COMPARATIVE STUDY OF COGNITIVE DEVELOPMENT OF STUDENTS UNDER MULTIPLE SYSTEMS OF EDUCATION AT SECONDARY LEVEL

By

Rukhsana Durrani

Reg.No. 58-FSS/MSEDU/F08

Submitted for partial fulfillment of the requirements for the Degree of MS in Education

DEPARTMENT OF EDUCATION
FACULTY OF SOCIAL SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY
ISLAMABAD

2011

COMPARATIVE STUDY OF COGNITIVE DEVELOPMENT OF STUDENTS UNDER MULTIPLE SYSTEMS OF EDUCATION AT SECONDARY LEVEL

By

Rukhsana Durrani

Reg.No. 58-FSS/MSEDU/F08

DEPARTMENT OF EDUCATION
FACULTY OF SOCIAL SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY
ISLAMABAD
2011

DEDICATION

Dedicated to my Beloved brother

Dr. Bakhtyar Ali Durrani
PhD (Physics)

Who always aspired to see his sister at the top of academic ladder and whose encouragement and support enabled me to complete this work

Approval Sheet

COMPARATIVE STUDY OF COGNITIVE DEVELOPMENT OF STUDENTS UNDER MULTIPLE SYSTEMS OF EDUCATION AT SECONDARY LEVEL

By

RUKHSANA DURRANI
58-FSS/MSEDU/F08

Accepted by the Department of Education, Faculty of Social Sciences, International Islamic University Islamabad, in partial fulfillment of the requirements for the award of degree of **MS in Education.**

Supervisor: _____
(Dr. Samina Yasmin Malik)

Internal Examiner: _____
(Prof. Dr. Nabi Bux Jumani)

External Examiner: _____
(Dr. Muhammad Javed Iqbal)

Dated: 21·09·11

Chairman
Department of Education
International Islamic University
Islamabad

Dean
Faculty of Social Sciences
International Islamic University
Islamabad

ACKNOWLEDGEMENTS

Thanks to Almighty Allah, The Creator of this universe who blessed me with an opportunity, courage and ability to complete this humble contribution towards knowledge.

The researcher would like to acknowledge Dr. Samina Malik, Chairperson Department of Education, IIUI and my thesis supervisor for her valuable guidance, support and encouragement, which helped me throughout my research work. She always remained very cooperative with me whenever I needed her help. I have no words to thank her for her supportive attitude.

The researcher is also very thankful to my dearest brother Dr. Bakhtyar Ali Durrani who always remained a source of motivation and provided every kind of support to me throughout my studies. His assistance and encouragement enabled me to complete my research work. His support enlightened my life with knowledge. I am also thankful to my Bhabi Dr. Lubna Shah for her encouragement.

The researcher feels grateful to Dr. A. R. Sagher for his support, guidance and valuable suggestions. I am also very thankful to Dr. P. A .Shami who helped me a lot in the time of trouble in my research work. I would say special thanks to Irfan Malik and Tanveer Afzal (AIOU) who provided me assistance in learning of SPSS soft ware for data analysis.

I am very thankful to my family members, my parents, sister, brothers and husband for their moral support and prayers.

Many special thanks go to my all friends who assisted me in data collection especially Amber Nisa and Huma. I am also thankful to the principals of all madaris and F.G Boys schools of Islamabad who cooperated with me and extended sincere hand of help to me in data collection.

(Rukhsana Durrani)

ABSTRACT

This research study is designed to examine the comparison of cognitive development of the students studying under multiple systems of education at secondary level. The research was carried out with the following objectives: a) to identify the extent of differences of cognitive development among the students of three systems of education at secondary level. b) to find out the extent of similarities of cognitive development among the students of three systems of education. c) to give a comparative analysis of cognitive development of the students of three system of education at secondary school level. d) to investigate which system of education is enhancing cognitive development of students.

The study was delimited to the capital territory of Islamabad. The students of all private schools, who were offering O' level, F.G Boys schools of public sector and madaris were the population of the study. 716 students were taken through stratified sampling technique. The students from each strata were taken according to the sample population ratio given by L. R. Gay. INTl was the research tool used for data collection.

SPSS 16 was used for data analysis and various statistical formulas, i.e Range, Mean, SD, Correlation, ANOVA and Post Hoc were applied to find out the results. The data were analyzed and tabulated in the form of tables and graphs. The results were tested in the light of null hypothesis and significant difference was found between the cognitive development of the students of the three systems of education.

It was found that there was a large difference of cognitive development between the students of private schools and madaris, public schools and madaris. However this difference was not much between the students of public and private schools. On the basis of findings, it was concluded that there was a variation between the cognitive

developments of the students of the three systems of education. The students of the private schools were found better than the students of public schools and madaris, while the madaris students were found weak as far as their cognitive development was concerned. The study recommended that the public schools and madaris should be provided with all those facilities which are helpful to enhance the cognitive abilities of their students.

Table of Content

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Education is the process of social, emotional and intellectual development of individuals. Each one of us undergoes many changes since birth till the end of life due to the impact of biological and environmental influences. These changes occur both in the form of growth and development. Mental or intellectual development leads to the creation of various kinds of mental abilities and capacities. These abilities enhance continuously with the passage of time as the individuals grow up. However, researches have shown possibilities of differences amongst individuals in overall mental abilities and capacities. Each child possesses different kind of abilities such as linguistic ability, thinking ability, problem solving ability, reasoning ability and analytical ability etc. The development of theses abilities in an individual is known as intellectual development of the individual. Intelligence is a concept which cannot be observed directly. It is the ability of an individual through which he thinks in terms of abstract ideas. Intelligence refers to mind in its cognitive aspect, especially in concern with high order thinking processes. These high order thinking processes include generalization, conceptions, logic and reasoning. (Srivastava, 2006)

According to Anderson, "cognitive psychology is an effort towards the understanding of human intelligence and how people think," (Anderson, 1990.p.1)

Education is the foundation of a society and plays a central role in the social and economic development of any nation. It is a powerful mean which refines character,

mental capabilities, social behavior and human values. Conventional education mainly focuses on the development of requisite skills, religious knowledge and social understanding which is required for the prosperity and stability of a society. The main purpose and aim of education is to train the young minds how to lead life by developing their mind and soul and equipping them with knowledge to enable them to face the realities of life. (UNESCO, 2000).

Education is the most important sector of development of any country. It produces productive and informed citizens and provides the opportunities and skills to the unprivileged class of the society. Globalization has brought many changes in every field of life. It makes the economic life more competitive and demanding and emphasized the importance of human expertness in different fields of life. So only those nations can combat with the challenges of globalization who have educated manpower equipped with the modern skills.

The prevailing system of education in Pakistan is the legacy of British India. This system of education was introduced by the British with the aim to make such clerks and subordinates who would carry out their mission. It was designed by Lord Macaulay to produce "your most obedient servants". The main belief of the system was in the words of Lord Macaulay "we want Indians in colour but Englishmen in taste and attitude". As the existing system of education was designed by the colonial rulers for their own purposes, it will hardly be expected that it fulfills the requirements of an independent Islamic state. Pakistan was founded for the purpose to bring changes in the mental and educational outlook of its citizens but unfortunately more than a half century has passed after its independence, our leadership seems little interested to bring innovative changes

in the sector of education. Truly speaking the reality of the creation of Pakistan might be reflected in other sectors and activities of the country but this aim has been projected least in the educational sector. Our education system has less relevance to our social, political, economical and other problems faced by the nation. After independence we do not need an army of clerks to fulfill the specific mission of government as was experienced in colonial period. But we need skillful manpower and self-reliant balanced citizens who are conscious of their heritage and have strong believe in the Islamic ideology (Quddus, 1990).

At present the Muslim world from Morocco to Indonesia has two parallel systems of education i.e. religious education systems and secular educational systems. And in each country these systems are further divided into other categories. But in case of Pakistan, the secular educational institutions are categorized as follows:

1. Public sector Institutions
2. Schools and colleges run by Christian missionary organizations
3. Private institutions established almost on the pattern of Christian mission schools.
4. Private English medium schools in urban areas which are based totally on commercial lines.
5. Schools and colleges established by different communities such as Agha Khanies and Ahmadies.

Among them there are ordinary schools which have Urdu medium of instruction and Model schools with English medium of instruction. Each of these categories has different syllabus, funds, financial resources, pay scales and salaries. There is also a difference in the socio-economic status of the students and staff of these schools.

On the other hand, the religious institutions are not less diverse; they are not divided on the basis of Islamic ideology and dogmas rather on the basis of their different sectarian thoughts. The religious educational institutions in Pakistan are grouped as follows:

1. Madaris of Deobandi sect
2. Schools of Barelvi thoughts
3. Madrasa of Ahl-i-Hadees
4. Religious schools of shia cult

All these categories of education in Pakistan show that we do not have a uniform system of education on national level. These all systems have their own deficiencies and limitations. The students who are passing out from these schools are not only different in their personalities, abilities and perceptions but also having different attitude, manners, philosophies and ideologies. These divergence leads to the world of huge differences of thoughts and ideas on national level which is not only dangerous for national solidarity but also harmful for the future of the country.

The existing diversity in education and a rapid expansion in it are creating a confusion and chaos in the society. We as a nation need a result oriented educational system which guarantees our demands as a Muslim society. Our education system failed to produce the men like Abu Hanifa, Alfarabi, Ibne Sina , Jabir Bin Hayyan and Allama Iqbal. Because it has not a purposeful destination. In fact our all systems of education are not able to fulfill the needs and demands of a respectable and free nation.(Amjad,n.d).

The major cause of the fall of education system are poor allocation of budget, lack of inspired planning, loss of idealism and lack of quality training for teachers at all levels (Hussain, 1992).

As far as our religious schools are concern they are based on the conventional ideologies and methodologies. They need to revive their systems in order to meet the challenges of the time. If we expect to get scholars and Ulmas from these religious schools who will serve the Muslim Ummah, it will never fulfill because they are not designed for this purpose actually. Any loyal Pakistani citizen can never think of an army who's command is divided amongst Panjabis, Sindhis, Pathans, Baluchis and Muhajirs etc.Because these armies might support and defend their own communities but will damage the solidarity and unity of the country itself. So similarly our multiple system of education is damaging the solidarity of the country as it is dividing the people into different groups, social classes and ideologies. And as a result, despite the abilities and skills, contradictory opinions even on national issues arise on the part of the society. Therefore, it is the need of the time that all the religious scholars and educationists should sit together and work for a uniform system of education which may develop the mental capabilities of the citizens of the country and also should be acceptable and suitable for all people of the country whether they are rich or poor, rural or urban. There should be no difference between the private schools and government schools. If the private sector wants to contribute, it should be given a clear cut parameter in order to bring itself in harmony with national system of education. In order to maintain the quality of education, the commercialization of education needs to be eliminated. (Amjad, n.d).

Education supports the harmonious development of the citizens of any nation. It increases the cognitive skills of the individuals and enables them to participate in the economic development of the country. In other words, we can say that through the process of education, individuals develop such abilities, skills, expertise and attitudes that assist them to change their behavior according to social, political and economic demands. In Pakistan there are different systems of education which are trying to enhance the cognitive abilities of the students to enable them to participate in the national progress (Shami, 2005).

1.1 STATEMENT OF PROBLEM

The education system of Pakistan includes pre-primary education, primary education, elementary or middle level education, secondary level education, higher secondary level of education and tertiary or higher level of education. Beside the public sector, private sector is also contributing to education. There are different types of schools in Pakistan at secondary level of education such as public schools, private schools and side by side madaris are also providing education to the students. These three systems of education have their own philosophy and curriculum. The students of these systems vary in mental, intellectual and cognitive capabilities. The cognitive development depends on the nature of the system in which they are studying. Therefore the study was designed to investigate and compare the cognitive development of the students of the three systems of education at secondary level.

1.2 OBJECTIVES OF THE STUDY

1. To identify the extent of differences of cognitive development among the students of three systems of education (public schools, private schools and madaris) at secondary level.
2. To find out the extent of similarities of cognitive development among the students of the three systems of education.
3. To give a comparative analysis of cognitive development of the students of the three systems of education at secondary school level.
4. To investigate which system of education is enhancing cognitive development of students.

1.3 VARIABLES OF THE STUDY

The cognitive development is a broader term, therefore, this research study was carried out under some selective cognitive abilities.

- Abstract reasoning
- Spatial relation
- Conceptual ability
- Accuracy of discrimination
- Eduction of relations
- Correlations

1.4 METHODOLOGY OF THE STUDY

The following methodology for the research was adopted:

1.4.1 Population

All male students of public schools, madaris and private schools of Islamabad Capital Territory were the population of the study. Among private schools, those constituted the population who were offering the O' levels to their students. The students from public schools were of secondary level and from madaris the students of Darja-e-sanawiya constituted the population of the study. The total number of boys students in public schools (F.G Boys schools) were (1716), the total population of boys in madaris were (170) and the total number of boys students in private schools were (1100). The detail of total number of students of the three systems is as follow:

Name of Schools	Public Schools	Private Schools(O'Levels students)	Madrassah
Total Number of students	1716	1100	170

1.4.2 Sample

Stratified random sampling technique was used. Three strata were based on the systems of education at secondary level i.e. public schools, private schools and madaris. The sample size was taken randomly from each stratum according to the L.R Gay prescribed sample population ratio (Gay, 1995). The distribution of the sample was as below:

	Public Schools	Private Schools (O-Levels students)	Madrassah
Total Number of students	1716	1100	170
L.R. Gay sample population ratio	314	284	118

1.4.3 RESEARCH TOOL

The research tool was a standardized test, i.e. Indigenous Test of Intelligence (INTI). The Test was developed by Ashfaq Hussain Gadezi and Mah Nazir Riaz and published in 2009. This test was purchased from the National Institute of Psychology Islamabad. This instrument contained five sub-tests .Each sub-test had its own time limit to attempt. These sub tests were basically MCQs of non-verbal figures. There are question figures and answer figures in the tests. The students were supposed to select an answer figure for the question figure. There were different numbers of questions in each sub-test according to the time of the test. The time limit for each question was one minute. Each test had its own total time limit according to the number of items in the test.

