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Effects of Private Tuition on the Academic Achievement of Secondary School Students in Subject of Mathematics in Kohat Division, Pakistan

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ABSTRACT

Research reveals that private or home tuition after school time plays a crucial role in strengthening and improving student's academic achievement (Atta, et al., 2011). The purpose of the study was to explore the effects of private tuition on the academic achievement of students in subject of mathematics at secondary school level. All the students at secondary school level in Kohat Division (Pakistan) constituted the population of the study. The study was delimited to the students of Government High School Ahmadi Banda Karak only. Fifty students of class 09 were selected as sample of the study. Sample students were divided into two groups i.e. control group and experimental group by equating them on the basis of their previous knowledge in subject of mathematics as determined through a pre-test. Each group was composed of 25 students. Students of the experimental group were engaged in tuition for two hours after school time. The study was experimental in nature therefore, "The

pre-test-post-test Equivalent Groups Design" was used for the collection of data. Statistical tools i.e. the mean, standard deviation and differences of means were computed for each group. Significance of difference between the mean scores of both the experimental and control groups on the variable of pre-test and post test scores was tested at 0.05 levels by applying t-test. After statistical analysis of the data, the researchers concluded that there is significant positive effect of private tuition on the academic achievement of students in subject of mathematics at secondary school level. Based on the findings, it was recommended that parents should arrange private tuition for their children to move up their achievement level in subject of mathematics.

Keywords: Effects; Private Tuition; Academic Achievement; Secondary School Students; Mathematics

INTRODUCTION

In Pakistan, majority of the parents provides tuition facilities for their children to improve their academic performance. There are some reasons for which they arrange tuition for their children. Firstly, some parents are uneducated or illiterate and secondly some parents are educated but have no time and remain too much busy to improve their economical position. Therefore, they come late to their homes. It is a reality that parents spent a lot of their economy on their children education but they are not able to look after their academic activities. Research shows that parental involvement and participations play a fundamental role in increasing the level of educational attainment of their children. Parents engage some tutors at home for making up the academic deficiencies and for increasing the academic abilities of their children. For this purpose, professional tutors are appointed for tutoring the children at home and gradually this trend of tutoring is being converted into a tradition rather an academic requirement (Atta, et al., 2011).

Home tuition is regarded as a very important instrument for the educational achievements of children. At secondary school level, students require guidance to compete with their class fellows and to get admissions in the most reputed and highly ranking educational institutions. In addition, it is very imperative to provide assistance to the students to do their homework properly which is assigned to him by the teachers. Furthermore, at secondary school level, courses are lengthy and tough therefore, it requires proper guidance and continuous supervision from parents. Home tuition is the best solution to these problems. Hence home tuition facilities should be provided to children whose parents are not able to participate with them in their academic activities. In addition, there are a lot of tuition academies, centers and coaching centers which are available in almost every corner of the urban as well as in rural areas of the country. These academies and centers provide teaching and guiding help in all the subject areas. But home tuition is regarded as more effective and successful because in tuition academies, students are put together in large group to tutoring purpose and hence individual attention is ignored (Atta, et al., 2011).

Now-a-days, in Pakistan, trend of home or private tuition is commonly observed in

almost every corner of the rural and urban areas especially in subject of mathematics because mathematics is tougher as compared to the other subjects. The main reasons of this trend are the poor performance of teachers, lack of mathematics teachers in institutions, extraordinary involvement of students in co-curricular activities etc. This is why majority of the parents especially in urban areas arrange private tuition for their children to raise the level of their academic achievement, to make up their academic deficiencies and to keep them busy.

The current research paper was specially designed to explore whether home or private tuition is beneficial in subject of mathematics or not. The principal researcher has been teaching mathematics at secondary school level for several years and therefore he was interested to conduct research study to explore the importance of tuition in subject of mathematics at secondary level. The findings of the study is beneficial for the students at secondary level because the researchers expect that through this study, the importance and effectiveness of the private tuition in subject of mathematics will be explored and that is why students at secondary school level will improve their academic performance in subject of mathematics through private or home tuition.

