Equal Effectiveness of Kumon Method of Teaching Mathematics among Boys & Girls

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Abstract-*The study was designed to investigate the effectiveness of Kumon method in comparison with traditional method in the teaching of Mathematics to grade-5. Kumon is a math and reading enrichment program, which provides practice and instruction to each individual. This helps the students to think and work independently. The hypothesis of this experimental study was that in Mathematics, Grade-5 students have no significant difference in their academic achievement treated by Kumon method and by traditional lecture method. The objective of the study was to determine the effectiveness of Kumon teaching method for academic achievement of children in Mathematics. All grade-5 students of Fazaia inter colleges of Rawalpindi and Islamabad was the population. Cluster sampling technique was used. One of the three Fazaia colleges (junior section) was selected randomly. All grade-5 students of the selected cluster formed the sample of the study. The study was conducted in two phases at two different time periods applying the same procedure, the same teachers but the groups were different. Data was collected and analyzed by applying t-test and recommendations were given on the basis of findings of the study. This experimental research shows that Kumon method is more effective for teaching mathematics to Grade 5 students in comparison with traditional lecture method. It also shows that Kumon method is equally helpful in teaching mathematics effectively to boys and girls.*

Key words- Kumon Method; teaching; learning; grade-5; gender vise; achievement; effectiveness

1. 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.

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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.

In Kumon method of teaching, work-sheets are used in a systematic and sequential order through which students undergo the small steps of learning. After having complete grip and mastery at one level, students move to the next level. Mastery is determined by completion time and accuracy.

1.1 Statement of the Problem

This study was planned to determine the difference between the academic achievement of Grade-5 students in Mathematics by teaching them through Kumon Method and through Traditional Lecture Method.

1.2 Objectives of the Study

Followings were the objectives:

(i) To compare the effectiveness of Kumon method and traditional lecture method for academic achievement of children in Mathematics.

(ii) To compare the effectiveness of Kumon method on academic achievement of boys and girls in Mathematics.

Hypothesis

H₁: There is significant difference in the mean achievement scores of Grade Five students if they are

taught Mathematics through Kumon Method of Teaching and through Traditional Lecture Method of Teaching.
H₂: There is significant difference in the mean achievement scores of grade 5 boys and grade 5 girls when taught through Kumon method.

2. LITERATURE REVIEW

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 every one. There is a need to help young children to face the challenges coming in their future life, at least upto 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;

- Majority of students have fear of Mathematics.
- Existing curriculum is disappointing both for the talented and non participating students.
- 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)

Mathematics education also reflects social discrimination, especially in case of gender differences which states that boys are better in doing mathematics as compared to girls. This analysis helps us to suggest the followings;

i) Math education should focus on achieving higher goals rather than narrow goals.
ii) Engage every child to work hard and achieve success; also teach them conceptually to face the challenging situations of mathematics.
iii) Use different assessment techniques to evaluate student's mathematical skills instead of examining the factual knowledge.

iv) Variety of resources should be used by math teacher to teach this subject effectively. (Zohrevand, Jafari, & Arshad, 2010)

Focus should be shifted from math contents towards the math learning process. These processes are formal problem solving method, heuristic approach, estimation and approximation of things, optimizating the use of AV.aids, logical and analytical approach to proof, make connection and mathematical communication. Using these processes and giving them importance helps students to remove the fear of the subject of mathematics from their minds. This can be achieved by using combination of different approaches, methods, techniques and procedures. These learning environments encourage students to participate, engage them and also give them the sense of becoming successful in their lives. There is a need to restructure board exams to assess student's learning, and reduce the failure in mathematics. In other words, these exams must also be challenging to evaluate the concept understanding and their competencies. There is a need to prepare teachers to teach mathematics. There must be resource material bank, which gives easy approach or access to that material. To reduce the content delivery by lecture method, we can use the geometric A.V.aids which leaves ever lasting impact on students mind and they can retain the concepts for longer time because when vision is involved it helps to improve their understandings and learning. Motivation on earlier stage matters a lot and contributes towards effective learning in the subject of mathematics. Students need motivation and ability to apply concepts. All students have the right to learn mathematics and they can learn mathematics well. The only requirement is to give them quality education in the subject of mathematics (Ahmed et al., 2004)

Welty, (1989)describes the points which are essential for teachers to strengthen their instructional process and make it impressive. Awareness about learner's thinking/cognitive level.