The tests consisted five subtests name:

1. Series
2. Matrices
3. Analogies
4. Odd one out
5. Similarities

1.4.4 DATA COLLECTION

Data were collected through personal visits to the students of public schools, madaris and private schools of Islamabad Capital Territory. Guidance was provided about the time and procedure of attempting the tests to the students before they started the test. The students were also directed about the rules and instructions of each test before they started the test. Time limit for each test was strictly followed by the researcher. The entry requirement of the test for students was 15 to 17 years of age of the students at secondary level. All schools and madaris were informed in advance in order to take time from the administration for conducting the test in their institutions. The researcher found that the most cooperative system of education was that of madaris. They extended helping hand whole heartedly to conduct the test in their Madrassas. They provided information and helped whenever the researcher needed. On the other side, the Private schools (those who were offering O-levels) were found the most difficult amongst the three systems in order to provide information to the researcher. They were found less cooperative in this regard. The Public schools (F.G schools) were also found very cooperative and helpful especially the behavior of their administration was very much supportive and cooperative. They helped in order to facilitate the researcher.

1.4.5 DATA ANALYSIS

The collected data were analyzed through the application of different statistical formulae. The results of the data were presented in the form of tables and graphs. For analysis of data SPSS software was used. Following statistical measures were used for data analysis:

Type of Analysis
Range
Mean
Standard Deviation
Pearson Product Moment
One way ANOVA
Post Hoc Test(Tucky Test)

1.5 DELIMITATION OF THE STUDY

The study was delimited to the schools located in Islamabad Capital Territory. The three systems of education were F.G Boys Schools, Private schools (who are offering O-level) and madaris.

1.6 HYPOTHESES

1. $\mathbf{H_{01}}$ There is no significant difference between the cognitive development of the students of public and private schools.
2. $\mathbf{H_{02}}$ There is no significant difference between the cognitive development of the students of public schools and madaris.
3. $\mathbf{H_{03}}$ There is no significant difference between the cognitive development of the students of madaris and private schools.
4. $\mathbf{H_{04}}$ There is no significant correlation between the scores of the students of the three systems of education on sub-tests of cognitive development.

1.7 SIGNIFICANCE OF THE STUDY

Unified system of education is important for the development of any society and for the progress of the nation. Cognitive abilities are very important for individual life. People engage in cognitive activities whether they are at home or outside in the community. Therefore, cognitive development of the students is one of the fundamental aims of any educational system. The designed study may prove fruitful for the public schools and madaris in order to take measures for the cognitive development of their students. It might also be helpful to bring some positive changes in our educational system especially in public sector schools and madaris in order to reduce the gap of large differences among the cognitive abilities of students studying in different types of schools. The more the cognitive abilities of the students develop the more they excel in life. The study may be important from different dimensions, such as it may be important for the three system of education to get benefit from each other in order to enhance the cognitive skills of their students by bringing change in their curriculum and teaching methodologies. The study will also examine other researches in the field of cognitive development, thus it will help to identify the major findings which can be adopted for the cognitive development of the students at different level of schooling. This study may be helpful for the policy makers and administrator to design such policies which reduce the differences of cognitive development among the students of the three systems of education. This study may give new directions to the policy makers to stream line the three systems of education of our country especially public schools madaris. This study may help to bring forth the positive aspects of the private schools which help to develop the cognitive abilities of their students. It might also be helpful for

future researchers in order to conduct researches on teaching methodologies of these three systems of education, which might bring changes in the style and strategies of teaching of teachers. The study might also be useful for the teachers in order to give more focus to activities and innovative techniques for the cognitive domain while they are planning their lessons. The study might give new direction for further researches in the other related fields.

Chapter 2

REVIEW OF LITERATURE

Hunt and Ellis (2004,p.2) stated about cognitive psychology as "The study of mental processes such as perceiving, remembering and reasoning" .Hunt and Ellis explanation is more reliable that the word 'intelligence' is not easy to define through some agreed definition. In all learning and thinking processes of individual the perception is involved as the individual relates his/her perception to the outside world in one way or the other. Information comes in one's mind, he thinks on it and stores it for the useful practices at future occasions.

The cognitive psychology gets priority due to the scientific curiosity, the need of its practical implication and to provide a base for the various fields of social sciences. History shows that people have written about the cognition for more than 2000 years but during last 100 years the proper scientific study of cognitive psychology has been started.

In the West the history of cognitive psychology is traced back to the ancient Greeks. Plato and Aristotle both had discussed human memory and thoughts. These philosophical discussions gave birth to a century long debate. Antagonists and empiricists believed that individual gained knowledge through experience while the nativists and rationalists said that the children have sufficient innate knowledge when they come to this world. During seventeenth and nineteenth century, the British philosophers also supported the empiricists views. These philosophical discussions gave new direction to

the field of psychology about human cognition and at the end of nineteenth century, a scientific approach was made to the understanding to cognition (Anderson, 1990).

All mental operations used in individual thinking are called cognition. Cognition is the intellectual capacity which reasons about the new information, learns some parts of it and retains them. The cognitive abilities vary from person to person. "Cognition includes skills necessary to encode, memorize, and recall information." (Schraw, Crippen & Hartley, 2006). Cognition as attainment of knowledge. (Reed, 1982). Goswami (2000, p. 1) describe cognition as, "the set of processes that enables us to gain information about our environment."Ashworth (2000, p.8) explain cognition as, "perception, remembering, thinking, reasoning, imagining and learning."

2.1 THEORIES OF COGNITIVE DEVELOPMENT

2.1.1 Piaget's theory of cognitive development

There are many theories of cognitive development but the theory of Jean Piaget is one of the most prominent theories of cognitive development in the field of educational psychology. Following are the basic assumptions of Piaget theory of cognitive development.

2.1.1.1 Basic Assumptions of Piaget's Theory

1. Piaget believed that children are energetic and provoked learners. They are not the passive learners of the environment rather they are always curious towards the things of their surrounding. They are always ready to experience and manipulate the new things and examine their effects.

2. Children always build up their knowledge from their own experiences. Their knowledge is not restricted to a separate piece of information but they make an overall view of the information they receive and Piaget called it Scheme, groups of similar thoughts and actions. He said that Scheme developed with the growing age of a child.
3. Piaget said that children's cognitive development took place through the process of accommodation and assimilation. When children interpret each new thing on the basis of their already existing knowledge is called assimilation but when they modify their knowledge at the occurrence of new events is called accommodation.
4. Piaget believed that interaction with social and physical environment is very essential for the cognitive development of children. Interaction with physical environment such as playing with sand, clay and water etc leads to new experiences of children. Interaction with other people gives the realization to a child that how other people are thinking about the different things.
5. According to Piaget, children sometimes explain the new events very easily on the basis of their already existing knowledge; this state according to Piaget is called equilibrium. But as the children grow sometimes they cannot interpret the things on the basis of their existing scheme, this stage is called disequilibrium. These stages lead a child to improve more complex thoughts and mental processes.
6. Piaget believed that cognitive development depends on the level of maturation of brain and as the time passes the child brain gets developed and his level of cognition also improves. He said that elementary school children cannot think as

the adults think. It is just because of the level of maturation of brain due to age factor. (Ormrod, 2000).

2.1.1.2 Piaget theory of cognitive development

The major characteristic of Piaget theory is based on four stages of logical reasoning abilities.

1. Sensorimotor stage

According to Piaget this stage commences from birth and remains till two years of child age. He said that during this stage children usually developed scheme which is purely based on behavior and perceptions. During sensorimotor stage the mental scheme of children is not completely developed and they cannot think about the things which are beyond their view. Although their mind is not fully developed but some important cognitive abilities become known as children start experiencing their environment on trial and error base.

2. Pre-operational stage

This stage of Piaget theory starts from 2 years and remains till 7 years of age. This is the stage where a child develops his symbolic thinking. The language and vocabulary both develop during the early part of pre-operational stage. Increase in vocabulary build up new schemes which serve as a symbol and enable the child to think about the things which are not even in direct contact. At this stage children become ego-centric and they

cannot understand others' perceptions. They may have trouble in understanding why they should share their things with classmates and why they must be careful not to hurt others.

When the children come near to the later part of pre-operational stage almost at the age of four or five years, they start thinking logically. For example, they sometimes draw the correct conclusion about the conservation and classification problems but yet they cannot elucidate why their conclusions are correct.

3. Concrete operational stage

According to Piaget when children approach to the concrete operational stage, they can explain the logical reasons behind their inferences. This stage commences from seven years and goes up till the age of twelve years. He said that children thoughts get organized and integrated into larger system of mental processes called operations. This enables the children to organize their thought in such a way which makes a sense. Students at this stage are capable of logical thinking. They can classify the things into different groups and can display deductive reasoning but yet their cognitive development is not completed.

4. Formal operational stage

This stage of cognitive development remains from eleven to twelve years.At this stage the students can think about those things which do not exist in concrete shape in surrounding such as abstract and hypothetical things, several scientific abilities which are necessary for mathematical reasoning and proportional reasoning occur during this stage.

At this stage, the students can understand why two parallel lines will never touch each other. They can understand the fractions, proportions and decimals. (Ormrod, 2000).

2.1.2 Vygotsky Theory of Cognitive development

Vygotsky highlights the importance of society and culture for cognitive development of children. He said that adults play an important role in the cognitive development of children, because they engage children in different challenging activities which enable them to fulfill various types of tasks. Following are some basic assumptions of Vygotsky theory

2.1.2.1 . Basic assumptions of Vygotsky theory of cognitive development

1. Vygotsky believed that many complex mental processes have their roots in different social activities and interaction. When children come into interaction with their adults they talk about objects and events with them. In this process of discussion, they learn how their adults think about different things in surrounding. According to Vygotsky, dialogue with others is essential for the cognitive development. Gradually they incorporate their own thinking with other adults interpretations. This process provokes internal mental activities which is called internalization. However, it is not necessary that children learn only from their elders but their mental development also takes place while they interact with their peers.
2. Vygotsky believed that language and thoughts develop independently of each other on the initial stage of two years. For adults thoughts and language both are

closely interrelated but it is not essential for children. For example when we talk about the pets we usually have the words cat and dog in our mind. Vygotsky suggested that thoughts and language both are isolate functions for infants and toddlers. He recommended that language appears and is used as a primary mean of communication by children on the initial stage of two years. Later on these both aspects (thought and language) become intertwined and children gradually start to express their views when they speak and they start to reflect in terms of words when interact with others. He said when thought and language combine with each other, children start *self talk,* (when children talk with themselves loudly) and gradually they also start *inner speech*, (when children start with themselves using mind rather than they talk orally).

3. According to Vygotsky children can perform far better different challenging tasks if they are helped by their adults. He identifies two kinds of abilities of children development. First is the actual developmental level, where the children perform different tasks independently without the support or help of elders. Second is the level of potential development. it is the ability of a child where he can perform challenging tasks with the help or assistance of competent individual. Usually children can perform different tasks easily with the collaboration of their adults.
4. Vygotsky proposed that performing more challenging tasks develop the cognition of the children. He said that the range of performing tasks dependently by children till the tasks perform by children independently is known as the **zone of proximal development** (ZPD). The zone of proximal development of a child reflects his learning and problem solving ability. Children develop these abilities

with the passage of time and they become the master of some abilities which were difficult for them previously.

2.1.3 Information processing theory of cognitive development

Information processing theory is basically the combination of theories which emphasizes on the development of cognitive processes. These cognitive processes contain those changes which children acquire with the passage of time as they grow older. This theory elaborates that children learn more rapidly, memorize quickly and can solve complex tasks when they grow up. There are four basic elements of this theory which are illustrated below.

1. Attention

There are two trends which are related to the children's attention and have impact on their learning in the process of cognitive development.

- As the children grow older their attention becomes less divert. Usually small children cannot focus their attention for long time on the work at hand rather their attention quickly diverges to other objects and events not related to the actual task. But when they grow older they learn to keep focus on the relevant task.
- Children usually learn the things to which they are intended to learn. Due to distractibility younger children often memorize many things which are irrelevant to the task as compared to the grown up children. For example when grade 1 and grade 7 students were given series of same task to perform. The

older students were found with good memorization of colors and background as compared to the younger children.

2. Learning strategies

These are the strategies adopted by the students for learning different tasks. Pre-school children often identify the need of remembering some concepts but they usually face problems in recognizing the suitable strategy for memorizing those concepts. There are some basic methods develop by children in order for learning different tasks. Foe example, at elementary level rehearsal is use for memorization. Another way is organization of information. Although it is not fully developed at the early stage of primary schooling but it develops with the passage of time. Research has proved that organized information can be learning very easily as compared to unorganized information. The next strategy is elaboration. It means to explore some new information on the basis of already known things. This strategy is gradually developed in the students when they promote to higher classes.

3. Knowledge base

With the passage of time as the children grow up, their knowledge develops in two ways.

- The children gain more and more knowledge over time as they grow older. This knowledge is based on the ability of reasoning and understanding. They learn new things and elaborate them on the basis of already known concepts. The more

knowledge the children already have, the more they can learn new concepts easily.

- As the children grow older, their knowledge and information bulk increases. They can integrate their knowledge and can make connection among the new things and previously known information. They can make association and interrelationship amongst the things, so they can organize their knowledge in a better way as compared to the younger children.

4. Metacognition

The word Metacognition refers to the awareness of once owns cognitive processes and its intended use to the learning of different things. Metacognition is developed in children in different ways. Which are discussed below.

- As the children grow up they become aware about the limitations of their memory. With the passage of time they realized that their memories are not perfect and they can not learn all things perfectly. But as compared to older children the youngsters have seem over optimistic about their memories. The kindergarten children have founded that their prediction about memorizing different words was not realistic as compared to the grade four students.
- Children learn more effective strategies for learning of various concepts when they grow older. They learn the use of techniques like, practice, association and amplification with the passage of time. They also become aware about the use of more effective strategies for a specific situation. For example when eight years child is learning something and he can not memorize it on a first try, he will try

out for the second time but this might not be happened with the six years child. Similarly ten years old child will be more aware about the use of different strategies as compare to the eight years child. These strategies make a big difference in classroom achievement of students. Those who are well known to different techniques of learning, their achievement level will be high, so it is very essential to guide students for effective strategies of learning before they given a task of learning of subject matter in classroom.

- Young children often do not know about their level of understanding of different things. They usually think that they are able to do things before they actually perform the task. Therefore, they do not study their class material because they think that they can do it. Similarly they do not ask questions in a class when they receive some difficult information. In the same way the high school and college students often find difficulty in assessing their level of difficulty. Therefore, sometimes they become over estimated that how accurately they can perform in exams. So a teacher should keep in mind all age levels of students while teaching. Various factors affect the learning abilities of students such as attention, readiness for learning, their previous knowledge and awareness about different learning strategies and these all developed with age. (Ormrod, 2000).