REVIEW OF RELATED LITERATURE

The review of related literature is divided into two sections i.e. Section – A which is about mathematics and the section – B is about tuition. So these are discussed section wise as under:

SECTION – A

What is Mathematics?

Mathematics is derived from Greek word "mathema" which means knowledge, study and learning. It is an area of knowledge which deals with quality, space, structure and change (Free online Wikipedia). Mathematics is the science of measurement, quality and magnitude. According to the new English dictionary, mathematics in a strict sense, is the obstruct science which is the basic conception of spatial and numerical relations. Mathematics also refers to the science of number and space. Its equivalent in Hindi or Punjabi is "Ganita" which refers to the science of computation or calculation**.** Mathematics is a systematized, precise and organized science (Bashir, 2000). Mathematics is a discipline of accurate, precise and logical analysis which provides us tools to describe, abstract and deals with the world and world ideas in a logical and intelligent way (Schoenfeld, 1982).

No doubt, mathematics is playing a fundamental role in everyday life. It has affected every aspect of society. There is no aspect of human life in which mathematics is not involved. Its knowledge is used in banking, educational institutions, industry, accounts, homes, shops, agriculture, business, science, research etc. There is a general agreement that every child has to study mathematics at school. Mathematical education is considered very important and crucial because without the application of mathematics, we cannot imagine a social life. Therefore, children are pressurized to succeed in mathematics as compared to

other subjects i.e. history or geography. That is why mathematics is a subject of special importance (Sheerazi, 2000). An effective and sound education in mathematics is essential for any modern knowledge based economy. Mathematics is now playing an important and crucial role in many areas where it has not formerly played much of role i.e. in biology and social sciences etc. If we fail to lay proper mathematical foundations during the formative years of childhood and adolescence, it will become increasingly difficult to cope with this weakness in the later life. The efforts to deal with these weaknesses and shortcomings during retraining in later life are usually meaningless and only successful to some extent (Parveen, 2009). Iqbal (2004) stated that the progress in science and technology is due to the knowledge of mathematics because it has enabled man to send satellites into space, to on other planets, to communicate through information technology, to launch guided missiles and send airships without pilots. Thus teaching and learning of mathematics occupies the important crucial position in social needs.

According to Gall and Hicks (1964), mathematics has played a vital role in science, technology, industry, business, and agriculture. Mathematical study has been linked with habits of effective thinking, intellectual independence, aesthetic appreciation and creative expression. Until now we accepted these objectives and opportunities to become stagnant until the challenges and issues of the modern world startled as out of our satisfaction. In the contemporary world, mathematics is being increasingly applied in science, technology, government, industry, economics and education. If a nation wants to ensure the production of men and women able to deal with the subject of mathematics at these higher levels, then it has to ensure the provision of proper foundations at secondary level (Farooq, et al., 2005).

Prof. Khawaja Masud stated that when the Soviet Union threw sputnik into the space in 1957 the Americans were astonished. They found out that deficiency in mathematics had let them down. They overhauled the entire curriculum, putting mathematics and science in its centre. Within a short period of ten years they landed a man on the moon (Suleman & Latif, 2006). It shows that mathematics is key subject and therefore it is imperative to pay proper attention on mathematics. Its curriculum should be reviewed and redesigned so that it may fulfill the emerging needs and demands of the contemporary society. In this way, soon Pakistan will also stand in the line of the most developed nations of the world.

Goals and Objectives of Mathematics Education

The national council of teachers of mathematics (NCTM) has identified five main goals which are essential for the fulfillment of student's mathematical needs for 21st century. These are described as under:

- The first goal of mathematics education is to value mathematics. Mathematics should be taught in such way that ensure for students that mathematics has value for them, therefore they should be encouraged and motivated to continue studying mathematics as long as they are in school or away from school. Students should appreciate the

cultural, historical, and scientific evaluation and importance of mathematics. A key to valuing mathematics is personal support and encouragement for learning mathematics from valued others.

