A Comparative Study of Achievements in Mathematics between Boys and Girls Students at the End of Elementary Education

Minara Yeasmin[1], Dr. Md. Kutubuddin Halder[2], Dr. Nimai Chand Maiti[3]

Abstract

Mathematics is the foundation for success in a variety of content areas, during a child's educational experience. Basically the goal of teaching mathematics, especially at the elementary level is to prepare pupils to develop critical and creative outlook as they confront the challenges of daily life (Meremikwu 2008). Also RTE, 2009 enables every child to access quality mathematics education at elementary level. This paper takes an attempt to look after whether there is a gender gap in that achievement level in mathematics of the students who have completed elementary education and. A Survey was conducted among 400 students in 19 schools of South 24 Parganas, West Bengal by random sampling technique. A standardized achievement test in mathematics prepared by the author was exercised as a tool. Data was analyzed by mean, standard deviation, t-test and graphical presentation. The mean value of the achievement test was found 23.94 out of 50. It also revealed that boys have done a little better achievement in mathematics than girls students and both boys and girls are comfortable in statistics and experience difficulties in application based problems in arithmetic and geometry.

Keywords: Achievement in mathematics, Comparison among Boys and Girls students, Elementary Education, Mathematics,

- [1] *Minara Yeasmin is currently an Assistant Professor in Department of Education in Aliah University, Kolkata, West Bengal, India. She is also a research scholar in University of Calcutta, PH-(+91)8013932965. E-mail: myeasmin047@gmail.com*
- [2] *Dr. Md. Kutubuddin Halder is currently a Professor in Department of Education in University of Calcutta, Kolkata, West Bengal, India ,E-mail: md.khedu@rediffmail.com*
- [3] *Dr. Nimai Chand Maiti is currently a Professor in Department of Education in University of Calcutta, Kolkata, West Bengal, India ,E-mail: nimaichandmaiti@gmail.com*

Introduction

Mathematics is the foundation for success in a variety of content areas, during a child's educational experience. Mathematics is not only crucial for success in school, but in being an informed citizen, being productive in one's chosen career and in personal fulfillment. In today's technology driven society greater demand have been placed on individual to interpret and use mathematics to make sense of information and complex situation. Mathematics now dominates almost every field of one's activities. In this age of science and Technology, it has permeated through the human life in such a way that, it has now become every man's everyday concern. Mathematics disciplines the mind, systematizes one's thought and reasoning. The subject has also rich potentialities of affording true enjoyment to its students. (Kumar & Rustagi, 2012)

Mathematics is an important subject in school curriculum. It is more closely related to one's daily life as compared to other subjects. Except one's mother tongue there is no other subject which is more closely related to one's daily life as mathematics. Mathematics is considered to be the father of all sciences. Napoleon remarked that- "The progress and improvement of mathematics is linked to the prosperity of the state". (Yadav, 2011)

Elementary education, that is, classes I–VIII consisting of primary (I–V) and upper primary (VI–VIII) is the foundation of the pyramid in the education system and has received a major push in the Tenth Plan through the Sarva Shiksha Abhiyan (SSA). Modern nations see value in building a mathematically literate society and hope for a strong mathematical elite that can shape the knowledge economy of the 21st century. At the same time, mathematical proficiency is universally considered hard to achieve.

Significance of the study

The study of mathematics has become a central intellectual discipline particularly for technological societies, such that as a society develops, so would its qualitative features (Ojo, 1986). This is a signal of the significant position agreement by mathematics and it is a tool for sustainable development. The notion of sustainable development here refers to mathematics as an instrument for maintaining economic development within acceptable levels of global resources without damage to the environment. In this context, a nation can develop the quantitative aspects through the mathematics contents designed for the citizenry right from elementary level to higher level of education. (Ramanujam & Subramaniam, 2012)Mathematics education should, aim to promote better leaning of mathematics for all. Its success should, in the long term, be measured by this criterion. Setting this goal reveals my underlying belief that good mathematics education benefits both society and the individual through its contribution and through its contribution to the individual. It can empower individuals in everyday life, bring them personal fulfillment through studying its beautiful patterns and working on its magnificent problems, and can strengthen more general values such as personal autonomy and the value of applying logical thought to issues. The elementary mathematics education is of greater importance because it is the foundation level. So, society wouldn't be able to achieve the overall development without achieving quality in elementary education especially in mathematics education. (Ramadas & Chunawala, 2004)Equally striking is the persistence of gender inequalities across India. Available data reveal, for instance, that girls fare worse than boys on most indicators of educational attainment. For instance, about 53 per cent boys complete primary education compared to 34 per cent girls. The PROBE (Public Report on Basic Education in India) survey revealed that while the gap in educational aspirations between social groups is narrowing rapidly, these common aspirations give very unequal attention to boys and girls. Most parents (mothers as well as fathers) expressed much stronger interest in their sons' education than in that of their daughters. Marginalized groups such as the scheduled castes (SCs) and scheduled tribes (STs) as well as religious minorities like Muslims, continue to fall out of the loop of schooling. A serious shortcoming has been the failure to ensure good quality elementary education. (Government, 2009)