2.2 COGNITIVE FACTORS WHICH AFFECT PROBLEM SOLVING ABILITY

Psychologists have marked out four factors which affects once success in solving a problem.

1. Power of memory in working.
2. Indoctrination of the problem.
3. How to integrate once knowledge in order to solve the problem.
4. Recall of related information from long term memory.

2.2.1 Power of Memory in Working

The memory in working for a specific task in a particular time has limited capacity. It can keep only few parts of information at a time but can generate so much cognitive processes. If a problem needs so much information for its solution at a time, in this situation the memory capacity might not be very effective to provide many directions to the individual. Once the capacity of working memory exceed, the problem cannot be solved. The students can overcome this problem by two ways. Firstly they can make an external record of the information related to the problem such as writing that information on a paper, secondly they can learn some skills through which they can recall those information quickly and easily almost with conscious effort.

2.2.2 Indoctrination of the Problem

Encoding has a key role in affecting problem solving ability. Students sometimes face trouble in encoding problems. This happened particularly in a situation when they do not have sufficient knowledge about the solution of the problem. They usually fail to encode a problem in terms of operations. In this situation the teacher can help them in many ways such as, explain them the problem in a correct way, encourage the students to give a concrete shape to the problem by themselves, guide them to point out any solution

which is there in their mind and encourage them for group work to identify different possible solutions for that problem.

2.2.3 How to integrate once knowledge in order to solve the problem

Researches has shown that students can solve different problems more accurately if they a depth understanding of the concept underlying and have a good organization of the relevant knowledge in their long term memory. For example the students can apply the principles of physics to different situations if they have good understanding of those principles. So it is very necessary for a teacher to teach few concepts but in depth with diverse understanding rather teaching more topics superficially.

2.2.4 Recall of related information from long term memory

We cannot solve a problem until we do not recall necessary information for it from a long term memory. There is a variety of information in our long term memory. Therefore, it depends on the ability of the person to pick out the right information on a right time. The solution of a problem through the use of long term memory depends that how a person encode a problem. If he could encode it in a right manner, he can retrieve many possible solutions of problem from long term memory (Ormrod, 2000).

2.3 SOME GENERAL COGNITIVE ABILITIES

2.3.1 Transductive reasoning

In transductive reasoning ability the child neither reasons inductively nor deductively. Deductive reasoning always moves from general to specific. For example, if

we say that all men are mortal and Ahmad is a man, so Ahmad is also mortal. Inductive reasoning is opposite to it. It makes generalization from specific illustrations. But in transductive reasoning a child go from particular to particular but with out making any generalization.

2.3.2 Classification

Classification refers to the ability of classifying the things into groups or categories.Before the age of seven children usually classifies the things from one dimension. But later they learn the idea of class inclusion for classification of objects. This ability develops with the passage of time and individual become known to the concept of similarities and differences in classification when they grow older. They also learn how to reason while classify the things into sets and subsets.

2.3.3 Seriation

Seriation refers to the mental ability through which we arrange the different elements according to their size, shape, volume and weight etc. It is the sequential arrangement of objects. The ability of seriation improves with age. For example the younger child might arrange the things in series but will not be able to construct this arrangement on the basis of logical series. The construction of series of younger child is based on simple observation while older child makes it on the basis of logical thinking.

2.3.4 Hypothetical reasoning

Hypothetical reasoning is the ability to make an alternative solution for a problem. It does not deal with the direct experience.

2.3.5 Analogical reasoning

It is the ability in which the search for the solution of the problems is limited to the situations which are similar to the problem in hand. In analogical reasoning the children explain how parts of analogies are logically connected to each other. The understanding of analogies is only possible through reflective thinking. It cannot be done through observations.

2.3.6 Deductive reasoning

Deductive reasoning simply means to draw a conclusion by the use of already set laws and rules. With the helps of this ability the students move logically from general to more specific solution. The deductive reasoning ability develops gradually with the passage of time and the children can draw more complex and logical solution when they reach to adulthood (Parsons, Hinson & Brown, 2001).

2.4 EDUCATIONAL SYSTEM OF PAKISTAN

Education in Pakistan is watched over by the Ministry of Education. The responsibility of academic institutions comes under provincial government. The federal government supports in curriculum development, accreditation and financing of research in education.

The education system in Pakistan is normally divided into five levels: primary, middle, high, Secondary School Certificate or SSC, intermediate or Higher Secondary (School) Certificate or HSC); and university programs leading to graduate and advanced degrees (Peter, 1994).

2.5 STAGES OF FORMAL EDUCATION IN PAKISTAN

2.5.1 Pre-School Education

In Pakistan the pre-schooling or early childhood education is commonly run by the private organizations and schools. It usually called a Play Group, Nursery and Kindergarten (also called 'KG' or 'Prep').The entry age for play group or for pre-school education is almost 2 years and six months. Historically the concept of Pre school education in Pakistan was usually refer to a kachi class but the Government has announced the policy to "formalize"Pre-school education *(kachi)* and introduce an ECE curriculum starting from the 2002.The main theme of kachi class in public schools of Pakistan was to accommodate the children of age 3 to 4 years in schools. Although there is a emphasized on the pre-school education in Pakistan but still it is commonly offered by the private schools with better facilities as compared to public sector schools. The pre-school education is mostly commonly in big cities while in most of rural areas there is no existence of pre-school education. (Shakil, 2002).

2.5.2 Primary education

The standard of national education system is mainly stirred from the system of education. After pre-school education, students go through primary education from

grades 1 to 5 which is the first stage of formal education in Pakistan. The curriculum usually depends on the nature of school whether it is English medium or Urdu medium. It also varies for private and public sector schools. The eight commonly study disciplines are Urdu, English, mathematics, arts, science, social studies, Islamiyat and in some schools studies. It is subject to the availability of a computer laboratory. The entry age for primary school education is 5 years which lasts till the age of 10 years.

2.5.3 Middle education

The second stage of formal education in Pakistan is middle level of schooling. This level start from class 6^{th} to 8^{th}.The age group of middle school level is usually 10 to 12 years. In Pakistan the single sex education is preferred by the community at middle stage however in cities there are many schools who offer co-education for students. Urdu, islamiyat, mathematics and science with the combination of some other subjects are offered at this stage. The subjects in schools depend on the availability of staff and resources. There is a huge variation of private and public schools at middle and primary level in Pakistan. Each school has their own policy and plan.

2.5.4 Secondary education

At the stage of high school students stays for two years in classes 9^{th} and 10^{th}. The Board of Intermediate and Secondary Education conducts the examination for students. Those who pass the secondary school examination successfully are awarded with Secondary School Certificate. Vocational education or technical education is normally offered at secondary level. The different fields such as carpenters, masons, mechanics,

welders, electrician, refrigeration and similarly other trades are offered to the students. The students at secondary level choose one stream amongst there streams of subjects. Science group, arts group and technical education group. Besides technical education the curriculum of secondary education usually includes a combination of eight courses including electives such as Biology, Computing, Chemistry and Physics as well as compulsory subjects such as English, Urdu, Mathematics, Islamiyat and Pakistan Studies.

2.5.6 Higher secondary education

The higher secondary stage of education is also called the "intermediate level of education" and is considered a part of college education. Higher Secondary Education refers to classes XI to XII. During two years of stay in the higher secondary education, a student after the age of 16 years can select the field of general education, professional education or technical education. The Board of Intermediate and Secondary Education (BISE) is responsible to conduct the examination. The BISE award a Higher Secondary School Certificate (HSSC).Besides public schools O ' Level and A' Level degrees are also offer by the private schools which are affiliated with the foreign agencies of education and those agencies are responsible for their examination and award of certificates to their students. There are many streams at the level of HSSC and students can choose from them according to their choice, such as pre-medical, pre-engineering, computer science, humanities (or social sciences) and commerce. Each stream has three electives subjects as well as three compulsory subjects of English, Urdu, and Islamiyat (for grade 11 only) and Pakistan Studies (for grade 12 only). (Wikipedia, n.d)

2.5.7 Tertiary education

To obtain the degree of higher education, higher secondary school certificate is required. Students who complete their first-degree stage are awarded with a Bachelor's degree either in arts or in science according to the field which they have chosen. Typically the students enter in higher education programs with the age of 18 years. Higher education is offered by the universities (Amoeba, 2009).

The universities in Pakistan are regulated by the Higher Education Commission. HEC is also financing the universities for fulfillment of research and other facilities. After earning the higher secondary school certificate , the students can study in professional colleges for earning a professional degree such as medical doctor (MBBS), engineering (B.Engg) ,dentistry (BDS), veterinary medicine (DVM), architecture (B.Arch), law (LLB), nursing (B.Nurs) and pharmacy (Pharm-D). These courses need four or five years of duration of study. Students can also join the university for Bachelor of Arts (BA), Bachelor of Science (B.Sc.), Bachelor of Commerce (B.Com) or Bachelor of Business Administration (BBA) degree courses. There are two types of Bachelor degree offer in Pakistan.BA and Honors degree. Honors degree requires three to four years of study, and students normally select a field of specialize of their interest

Master's degree programs need 2 years of duration. It can be in science or in social sciences, depending on the choice of the students. There are also Masters in Philosophy (M.Phil) programs offer in universities of Pakistan. It is offered in a variety of subjects and is commenced after doing Masters. Doctor of Philosophy (PhD) level of education is also offered in selected fields and for those students who have completed their M.Phil degree. Students require choosing some selected area for their PhD research.

It also depends on the availability of man and material resources of the universities in which the students are doing their PhD. Both M.Phil and PhD education is divided into course work and research. (Kurian, n.d)

2.5.8 Non-formal Education

Non formal education system is going on side by side to the formal educational system in Pakistan. Those students who have not access to the formal schools they avail the opportunity through non-formal education. There is a huge population in Pakistan who has not access to the formal schools, particularly in rural areas. The government has launched many non-formal educational programs for these areas to educate the people. This system has its own curriculum and schedule according to the geographical location of the people. Allama Iqbal Open University has a great contribution in provision of non formal education. It is offering education in many fields up to higher education.

2.5.9 Examinations

There is an annual system of examination in Pakistan particularly in schools up to the intermediate level. However in universities there is a semester system of examination but still there are some universities who are offering annual examinations. The respective schools are responsible for the examination of student's progress till the middle level. There are different boards (Board of Intermediate and Secondary Education) which conduct examinations for secondary and higher secondary school certificates. The examination for higher education degree is conducted by the respective universities (UNESCO, 2002).

2.6 EDUCATION EXPENDITURE AS PERCENTAGE OF GDP

Public expenditure on education lies on the fringes of 2 percent of GDP. Calculations show that during the past 37 years, the highest public expenditure on education was 2.80 percent of GDP in 1987-88. Public expenditure on education as a percentage of GDP was actually reduced in 16 years and maintained in 5 years between 1972–73 and 2008-09. Thus, out of total 37 years since 1972, public expenditure on education as a percentage of GDP either decreased or remained stagnant for 21 years. If linear trend were maintained since 1972, Pakistan could have touched 4 percent of GDP well before 2015 (Siraj, 2010).

2.7 PROBLEMS CAUSED BY MULTIPLE SYSTEM OF EDUCATION IN PAKISTAN

2.7.1. Disintegration in the nation

Our existing educational system has divided the society into religious and secular sects and these classes are further divided in terms of languages, traditions and social status. These differences give birth to many other problems of which roots are getting firm in the society and they can be solve through specific and realistic national objectives of education.

2.7.2. Division of spiritual and worldly knowledge

Pakistan is an Islamic state and majority of the population is practising Muslims. Every Muslim of the state loves his/her religion and there is no one who doesn't want to have religious education in their educational system. All Muslims want to have

awareness about the fundamentals of Islam But being an Islamic state our system of education bifurcates secular education from religious education. We are Muslims but we have religious educational institutions in the form of madaris and secular institutions in the form of schools. Our schools are different from madaris and these are different from schools. Syed Abul'ala Maudoodi describes the above discussion in the following words. The isolation of spiritual matters from world affairs is a Christian concept and we can also find its origin in Buddhism or Hinduism.

2.7.3. Linguistic diversities and division

Another problem in the educational system is that it divides the secular educational system further into diverse tracks i.e. English medium schools and Urdu medium schools. This difference gave birth to many social classes in the society. These differences of English medium and Urdu medium schools create many groups in the society, who do not restrict to the language differences but they have cultural differences also. For example, the students of English medium schools have different ideas, culture and behavior. They have dominant impact of Western culture on their personalities and have efficiency on English language. They are highly welcomed in the society in jobs etc. As the medium of instruction of higher education in Pakistan is English, because of language proficiency they easily get higher education too.

2.7.4. Differences on the basis of students financial status

A just society ensures the fundamental rights of all of its citizens without any discrimination of social classes and sects. But our current educational system lacks the

provision of equal opportunity of education to all of its citizens. There are different schools for different social classes of the society, so those who belong to the rich families and can afford the expenses they are getting quality education. And those who are financially weak are equipped with poor education. It is true that Muslims had democratized the education system. Every one was allowed to get equal opportunities of education without any discrimination. The system of education was uniform, facilitated both rich and poor equally and did not divide the society into classes.

2.7.5. Commercialization of Education

The system of education in Pakistan is totally commercial. It ignores the social and moral values of the society which have to be inculcated in children. Education is not for the aim of social service but it is only for material purposes .The students want to get education only to secure good jobs in the market. They have deficit of loyalty with country. Our educational system has deep impacts of Western materialism and these impacts reflect in the student's personalities also. our policy makers should have identify the objectives of education which are based on our Islamic society .Unless we have clear cut objectives we cannot realize that whether we are going near or far from the destination. (Amjad, n.d)

2.7.6. Miscellaneous Problems

1. Access to basic or primary education is the major issue. Statistics, indicates that enrollment in primary education is not only low, but there is found wide disparities in enrolments in all provinces, in genders and in locations (urban vs.

rural). Beside these hurdles, there a tribal, ethnic system and feudalism which is the main hinder in the way of access to education in Pakistan.