- The second goal of mathematics education is to reason mathematically. Students have to learn, to collect evidences, make assumptions, to formulate models, invent counter-examples and build authentic arguments to clarify complex situations. In this way, they will be able to develop an informed skepticism and sharp insight characteristic of mathematical prospective. Sound reasoning should be valued as much as student's ability to explore the accurate results.
- The third goal of mathematics education is to communicate mathematics. For this purpose students have to learn to read, write and speak about mathematics. As students try hard to communicate their ideas therefore they learn to clarify, refine and strengthen their thinking.
- The fourth goal of mathematics education is to develop confidence in students' ability to reason mathematically. Ability to deal with the mathematical demands of everyday life depends on the attitudes which students develop toward mathematics**.** To learn and utilize mathematics, students must have self-confidence and self-efficiency made on success. Students should be known that mathematics is a common and well-known human activity.
- The fifth and last goal of mathematics education is to solve problems. Students should be able to apply a wide range of mathematical methods and techniques to solve problems. Students should be handed over a wide range of problems which are different in context, length, complexity, procedures and methods. Students need to recast unclear problems in a form amenable to analysis, to select proper strategies for the solution of problems, to recognize and formulate several solutions when that is appropriate, to work with others in getting agreement on solutions that are effective, useful as well as logical. For productive and useful citizenship, skills in problem solving are very important (Sheerazi, 2000).

According to Serieux (2000), the following are the main goals of mathematics education:

- To build up the awareness that mathematics is useful and worth learning subject.
- To provide mathematical experiences that will facilitate the students to deal with and understand their surroundings.
- To develop skills for mathematical problem-solving.
- To promote a sense of achievement in mathematics.
- To provide such learning experiences that stimulates interest in mathematics.
- To develop the capability to think critically and reason logically.

Objectives of Teaching Mathematics at Secondary School Level

At secondary school level, following are the main objectives of teaching mathematics:

- To equip students with the ability to acquire understating of concepts of Mathematics and to use them for the solution of the problems of the world they live in.

- To make up the sound base of the students in mathematics for specialization at higher levels or to make them able to utilize it in scientific and technical fields.
- To enable the students to reason consistently, to draw correct conclusions for given hypotheses; and to inculcate in them a habit of examining any situation critically and analytically.
- To equip the learners with the ability to communicate their thoughts through symbolic expressions and graphs.
- To build up sense of dissimilarity between relevant and irrelevant data.
- To provide the students with the basic understanding and awareness of the power of Mathematics in generalization and abstraction.
- To promote the spirit of exploration and discovery in students (Govt. of Pakistan, 2002).

SECTION – B

Concept of Tutoring and Tutor

Tutoring refers to the individuals who are not teachers professionally but they assist and support the learning of others in an in an interactive, purposeful, systematic and efficient way. Generally it is performed on a one-to-one basis, in a pair. These tutors can be parents; brothers and sisters; other family members; other learners from the peer groups and a wide range of volunteers. To assist others in learning, tutors often learn themselves (Topping, 2000). The function of tutoring is to assist and facilitate learners. Tutors help or facilitate students to become self-sufficient and independent learners who can perform on their own. The aim of tutoring is to improve the learning of a student in the classroom or outside the classroom. A tutor facilitates learning for individuals or small groups. Tutors are also role models for their learners and they possess knowledge and skills and share them with their learners. They are expected to assist learners in clarification of concepts by using different techniques and strategies such as evaluating class materials, discussing the text, working on sample problems, and predicting test questions.

Tutoring is a very old practice. It was commonly practiced in Ancient Greece and Rome and is recorded in ancient texts even before them. Over the centuries it has gone up and down in popularity, but it has never gone away. Tutors do not require to be ‘experts’ in the skill or content they are teaching. But it is generally better if they know a bit more than as compared to their tutees. However, if tutors are much more educated and trained than the tutees, they are expected to become bored with the content the tutee has to learn, and will not gain much themselves (Topping, 2000). Tutoring provides individualized instruction, customized to learners own way of learning, and an environment in which students progress at their own speed and receive praise, feedback, and encouragement over what they might receive from one teacher. Tutoring maximizes time on task, and students see skills demonstrated instead of just verbalized (Fager, 1996). Atta, et al (2011) conducted a study to know the effects of private home tuition on educational attainments of students at secondary school level in Dera Ismail Khan (Khyber Pakhtunkhwa) Pakistan and concluded that there is a significant effect of private home tuition on the educational attainments of 10th

class students for rural and urban schools. They concluded that there is a direct relationship between the two variables i.e. more time spent on tuition more will be the educational attainment.

