

Effectiveness of Kumon Method of Teaching Mathematics at Elementary School Level in Pakistan: A Longitudinal Study

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Abstract

The experimental study was designed to determine the effectiveness of Kumon method in comparison with traditional lecture method in the teaching of Mathematics to grade-6. The objective of the study was to determine the effectiveness of Kumon method for academic achievement of children in Mathematics. All students of grade-6 of Fazaia Inter colleges of Rawalpindi and Islamabad was the population. Cluster sampling technique randomly was used. One of the three Fazaia colleges (Grade-6) was selected randomly. All grade-6 students of the selected cluster formed the sample of the study. Data was collected and analyzed by applying t-test and recommendations were given on the basis of findings of the study. This study shows that Kumon method is more effective for teaching mathematics to Grade 6 students in comparison with traditional lecture method and equally helpful in teaching mathematics effectively to boys and girls.

Key Words:

Kumon Method,
Teaching, Learning,
Grade-6, Achievements,
Effectiveness

Introduction

Mathematics enjoys a vital position in school curriculum. It is offered as a compulsory subject in educational institutions up to class X. It encompasses various areas like Algebra, Arithmetic, Geometry, Trigonometry and Statistics. It has also attained a rank of special universal language through which one can express ideas about shape, quantity and relationships. Mathematics is considered as “key to success”. Traditional theories of Mathematics are undergoing change with the advent of Computer skills.

Kumon is a method which develops computational skills and enables students to work within prescribed time and in more complex situation. It enables the students to make rich connections among different concepts of Mathematics. By doing such activities, without any conscious thought, students can perform basic functions and fundamentals of Mathematics.

(“Private tuition for children in core subjects of maths & English,” n.d.)believed that having learnt through Kumon method, the student can reduce his/ her anxiety in Mathematics, can improve his/her mathematical ability to solve problems and he/she can learn to know the reason which hindered performance.

Weischadle (2002) advocated that this method of learning Mathematics develops self-learning skill of each student when they work within the prescribed time.

Our educational system is marks-oriented. Students are in the race of getting better grades, to be recognized socially and to get admission in the renowned institutions. Creative learning approaches are rarely seen in our educational set up.

Objectives of the Study

Followings were the objectives:

- (i) To determine the effectiveness of Kumon teaching method for academic achievement of children in Mathematics.
- (ii) To compare the effectiveness of Kumon method and traditional lecture method for academic achievement of children in Mathematics.
- (iii) To compare the effectiveness of Kumon method on academic achievement of boys and girls in Mathematics.

Null Hypotheses

Ho1: There is no significant difference in the mean achievement scores of Grade six students if they are taught Mathematics through Kumon Method of Teaching and through Traditional Lecture Method of Teaching.

Ho2: There is no significant difference in the mean achievement scores of grade 6 boys and grade 6 girls when taught through Kumon method.

Literature

Significance and Scope of Mathematics

Mathematics education believes on Mathematization of cognition of a child, clarity of concepts which leads towards systematic and logical inferences which is the actual soul of this subject. Mathematics gives way to think, how to deal with the abstract and how to solve the problems in an effective manner. It is studied as a compulsory subject at Secondary level, so child must be provided quality education in the subject of Mathematics. The requirement for Pakistan is to provide affordable and enjoyable mathematics education for everyone. There is a need to help young children to face the challenges coming in their future life, at least up to elementary school level. This can be done with the help of mathematics education ("Mathematics," n.d.)