2. The quality of education is poor in Pakistan especially in the far flung rural areas of public schools. There is a low standard curriculum, lack of infrastructure facilities and untrained teaching staff affects the quality of education. These problems results the low level of learning achievement of students.
3. The majority of boys and girls have no access to education because the education is expensive for the low income population of Pakistan. There are many other reasons such as security problems particularly foe females, lack of availability of teachers, arch behavior of teachers with students also cause the high drop-out rate of students from schools.
4. The contribution of local community in educational and literacy programs is very essential but unfortunately in Pakistan the involvement of local community is not satisfactory. This becomes more important in rural areas where the enrollment rate of students in schools is very low.
5. The government has not given sufficient attention to the primary education rather more emphasize was given to the higher and professional education for last few years.
6. The private sector is contributing a lot in the provision of basic education but majority of private schools are located in the urban areas. Whereas the rural areas are neglected in this regard where the literacy rate is very low.(Shami and Hussain 2005)

2.8 MADRASSAH EDUCATION IN PAKISTAN

Besides the modern educational system in Pakistan there is also a religious educational system, given in Madrassah. These madaris have their own system of education and own management without the interference of National or Provincial Government. However grants are provided by the government to these institutions. There is a separate board of examination for madaris to conduct their examinations. They have their own system of marking and grading. There is a large enrollment in the Madrassah of Pakistan especially of homeless children. The government is making efforts to bring madaris in mainstreaming. The main aim of this struggle is to provide the employment opportunities to the graduates of madaris (Shah, 2003).

The Madrassah system of education in Pakistan is divided further into many subsects. But the main sects are Sunni and Shia and each sect have their own curriculum. The following are the subsets of Madrassas.

- Deonbandi
- Barelvi
- Ahi-i-Hadith
- Jamat-e-Islami

(Maj,2006)

2.9 HISTORY OF MADAARIS IN PAKISTAN

2.9.1 Definition

Madrassah is an Arabic word (مدرسة) which has two meanings, its more common meaning is a school, and its second meaning refers to an educational institution offering instructions of Islamic subjects but it is not necessary to limit these instructions to the

Holy Quran, Hadith, and Fiqh. Madrassah is a place where the students learn Islamic education according to the pre set curriculum of Madrassah. They have their own system of education and instructions. ("Madrassah", 1995).

2.10 HISTORY OF MADARIS

Madrassah as an Islamic institution has very old history. In early Islamic era madras was used as an institution for Islamic teaching of Quran and Hadith. During the Abbasid dynasty in 11th century the first Madrassah, Madrassah Nizamiyah was established in Baghadad. Food, lodging and education were free in this Madrassah. Madaris spread rapidly in throughout Islamic world. However each country has their own curricula of madaris but the main focus of these Madaris is to produce religious scholars or Ulmas for future. (Weaver, 1995)

2.11 TYPES OF MADARIS

There are various types of madaris in Pakistan. These types depend on the ideology of the particular religious group. These Madaris have their own boards of examination and have design their own curricula according to their ideology but these all are common in Islamic teaching as a focal point. The prominent boards of Madaris are as:

1. Wafaq ul Madaris Al Arabia Pakistan.
2. Tanzeem ul Madaris Ahle Sunnat Pakistan.
3. Wafaq ul Madaris Alsafia Pakistan.
4. Wafaq ul madaris Shia Pakistan.
5. Raabta Al Madaris Islamia Pakistan.

Central Boards of Madrassah in Pakistan

Name	Sub-Sect	Place	Date Established
Wafaq ul Madaris	Deobandi	Multan	1959
Tanzim ul Madaris	Barelvi	Lahore	1960
Wafaq ul Madans (Shia) Pakistan	Shia	Lahore	1959
Rabta-tul-Madaris-al-Islamia	Jamaat-i-Islami	Lahore	1983
Wafq-ul-Madaris-al-Salafia	Ahl-i-Hadith	Faisalabad	1955

(Mehmood, 2008)

2.12 LEVELS OF EDUCATION IN MADRASSAS

2.12.1 Darja Ibtedaiya

This is the primary level of education. It has five years of duration and starts from grade I till grade V. The main emphasize of this grade is on reading of Quran and other fundamental teachings of Islam. Besides Islamic subjects mathematics and Urdu language are also taught to the students at this level of education.

2.12.2 Darja Mutawasta

This is the middle level of education starts from grade 6 to 8 having total three years of duration. Those students who have passed their primary level of education are qualified for admission in Darja Mutawasta. Like primary grades the main emphasize on middle education is also on religious teaching. The teaching of Social studies also starts along with the Mathematics and Urdu language on this level of education.

2.12.3. Darja Sanwiya Aama

This is the secondary level of education starts from grade 9 to 10, having two years of schooling. The subjects of religious education get advance on this level and other subjects like Urdu and mathematics eliminate from this level. The main subjects are logic, Hadith and Fiqha. The students get their certificate from the Board of Wafaq ul Madaris after the completion of Drja Sanwiya Aama.

2.12.4. Darja Sanwiya Khaasa

This level has two years of duration. The students who completed their Darja Sanwiya Aama are eligible for the admission in Darja Saniwiya Khaasa. The concern board is responsible for the examination of this level and a certificate issue to the students after the completion of Darja Sanwiya Khaasa. The students who have completed Darja Sanwiya Khaasa are eligible for the admission in Darja Aalia which is equalent to B.A of formal education. Darja Aalmiya is equalent to M.A.

2.13. DIFFERENT SCALES /TESTS USE TO CHECK THE COGNITIVE DEVELOPMENT

There are many scales and tests used to measure the cognitive abilities or cognitive development of different age groups. Some of the tests and scales are discussed below.

2.13.1 Cognitive abilities Test (Cog AT), Form 6

This test is developed by David F. Lohman and Hagen. It is a group administered battery. The main purpose of the test is to measure and assess the student's abilities such

as reasoning abilities and problem solving abilities by using the verbal, quantitative and non-verbal (spatial) symbols. This test also gives the predictive achievement scores when is combined with the Iowa test. Each level of cog AT test consists of three test batteries. It can be use for different level of students such as low, average and outstanding categories. This test is designed for a wide range of academic levels of students from kindergarten to grade 12.The time for the tests is 30 minutes or less for each session for K level,50 minutes or less per session for level 1-2 and 60 minutes for levels A-H per session. (Lohman & Hagen,2001).

2.13.2 The Cognitive Abilities Test (CAT)

CAT test is made by David F Lohman, Elizabeth P Hagen and Robert L Thorndike. It is suitable for the age group from 7 to 17 years. This is a group administered test. It is used widely in UK for measuring of reasoning abilities of students. CAT test measures the three main areas of reasoning abilities, verbal, non verbal, quantitative and spatial ability. It points out the strength and weaknesses of the individual students and their preferred learning styles. It also helps in developing the students learning plans. There are different sections of the test and each section has almost 45 minutes time duration. (Lohman, Hagen & Thorndike,n.d).

2.13.3 Canadian Cognitive Abilities Test (CCAT)

Canadian cognitive abilities Test is a group administered tool .It helps to determine the general level of cognitive abilities. It basically measure three areas of cognitive abilities in terms of verbal, quantitative and non-verbal abilities. This test

measures the abilities of students from grade 1 to grade 12.The test for grade 1-2 helps to assess verbal abilities such as verbal reasoning and oral vocabulary. In quantitative abilities it tests rational concepts and quantitative concepts. For nonverbal abilities it measures the figure, classification and matrices. Test which is designed for grade 3 -12 (A-H) measures verbal classification, sentence completion, and verbal analogies. In quantitative abilities it assesses the quantitative relations, number series and equation building. The third part of the tests measures the figure classification, figure analogies and figure analysis. Every test for each grade has a specific level of difficulty. The time limit for Canadian cognitive abilities Test is 90 minutes (Education, n.d).

2.13.4 GAMA Test of General Ability Measure for Adults

GAMA test of general cognitive abilities is prepared by Jack A. Naglieri, PhD, and Achilles N. Bardos, PhD. This test is suitable for age group of 18 years and above. It is a paper –pencil or computer administered test and measures the general abilities of adults. It is a self administered test includes abstract designs, colors and shapes for measuring the general abilities. It can be administered both for individual and groups population. The nonverbal part of the test overcomes the language, cultural and educational hinders for the individuals and make it suitable for large population. This test includes the number of items such as matching, sequences, analogies, and constructions. The reading level for GAMA tests required is till grade 3.The time limit for completion of test is 25 minutes. (Naglieri and Bardos, n.d)

2.13.5. Naglieri Nonverbal Ability Test-Second Edition (NNAT–2)

Naglieri Nonverbal Ability Test is developed by Jack A. Naglieri.It is published in 2007.The suitable age grouped for this test is 5-17 years. This can be administer for checking the general cognitive abilities of grade K to 12.It is a papare-pencile test and can be administered online also. Naglieri Nonverbal Ability Test can be use for diverse population and is well-suited for identifying gifted and talented students. It requires 30 minutes for administration and does not need any spoken or written language, therefore, it is more suitable for those who do not know English language. (Naglieri, 2007)

2.13.6. Indigenous Nonverbal test of intelligence (2001)

1. **Series**

   In this sub test the items are presented in series of figures, patterns and designs. The students were asked to choose the next figure from the answer figures to complete the series and make a logical continuation of figures amongst the given choices. It basically deals to encode the term, deduce the link between each successive pair of figures or patterns and than apply this relationship to create a correct completion.

2. **Matrices**

   It is basically a kind of inductive reasoning which combines the elements of series completion, analogies and classification problems in the matrix form. In matrix items there are nine small cells surrounded in one large square. In each of the small square is a figural design that is part of several patterns. The patterns go horizontally across the matrix, and vertically down the matrix.

3. **Analogies**

In these types of items, the student's task is to deduce relationship between the items and apply it in the new case. Students have to detect the relationship in the first two patterns and to find out which one of the figures given as answer options exemplifies the similar relationship in the third figure.

4. **Odd one out**

Classification items require essentially the same set of performance components as series completion and analogy problems. Odd One Out consists of the set of terms, one of which does not belong to others. The examinee's task is to the figure out which term, figure, design, pattern do not belong to other figure, design and patterns etc.

5. **Similarities**

It consists of four sets of two terms each. Preceding the four sets of terms is a single term appearing by itself .The examinee's task is to indicate with which of the four sets of two terms, the single term should appear. The performance components used to solve such problems are much the same as those used to solve series completion and analogies, although that is applied in a slightly different way. Here first one must encode the terms of the problems, next infer what is common to each of the pair of two terms, and then map the higher-order differences between the pairs of lower order relation inferred. These differences are further used as the basis for deciding to which of the four categories the single term belongs. Finally students need to apply what they have learnt in order to determine to which category the single term belongs. (Gardezi, 2009)

2.14 REVIEW OF RELATED RESEARCHES/ARTICLE/THESIS

Abdur Rehman has done his Ph.D research on the topic "A study of relationship of self-concept with classroom environment, gender role, cognitive development and academic achievement of the students at secondary level". The students of secondary level both male and female from the public and private schools of D.I.Khan were his sample for the research. He used a tool for data collection is "Progressive Matrices by Raven". His findings of the study along with other findings are that his research shows the differences in the cognitive development of students. It was observed that the students belonging to advanced culture had faster cognitive development than those students who belonged to less advance culture meant that the difference of cognitive development was not only because of chronological age but other factors were also involved in it. He also observed that there was a positive correlation between the self concept and cognitive development of the students. It means when students developed the ability to think abstractly, did not mean that they developed the psychological constructs to describe others but they could also develop a construct to describe the self.(Rehman, 2001).

Thesis by Hafiz Muhammad Iqbal in 1997 on the topic "A study of the effectiveness of intervention methodology on the cognitive development of science students "He used the Science Reasoning Task which is also known as the Piagetian Reasoning Task II and CASE intervention as an instrument for his data collection. The students of Middle grade were included in his sample. The study was experimental in nature and was based on pre and post tests of the students.

This study concluded that most of the control group students were having higher cognitive level than their experimental group. It was observed that the experimental

group performs better than control group on achievement test of science and mathematics. The research had shown that the increase of cognitive capacity of experimental group was responsible for their better achievement in science and mathematics. The CASE intervention was a series of lessons and strategies used in the research for delivering the lessons and were found that this intervention was effective both for girls and boys and also for public and private schools (Iqbal, 1997).

A research paper with the title "cognitive development in the relation to secondary school final examination results in the Italian school system" was basically written on the cognitive development of the students studying in the Italian schools. The researchers had developed Piaget type questionnaire for data collection and administered it on 800 students of the science faculty in the Bari University. They administered this questionnaire at the beginning of the academic year and compared the results of the students on the questionnaires with their grades of final academic examination. They found from the statistical results that the correlations between the two results were always positive but very low. Therefore, they suggested that the primary aim of any educational institution should be the cognitive development of their students and this improvement should be reflected in the school grades of the students. They further argue that the teacher should give more emphasis on the development of high level cognitive processes at secondary level rather than the factual knowledge of specific facts (Cinquepalmi, Muciaccia, & Picciarelli, 2007)

A research paper written with the title "Cognitive development and student approaches to learning: An investigation of Perry's theory with Chinese and U.S. university students" aimed to provide evidences for the relationship between the

approaches to learning and stages of cognitive development on the cross-cultural differences. The sample for this research was the 67 U.S and 193 Mainland Chinese students. The instruments used for this study were: Zhang Cognitive Development Inventory, Study Process Questionnaire and a demographic questionnaire was also designed for data collection. Besides, the researcher also obtained self- report measures of achievement scores. The study found that the cognitive development and students' approaches to learning were related to each other. The cognitive developmental patterns of Chinese students were different from the US students. The research also revealed that the extracurricular activities had positively contributed in the cognitive development of both US and Chinese students. There was a significant relationship between the cognitive development and scores of achievement of the US group whereas there was no relationship between the cognitive development and achievement scores of the Chinese group. (Li-Fang and David 2001).

This was a theoretical article on cognitive ability in which the author discussed different dimensions of cognitive abilities and their relationship with each other. He said that a positive correlation among the different abilities of individuals existed which reflected on the major cognitive ability or IQ tests. According to the article some people solved problems quickly, identify the relationship easily and understand the concepts with no trouble. We call these people smart, bright, sharp and intelligent. The psychologists have developed different tests for the measurement of these traits originally called IQ tests or inventories but now the name has changed and these tests now often refer to as test of cognitive abilities (Dickens, 2004).

Chapter 3

RESEARCH METHODOLOGY

This research study was carried out to study the comparison of cognitive development of the students of the three systems of education at secondary level. The three systems of education were the private schools, public schools and madaris.

3.1 DESIGN OF THE STUDY

The design of the study was a survey (descriptive) type. The research was quantitative in nature. It was also a comparative study and the researcher had compared the test scores of the students of the three systems of education in order to check the cognitive development of the students of each system. The test scores of the students of each system were compared with the other two systems.