A private tutor is a private teacher who teaches a specific educational subject or skill to an individual student or small group of students. This practice enables a student to enhance his knowledge or skill for more rapidly than in a traditional classroom situation. These private tutors are frequently appointed and paid by the student, the student's family members or an agency. Some of these tutors are used for remedial students or some are appointed for students who need special attention; many provide more advanced material for extremely talented and highly motivated students, or in the context of home schooling. Tutoring also takes place when one adult assists another adult student to study a specific course or subject that he is taking to get an excellent result. The adult can also let the student work on his own and can be there if the student has any questions.

Trend of home tuition is increasingly adopted in every area of the country especially in urban areas. In urban areas kidnapping is a common practice therefore majority of the rich parents arrange tuition for their children at home. In addition, there are various academies and tuitions centers in every corner of the country to promote quality education. These academies or tuitions centers play a significant role in raising the achievement level of the students. However, home tuition is more beneficial and effective as compared to the private tuition which takes place in academies or tuition centers. Home tuition is safe and student is given special attention individually. Home tutoring is a type of tutoring that takes place in the home. Tutoring is instruction or receiving guidance by a tutor.

Benefits of Tutoring

According to Ngiam (2010), following are the benefits of private tutoring:

- Students get more attention as compared to the regular classroom activities.
- Due to the private home tuition, the achievement level can be increased.
- With the help of private home tuition, parents can improve the classroom performance of their children.
- Through private home tuition, communication and interaction between students and teachers ensured. In this way the students can find the answer of each and every question from their tutor.
- Due to private home tuition, the participation and involvement of the parents can be ensured in each and every academic activity of their children.

According to Goh (2010), as each and every child is different and performs differently at home and in schools. Some children are very talented and some need extra attention. In order to meet this competency, private home tuition has become essential for each and every student. A brilliant student needs private home tuition to compete with other while weak students need it for achieving good marks. There are a number of benefits of private home tuition for both student and parents. Some of them are described as under:

- Private home tuition causes an additional attention**.** In traditional classroom system, teachers are not able to pay their attention individually to each student. In private home tuition, the teachers provide special attention to the students.
- Private home tuition improves learning styles of the students. Private home tuition assists the students to build confidence and thus they can accelerate their learning process. That is why it can be rightly said that private home tuition is very important and crucial for the students to explore the most effective and useful learning styles.
- Private home tuition improves academic performance of the students. Sometimes the students feel difficulty in some tough subjects but due to private home tuition, they are able to concentrate more attention on those difficult subjects. It is recommended that the students should take full advantage and try different exercises to improve their performance.
- Private home tuition causes personalized relationship. In private home tuition, the students are able to share their opinions and thoughts and difficulties with their teacher and they feel closer and inform them about the weaker subjects which are not possible in the regular classroom sessions. Private home tuition open every communication channel for teachers and students in which they participate and remove difficulties.
- Private home tuition causes parent's involvement. In private home tuition, parents are able to keep track of the performance of their children; also they are able to get involved with the teachers to observe the progress of their children. Through private home tuition, the parents are being well informed about each and every activity of their child.

STATEMENT OF THE PROBLEM

The paper under research was specially designed to explore the effects of private tuition on the academic achievement of secondary school students in subject of mathematics. Therefore, the statement of the problem was entitled as ***"Effects of Private Tuition on the Academic Achievement of Secondary School Students in Subject of Mathematics in Kohat Division, Pakistan".***

OBJECTIVES OF THE STUDY

The objectives of the study were:

- to explore the effects of private tuition on the academic achievement of students in the subject of Mathematics at secondary school level; and
- to suggest workable recommendations for the enhancement of students' academic achievement in subject of mathematics at secondary school level

HYPOTHESES OF THE STUDY

The following three null hypotheses were developed for the achievement of above

mentioned objectives:

- There is no significant different between the performance of control and experimental groups on pre-test.
- There is no significant difference between the performance of the control and experimental groups on post-test.
- There is no significant difference between the performance of control and experimental groups on retention test.