Must know about their experiences, interests and goals. Participation of the teachers is essential to design and plan an effective teaching- learning process. Material which is not relevant should be avoided during teaching-learning process. Teachers should learn new teaching materials which strengthen teaching-learning process. An ample opportunity should be given to the students to participate in teaching-learning situations in class.

(Shinn, 1997) said that the traditional approach of teaching which is still used in present day classroom situations needs to be revised to fulfill the needs of advance concepts in the field of science. Teachers must play an active role throughout their lessons and disseminate the facts to students. Lecture method is very cheap and economical. That's why it is commonly and frequently used in teaching process. It also a time saving method. Once a teacher prepares a lesson, he / she can repeat it more than one time. In very little time, a teacher can deliver a lot of knowledge.

Teaching objectives are continuously changing; although this traditional method has a lot of advantages, it is now discontinued. It is not recommended to use this traditional method alone. It is quite difficult to achieve the new objectives of teaching by using lecture method. The goals of teaching can be achieved by maximum and active participation of children in the process of learning.

The role of a teacher should be like a facilitator, which makes learning easier to young kids and involves them in the process of learning. Teacher should make classrooms as student-centered instead of teacher- centered, and allow students to recognize their problems freely. The teachers should help the learners to build up their knowledge by using different and new instructional material and strategies. Lecture method needs to be revised because students get bored when they are passive listeners(Freeman et al., 2014)

2.1 Kumon Method

Kumon method is time-framed method of learning with emphasis on building ability of independent learning among students. Kumon lectures or lessons are planed according to needs of every student, which encourages each student to get more and more. It is supplementary program which help in achieving goals of an institution ("Private tuition for children in core subjects of maths & English," n.d.)

2.1.1 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. They can avail as much time as they require to get mastery on that particular unit or lesson.
- ❖ There is a lot of repetition of work in Kumon method which makes understanding easy to every child. They can repeat their task again and again until they get complete grip on that topic.
- ❖ 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. It also shows the proficiency of every child in a subject, or need to get it.
- ❖ 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.

2.2 Spreading Globally

2.2.1 More than 50 countries, Kumon is offering opportunities to students to learn

Kumon has its basic aim nurturing the students to meet the challenges of 21st century and gives support to societies globally. All over the world Kumon method of teaching provides activities to help students to explore their talent and develops maximum competencies to learn.

Total World Enrollment:

4,289,000 (total number of subject enrollments as of July, 2015) researcher's personal visit to Dehiwala Colombo 6, Srilanka

2.2.2 Kumon Method develops student's basic learning & academic abilities globally accepted

Kumon method is basically a Japanese technique, but it is accepted all over the world. Question arises why it is accepted by various countries different to one an other in their cultures, values, and in their systems of education? The main reason, Kumon works with the mission to develop high academic abilities, over which foundation of whole education is laid. Students of all age groups are benefited by Kumon because Kumon method is an independent study program which is ideal for all.

2.2.3 Kumon aspiration is to help children grow along with people of world

Kumon method of teaching is spreading all over the world very quickly because it is a very simple method which requires only pen and paper. People all around the world are now realizing the need to explore their talent and to develop their skills up to maximum, this is the reason which gives the aspiration to people and that aspiration is the reason of spreading Kumon.

Kumon believes in the hidden talent of each child. Children flourish without considering their age or grade level. Every time a child has to face unknown and inexperienced challenge independently, he/ she undergoes a procedure where his/ her skill development is brought to maximum level having strong achievement sense.

Kumon workbooks carried small steps, where each child is allowed to progress gradually, which enable them to flourish smoothly from easy to difficult problems and finally towards advance level by their own.

In 1954, Toru Kumon was the founder of worksheets. These worksheets are continuously updated by considering reactions of students towards worksheets and feedback of Instructors. By getting the information from students and instructors, the worksheets are made more effective for self-learning. These worksheets are made to allow students to higher level of learning by their own. If students face some difficulties in solving the problems which are not understandable to them by their own, then kumon teachers are there to guide them. They never spoon-feed them with the solution of those problems. Instructors check the level of their understanding before facilitating them with hints. Instructors also help them by showing some examples/ problems already studied, to enable them to solve difficult problems by themselves. In doing so, students feel satisfaction with a sense of achievement and become able

to get mastery of new tasks independently ("Learn Japanese at Kumon! Class and Correspondence Course | KUMON Japanese Language Program," n.d.)