3.2 POPULATION OF THE STUDY

All male students of the public schools, madaris and private schools of Islamabad Capital Territory constituted the population of the study. Among private schools, those were the population who were offering the O' levels to their students. The students from public schools were of secondary level and from madaris the students of Darja Sanwiya Aama were the population of the study. The total number of male students in the public schools (F.G Boys schools) was (1716), the total population of madaris male students was (170) and the total number of male students in private schools was (1100).

Name of Schools	Public Schools	Private Schools (O-Levels students)	Madrassah
Total Number of students	1716	1100	170

3.3 SAMPLE

Stratified random sampling technique was used. Three strata were based on the systems of education at secondary level i.e. public schools, private schools and madaris. The sample size was taken randomly from each stratum according to the L.R Gay prescribed sample population ratio (Gay,1995). The distribution of the sample was as below:

	Public Schools	Private Schools (O-Levels students)	Madrassah
Total Number of students	1716	1100	170
L.R. Gay sample population ratio	314	284	118

3.4 RESEARCH TOOL

The research tool was a standardized test, Indigenous-Test of Intelligence (INTI). This test was purchased from the National Institute of Psychology Islamabad. This instrument contained five sub-tests .Each sub-test had its own time limit to attempt. These sub-tests were basically MCQs of non-verbal figures. The students had to select an answer figure for the question figure. There were different numbers of questions in each sub test according to the time of the test. The tests consisted five sub-tests namely.

1. Series
2. Matrices
3. Analogies
4. Odd one out
5. Similarities

Each test had its own time limit according to the difficulty level of the test.

3.5 HYPOTHESIS

1. $\mathbf{H_{01}}$ There is no significant difference between the cognitive development of the students of public and private schools.
2. $\mathbf{H_{02}}$ There is no significant difference between the cognitive development of the students of public schools and madaris.
3. $\mathbf{H_{03}}$ There is no significant difference between the cognitive development of the students of madaris and private schools.
4. $\mathbf{H_{04}}$ There is no significant correlation between the scores of the students of the three systems of education on sub-tests of cognitive development.

3.6. DATA COLLECTION

Data were collected through personal visits to the students of public schools, madaris and private schools of Islamabad Capital Territory. Guidance was provided about the time and procedure of attempting the tests to the students before they started the test. The students were also directed about the rules and instructions of each test before they started it. Time limit for each test was strictly followed by the researcher. The entry

requirement of the test for students was 15 to 17 years of age of the students at secondary level. All schools and madaris were informed in advance in order to take time from the administration for conducting the test in their institutions. The researcher has founded that the most cooperative system of education was of madaris. They extended their helping hands whole heartedly to conduct the test in their madaris. They provided information and help whenever the researcher needed. On the other side the private schools (those who were offering O' levels) were founded the most difficult amongst three systems in order to provide information to the researcher. They were found highly obstinate in this regard. The public schools (F.G schools) were also found very cooperative and helpful especially the behavior of their administration was very much educated and cooperative. They helped in order to facilitate the researcher.

3.7 DATA ANALYSIS

The collected data was analyzed through the application of different statistical formulas. For analysis of data SPSS software was used. The statistical measures used were Range, Mean, SD, Pearson product moment, One way ANOVA and Tucky test.

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

The main purpose of this research was to compare the cognitive development of the students of the three systems of education i.e. public schools, private schools and madaris. This chapter deals with the analysis and interpretation of the data which was collected through the instrument of the study. The data is analyzed through application of different statistics such as Range, Mean, SD, ANOVA, Correlation and Post Hoc. For analysis of data SPSS software was used.

Table 4.1: *Basic statistics of total test of cognitive development of the students of the three systems of education*

(N = 716)

Formula	Cognitive development Test , Max Score = 90	Series Max = 20	Matrices Max=20	Analogies Max = 20	Odd One Out Max =15	Similarities Max=15
Rang	64	17	17	18	15	13
Mean	34.72	6.17	6.54	7.05	8.28	6.71
SD	12.44	3.40	3.47	3.52	3.02	2.78

Table No. 4.1 shows that that the range of scores on total tests of cognitive development of the students of the three systems of education was 64, on the sub-test Series the range was 17, on sub-test Matrices range was 17, on sub-test Analogies the range was 18, on sub-test Odd One Out the range was 15 and on the sub-test Similarities the range was 13.So it was concluded that the range of the scores of the students of the three systems on sub-test Analogies had the highest value (18) while the lowest range on sub-test Similarities was (13).The sub-tests Series and Matrices had the same range (17).

Similarly, the table shows that the mean of the total tests score of the students was 34.72.On sub-test Series the mean value was 6.17, on sub-test Matrices, the mean value was 6.54, on sub-tests Analogies the mean value was 7.05, on sub-tests Odd One Out the mean value was 8.28 and on sub-tests Similarities the mean value was 6.71.It was concluded from the table that mean of the total tests score was 34.72.The sub-test Odd One Out had the highest mean value (8.28) while the sub-test series had the lowest mean value (6.17).

The table shows that the SD of the total tests score of the students of the three systems of education was (12.44). On sub-test Series, the SD was (3.40), on sub-test Matrices, the SD was (3.47), on sub-test Analogies, the SD (3.52), on sub-test Odd One Out the SD was (3.02) and on sub-test Similarities the SD was (2.78). It was concluded from the table that the SD of the total tests scores is (12.44). The sub-test Analogies had the highest value of SD (3.52) while the sub-test Similarities had the lowest SD (2.78).

Figure 4.1: Comparison of cognitive development of the students of three systems of education through basic statistics.

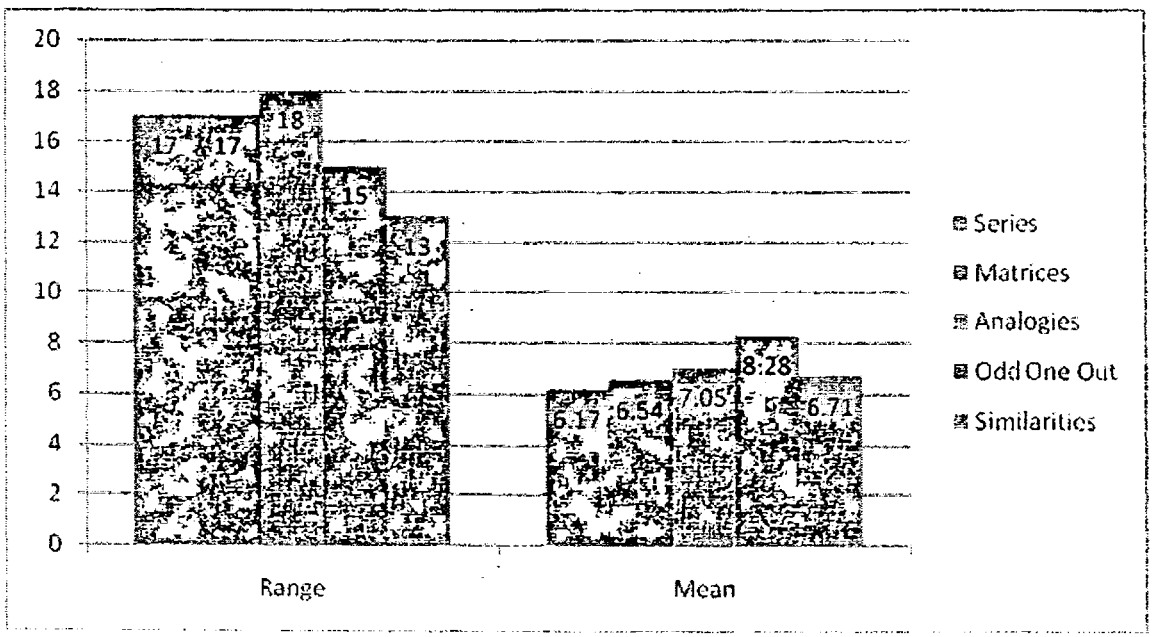


Table 4.2: *Basic statistics of all sub-tests of the students of the public schools*

		Sum	Series	Matrices	Analogies	Odd one out	Similarities
Public School	Mean	33.43	4.89	6.04	7.03	8.45	7.09
	N	314	314	314	314	314	314
	Std. Deviation	8.998	2.657	2.971	3.301	2.080	2.181

Table 4.2 shows that the mean of the total tests score of the students of the public schools was (33.43).The mean value of the sub-test Series was (4.89), mean value of the sub-tests Matrices was (6.04), the mean value of sub-test Analogies was (7.03), the means value of sub-test Odd One Out was (8.45) and the mean value of the sub-test Similarities was (7.09). So it was concluded that the students of public schools had scored the highest mean value on the sub-test Odd One Out and the lowest mean value on the sub-tests Series.

The table shows that the SD of the total tests of the students of public schools was (8.998).On sub-test Series the SD was (2.657), on sub-test Matrices SD was (2.971), on sub-test Analogies the SD was (3.301), on sub-test Odd One Out the SD was (2.080) and the SD of sub-test Similarities was (2.181).It was concluded that the students of the public schools had scored the highest value of SD on sub-test Analogies while on sub-test Odd One Out the students had scored the lowest value of SD (2.080).

Figure 4.2: *Comparison of the students scores of the public schools at all sub-tests*

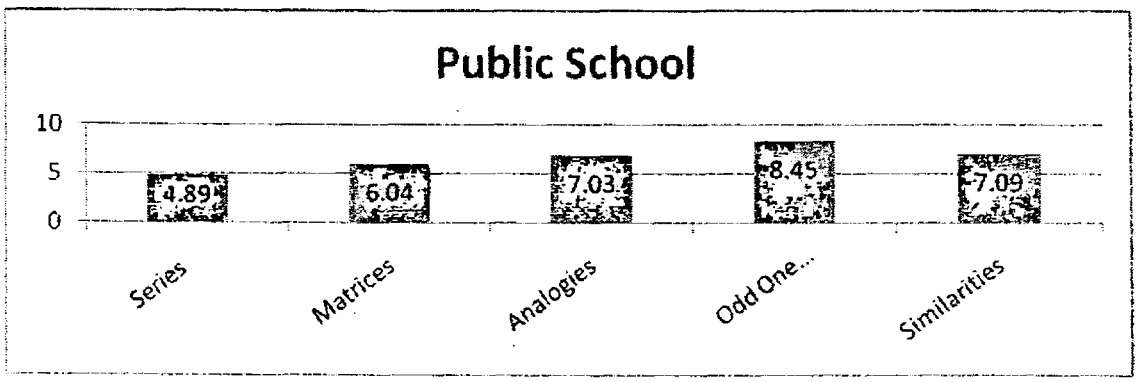


Table 4.3: Basic statistics of all sub-tests of the students of the madaris

		Sum	Series	Matrices	Analogies	Odd one out	Similarities
Madrassah	Mean	20.64	3.59	3.89	4.03	4.91	4.22
	N	118	118	118	118	118	118
	Std. Deviation	6.563	1.845	1.951	1.790	2.736	2.030

The table 4.3 shows that the mean of the total tests score of the students of madaris was (20.64).The mean value of the sub-test Series was (3.59), mean value of the sub-tests Matrices was (3.89), the mean value of sub-test Analogies was (4.03), the means value of sub-test Odd One Out was (4.91) and the mean value of the sub-test Similarities was (4.22).So it was concluded that the students of madaris had scored the highest mean value on the sub-test Odd One Out and the lowest mean value on the sub-tests Series.

The table shows that the SD of the total tests of the students of madaris was (6.563).On sub-test Series the SD was (1.845), on sub-test Matrices SD was (1.951), on sub-test Analogies the SD was (1.790), on sub-test Odd One Out the SD was (2.736) and the SD of sub-test Similarities was (2.030). It was concluded that the students of madaris had scored the highest value of SD (2.736) on sub-test Odd One Out while on sub-test Analogies the students had scored the lowest value of SD (1.790).

Figure 4.3: Comparison of all sub-tests of the students of the madaris

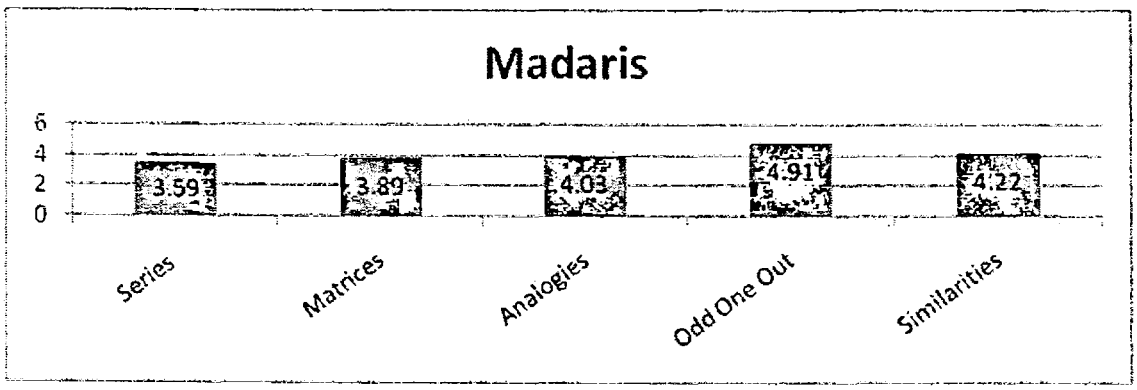


Table 4.4: Basic statistics of the sub-test Series of the students of the private schools

		Sum	Series	Matrices	Analogies	Odd one out	Similarities
Private School	Mean	41.98	8.66	8.20	8.32	9.48	7.32
	N	284	284	284	284	284	284
	Std. Deviation	12.107	3.036	3.628	3.545	3.001	3.074

The table 4.4 shows that the mean of the total tests score of the students of private schools was (41.98).The mean value of the sub-test Series was (8.66), mean value of the sub-tests Matrices was (8.20), the mean value of sub-test Analogies was (8.32), the means value of sub-test Odd One Out was (9.48) and the mean value of the sub-test Similarities was (7.32).So it was concluded that the students of the private schools had scored the highest mean value on the sub-test Odd One Out (9.48) and the lowest mean value on the sub-tests Similarities (7.32).

The table shows that the SD of the total tests of the students of the private schools was (12.107).On sub-test Series the SD was (3.036), on sub-test Matrices SD was (3.628), on sub-test Analogies the SD was (3.545), on sub-test Odd One Out the SD was (3.001) and the SD of sub-test Similarities was (3.074). It was concluded that the students of the private schools had scored the highest value of SD (3.628) on sub-test Matrices while on sub-test Odd One Out the students had scored the lowest value of SD (3.001).