RESEARCH METHODOLOGY

1. Population of the Study

All the secondary school students in Kohat Division, Khyber Pakhtunkhwa (Pakistan) constituted the population of the study.

2. Sample & Sampling Technique

Forty students of class 09 of the Government High School Ahmadi Banda Karak were selected as sample through simple random sampling technique. Sample students were classified into two groups i.e. control group and experimental group. In each group, 25 students were included.

3. Delimitations of the Study

The study was delimited only to the students of Government High School Ahmadi Banda Karak. The study was further delimited to the students of 09th class. The study was also delimited to the following four units in subject of mathematics:

Table 1: Detail of the Units of Mathematics Studied during Experiment

S. No.		S. No	UNITS
1.	Set	3.	Factorization
2.	Algebraic Expression	4.	Matrices

4. Appointment of Teachers for Experimentation

As the study was experimental in nature, therefore, two mathematics teachers having equal qualifications and teaching experience were selected. Provision of such teachers was a strenuous and tiring job for the researchers but after great efforts, they succeeded in providing mathematics teachers with equal teaching experience and qualifications. Both these teachers have been serving in elementary and secondary education department in Khyber Pakhtunkhwa since 2005. Their qualifications were M.Sc (Mathematics) and B.Ed.

For the students of experimental group, tuition arrangement was made after school time in subject of mathematics by the principal researcher himself because he has a vast experience in teaching of mathematics as he has been teaching mathematics for several years at secondary school level. In this way, students of experimental group were engaged in tuition

for two hours after school time.

5. Research Design

Research design is an important stage of a research study. Precise results of a research study depend upon the effectiveness of research design and instrument. This study was experimental in nature, therefore, "The pre-test-post-test Equivalent Groups Design" was carried out. According to this design, subjects are randomly adjusted to the both groups. Following is the symbolic representation of the design:

R	**E**	**=**	**O1**	**T**	**O2**
R	**C**	**=**	**O3**		**O4**

Where

R = Randomly selected
E = Experimental Group
C = Control Group
O = Observation or Measurement
T = Experimental treatment

6. Instrumentation

The study was experimental type and therefore pre-test and post-test technique was used for the collection of data. To collect data from both groups i.e. control and experimental groups, a question paper was made in the four chapters of mathematics and then distributed among the participants of both groups before the treatment as pr-test. Likewise, another question paper was made and distributed among the students of both groups after treatment as post-test. These two question papers were used as a research tool.

7. Data Collection

In order to collect data, the researchers along with other two mathematics teachers administered a pre-test, post-test and then a retention test to the both groups. For this purpose, question papers were developed covering the four units of the mathematics. In this way, raw data was collected by the conduction of both tests.

8. Data Analysis

For the analysis of data, raw scores obtained from tests i.e. pre-test, post-test and retention test were presented in tabular form. Statistical tools i.e., mean, standard deviation, and differences of means were calculated for each group. Significance of difference between the mean scores of both the experimental and control groups on the variable of pre-test scores, post test scores and retention test scores was tested at 0.05 levels by applying t-test.

ANALYSIS OF DATA AND RESULTS

The purpose of the study was to examine the effects of private tuition on the academic achievement of secondary school students in subject of mathematics. The study was experimental type and pre-test and post-test technique was used as research instrument. Sample students were classified into two groups on the basis of pre-test scores i.e., control group and experimental group. Both these groups were taught by two mathematics teachers. For the students of experimental group, tuition arrangement was made after school time in subject of mathematics by the principal researcher himself because he has a vast experience in teaching of mathematics. In this way, students were engaged in tuition for two hours. This experiment was completed in eight weeks. Then, the researchers along with two other mathematics teachers administered a post-test immediately to investigate whether students of experimental group have learnt well as compared to the students of control group. For this purpose the teachers made question papers covering the four chapters of mathematics which were taught during treatment for the both groups. After two weeks, the researchers again administered the same post-test with slight changes in the sequences of the questions as a retention test to the students of both groups. In this way data was collected and compared. The whole statistical process is explained as under:

Ho 1: There is no significant different between the performance of control and experimental groups on pre-test.