School mathematics should be such that; i) Students should take interest in learning mathematics and enjoy it. ii) Learn the importance of Mathematics. iii) Every child has certain experiences in his life and Mathematics is a part of it, which he/she can share it with others. iv) Mathematics helps children to put and solve the problems. v) Students make relationships by using abstractions. vi) Teachers must have the ability to engage every student in the classroom. Followings are the core areas of concern; i) Majority of students have fear of Mathematics. ii) Existing curriculum is disappointing both for the talented and non-participating students. iii) Old strategies to assess a student which considers mathematical perception as mechanical computation. iv) Teachers lacking in preparation can't help students in learning of Mathematics ([Ahmed, Clark-Jeavons, & Oldknow, 2004](#))

Importance of Mathematics for Human Life

Mathematics is called as the gateway and key to all sciences. Kant, the famous philosopher, said that all sciences depend on Mathematics. If they do not relate to mathematics, they are called defective areas. To know what is happening in the world all around, one must have knowledge of mathematics. If we neglect the importance of mathematics and without its knowledge we are unable to get information about all things in the world. Kant also stressed that all natural sciences are taken as science only if they are mathematical, and mathematics has very vital place in the setting of civilization by updating all branches of science ("Mathematics," n.d.)

Lecturing

In this method, teacher carefully plans his / her expository lesson and formally delivers it to his / her students. This method of teaching is also called as method of exposition. (James Michael Lee)

Advantages of Lecture Method

It can be used:

1. To Motivate

A teacher can raise curiosity among students by giving some information about the significant persons, important events and problems.

2. To Clarify

Sometimes, students feel difficulty and get troubled during their study, teacher should aim to clarify ambiguities by lecturing for few minutes, although the purpose of lecture is to save the time.

3. To Review

By using lecture method, a teacher is able to summarize main points of the lesson and indicates the importance of

that topic.

4. To Expand Contents

Lecture is considered as the best method to present lot of information regarding the lesson. Students always take interest to know more than the text book. They are interested in teacher's readings, travels and in his/ her experiences (Johnson, 1989)

Disadvantages of Lecturing

1. Best teaching can take place when students are allowed to talk, to ask and to participate in teaching-learning process. While lecturing makes students as passive listeners.
2. Readymade material is provided to students in lecture method of teaching, which reduces the opportunity to learn by doing.
3. If there is no learning that means there is no teaching.
4. Lecturing method has no guarantee about understanding of content.
5. Students of an average high school may not will to attend forty minutes class.
6. Most of teachers are unable to keep up the interest of whole class during lecture.

Kumon Method

Toru Kumon was the founder of the Kumon program of learning about 50 years ago in Japan (KNA, 2008). Toru was working in a high-school as teacher of Mathematics and as a Father too(Izumi, 2001). Toru's son was facing difficulties in Mathematics so Toru developed worksheet series for his son which he had to complete daily after his school (Izumi, 2001). Toru's son started working with these worksheets in grade-2 and at the time when he was in the grade-6, he started to solve Calculus (KNA, 2008).

There are seven components which comprises the Kumon Method of Learning (Izumi, 2001):

1. Individualized learning–Kumon student works and moves to the next higher level at a pace which is dictated according to the abilities of a student and his initiative (KNA, 2008). The teacher's primary goal is to pursue and help children attain the highest potential of each unique student (KNA, 2008).
2. Independent learning–the level of difficulty progresses so gradually that learner advances smoothly and independently. As a result, the learner develops self-motivation and self-reliance (KNA, 2008).
3. Comfortable starting point–each student's starting point is determined by a Placement Test (KNA, 2008). The starting point is intentionally set low so that initial work is completed and mastered easily (KNA, 2008). This initial success fosters student's concentration, study habits, confidence, and proficiency with later steps (KNA, 2008).
4. Curriculum–the study materials are organized so that skills develop incrementally and in a logical progression. The levels of the Math programs are divided into smaller steps. For each step, students complete a 10 page worksheet booklet (or set).
5. Repeated practice–the Kumon Method ensures comprehension and retention by requiring daily practice (KNA, 2008). The amount of practice for each worksheet and each level is determined by the learner's needs and performance.
6. Mastery–Kumon assesses speed and accuracy which measures the level of mastery. The learner is said to be have mastered in a level, when he/she gets cent percent accuracy in a task in a given time (KNA, 2008).
7. At higher study level–“Kumon's goal for all learners is to attain advanced student status as soon as possible” (Izumi, 2001, p. 65). Students are promoted to higher level up to three or more levels from the time of their entry in one study year (Niikura, 2006b).