Figure 4.4: Comparison of the sub-test Series of the students of the private schools

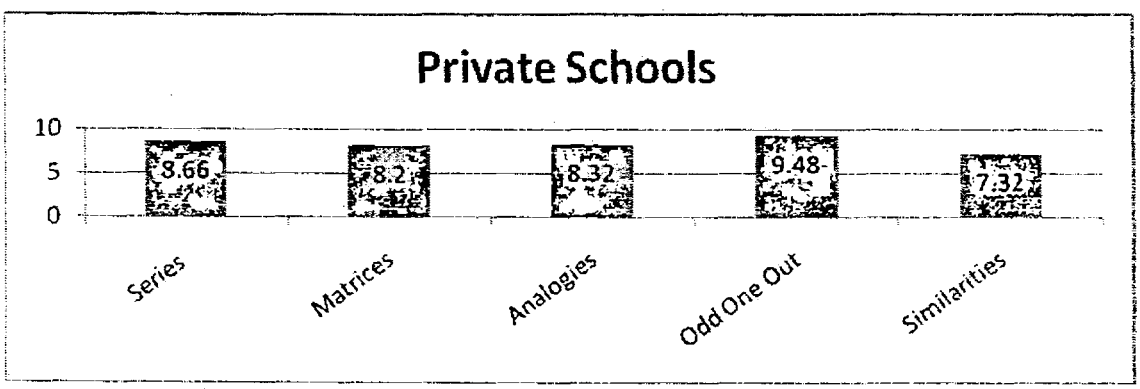


Table 4.5: Inter correlation among the scores of the students of the three systems of education at sub-tests

	N	Series	Matrices	Analogies	Odd one out	Similarities
Series	716	1	.580**	.507**	.479**	.317**
Matrices	716	.580**	1	.582**	.488**	.442**
Analogies	716	.507**	.582**	1	.498**	.432**
Odd one out	716	.479**	.488**	.498**	1	.470**
Similarities	716	.317**	.442**	.432**	.470**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The table 4.5 shows that the inter correlation between the scores of the students of the three systems of education at sub-test series with Series was (1), Series with Matrices was (.580),Series with Analogies was (.507), Series with Odd One Out was (.479) , Series with Similarities was (.317), Matrices with Matrices was (1), Matrices with Analogies was (.582), Matrices with Odd One Out was (.488), Matrices with Similarities was (.479), Analogies with Analogies was (1), Analogies with Odd One Out was (.498), Analogies with similarities was (.432), Odd One Out with Odd One Out is (1), Odd One Out with Similarities was (.470) and similarities with similarities was (1).So null hypothesis H4 is not accepted. Therefore it was concluded that there was a high correlation between the scores on sub-test series with Matrices, Moderate correlation between the scores of sub-test Analogies with Matrices, positive weak correlation between the scores of sub-test Odd One Out with Analogies and weak correlation between the scores of the sub-test Similarities with Series.

Table 4.6: Comparative ANOVA statistics scores of cognitive development of students on over all tests

		Sum of Squares	df	Mean Square	F	p-value
Sum	Between Groups	38906.539	2	19453.270	193.018	.000
	Within Groups	71859.338	713	100.784		
	Total	110765.877	715			

The table 4.6 shows that F-Value (193.018) and *p* (.000) was significant at 0.05 level so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the cognitive development of the students of the three systems of education.

Table 4.7: Comparative ANOVA statistics scores of cognitive development of the students on a sub-test Series

		Sum of Squares	df	Mean Square	F	p-value
Series	Between Groups	3060.335	2	1530.167	209.157	.000
	Within Groups	5216.217	713	7.316		
	Total	8276.552	715			

The table 4.7 indicates that F-Value (209.157) and *p* (.000) was significant at 0.05 level, so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the scores of the students of the three systems of education at level Series.

Table 4.8: Comparative ANOVA statistics scores of cognitive development of the students on a sub-test Matrices

		Sum of Squares	df	Mean Square	F	p-value
Matrices	Between Groups	1687.758	2	843.879	86.772	.000
	Within Groups	6934.067	713	9.725		
	Total	8621.825	715			

The table 4.8 shows that F-Value (86.772) and *p* value (.000) was significant at 0.05 level so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the scores of the students of the three systems of education at Matrices sub-test.

Table 4.9: *Comparative ANOVA statistics scores of cognitive development of the students on a sub-test Analogies.*

		Sum of Squares	df	Mean Square	F	p-value
Analogies	Between Groups	1540.562	2	770.281	74.815	.000
	Within Groups	7340.917	713	10.296		
	Total	8881.479	715			

Table No. 4.9 shows that F-Value (74.815) and *p* value (.000) was significant at 0.05 level so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the scores of the students of the three systems of education at Analogies sub-test.

Table 4.10: Comparative ANOVA statistics scores of cognitive development of the students on a sub-test Odd One Out.

		Sum of Squares	df	Mean Square	F	*p*-value
Odd one out	Between Groups	1762.226	2	881.113	131.469	.000
	Within Groups	4778.571	713	6.702		
	Total	6540.797	715			

The table 4.10 shows that F-Value (131.469) and *p* value (.000) was significant at 0.05 level so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the scores of the students of the three systems of education at sub-test Odd One Out.

Table 4.11: Comparative ANOVA statistics scores of cognitive development of the students on a sub-test Similarities

		Sum of Squares	df	Mean Square	F	*p*-value
Similarities	Between Groups	882.377	2	441.189	67.713	.000
	Within Groups	4645.616	713	6.516		
	Total	5527.993	715			

The table 4.11 shows that F-Value (67.713) and *p* value (.000) was significant at 0.05 level so null hypothesis was not accepted. Therefore, it was concluded that there was a significant difference between the scores of the students of the three systems of education at sub-test Similarities.

Figure 4.5 *Comparative ANOVA statistics scores of cognitive development of the students on a all test (between groups)*

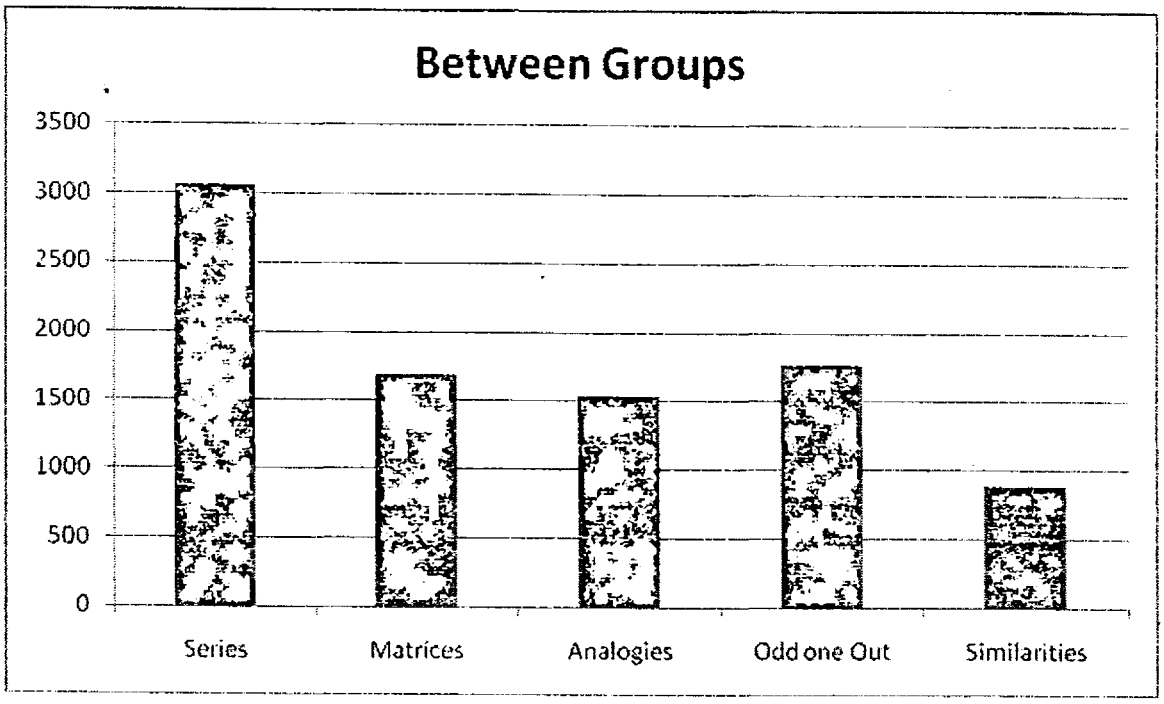


Figure 4.6 *Comparative ANOVA statistics scores of cognitive development of the students on a all test (within group)*

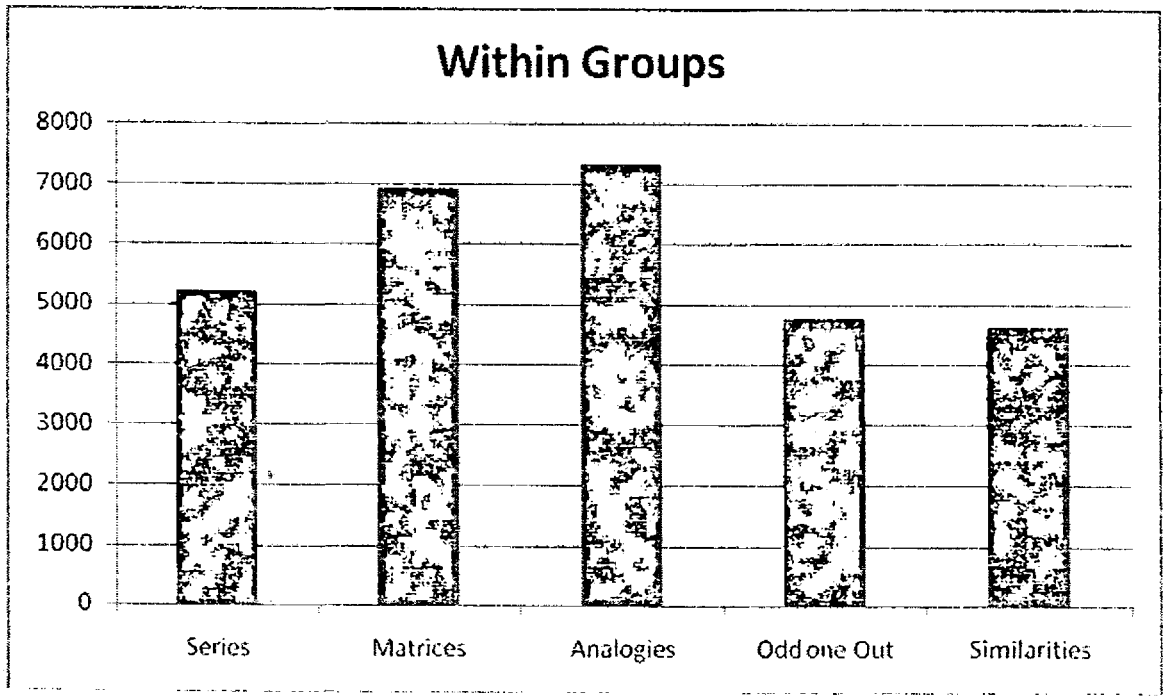


Table 4.12: Comparison of Post Hoc statistics of cognitive development at total tests of the students of the three systems of education

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Sum	Tukey HSD	**Public School**	Private School	-8.549*	.822	.000
			Madrassah	12.798*	1.084	.000
		Private School	Public School	8.549*	.822	.000
			Madrassah	21.347*	1.100	.000
		Madrassah	Public School	-12.798*	1.084	.000
			Private School	-21.347*	1.100	.000

*. The mean difference is significant at the 0.05 level.

The table 4.12 shows that the mean difference between the students of the public school and private school at total test was (-8.549), the mean difference between the students of the public schools and madaris was (12.798) and the mean difference between the students of the private schools and madaris was (21.347).Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the means score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the madaris students. Furthermore, the mean score of the students of the private schools was also better than the mean score of the students of madaris.

Table 4.13: Homogeneous grouping of the students of the three systems of education at total tests

	School/College	N	Subset for alpha = 0.05		
			1	2	3
Tukey HSD[a]	Madrassah	118	20.64	--	--
	Public School	314	--	33.43	--
	Private School	284	--	--	41.98
	Sig.		1.000	1.000	1.000

Means for groups in homogeneous sub-tests are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.13 shows that at homogeneous grouping the scores of the students of madaris at total tests were significantly different with a mean value (20.64), scores of the students of the public schools were significantly different with the mean value (33.43) and the scores of the students of the private schools were significantly different with the mean value (41.98).Therefore the null Hypothesis H1, H2 and H3 were not accepted. So it was concluded from the table that the scores of the students of madaris, public schools and private schools at total test were significantly different from one another.

Figure 4.7: Comparison of homogeneous grouping of the students of the three systems of education at total tests

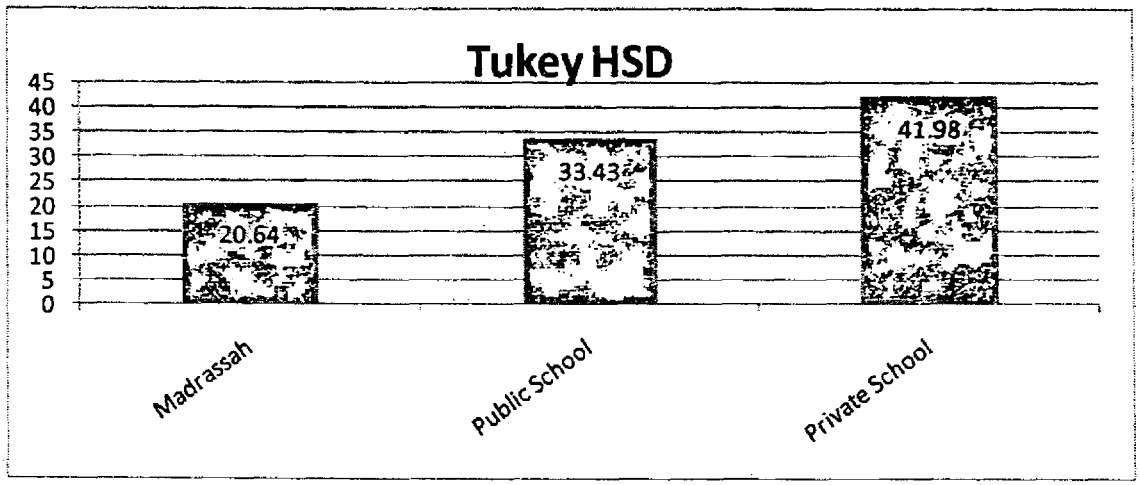


Table 4.14: Comparison of mean difference of cognitive development at sub- test series of the students of the three systems of education

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Series	Tukey HSD	Public School	Private School	-3.773*	.221	.000
			Madrassah	1.292*	.292	.000
		Private School	Public School	3.773*	.221	.000
			Madrassah	5.065*	.296	.000
		Madrassah	Public School	-1.292*	.292	.000
			Private School	-5.065*	.296	.000

*. The mean difference is significant at the 0.05 level.

