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A Comparative Study on the Performance of Male versus Female Students in the Subject of Mathematics

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ABSTRACT

The main purpose of this study was to compare the performance of male versus female students of Government Schools at Higher Secondary level in the subject of Mathematics in Rawalpindi division. The main objectives of the study were: (1) To assess the performance of male and female students of government schools at higher secondary level in the subject of Mathematics, (2) To compare the performance of male and female students of government schools at higher secondary level in the subject of Mathematics, (3) To identify the weak areas of male and female students in Mathematics in which they need more attention and (4) To give suggestions for the improvement in the light of their weak areas.

All provincial government higher secondary schools (27 male and 24 female) of Rawalpindi Division constituted the population of the study. Six Higher Secondary Schools were taken from each district, comprising 3 male and 3 female Higher Secondary Schools. In this way 24 Higher Secondary Schools were chosen as sample of the study. For collection of the data 10 students were taken randomly from each Higher Secondary School of boys & girls. The study was delimited to the 120 male and 120 female students of 24 Higher

Secondary Schools. A test was developed and administered to the male and female sample students of Rawalpindi Division. F test in ANOVA table and the co-efficient of variation was used for the comparison on the performance of boys and girls students.

Key Words: f-test, co-efficient of variation

1. INTRODUCTION

Mathematics is as important to a country as protein is to young ones. For better understanding and to keep them in function of science and technology it works as a vital device, the discipline acts as the vital role of an initiate to the much desired technological development needed for the national development. It has become an essential objective for the education of mathematics to facilitate the students to build up abilities to distinguish the relation between mathematics and the facts of life, and to recognize and realize the character of mathematics performing in the human life. The performances of female and male students in mathematics are different by inequalities in their physiological structures. Even though the majority of the researchers have found the better performance of boys than girls particularly in higher education, a small number of other researchers found that girls performance better than boys and during early education, a number of other researcher found no important difference. An analysis of some gender based studies that were done in the decade between 1985 and 1995 showed that there is a significant discrepancy in the literature in the disparity performance between girls and boys in the subject of mathematics. The researchers noted that by means of the contradictory results and noteworthy procedural flaws observed, further experimental researches are required to explore the reality of gender bias in the classroom (Fennema and Sherman, 1978).

Researches of last ten years have revealed that females and males have approached differently in learning and have different classroom experiences, because teachers treat them in different ways. Attainment potential for females in several subjects is generally lower, as they are poor students or they belong to a certain cultural and racial group (Callahan and Clements, 1984).

Traditionally, the achievement of females in advanced mathematics is hard to define. In the primary stage the achievement of girls is equal to boys in mathematics but it decreases in the middle standard school. A study of twelfth grade girls in 15 countries on the achievement in mathematics exposed that girls of nine countries showed less performance than the boys. The turn down of female attainment starts at the age of ten because of strong outline of socialization as the differences in gender (Geist and King, 2008).

As girls grow during school, they drop and discontinue the subject of mathematics in general. This digests reviews talk to point out the handling of female students that inhibits their capability to effectively learn math, general methods of communication and teaching practices in the classroom. It also identifies some pessimistic attitudes of teachers and parents about female mathematics attainment may discourage girls from ongoing their math education (Pallas and Alexander, 1983).

As a result, the poor performance of secondary school student in the subject (mathematics) cannot be acceptable to go unattended to. Hence the effort to look into the possible causes of student's poor performance in the subject and this study will also try to dive into the comparative assessment of performance of male students and female students at higher secondary school level.

2. REVIEW OF RELATED LITERATURE

Importance of Mathematics

"What makes the math in sciences so vital?" this question can be answered by quoting Galileo: "Only those can read the great book of nature who knows the language in which it was written. And that language is mathematics." adding "Math is the way to understand all sorts of things in the world around us."

Mathematics Self-Efficacy

By definition, self-efficacy is the perception of individual ability to perform and complete tasks. Therefore, self-efficacy information helps individuals determine how much effort they should expend in order to complete a task Individuals attribute their self-efficacy to past experiences and how those experiences relate to them personally. Self-reflection of exposure to or lack of exposure to, mathematics classes is therefore the primary source of mathematics self-efficacy. If individuals have no basis of the knowledge required to properly assess their ability, then their assessment will in the end be flawed. In essence, it is difficult for students to objectively evaluate themselves on topics for which they have little knowledge. Therefore, exposures to mathematics with positive outcomes increases mathematics self-efficacy while exposure to mathematics with negative outcomes decreases mathematics self-efficacy, provided the positive outcomes are attributed to increases in personal capability.

However, continual attempts should be made at enhancing the learning experience for students that have been shown to have low levels of self-efficacy thereby enabling individuals to master the important concepts of mathematics while enabling them to become lifelong, self- regulated learners (Bandura 1993).

Using Mathematics in Problem-Solving

Numerous researches have been done in the area of teaching and learning during the recent years which have led to the development of plans for problem-solving teaching or what is usually referred to as supreme mental processes; some of the studies done in various countries are as follows:

Murphy, Danald (1988) referred to their research as modifying the traditional classroom model to facilitate the development of creative skills. This model shows a considerable increase in creativity grades.

Runco & Okuda (1998) have reviewed the role of problem discovery in divergent thinking and creative process of teenagers and resulted that teenagers obviously had a better response to the discoverable problems; moreover, problem discovery is relevant to the creative process of teenagers.