Success from the Beginning

In Kumon method of teaching, every child goes through a diagnostic test of his/ her previous learning which decides the exact starting point, which is comfortable to each individual and that starting point is kept one level below their present status in school. This starting point which is determined by Kumon instructors is most beneficial to them in developing their independent learning ability, in building self-confidence and to set a proper routine with program.

Promoting the Level -Just Right to Children

In Kumon program, students are allowed to work on their own comfortable pace and flourish neither keeping ages nor grades in mind, so Kumon provides just right level to them. After having ability to comprehend the concepts, students move to the next or advance level.

Comprehending Concepts

Students become able to comprehend and understand truly after completing their work correctly within allotted time-frame. Completion of assignments not only correctly but also in recommended time will enable them to get strong grip of each concept and have ability to comprehend it.

Practice and Practice Makes Man Perfect

When students work daily under Kumon for 30-minute, that practice develops skills and they fully and deeply concentrate on each topic. Regular work practice makes them able to understand mathematics (“Private tuition for children in core subjects of maths & English,” n.d.)

Believing in Each Child’s Talent

Instructors have strong belief in every student’s potential and ability to do well by Kumon. Teachers play a role of facilitators at Kumon who guide them to perform their activities at their level best. Teachers plan their lesson-notes to achieve desired learning objectives of every child in the long-term.

Self-learning

- Students become more confident, disciplined and get success in their academics.
- Kumon develops basic skills of students, which is gateway to overall success.
- Kumon enables students to get mastery on basics of Mathematics.
- Kumon enables students to improve their study habits.
- Kumon enables students to develop their logical thinking and problem solving skills.

Kumon Program is good for everyone

Kumon program caters all students from pre-school to higher level because it is carefully planned and has complete curriculum for all stages. Kumon helps students of all ages and at all stages in their schooling, which enables them to face the challenges of higher classes (“Private tuition for children in core subjects of maths & English,” n.d.)

Kumon Program helps Children to Grow academically and Personally

Kumon method enables students to get command over basic skills which lead towards academic success as well as towards their personality grooming. Kumon helps the students to do the following:

- Mastery on fundamentals of mathematics and reading.
- Improvement of study habits.
- Enables students to concentrate deeply.
- Build confidence and discipline.
- Enables the students to learn independently.
- Develop their skills to think critically & analytically.

Kumon Method is aligned with Standards of a State

Kumon is globally accepted curriculum due to its organization in logical and systematic manner which helps the students to achieve success in their respective fields.

Kumon Program is for all Kind of Children having Learning Disabilities

Kumon enables every child to flourish from pre-school to high-school. Kumon program is highly flexible according to the needs of every individual. It can adjust or accommodate every child.

Data Supports the Efficacy of Kumon Method

Many research studies have been conducted to show the performance of Kumon students in standardized tests. Data from the Trends in International Mathematics and Science Study show that 4th and 8th grade Kumon children scored above national and international averages in mathematics. In the United States, more than 50 percent math students are above their grade level, and one-fourth of them are 2 to 3 years above their grade in school (“Kumon India opens new Centres in Mumbai and Pune,” n.d.)

Reasons which Make Kumon Method of Teaching different and Great

There are many advantages of Kumon, which are as follows:

- Students in Kumon have to work with their own speed or pace, which gives them opportunity to work without the fear of getting late or left behind as compared to other fellow beings.
- There is a lot of repetition of work in Kumon method which makes understanding easy to every child.
- In Kumon method, every child is given his/ her work in the form of a test, which is marked daily to see the accuracy and also the test is time-based. The booklets which are given to each child has its fixed time-frame to complete that task. If a child completes his/ her work within given standard time, he/ she will move on to the next level.
- The workbooks are not too long; they are short, but done and checked daily which gives the opportunity to focus without boredom. Every Kumon workbook takes maximum 20 minutes per day.