Kumon instructor plays an important and key role to explore the hidden potential in each student. Instructors pay attention on each and every child personally to see their academic ability, their personality and how they solve the worksheets. Instructors are there to provide effective support to them to make sure their learning at a" just-right" level them. The academic growth of each student is acknowledged by Kumon instructors without comparing with others, while praising and encouraging them. At the same time, they also meet regularly with parents to evaluate and monitor the academic development of every child. Students are benefited fruitfully by Kumon through true dedication of teachers, who sincerely wish to achieve the desires of Kumon program.

3. RESEARCH METODOLOGY

The study was experimental in nature and it was conducted to determine to compare Kumon method with Traditional lecture method. Cluster sampling technique randomly was used to select the sample from population. One of the three Fazaia Inter Colleges of Rawalpindi and Islamabad was selected. All class-V students were the sample of this research study. ''Mathematics Achievement Test'' were used for the collection of data which were developed by Teacher's Training Institute Islamabad. 25 test items were there in the Pre-test as well as in the Post-test while 10 items were in each end chapter test.

Experimental Design

Pre-test Post test time series equivalent group design is considered as more effective for Mathematics as compared to other experimental designs because it excludes irrelevant materials. (Bukhari, M.A, 1999).

Experimental group and Control group were equated by considering students' results in pre-test.

Experimental group was taught by Kumon method and control group was treated by traditional lecture method.

The following design was used for data collection.

	Pre	ECT_1	ECT_2	ECT_3	Post
E_R	O_1	$t_{treatment}O_3$	$t_{treatment}O_5$	$t_{treatment}O_7$	$t_{treatment}O_9$
C_R	O_2	O_4	O_6	O_8	O_{10}

Validity and Reliability

The data collection instrument was improved by consulting three Mathematics experts. Test –re-test method was used to determine the reliability. The test was administered on grade-5 students of other colleges which were not the part of sample. The reliability figure was 0.86 which was calculated by applying Spearman Brown formula using Statistical Package for Social Sciences (SPSS).

Procedure of study

For the formation of the experimental and control groups of Grade-5 students, pre-test was administered on the

sample. The test was of 90 minutes duration. After conducting the test, results were prepared to form both the groups.

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.

Presentation and Analysis of Data

It deals with the experiment conducted for twelve weeks during the period October, 2014 to December, 2014.

4.1: Pre-test and Post- test

Data were used to calculate Mean value, Standard deviation value and t-values and these values have been presented in table 1, and figure 1.

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

Scale	Experimental (n =35)		Control (n =35)		t(68)	P	95% CI	
	Mean	S.D	Mean	S.D			LL	UL
Pre-test	17.23	3.14	17.54	2.86	0.44	.663	-1.75	1.12
Post-test	22.37	1.82	18.74	2.51	6.92	.000	2.58	4.67

CI=*Confidence Interval; LL=Lower Limit; UL=Upper Limit;*

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 17.23 and mean value of control group is 17.54. Difference between the Mean values of pre test on experimental and control groups is 0.31 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 22.37 and mean value of control group is 18.74. Difference between the Mean values of post test on experimental and control groups is 3.63 and it is highly significant even at p < .001.

4.2: End Chapter Tests

End chapter tests were also conducted as per requirements of experimental design, and the data collected in these tests

were used to calculate Mean values, Standard deviation values and t-values and these values have been placed in Table 2.

Table-2: Data of End Chapter Tests

Scale	Experimental (n =35)		Control (n =35)		t(68)	P	95% CI	
	Mean	S.D	Mean	S.D			LL	UL
ECT1	7.83	1.5	5.74	1.58	6.32	.000	1.43	2.74
ECT2	8.14	.94	6.71	1.43	4.94	.000	.85	2.0
ECT3	8.89	.77	7.0	1.52	4.46	.000	1.28	2.43

Note. CI=Confidence Interval; LL=Lower Limit; UL=Upper Limit; ECT1= End Chapter Test-1; ECT2= End Chapter Test-2; ECT3= End Chapter Test-3;