The table 4.14 shows that the mean difference between the students of the public schools and the private schools at sub-test Series was (-3.773), the mean difference between the students of the public schools and madaris was (1.292) and the mean difference between the students of the private schools and the madaris was (5.065) .Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the mean score of the students of the private schools was better than the mean score of the students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test series. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test series.

Table 4.15: *Homogeneous grouping of the students of the three systems of education at sub- test Series*

		School/ College	N	Subset for alpha = 0.05		
				1	2	3
Series	Tukey HSD[a]	Madrassah	118	3.59	--	--
		Public School	314	--	4.89	--
		Private School	284	--	--	8.66
		Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.15 shows that at homogeneous grouping the scores of the students of the madaris at sub-test series were significantly different with a mean value (3.53), scores of the students of the public schools were significantly different with the mean value (4.89) and the scores of the students of the private schools were significantly different with the mean value (8.66).Therefore, the null Hypothesis H_{01}, H_{02} and H_{03} were not accepted. So it was concluded from the table that the scores of the students of the madaris, public schools and private schools at sub-test Series were significantly different from one another.

Figure 4.8: *Comparison of homogeneous grouping of the students of the three systems of education at sub- test Series*

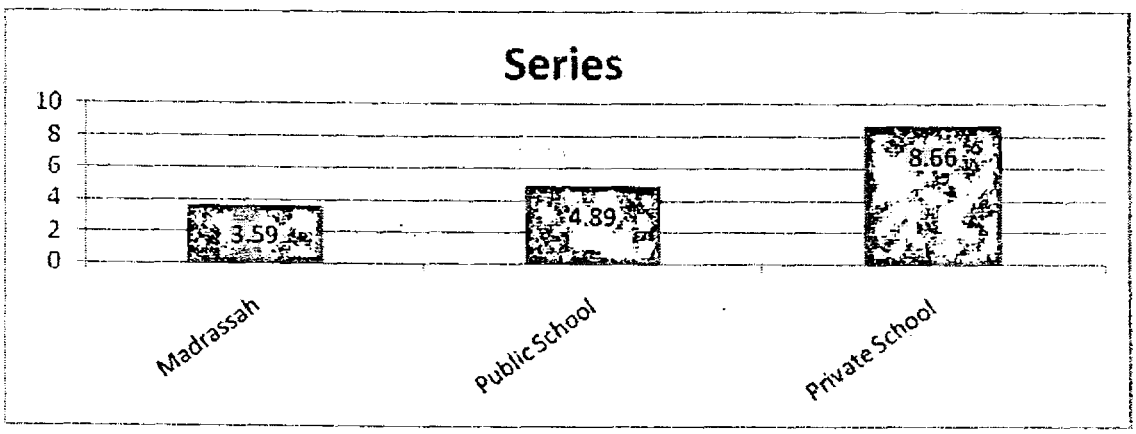


Table 4.16: Comparison of mean difference of cognitive development at sub-test matrices of the students of the three systems of education

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Matrices	Tukey HSD	Public School	Private School	-2.159*	.255	.000
			Madrassah	2.148*	.337	.000
		Private School	Public School	2.159*	.255	.000
			Madrassah	4.307*	.342	.000
		Madrassah	Public School	-2.148*	.337	.000
			Private School	-4.307*	.342	.000

*. The mean difference is significant at the 0.05 level.

The table 4.16 shows that the mean difference between the students of the public schools and the private schools at sub-test Matrices was (-2.159), the mean difference between the students of the public schools and the madaris students was (2.148) and the mean difference between the students of the private schools and the madaris students was (4.307) .Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of madaris students at sub-test Matrices. Furthermore, the mean score of the students of the private schools was also better than the mean score of madaris students at sub-test Matrices.

Table 4.17: Homogeneous grouping of the students of the three systems of education at sub-test Matrices

		School/ College	N	Subset for alpha = 0.05		
				1	2	3
Matrices	Tukey HSD[a]	Madrassah	118	3.89	--	--
		Public School	314	--	6.04	--
		Private School	284	--	--	8.20
		Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.17 shows that at homogeneous grouping the scores of the students of the madaris at sub-test Matrices were significantly different with a mean value (3.89), scores of the students of the public schools were significantly different with the mean value (6.04) and the scores of the students of the private schools were significantly different with the mean value (8.20).Therefore, the null Hypothesis H1, H2 and H3 were not acceptetd. So it was concluded from the table that the scores of the students of the madaris, public schools and the private schools at sub-test Matrices were significantly different from one another.

Figure 4.9: Comparison of homogeneous grouping of the students of the three systems of education at sub-test Matrices

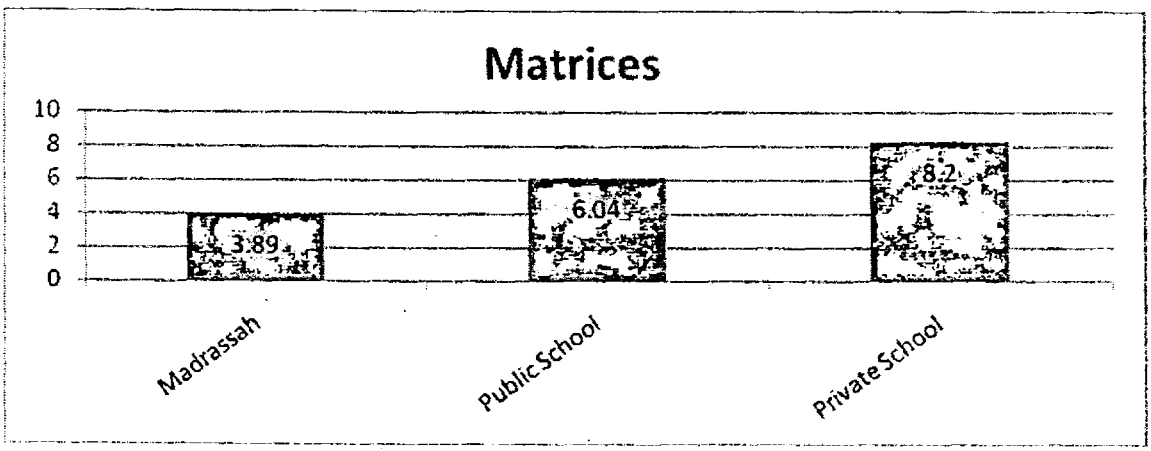


Table 4.18: *Comparison of mean difference of cognitive development at sub- test Analogies of the students of the three systems of education*

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Analogies	Tukey HSD	Public School	Private School	-1.298*	.263	.000
			Madrassah	3.000*	.346	.000
		Private School	Public School	1.298*	.263	.000
			Madrassah	4.299*	.351	.000
		Madrassah	Public School	-3.000*	.346	.000
			Private School	-4.299*	.351	.000

*. The mean difference is significant at the 0.05 level.

The table 4.18 shows that the mean difference between the students of the public schools and the private schools at sub-test Analogies was (-1.298), the mean difference between the students of the public schools and the madaris students was (3.000) and the mean difference between the students of the private schools and the madaris students was (4.299) .Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Analogies. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Analogies.

Table 4.19: Homogeneous grouping of the students of the three systems of education at sub-tests

		School/ College	N	Subset for alpha = 0.05		
				1	2	3
Analogies	Tukey HSD[a]	Madrassah	118	4.03	--	--
		Public School	314	--	7.03	--
		Private School	284	--	--	8.32
		Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.19 shows that at homogeneous grouping the scores of the students of the madaris at sub-test Analogies were significantly different with a mean value (4.03), scores of the students of the public schools were significantly different with the mean value (7.03) and the scores of the students of the private schools were significantly different with the mean value (8.32).Therefore, the null Hypothesis H1, H2 and H3 were not accepted. So it was concluded from the table that the scores of the students of the madaris, public schools and the private schools on homogenous grouping at sub-test Analogies were significantly different from one another.

Figure 4.10: Comparison of Homogeneous grouping of the students of the three systems of education at sub-tests

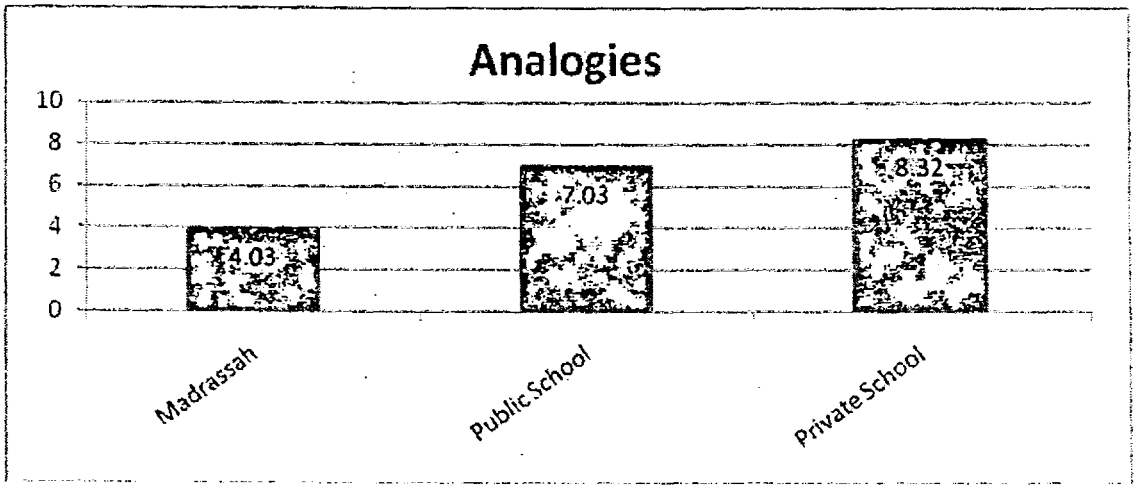


Table 4.20: Comparison of means of cognitive development at total test of the students of the three systems of education

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Odd one out	Tukey HSD	**Public School**	Private School	-1.033*	.212	.000
			Madrassah	3.542*	.280	.000
		Private School	Public School	1.033*	.212	.000
			Madrassah	4.576*	.284	.000
		Madrassah	Public School	-3.542*	.280	.000
			Private School	-4.576*	.284	.000

*. The mean difference is significant at the 0.05 level.

The table 4.20 shows that the mean difference between the students of the public schools and the private schools at sub-test Odd One Out was (-1.033), the mean difference between the students of the public schools and the madaris students was (3.542) and the mean difference between the students of the private schools and the madaris students was (4.576) .Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Odd One Out. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Odd One Out.

Table 4.21: Homogeneous grouping of the students of three systems of education at all sub tests

		School/ College	N	Subset for alpha = 0.05		
				1	2	3
Odd one out	Tukey HSD[a]	Madrassah	118	4.91	--	--
		Public School	314	--	8.45	--
		Private School	284	--	--	9.48
		Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.21 shows that at homogeneous grouping the scores of the students of the madaris at sub-test Odd One Out were significantly different with a mean value (4.91), scores of the students of the public schools were significantly different with the mean value (8.45) and the scores of the students of the private schools were significantly different with the mean value (9.48).Therefore, the null Hypothesis H1, H2 and H3 were not accepted. So it was concluded from the table that the scores of the students of the madaris, the public schools and the private schools on homogenous grouping at sub-test Odd One Out were significantly different from one another.

Figure 4.11: Comparison of Homogeneous grouping of the students of three systems of education at all sub tests

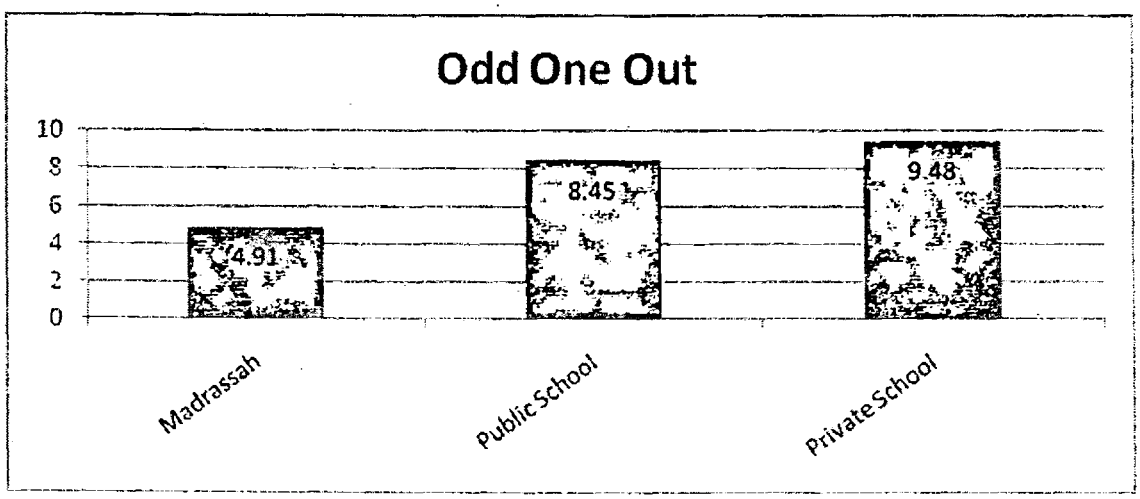


Table 4.22: Comparison of mean difference of cognitive development at total test of the students of the three systems of education

Dependent Variable		School College (I)	School College (J)	Mean Difference (I-J)	Std. Error	Sig.
Similarities	Tukey HSD	Public School	Private School	-.231	.209	.510
			Madrassah	2.869*	.276	.000
		Private School	Public School	.231	.209	.510
			Madrassah	3.100*	.280	.000
		Madrassah	Public School	-2.869*	.276	.000
			Private School	-3.100*	.280	.000

*. The mean difference is significant at the 0.05 level.

The table 4.22 shows that the mean difference between the students of the public schools and the private schools at sub-test Similarities was (-.231), the mean difference between the students of the public schools and the madaris students was (2.869) and the mean difference between the students of the private schools and the madaris students was (3.100) .Therefore, the mean difference was significance at .05 level, so the null hypothesis was not accepted. It was concluded that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Similarities. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Similarities.