Gender and Mathematical Education

Nowadays, the problem field has changed from "women and mathematics" to "gender and mathematics". This change started with the attention on women exerted by women. In the mid-1990s, the focus was broadened to a gender perspective. The International Organization of Women and Mathematics Education (IOWME) - an international network of individuals and organizations who share a commitment to achieving equity in education and who are interested in the links between gender and mathematics teaching and learning – is a main factor in this change (Fennema & Sherman, 1978).

The gender gap in mathematics is not a new unknown fact. There are a lot of researches relating to the difference among genders and the possible causes of the gender gap. Study towards the reason of the gap refers to three main factors that may contribute to the differences. These consist of local biological differences, social influences, and cultural pressures. On the other hand, there are also claims stating there is no long a gender gap (Beaudry & Campbell, 1998).

3. RESEARCH METHODOLOGY

3.1 POPULATION

All male and female students of the Government Higher Secondary schools of Rawalpindi Division constituted the population of the study.

3.2 DELIMITATION OF THE STUDY

There are four districts (Rawalpindi, Attock, Jhelum and Chakwal) in Rawalpindi Division. The study was delimited to six schools (3 male + 3 female) from each district.

3.3 SAMPLE

For choosing the sample from the population the simple random sampling technique was used. For collection of the data 10 students were taken randomly from each selected Higher Secondary School. The sample of this study consisted of 120 male and 120 female students of 24 Higher Secondary Schools (12 male & 12 female).

3.4 RESEARCH INSTRUMENT

After a thorough review of the techniques of test, a test was developed. For determining the reliability of the instrument, Split Half Methods was applied to calculate internal consistency of the items. Consent of the teachers and experts was taken in the

construction of tests. The test items (MCQs) were prepared from ten chapters of the Text book of Mathematics.

4. RESULTS AND DISCUSSION

To check the performance of the male and female students of each district of Rawalpindi Division, the mean and standard deviation of all the ten chapters were calculated separately. F test in ANOVA table and the co-efficient of variation was used for the comparison on the performance of male and female students.

In general, the study results revealed that the performance of male and female students was average. Through all the analysis of data the performance of male is better than female students in all the chapters of mathematics.

If it is correct that girls are less interested than boys in math. An encouraging answer to the question about gender differences in interest in math might guide to further study of an inspiration that repels many of us, i.e., the question of inherited differences. But the inherited argument does not give the idea particularly helpful to us, as educators and beginning the argument about interest in math would enable us to examine the question of gender differences in a way that might be helpful.

Research on gender and mathematics has provided a powerful systematic discussion during the past 3 decades. The whole educational community composed of researchers, practitioners, and policymakers have to continue to engage in this discussion about and to explore ways to get deeper our understanding in gender differences in mathematics. It is in conversation about philosophical questions as well as research questions that our understanding of gender and mathematics will raise.

5. CONCLUSIONS

In the light of statistical analysis and the findings of the study, the following conclusions were drawn.

1 The study results revealed that the performance of male and female students of Government schools at the higher secondary level in the subject of mathematics was average performance.

2 The study results showed that the performance of male students was better than female students.

3 The study results exposed that the areas in which the students were weak are Sets, Functions and Groups, Quadratic Equations, Mathematical Induction and Binomial Theorem.

4. The study results uncovered that the areas in which the students have performed satisfactory are Number System, Matrices and Determinants, Sequences and Series, Permutation, Combination and Probability, Fundamentals of Trigonometry, Trigonometric Identities and Application of Trigonometry.

6. RECOMMENDATIONS

In order to improve in the weak areas mentioned above and the quality of students and at higher secondary level in subject of mathematics, following are the major recommendations.

1. It is recommended that guidance and counselling should be element of school timetable at secondary level. Students should be counselled to opt for Mathematics up to secondary school level.

2. It is recommended that teachers should give more detailed explanations of concepts, provide more opportunity for discussion and more encouragement. Teachers' knowledge of the subject should be matched by knowledge of how to explain it.

3. It is recommended that the girls should be provided more opportunities to interact with their peer group to increase their interest and clear their doubts about the mathematical concepts.

4. It is recommended that the students should be sorted into groups according to ability and taught separately according to whether they were weak, average or good and more tests would be a better form of learning.

5. It is recommended that the need for teaching materials that related to the local situation and that brought out the practical dimensions of mathematics is emphasized.

6. It is recommended that structuring lessons around the thinking processes needed to reach your destination at answers to questions according to the students both male and female need. Math problems can reflect student experiences and can put emphasis on practical, real life applications.

7. Techniques need to be researched and developed to help both males and females select more appropriate subjects at tertiary level. Initiatives are in place to assist females, and these initiatives need to be further developed, particularly to find ways to encourage females to take the more specialized mathematics subjects. Regional trainings initiatives need to be developed to bring teachers and students closer together.

8. It is recommended that mathematics teaching and evaluation strategies should be developed wisely that males and females tend to see themselves as equal, capable of competing and collaborating in classroom activities.

9. It is recommended that the mathematics teachers should be strengthened with refresher courses, orientation workshop and provision of on the job trainings to overcome the difficulties of teaching mathematics.

10. It is recommended that mathematics working teachers, educators and expert need to be involved in the development of new curriculum.

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