Methodology

This study was experimental in nature. It was conducted to see the effectiveness of Kumon method with comparison to traditional method for teaching of Mathematics to Grade-6 students.

Population

The population of the study consisted of 6th grade students studying in three Fazaia Inter Colleges in Rawalpindi and Islamabad, Pakistan. The population consisted of 117 boys and 99 girls. The population size was thus 216 students.

Sampling Technique and Sample Size

One of the three Fazaia Inter Colleges was selected by Cluster Sampling Technique Randomly. All grade-6 students were taken from selected college.

Research Instrument

“Mathematics Achievement Test” was used as a tool for data collection. The test consisted of objective type questions, 25 test items (MCQs) in the Pre-test and the Post-test, with 10 items in each end chapter test.

Time-Table

The time-table of study scheduled was as under:-

On March, Pre-test (academics) was conducted on Grade-6 students of F.I.C J/C Nur Khan at 9:00 A.M.

Weekly Time-Table from April to May (six weeks)

Daily 3rd period from 9:10A.M to 9:50 A.M for both the groups.

Two End Chapter Tests were also conducted after completion of each of the two chapters. (Chapter 1 and 2)

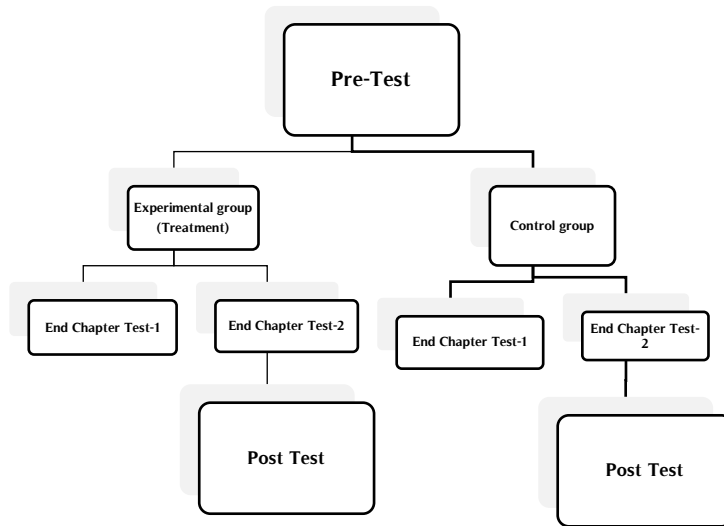
Post-test (academics) was conducted on 15th May, at 9:00A.M.

Pre-test Post-test time series equivalent group design was used.

The two groups were equated on the basis of pre-test results. One group was named as the experimental group, and other group was named as the control group. Experimental group was treated by Kumon method and traditional lecture method was used to treat control group.

For the purpose of data collection, the following design was used.

	Pre	ECT₁	ECT₂	Post
E _R	O ₁	t _{treatment} O ₃	t _{treatment} O ₅	O ₇
C _R	O ₂	O ₄	O ₆	O ₈



(Conceptual Framework)

Validity and Reliability

The instrument was improved in consultation with three working Mathematics teachers. Reliability of the test was determined by test-retest method. The reliability figures of pre-test and posttest of academic achievement were 0.84 and 0.82 respectively which were calculated through Spearman Brown.

Procedural Steps

Students Group Formation

Two equal groups of students were formed in the light of pre-test results. There was equal number of students in both the groups, 35 students (male & female) in each group. Two groups were formed on the basis of their mean values in academics. One group which was treated by Kumon method was named as experimental group and other group was taught by traditional lecture method and it was named as control group.

Lesson Plans for Experimental and Control Groups

Text book was consulted to prepare lesson plans. For this study, Mathematics Book-6 was used in consultation with the experts and subject specialists of Mathematics. Several teaching aids were used as teaching materials to teach Mathematics through kumon method and lecture method and these aids areas under:-

- Lesson plans on kumon teaching method
- Lesson plans on traditional lecture method of teaching.
- Chalk, Duster, Textbook, black-board /white-board and marker;
- Teaching material required for teaching like multi-media, charts, flash cards etc.
- Work sheets of experimental group.