Figure 2

End Chapter Tests (ECT) achievement score
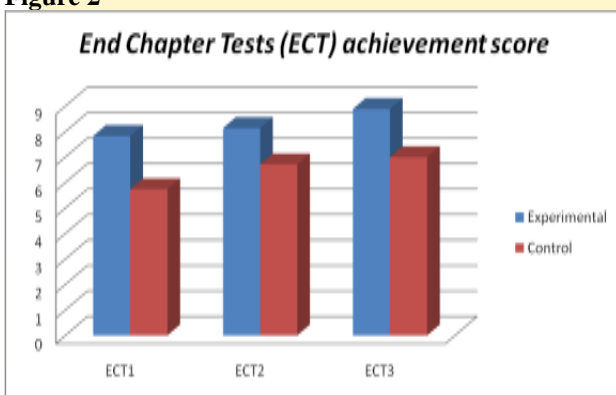
It is clear from the data of Table 2and figure 2 that:-
1. Mean values of experimental group in ECT_1, ECT_2 and ECT_3 are (7.83), (8.14) and (8.89) respectively. Mean values of control group in ECT_1, ECT_2 and ECT_3 are ((5.74), (6.71) and 7.0) respectively.
2. Differences between the Mean values of ECT_1, ECT_2 and ECT_3 on experimental and control groups are 2.09, 1.43 and 1.89 respectively and are highly significant at $p < .001$.

**4.3: Pre-test and Post-test forboys and girls of experimental group**

Data were used to calculate Mean value, Standard deviation value and t-values and these values have been presented in table 3.

Table-3: Data of Pre-test and Post-test forboys and girls of experimental group

Scale	Boys (n =17)		Girls (n =18)		p	95% CI	
	Mean	S.D	Mean	S.D		LL	UL
Pre-test	17.47	3.18	17.00	3.18	0.44	.66	-1.72	2.66
Post-test	22.59	1.77	22.17	1.88	0.681	.50	-0.84	1.68

Note.ECT1= End Chapter Test-1; ECT2= End Chapter Test-2; ECT3= End Chapter Test-3;

Figure 3

Pre-Post test scores of experimental group
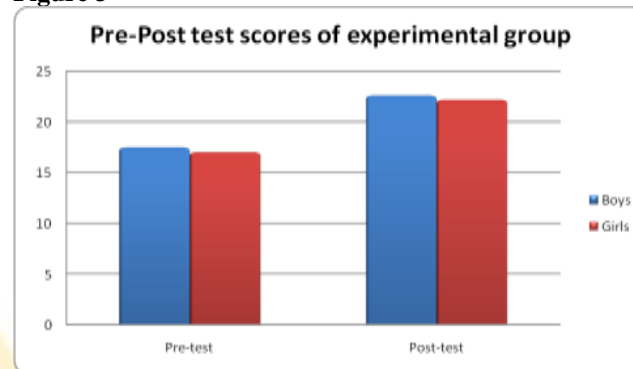
It is clear from the data of Table 3 and Figure 3, that:-
1. Mean values of pre-test for boys and for girls are (17.47) and (17.00) respectively. Difference between the Mean values of pre-test of boys and girls on experimental group is (0.47) and it is not significant at $p > .05$.
2. Mean values of post-test for boys and for girls are (22.59) and (22.17) respectively. Difference between the Mean values of boy and girls on post-test of experimental group is (0.42) and it is not significant at $p > .05$.

**4.4: End Chapter Tests for boys and girls on Experimental group**

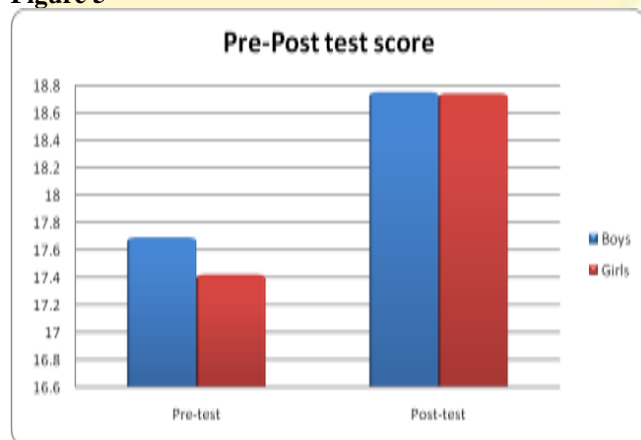End chapter tests were also conducted as per requirements of experimental design, and the data collected in these tests were used to calculate Mean values, Standard deviation values and t-values and these values have been placed in Table 4and figure 4.