Objectives

This paper aims to

- Compare the achievement between boys and girls students in mathematics.
- Compare the achievement between boys and girls students in different groups of mathematics.
- Compare the achievement between boys and girls students according to the grading system of evaluation.

Hypothesis

H01: There is no significant difference in the

achievement in mathematics between the boys and girls students of schools in south 24 Parganas.

Method

Sample and Sampling Technique

Stratified random techniques were adopted for the study. 400 students were taken from nineteen schools. Out of these 210 students were boys and 190 were girls.

Tools

An Achievement test in mathematics for class VIII was made and standardized. The test was comprised of 40 items and the researcher found the reliability by KR-20 method and split half method. Values of reliability by those methods were 0.87 and 0.91 respectively. The author has gone through the text books of mathematics under different boards namely WBBSE, ICSE and CBSE and divided the whole content into five traditional groups consisting of arithmetic, algebra, geometry, mensuration, statistical representation.

Collection of data

The author visited 19 schools and administered the achievement test in mathematics on 400 students of these schools and collected data from the students with' the help of the teachers of the respective schools.

Statistical Treatment

Both qualitative and quantitative analysis has been done for variables yielding quantitative results, percentage, mean standard deviation, t-value, and co-relation, were calculated and graphically presented. Qualitative analysis was made on the basis of visit to nineteen schools and discussion with the students and teachers of the concerned schools. The author has followed the grading system of West Bengal Board of Secondary Education. These are given in the *table 1*.

Findings

The author has categorized the response of the students in three parts namely ' no response' , ' wrong response' and 'correct response'. Graphical representation are shown in this categories of response and in different groups of mathematics and according to grading system of evaluation.

Table 1: Grade wise achievement w.r.t Gender

Raw Marks out of 100	Grade	Interpretation	Students		
			Boys (%)	Girls (%)	Total (%)
90-100	AA	Outstanding	2.4	1.6	2
80-89	A+	Excellent	8.1	3.2	5.8
60-79	A	Very Good	22.9	15.3	19.3
45-59	B+	Good	18.6	25.8	22
35-44	B	Satisfactory	27.1	23.7	25.5
25-34	C	Marginal	15.7	15.8	15.8
below 25	D	Disqualified	5.2	14.7	9.8

Table 2: t-test for testing the achievements in Mathematics Gender wise

Gender	N	Mean	Std. Deviation	t-value
Boys (total)	210	25.67	9.85	3.97
Girls (total)	190	22.03	8.47	

The computed t-value is 3.97 (table-2). It is more than the critical values at both the 5 percent and 1 percent levels of significance (critical t-value at 5% and 1% level of significance for degree of freedom 398 is 1.97 and 2.59 respectively) It should thus be taken as quite significant and consequently the null hypothesis H01 stands rejected at both the levels of significance. It can be said that there stands significant difference between the achievements of boys and girls signifying that boys have better achievements than girls in mathematics.

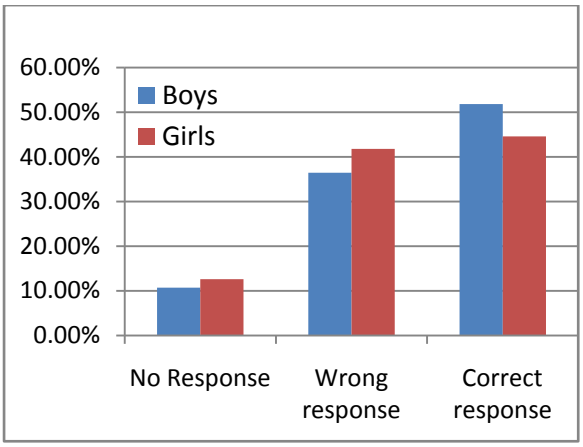

Fig. 1: Comparison between Boys and Girls Students with respect to different categories of response

This figure gives a clear picture of comparison between the response of boys and girls students in different categories. It was clear that boys were in a better position than girls in all categories of response.