Analysis and Interpretation of Data

Pre-test and Post- test

Table 1. Data of Pre-test and Post-test

Scale	Exp. Group (n =35)		Cont. Group (n =35)		P	95% Confidence Interval		
	M	SD	M	SD		Lower Limit	Upper Limit	
Pre-test	16.77	4.01	16.97	4.25	-0.20	.84	-2.17	1.77
Post-test	20.89	2.41	17.40	3.81	4.57	.000	1.96	5.00



Figure 1

It is clear from the data of Table 1 and Figure 1, that:-

1. Mean value of pre-test on experimental group is 16.77 and mean value on control group is 16.97. Difference between the Mean values of pre test on experimental and control group is (0.20) and it is not significant, and the groups are approximately equivalent at pre-test level.
2. Mean value of post-test on experimental group is 20.89 and mean value on control group is 17.40. Difference between the Mean values of post test of experimental and control group is (3.49) and it is significant at 0.05 levels.
3. This mean difference of pre-test and post-test on experimental group is 4.12 and it is highly significant even at $p < .001$.

End Chapter Tests

Table 2. Data of End Chapter Tests

Scale	Exp. Group (n =35)		Cont. Group(n =35)		p	95% CI		
	M	S.D	M	S.D		Lower Limit	Upper Limit	
ECT1	7.86	1.47	6.31	1.34	4.56	.000	.869	2.27
ECT2	8.43	.97	7.03	1.12	5.55	.000	.897	1.90

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2

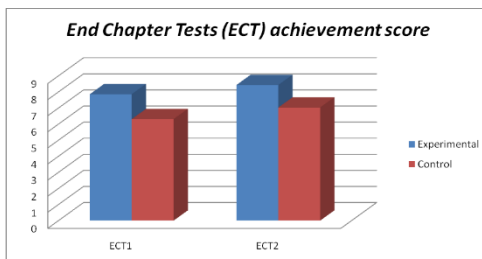


Figure 2

It is clear from the data of Table 2 and Figure 2, that:-

1. Mean values of experimental group in ECT₁ and in ECT₂ are 7.86 and 8.43 respectively. And mean values of control group in ECT₁ and in ECT₂ are 6.31 and 7.03 respectively.
2. The differences on means of ECT₁ and ECT₂ on Experimental and control groups are 1.55 and 1.4 respectively and these differences are highly significant at $p < .001$.

Pre-test and Post-test for boys and girls of experimental group

Table 3. Data of Pre-test and Post-test for Boys and Girls of Experimental Group

Scale	Boys (n =19)		Girls (n =16)		P	95% CI		
	M	SD	M	SD		LL	UL	
Pre-test	17.05	3.96	16.44	4.17	.446	.658	-2.19	3.40
Post-test	21.11	2.42	20.63	2.44	.581	.565	-1.20	2.16

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2;

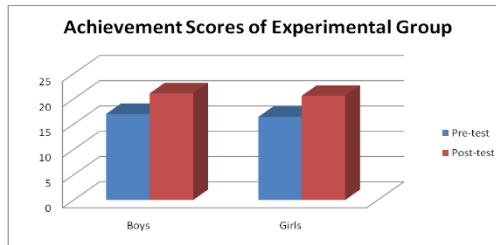


Figure 3

It is clear from the data of Table 3 and Figure 3, that:-

1. Mean value of pre-test for boys is (17.05) and mean value of pre-test for girls is (16.44). Difference between the Mean values of pre-test of boys and girls on experimental group is (0.61) and it is not significant at $p > .05$.
2. Mean value of post-test for boys is (21.11) and mean value of post-test for girls is (20.63). Difference between the Mean values of boy and girls on post-test of experimental group is (0.48) and it is not significant at $p > .05$.