Table 2: Significance of difference between the mean scores on pre-test of control and experimental groups

GROUPS	N	Mean	SD	SE	t-value	p-value
EXPERIMENTAL	25	43.64	1.68	0.49	0.082	0.94
CONTROL	25	43.60	1.78			

Non-Significant (p > 0.05) df = 48 table value of t at 0.05 = 02.01

Table 2 illustrates that the calculated value of t was found to be 0.082 which is statistically non-significant as it is less than the critical table value of t at 0.05 level. Hence the null hypothesis that "There is no significant different between the performance of control and experimental groups on pre-test" is accepted. It unambiguously shows that the students of both groups showed equal performance on pre-test. It was furhter explained by the following graph:

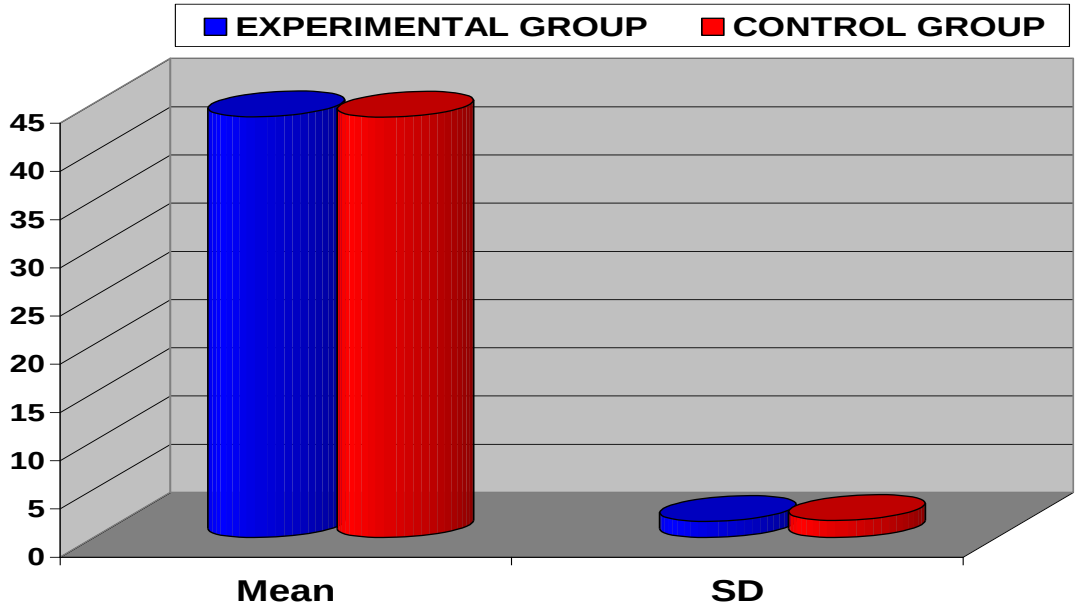

Fig.1: Showing the Mean scores and SD of Experimetnal and Control Group on Pre-Test

Ho 2: There is no significant difference between the performance of the control and experimental groups on post-test.

Table 3: Significance of difference between the mean scores on post-test of control group and experimental group

GROUPS	N	Mean	SD	SE	t-value	p-value
EXPERIMENTAL	25	91.24	1.68	0.51	46.74*	0.000
CONTROL	25	67.60	1.89			

***Significant ($p < 0.05$) df = 48 table value of t at 0.05 = 02.01**

Table 3 depicts that the computed value of t was found to be 46.74 which is statistically significant as it is greater than the critical table value of t at 0.05 level. Hence the null hypothesis that "There is no significant different between the performance of control and experimental groups on post-test" is rejected. It clearly indicates that the students of experimental group showed significantly excellent performance as compared to the students of control group on post-test. It was furhter clarified by the following graph:

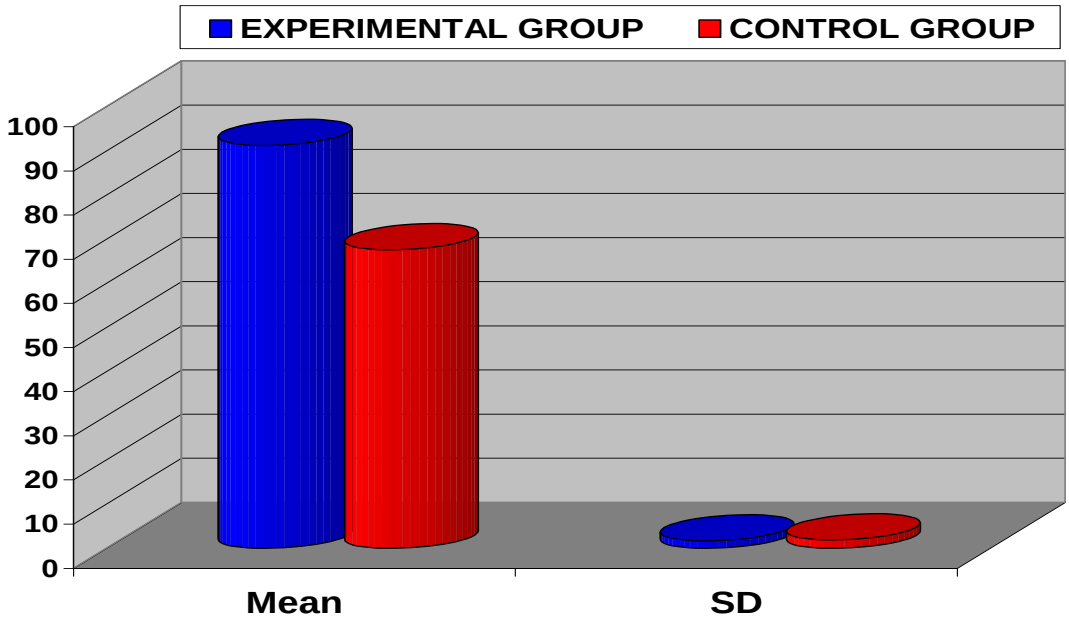

Fig.2: Showing the Mean scores and SD of Experimetnal and Control Group on Post-Test

Ho 3: There is no significant difference between the performance of control and experimental groups on retention test.

Table 4: Significance of difference between the mean scores on retention test of control and experimental groups

GROUPS	N	Mean	SD	SE	t-value	p-value
EXPERIMENTAL	25	86.04	1.81	0.47	44.42*	0.000
CONTROL	25	65.04	1.52			

***Significant ($p < 0.05$) df = 48 table value of t at 0.05 = 02.01**

Table 4 indicates that the computed value of t was found to be 44.42 which is statistically significant as it is greater than the table value of t at 0.05 level. Hence the null hypothesis that "There is no significant different between the performance of control and experimental groups on retention test" is rejected. It explicitly depicts that the students of experimental group showed significantly excellent performance as compared to the students of control group on retention test. It was furhter elaborated by the following graph:

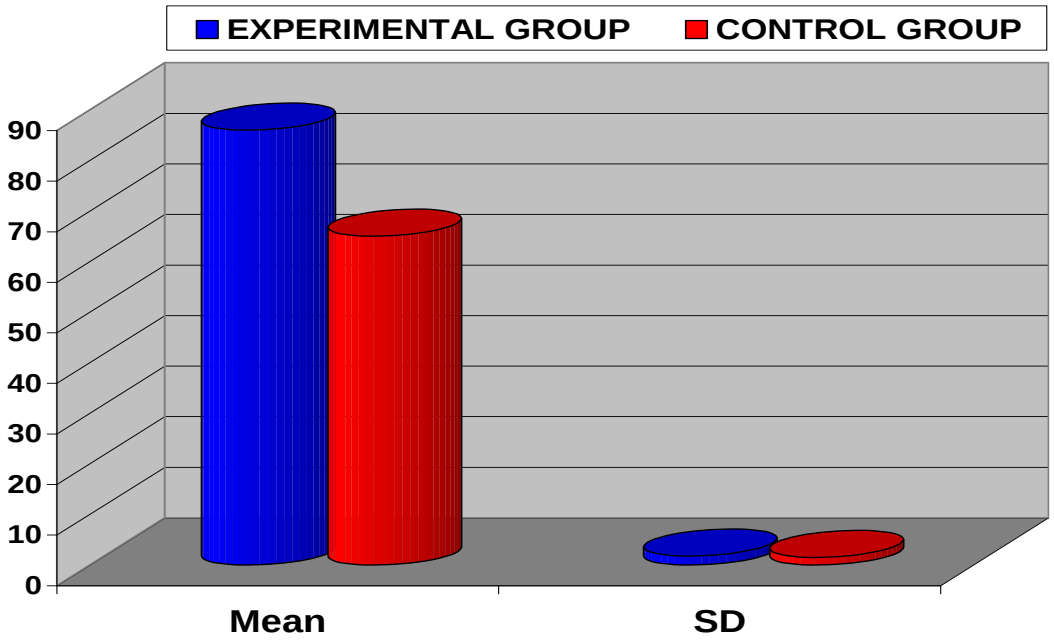

Fig.3: Showing the Mean scores and SD of Experimetnal and Control Group on Retention Test

CONCLUSIONS

After statistical analysis of the data, the researchers arrived at the following conclusions:

- There is a significant positive effect of private tuition on the academic achievement of students in subject of mathematics at secondary level. Private tuition is very effective in raising the achievement level of students in subject of mathematics. Furthermore, tuition was found more effective in clarifying difficult concepts of students in subject of mathematics
- The students of experimental group showed surprising better performance than the students of control group. Private tuition was found to be more effective and useful because each student was given special attention by the tutor. In addition, it was also proved effective in raising the motivational level of the students. Retention of the students of experimental group was also found much better than that of the students of control group.

RECOMMENDATIONS

Keeping in view the above conclusions, the researchers make some recommendations which are described as under:

- As private tuition is very effective in raising the achievement level of the students in subject of mathematics therefore, it is strongly recommended that parents should

arrange home tuition for their children to increase their achievement level in subject of mathematics.

- Generally mathematics is considered a very difficult and complicated subject as compared to the other science subjects therefore it is strongly recommended that educated parents should teach their children at home or arrange private tuition after school time.
- Homework plays a remarkable role in strengthening and enhancing student's academic performance therefore it is strongly recommended that teachers should assign homework to students especially in subject to mathematics. In this way students will give time to study at home to complete their homework. In addition, mathematics teachers are advised to arrange weekly test to enhance the performance of students in subject of mathematics. In this way, students will be bound to study at home.
- Extraordinary involvement in co-curricular activities especially cricket and volleyball badly effects students' academic performance. Therefore, it is strongly recommended that students should not be allowed for extraordinary involvement in co-curricular activities. Parents can play this role and they are advised to forbid their children from playing cricket and other games like football, volleyball. Parents are also advised to pay full attention on their children education at home. They should develop a time table for their children regarding homework and studies.
- Majority of our institutions at secondary school level lack of mathematics teachers. In addition, majority of the in-service mathematics teachers are not competent and possess poor knowledge and teaching methodologies that is why students show unsatisfactory performance in subject of mathematics. Therefore it is strongly recommended that competent mathematics teachers should be appointed through competitive and transparent examination.
- Appointment of the teachers should be made according to the strength of students so that teachers may pay proper attention to each student individually. In this way, student's academic achievement in subject of mathematics will be improved.
- In-service mathematics teachers should be given special training in mathematics and teaching methodologies to enhance their teaching performance.

RECOMMENDATIONS FOR FURTHER STUDIES

The researchers make the recommendations for future study which are described as under:

- It is recommended that such type of study should be conducted at elementary, higher secondary and tertiary level.
- It is also recommended that such type of study should be conducted in other districts and provinces of the country as well as in other subjects i.e., English, chemistry, biology, physics etc.
- It is also recommended that such type of study should be conducted on female population at elementary, secondary and higher secondary level.

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