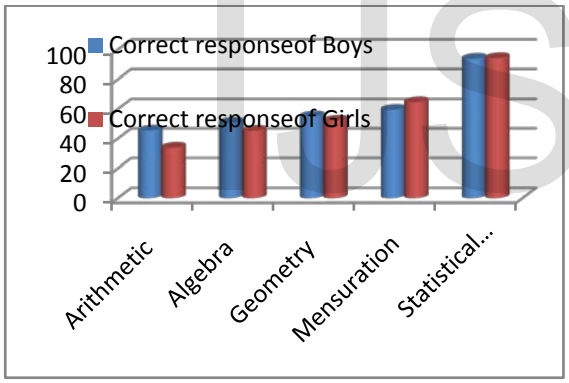

Fig. 2: Comparison of correct responses of Boys and Girls in different groups in Mathematics

Figure 3 gave us a total view of correct response of all boys and girls students. It was clear from that figure that the trend in giving correct response in all groups of mathematics shown above had gone in same path. Among different groups of mathematics the result focused the point that the students were more comfortable with statistics and the back drop lies in the arithmetic and geometry group.

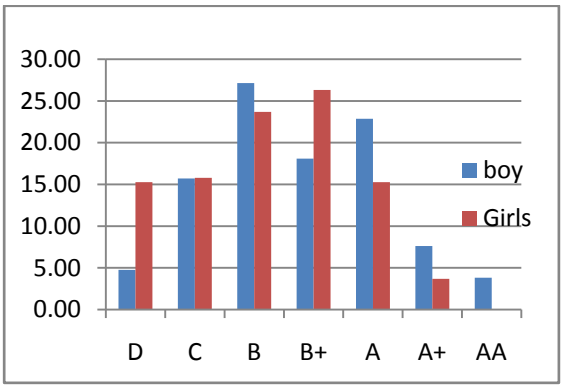

Figure 3: Achievement of Boys and Girls according to Grade Level

Conclusion

Overall mean value of the scores of the achievement test in mathematics was.23.94 out of 50.

With respect to different groups, in statistical representation group both boys and girls had performed excellent level of grading system and in arithmetic and geometry both of them faced difficulties to give correct response.

Boys had done better performances than the girls students in the achievement test in mathematics. The difference in their achievement was by 7.3 %. 8.1 % boys students got A+ grade whereas only 3.2 % girls students achieved that grade and 5.2 % boys students were at disqualified level of grading system (below 25 % marks) while 14.7 % girls students were in that level.

In terms of different categories of responses it was found that 51.84 % of boys students gave correct response while 44.57 % girls students gave that.

In sum, additional collaborative efforts – institutional, financial and analytical – are needed in order to supplement the lessons learned from this study and add a new dynamic to on-going national efforts to improve the quality of learning for all elementary school-age children in mathematics. Teachers have a pivotal role to play in schools, especially in rural areas where they are the sole representatives of the education system. Much of school quality in fact depends on the teacher. There are two aspects of the quality of teachers that are especially relevant in the present context. The first issue has to do with the role of teachers in the management of the school. The diligence with which records are maintained, incentive schemes implemented,

infrastructure maintained, as well as the regularity of teacher attendance and teacher involvement are all important determinants of teacher quality that affect educational outcomes. Unfortunately, all too often most or all of these areas of teacher performance leave a lot to be desired.

Works Cited

Government of India (2009). Right of Children to free and compulsory education. *The Gazette of India , Ministry of Law and Justice*.

Kumar, S. A., & Rustagi, P. (2012). *Elementary Education in India: Progress, Setbacks, and Challenges.*

Ramadas, J., & Chunawala, S. (2004). *Research Trends in Science, Technology and Mathematics Education* . Mumbai: Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research.

Ramanujam, R., & Subramaniam, K. (2012). *Mathematics Education in India: Status and outlook* . V. N. Purav Marg, Mankhurd, Mumbai – 400088.: Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research.

Yadav, S. K. (2011). *National Study On Ten Year School Curriculum Implementation, Department of Teacher Education and Extension.* Sri Aurobindo Marg, New Delhi – 110016.: National Council of Educational Research and Training.