End Chapter Tests for Boys and Girls on Experimental Group

Table 4. Data of End Chapter Tests for Boys and Girls on Experimental Group

Scale	Boys (n =19)		Girls (n =16)		p	95% CI	
	M	SD	M	SD		LL	UL
ECT1	8.00	1.63	7.69	1.30	.617	.541	-.717 1.34
ECT2	8.53	.905	8.31	1.07	.638	.528	-.468 .895

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2;

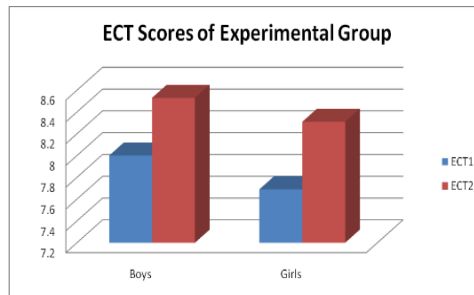


Figure 4

It is clear from the data of Table 4 and Figure 4, that:-

1. Mean values of boys on experimental group in ECT₁ and ECT₂ are (8.00) and (8.53) respectively and mean values of girls on experimental group in ECT₁ and ECT₂ are (7.69) and (8.31) respectively.
2. Difference between the Mean values of ECT₁ and ECT₂ of boys and girls on experimental group are 0.31 and 0.22 respectively and these differences are non significant at $p > .05$.

Pre-test and Post-test for Boys and Girls of Control Group

Table 5. Data of Pre-test and Post Test for Boys and Girls on Control Group

Scale	Boys (n =19)		Girls (n =16)		p	95% CI	
	M	SD	M	SD		LL	UL
Pre-test	16.37	4.13	17.69	4.40	-.912	.368	-4.26 1.62
Post-test	17.05	4.22	17.81	3.31	-.582	.565	-3.41 1.89

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2;

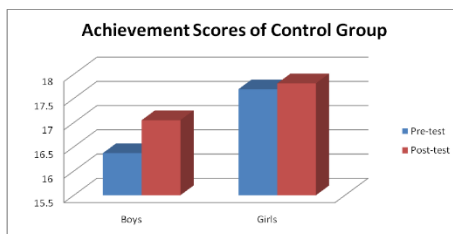


Figure 5

It is clear from the data of Table 5 and Figure 5, that:-

1. Mean value of pre-test for boys on control group is (16.37) and mean value for girls on control group is (17.69). Difference between the Mean values of pre-test of boys and girls on control group is (1.32) and it is not significant at $p > .05$.
2. Mean value of post-test for boys on control group is (17.05) and mean value for girls is (17.81). Difference between the Mean values of boy and girls on post-test of control group is (0.76) and it is not significant at $p > .05$.

End Chapter Tests for Boys and Girls on Control Group

Table 6. Data of End Chapter Tests for Boys and Girls on Control Group

Scale	Boys (n =19)		Girls (n =16)		p	95% CI		
	M	SD	M	SD		LL	UL	
ECT1	6.53	1.17	6.06	1.52	1.01	.317	-.464	1.392
ECT2	6.58	.961	7.56	1.09	-2.83	.008	-1.69	-.277

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2;

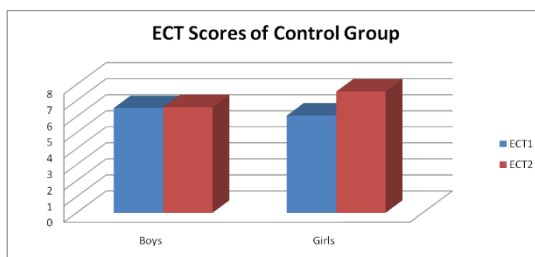


Figure 6

It is clear from the data of Table 6 and Figure 6, that:-

1. Mean values of boys in ECT₁ and ECT₂ are (6.53) and (6.58) respectively, and mean values of girls in ECT₁ and ECT₂ are (6.06) and (7.56) respectively.
2. Difference between the Mean values of ECT₁ and ECT₂ of boys and girls of control group are 0.47 and 0.98 respectively and are non significant at $p > .05$.

