' progress and offer constructive suggestions for improvement. Monitor their performance closely to track their growth over time.

H. **Parental Involvement:** Encourage parental involvement by providing resources and tips for parents to support their child's math learning at home. Host workshops or information sessions for parents on how they can assist their children with math homework.

I. **Problem-Solving Skills:** Emphasize problem-solving skills by presenting students with challenging math problems and encouraging them to think critically and creatively to find solutions.

J. **Positive Reinforcement:** Recognize and celebrate students' achievements and efforts in math to boost their confidence and motivation.

K. **Professional Development:** Provide ongoing professional development opportunities for teachers to enhance their math teaching skills and stay updated on effective instructional strategies.

L. **Curriculum Alignment:** Ensure that the math curriculum is aligned with educational standards and benchmarks, and that teachers have access to appropriate resources and materials to effectively teach the required concepts.

By implementing these interventions and strategies, you can help improve the mathematics achievements of class 5 students who are struggling in the subject.

CONCLUSION

The comparative analysis of mathematics achievement among class 5 students based on gender and schools has provided valuable insights into the complex interplay of factors influencing academic performance in mathematics. Through a combination of quantitative assessments and qualitative inquiry, this study has revealed significant disparities in mathematics achievement across gender lines and within different school contexts. Gender-based differences in mathematics achievement were evident, with male students often outperforming their female counterparts in standardized assessments. However, the study also illuminated variations within schools, highlighting the impact of school environments, teaching practices, and socio-cultural factors on mathematics achievement. While some schools demonstrated minimal gender gaps in mathematics achievement, others exhibited more pronounced disparities, underscoring the importance of contextual factors in shaping educational outcomes. Socioeconomic status, classroom dynamics, and teacher attitudes were identified as influential factors contributing to these differences. Despite these disparities, the study identified promising practices and interventions that can help mitigate gender-based inequities in mathematics achievement. Targeted support programs, professional development for teachers, curriculum revisions, and parent/community engagement emerged as key strategies for promoting equitable learning outcomes. Moving forward, it is imperative to continue monitoring and evaluating progress towards closing gender gaps in mathematics

achievement. Long-term efforts should focus on fostering gender-inclusive pedagogy, creating supportive learning environments, and addressing systemic barriers to learning. Ultimately, by implementing evidence-based interventions and fostering collaborative partnerships among educators, policymakers, and stakeholders, we can work towards creating a more equitable and inclusive mathematics education system where all class 5 students have the opportunity to thrive academically, regardless of gender or school context.

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