Table-4 Data of End Chapter Tests for boys and girls on Experimental group

Scale	Boys (n =17)		Girls (n =18)			P	95% CI	
	M	S.D	M	S.D			LL	UL
ECT1	7.59	1.23	8.06	1.06	-1.2	.24	-1.25	0.32
ECT2	8.12	.93	8.17	.99	-0.15	.88	-0.71	0.61
ECT3	8.88	.67	8.83	.86	0.19	.86	-0.49	0.59

Note. CI=Confidence Interval; LL=Lower Limit; UL=Upper Limit; ECT1= End Chapter Test-1; ECT2= End Chapter Test-2; ECT3= End Chapter Test-3;

Figure 4

End Chapter Tests (ECT) achievement scores of experimental group
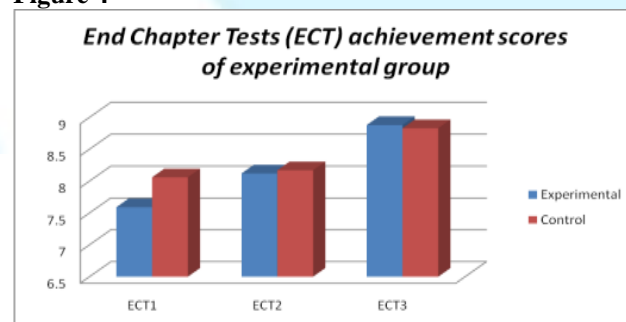
It is clear from the data of Table 4 and Figure 4, that:-
1. Mean values of boys in ECT $_1$, ECT $_2$ and ECT $_3$ are (7.59), (8.12) and (8.88) respectively and mean values of girlsin ECT $_1$, ECT $_2$ and ECT $_3$ are (8.06), (8.17) and (8.83) respectively.
2. Difference between the Mean values of ECT $_1$, ECT $_2$ and ECT $_3$ of boys and girls of experimental group are 0.47, 0.05, and 0.05 respectively and these differences are insignificant at p > .05.

4.5: Pre-test and Post-test for boys and girls of Control group

Data were used to calculate Mean value, Standard deviation value and t-values and these values have been presented inTable 5 and figure 5.

Table-5: Data of Pre-test and Post test for boys and girls on Control Group

Scale	Boys (n =16)		Girls (n =19)			P	95% CI	
	M	S.D	M	S.D			LL	UL
Pre-test	17.69	3.01	17.42	2.82	0.271	.789	-1.74	2.27
Post-test	18.75	2.78	18.74	2.33	0.015	.98	-1.75	1.77

Note. CI=*Confidence Interval; LL=Lower Limit; UL=Upper Limit; ECT1= End Chapter Test-1; ECT2= End Chapter Test-2; ECT3= End Chapter Test-3;*

Figure 5

It is clear from the data of Table 5 and Figure 5, that:-
1. Mean value of pre-test for boys and for girls are (17.69) and (17.42) respectively. Difference between the Mean values of pre-test for boys and girls on control group is 0.27 and it is not significant at p > .05.
2. Mean value of post-test for boys and for girls are (18.75) and (18.74) respectively. Difference between the Mean values of post-test of boys and girls of control group is 0.01and it is not significant at p > .05.

4.6: End Chapter Tests scores for boys and girls of Control group

End chapter tests were also conducted as per requirements of experimental design, and the data collected in these tests were used to calculate Mean values, Standard deviation values and t-values and these values have been placed in Table 6 and figure 6.

Table-6: Data of End Chapter Tests for boys and girls of control group (Phase-I)

Scale	Boys (n =16)		Girls (n =19)			P	95% CI	
	M	SD	M	SD			LL	UL
ECT1	5.75	1.39	5.74	1.759	.024	.98	-1.09	1.11
ECT2	6.50	1.71	6.89	1.15	-0.81	.42	-1.38	.595
ECT3	6.69	1.54	7.26	1.49	-1.12	.26	-1.61	.466

Note. CI=*Confidence Interval; LL=Lower Limit; UL=Upper Limit; ECT1= End Chapter Test-1; ECT2= End Chapter Test-2; ECT3= End Chapter Test-3;*