Descriptive Statistics and Paired Sample t-test for Experimental Group

Table 7. Descriptive Statistics and Paired Sample t-test for Experimental Group

Results	Pre-test		Post-test		95% CI for Mean Difference	r	t
	M	S.D	M	S.D			
Achievement Score	16.77	4.05	20.89	2.41	-4.89, -3.33	.866**	-10.71**

** $p < .001$.

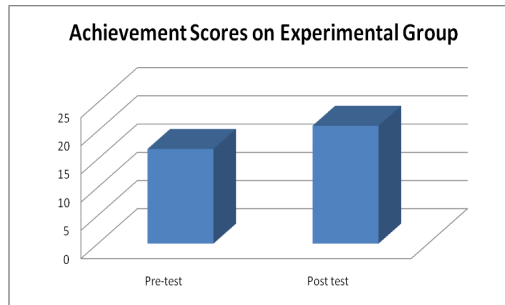


Figure 7

It is clear from the data of Table 7 and Figure 7, that:- Mean value of pre-test on experimental group is 16.77 and mean value of post-test on experimental group is 20.89. These figures show significant difference in pretest and posttest scores at .001 significant level.

Descriptive Statistics and Paired Sample t-test for Control Group

Table 8. Descriptive Statistics and Paired Sample t-test for Control Group

Results	Pre-test		Post-test		95% CI for Mean Difference	r	t
	M	S.D	M	S.D			
Achievement Score	16.97	4.25	17.40	3.81	-0.95, .100	.93**	-1.64

*p<.01; **p<.001.

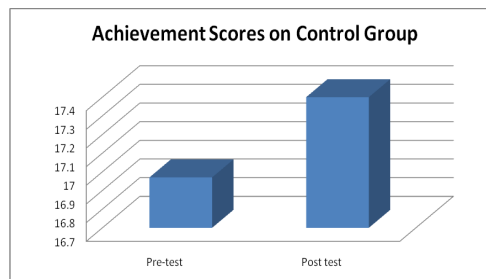


Figure 8

It is clear from the data of Table 8 and Figure 8, that:- Mean value of pre-test on experimental group is 16.97 and mean value on post-test for experimental group is 17.40. These figures show significant difference in pretest and posttest scores at .001 significant levels.

Findings

1. Mean value of the pre-test on experimental group was 16.77 and mean value on control group was 16.97. Difference between the Mean values of pre test on experimental and control group was (0.20) which was not significant, and the groups were approximately equivalent at pre-test level. (Table No.1)
2. Mean value of post-test on experimental group was 20.89 and mean value on control group was 17.40. Difference between the Mean values of post test on experimental and control group was (3.49) which was significant at 0.05 levels. (Table No.1)
3. This mean difference of pre-test and post-test on experimental group was 4.12 which were highly significant even at $p < .001$. (Table No.1)
4. Mean values of experimental group in ECT₁ and in ECT₂ were 7.86 and 8.43 respectively. And mean values of control group in ECT₁ and in ECT₂ were 6.31 and 7.03 respectively.

- The differences on means of ECT₁ and ECT₂ on Experimental and control groups were 1.55 and 1.4 respectively and these differences were highly significant at $p < .001$. (Table No.2)
5. Mean value of pre-test for boys on experimental group was (17.05) and mean value for girls on experimental group was (16.44). Difference between the Mean values of pre-test of boys and girls on experimental group was (0.61) which was not significant at $p > .05$. (Table No.3)
 6. Mean value of post-test for boys on experimental group was (21.11) and mean value for girls was (20.63). Difference between the Mean values of boy and girls on post-test of experimental group was (0.48) which was not significant at $p > .05$. (Table No.3)
 7. Mean values of boys on experimental group in ECT₁ and ECT₂ are (8.00) and (8.53) respectively and mean values of girls on experimental group in ECT₁ and ECT₂ are (7.69) and (8.31) respectively. (Table No.4)
 8. Difference between the Mean values of ECT₁ and ECT₂ of boys and girls on experimental group were 0.31 and 0.22 respectively and these differences were insignificant at $p > .05$. (Table No.4)
 9. Mean value of pre-test for boys on control group was (16.37) and mean value for girls on control group was (17.69). Difference between the Mean values of pre-test of boys and girls on control group was (1.32) which was not significant at $p > .05$. (Table No.5)
 10. Mean value of post-test for boys on control group was (17.05) and mean value for girls was (17.81). Difference between the Mean values of boy and girls on post-test of control group was (0.76) which was not significant at $p > .05$. (Table No.5)
 11. Mean values of boys in ECT₁ and ECT₂ were (6.53) and (6.58) respectively, and mean values of girls in ECT₁ and ECT₂ were (6.06) and (7.56) respectively. (Table No.6)
 12. Difference between the Mean values of ECT₁ and ECT₂ of boys and girls of control group were 0.47 and 0.98 respectively and were insignificant at $p > .05$. (Table No.6)
 13. Mean value of pre-test on experimental group was 16.77 and mean value of post-test on experimental group was 20.89. These figures show significance difference in pretest to posttest scores at .001 significant levels. (Table No.7)
 14. Mean value of pre-test on experimental group was 16.97 and mean value of post-test on experimental group was 17.40. These figures show significance difference in pretest to posttest scores at .001 significant levels. (Table No.8)

Discussion

It is clear from finding No.1, that there was no significant difference between the experimental and control group values at pre-test level and that the experimental and control groups were approximately equivalent. The results on finding 2, shows that the differences between mean values of post-tests have been significant. It was therefore concluded that the Kumon method of teaching mathematics has been effective.

Differences between the mean values of ECTs (findings 3 and 4) have been shown significant, with the result that Kumon method has been effective in teaching mathematics. When performances of boys and girls of experimental group were compared, it also shows the significant difference in their achievement which supports Kumon method. Kumon method is equally effective for boys as well as girls.

Conclusion

In our education system, for teaching of mathematics at elementary school level, a number of methods are available, but lecture method of teaching is still in use to teach Mathematics to junior classes. Mathematics by Kumon method is a new and an innovated approach. Seventy students of Grade -6 were picked from Fazaia Inter College.

Jinnah Camp Nur Khan Rawalpindi for research purpose. From the 6th Grade Mathematics book, an academic achievement test was designed.

It is clear from the findings, that there was no significant difference between the experimental and control group values at pre-test level which means that the experimental and control groups were approximately equivalent. The results show that the differences between mean values of post-tests of both comparison groups were significant. It was therefore concluded that the Kumon method of teaching mathematics to 5th grade students was more effective than the traditional method.

Differences between the mean values of ECTs were significant, which further supported the result that Kumon method was effective in teaching mathematics.

A comparison of the performance of boys and girls in the groups shows that there were no gender differences in learning mathematics through the Kumon method.

Recommendations

1. First recommendation for 6th class math teachers for teaching this subject be given by explaining to them very clearly, in simple language, how to use this method practically in the classroom.
2. Rote learning may be discouraged by using Kumon Method of Teaching which may be used for Mathematics in the subject of Mathematics at grade 6 level.
3. Kumon Method may be referred for Mathematics teachers training institutes. Practical teaching of Mathematics be conducted during the teaching practice.
4. Kumon Method be encouraged among working Math teachers. The departments of education may conduct refresher courses, training programs and workshops in order to introduce Kumon Teaching Method to the working teachers.
5. The text books of Mathematics for grade 6 be revised by curriculum planners under the shade of Kumon Teaching Method. In public and private schools of Pakistan, Kumon Teaching Method be used at 5th grade level.
6. In public and private schools of Pakistan, Kumon Teaching Method be used at 6th grade level.
7. Research studies be conducted to validate effectiveness of Kumon method in the subject of Maths at other grade levels and by taking separate groups of boys and girls at different stages of school. This study be replicated on the subject of English at different levels of education.

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