Figure 6
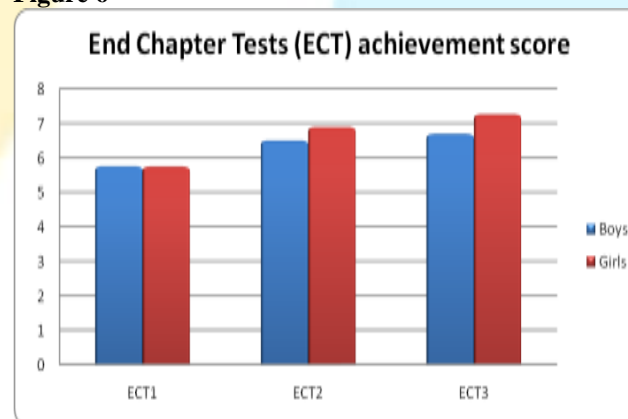
It is clear from the data of Table 6 and Figure 6, that:-
1. Mean values of boys in ECT $_1$, ECT $_2$ and ECT $_3$are (5.75), (6.5) and (6.69) respectively and mean values of girlsin ECT $_1$, ECT $_2$ and ECT $_3$are (5.74), (6.89) and (7.26) respectively.
2. Difference between the Mean values of boys and girlson control group in ECT$_1$, ECT$_2$ and ECT$_3$ are 0.01, 0.39, and 0.57 respectively and these differences are not significant at p > .05.

4. FINDINGS AND CONCLUSION

Findings
1. Mean value of the pre-test on experimental group was 17.23 and mean value of control group was 17.54.Difference between the Mean values of pre-test on experimental and control groups was 0.31 which was not significant so the groups were approximately equivalent at pre test level. (Table No.1)
2. Mean value of the post-test on experimental group is 22.37 and mean value of control group was 18.74. Difference between the Mean values

of post test on experimental and control groups was 3.63 which was highly significant even at $p < .001$. (Table No.1)

3. Mean values of experimental group in ECT_1, ECT_2 and ECT_3 were (7.83),(8.14) and (8.89) respectively. Mean values of control group in ECT_1, ECT_2 and ECT_3 were ((5.74), (6.71) and 7.0) respectively. (Table No.2)
4. Differences between the Mean values of ECT_1, ECT_2 and ECT_3 on experimental and control groups were 2.09, 1.43 and 1.89 respectively and are highly significant at $p < .001$. (Table No.2)
5. Mean values of the pre-test for boys and for girls were (17.47) and (17.00) respectively .Difference between the Mean values of pre-test of boys and girls on experimental group was (0.47) and which was not significant at $p > .05$.   (Table No.3)
6. Mean values of the post-test for boys and for girls were (22.59) and (22.17) respectively. Difference between the Mean values of boy and girls on post-test of experimental group was (0.42) which was not significant at $p > .05$. (Table No.3)
7. Mean values of boys in ECT_1, ECT_2 and ECT_3 were (7.59), (8.12) and (8.88) respectively and mean values of girls in ECT_1, ECT_2 and ECT_3 were (8.06), (8.17) and (8.83) respectively. (Table No.4)
8. Difference between the Mean values of ECT_1, ECT_2 and ECT_3 of boys and girls of experimental group were 0.47, 0.05, and 0.05 respectively and these differences were insignificant at $p > .05$. (Table No.4)
9. Mean value of the pre-test for boys and for girls were (17.69) and (17.42) respectively. Difference between the Mean values of pre-test for boys and girls on control group was 0.27 which was not significant at $p > .05$. (Table No.5)
10. Mean value of the post-test for boys and for girls were (18.75) and (18.74) respectively. Difference between the Mean values of post-test of boys and girls of control group was 0.01which was not significant at $p > .05$. (Table No.5)
11. Mean values of boys in ECT_1, ECT_2 and ECT_3 were (5.75), (6.5) and (6.69) respectively and mean values of girls in ECT_1, ECT_2 and ECT_3 were (5.74), (6.89) and (7.26) respectively. (Table No.6)
12. Difference between the Mean values of boys and girls on control group in ECT_1, ECT_2 and ECT_3 were 0.01, 0.39, and 0.57 respectively and these differences were insignificant at $p > .05$. (Table No.6)

5. CONCLUSION

In our education system, for teaching of mathematics at primary 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 5 were picked from Fazaia Inter College Jinnah Camp Nur Khan Rawalpindi for research purpose. From the 5th 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 in both the experiments 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 in both the experiments 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.

6. DISCUSSION AND RECOMMENDATIONS

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.

7. RECOMMENDATIONS

1. First recommendation for 5th 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 5 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 5 be revised by curriculum planners under the shade of Kumon Teaching Method.
6. In public and private schools of Pakistan, Kumon Teaching Method be used at 5th grade level.

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