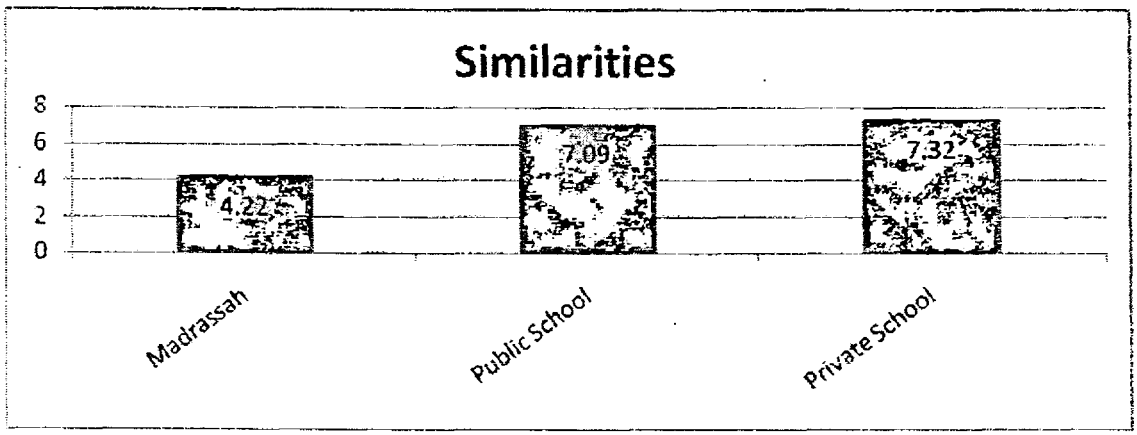
Table 4.23: Homogeneous grouping of the students of the three systems of education at sub-test Similarities

		School/ College	N	Subset for alpha = 0.05		
				1	2	3
Similarities	Tukey HSD[a]	Madrassah	118	4.22	--	--
		Public School	314	--	7.09	--
		Private School	284	--	--	7.32
		Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 197.623.

The table 4.23 shows that at homogeneous grouping the scores of the students of the madaris at sub-test Similarities were significantly different with a mean value (4.22), scores of the students of the public schools were significantly different with the mean value (7.09) and the scores of the students of the private schools were significantly different with the mean value (7.32).Therefore, the null Hypothesis H1, H2 and H3 were not accepted. So it was concluded from the table that the scores of the students of the madaris, the public schools and the private schools at sub-test Similarities were significantly different from one another.

Figure 4.12: Comparison of Homogeneous grouping of the students of the three systems of education at sub-test Similarities



Chapter 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary, findings and conclusions of the study. Some valuable recommendations have also been made for the improvement for the cognitive development of the students of the three systems of education.

5.1 SUMMARY

The main purpose of this research study was to compare the cognitive development of the secondary level students studying under multiple systems of education in Islamabad capital territory. The study was conducted under the main objectives as: a) to identify the extent of differences of cognitive development among the students of three systems of education (Public schools, Private schools, madaris) at secondary level. b) to find out the extent of similarities of cognitive development among the students of the three systems of education. c) to give a comparative analysis of cognitive development of the students of the three systems of education at secondary school level. d) to investigate which system of education was enhancing cognitive development of students.

The three systems of education were: public schools, private schools and Madrasas. From public schools F.G Boys schools were taken as population and from private sector those schools those the part of population which were offering O'level. All

those Madaris of Islamabad capital were included in the population which were offering Darja Sanwiya Aama which is equivalent to Matric level of formal system of education. The population of the study was limited to male students. The stratified sampling technique was used and the students were randomly selected from each strata according to the sample and population ratio given by L.R Gay in his book Educational Research. The researcher had reviewed various articles and thesis on the cognitive development and finally a standardized test (Indigenous Test of Intelligence) was selected for data collection. This test basically measures those cognitive abilities which the researcher had identified for this study. It included five sub-tests and each test had different types of non-verbal questions according to the time limit of each test. The data was analyzed by application of different statistics such as Range, Mean, SD, ANOVA, and Correlation and Post Hoc Tucky test.

5.2 FINDINGS

The following main findings were drawn from the statistical analysis of the data:

1. It was found that the range scores of the students of the three systems on sub-test Analogies had the highest value (18) while the lowest range on sub-test Similarities was (13).The sub-tests Series and Matrices had the same range (17). (Table 4.1)
2. It was reported that the mean score of the total tests was 34.72.The sub test Odd One Out had the highest mean value (8.28) while the sub-test Series had lowest mean value (6.17) (Table 4.1).

3. It was revealed that the SD of the total tests scores was 12.44.The sub-test Analogies had the highest value of SD (3.52) while the sub-test Similarities had the lowest SD (2.78) (Table 4.1).
4. It was found that the students of public schools had scored the highest mean value on the sub-test Odd One Out and the lowest mean value on the sub-tests Series (Table 4.22)
5. It was reported that the students of public schools had scored the highest value of SD on sub-test Analogies while on sub-test Odd One Out the students had scored the lowest value of SD (2.080) (Table 4.22).
6. The researcher found that the students of the madaris had scored the highest mean value on the sub-test Odd One Out and the lowest mean value on the sub-test Series (Table 3).
7. It was cleared that the students of Madrassah have scored the highest value of SD (2.736) on sub test Odd one out while on sub test Analogies the students have scored the lowest value of SD (1.790). (Table 4. 3)
8. It was found that the students of the private schools had scored the highest mean value on the sub-test Odd One Out (9.48) and the lowest mean value on the sub-tests Similarities (7.32) (Table 4.4).
9. It was discovered that the students of the private schools had scored the highest value of SD (3.628) on sub-test Matrices while on sub-test Odd One Out the students had scored the lowest value of SD (3.001) (Table 4.4).
10. It was found that there was a high correlation between the scores on sub-test Series with Matrices, Moderate correlation between the scores of sub-test

Analogies with Matrices, positive weak correlation between the scores of sub-test Odd One Out with Analogies and weak correlation between the scores of sub-test Similarities with Series (Table 4.5).

11. It was reported that there was a significant difference between the cognitive development of the students of the three systems of education (Table 4.6).
12. It was found that there was a significant difference between the scores of the students of the three systems of education at level series.(Table 4.7).
13. It was reported that there was a significant difference between the scores of the students of the three systems of education at Matrices sub-test (Table 4.8).
14. It was that there was a significant difference between the scores of the students of the three systems of education at Analogies sub-test. (Table 4.9).
15. It was revealed that there was a significant difference between the scores of the students of the three systems of education at sub-test Odd One Out (Table 4.10).
16. It was discovered that there was a significant difference between the scores of the students of the three systems of education at sub-test Similarities (Table 4.11).
17. It was found that the means score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the madaris students. Furthermore, the mean score of the students of the private schools was also better than the mean score of the students of the madaris (Table 4.12).
18. It was reported from the table that the scores of the students of the madaris, public schools and the private schools at total test were significantly different from one another (Table 4.13).

19. It was found that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Series. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Series (Table 4.14).
20. It was revealed that the scores of the students of the madaris, public schools and private schools at sub-test Series were significantly different from one another (Table 4.15).
21. It was discovered that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Matrices. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Matrices (Table 4.16).
22. It was found that the scores of the students of the madaris, public schools and private schools at sub-test Matrices were significantly different from one another (Table 4.17).
23. It was reported that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Analogies. Furthermore, the mean score of the students of the

private schools was also better than the mean score of the madaris students at sub-test Analogies (Table 4.18).

24. It was found that the scores of the students of the madaris, public schools and private schools on homogenous grouping at sub-test Analogies were significantly different from one another (Table 4.19).
25. It was revealed that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students at sub-test Odd One Out. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Odd One Out (Table 4.20).
26. It was found that the scores of the students of the madaris, public schools and private schools on homogenous grouping at sub-test Odd One Out were significantly different from one another (Table 4.21).
27. It was reported that the mean score of the students of the private schools was better than the mean score of the students of the public schools and the mean score of the students of the public school is better than the mean score of the madaris students at sub-test Similarities. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students at sub-test Similarities (Table 4.22).
28. It was found that the scores of the students of the madaris, public schools and private schools at sub-test Similarities were significantly different from one another (Table 4.23).

5.3 CONCLUSION

On the basis of findings the following conclusions were made in the light of the objectives of the study.

1. Objective No 1 of the study was to identify the extent of differences of cognitive development among the students of three systems of education (public schools, private schools and madaris) at secondary level. So keeping in view this objective it was concluded that there was much difference between the range values of Analogies and Similarities but there was a slight difference between the range values of Analogies and Series and Matrices. And there was no difference between the range value of Series and Matrices.
2. Objective No 2 of the study was to find out the extent of similarities of cognitive development among the students of the three systems of education. So in the light of this objective it was concluded from the findings that on sub-test Analogies the students of the three systems had the highest range while they had the lowest range value on the sub-tests Similarities. So we can say that the second objective of the study has been achieved.
3. This conclusion also reflected the above mentioned objective No 2 that the students of all the three systems had scored the highest mean value on sub-test Odd One Out while the lowest mean value on sub-test Series. It was also clear from the findings that the sub-test Analogies had the highest SD and the sub-test Similarities had the lowest SD so the first two objectives of the study also reflects in this conclusion.

4. This conclusion is based on objective No 3 which stated that to give a comparative analysis of cognitive development of the students of the three systems of education at secondary school level. Therefore, when the mean of the scores of the students of the three systems on each sub-test were compared individually, the students of the madaris and the public schools had scored the highest mean value on the sub-test Odd One Out and the lowest mean value on sub-test Series, while the students of the private schools had also scored the highest mean value on sub-test Odd One Out but the lowest mean value on sub-test Similarities.
5. This conclusion is also based on objective No 3, that the students of the public schools had scored the highest value of SD on sub-test Analogies while the students of the madaris had scored the lowest value of SD on the same test. Similarly the students of the madaris had the highest value of SD on sub-test Odd One Out while the students of the public schools had the lowest SD value on the same test. So the two the systems had opposite scores on both sub-tests. On the other hand the students of the private schools had highest SD value on sub-test Matrices and lowest value of SD on sub-test Odd One Out like the students of the public schools.
6. Similarly objective No 3 also achieved as the scores of the students of the three systems of all five sub-tests were correlated and it was observed that there was a high correlation between the scores of sub-test Series with Matrices, Moderate correlation between the scores of sub-test Analogies with Matrices, positive weak correlation between the scores of the sub-test Odd

One Out with Analogies and weak correlation between the scores of sub-test Similarities with Series.

7. Objective No 4 stated that to investigate which system of education is enhancing cognitive development of students. Therefore, When the mean scores of the students of the three systems were compared both on total test and also on each sub-test it was found that the mean score of the students of the private schools was better than the mean score of students of the public schools and the mean score of the students of the public schools was better than the mean score of the madaris students. Furthermore, the mean score of the students of the private schools was also better than the mean score of the madaris students.

5.4 RECOMMENDATIONS

The following recommendations were made on the basis of findings and conclusions of the research.

1. As the findings indicated that the results of the private schools were better on each test, so it is recommended that the other two systems might follow the measures which are adopted by the private schools for the cognitive development of their students in order to improve the cognitive abilities of their students.
2. Cognitive abilities are not something only God gifted but according to the educationists and psychologists environment also plays an important role in the development of cognitive abilities, so it is recommended that there is a need of change in over all school environments in public schools and especially in

Madrassah. Because the researcher has observed a very poor creative educational environment in madaris.

3. As the study reflects that there is a slight difference between the cognitive development of the private schools students and public schools students, so the government might investigate the reasons which caused low cognitive development of the public schools students and than might be able to take measures to bring it up to the level of private schools.
4. It is quite difficult for poor the population of Pakistan to get admission in private schools because of their high charges of fee, so it is recommended that if the government takes measures to provide all those facilities which help to improve the cognitive abilities of the students to public schools and madrasas.
5. Teaching methodologies plays important role in the cognitive development of the students so it is recommended that specific importance might be given to both pre service and in-service teachers training as far as the development of cognitive abilities of the students are concerned.
6. All necessary equipments which facilities the cognitive development of the students during the teaching learning process might be provided to the public schools and madaris.
7. It is recommended that the experts might compare the curriculum of three systems of education and stream line it in order to develop the cognitive abilities of the students.

Bibliography

Ackerman, L.P., Lohman, F,D. (2005). Individual Differences in Cognitive Functions. *Learning and individual differences,2*, 139-162.

Amjad, M. (n.d).*The Existing Education System: A Critique*. Retrieved on July 06-2010 from http://www.renaissance.com.pk/novisma95.html.

Amoeba, (2009).*Education system in Pakistan*. Retrieved 10.08.2010 from http://www.cssforum.com.pk/css-compulsory-subjects/current-affairs/current-affairs-notes/1968-education-system-pakistan.html

Anderson, J. R. (1990). *Cognitive psychology and its implications*.(3rd ed). New York :W. H. Freeman and company.

Ashcraft, M. H. (1998). *Fundamentals of cognition*. New York: Addison Wesley.

Ashworth, P. (2000). *Psychology and human nature*. London: Psychology Press.

Candoli, C. (1991). *School System Administration*. Pennsylvania: Technomic.

Chandran, S.(2003). Madrassas in Pakistan. *IPCS,11*, 1-4.

Charles, F. (2004). *Educational Psychology Its problems and Methods*. New Delhi : Sonali.

Cinquepalmi, R., Muciaccia, F., & Picciarelli. V. (2007). Cognitive development in relation to secondary school final examination results in the Italian school system. *International journal of Science,* 7(2), 215-219.

Dennis, C. (2007). *Psychology and the Teacher*. (8th Ed.). New York: Continuum.

Dickens, T. W. (2004). *Cognitive Ability*. Retrieved on 01-07-2010, from http://www.google.com.pk/search?hl=en&biw=1131&bih=588&rlz=1W1RNRN_en&q=Cognitive+Ability&oq=Cognitive+Ability&aq=f&aqi=g10&aql=&gs_sm=e&gs_upl=3198114648101159281108122101010141468122612-3.3.119.

Duris, L. (1989). *Essentials of Educational psychology*. France: Jessica Kingsley.

Education in Pakistan. (n.d) retrieved on 12-07-2010 from http://en.wikipedia.org/wiki/Education_in_Pakistan

Education, N.(n.d). *Canadian Cognitive Abilities Test (CCAT)* retrieved on 10-10-2010 from http://www.assess.nelson.com/group/ccat-k.html.

Gardezi, A. H. (2009). *Indigenous Nonverbal Test of intelligence 2001*.Islamabd: National Institute of Psychology.

Gay, L. R,. (1995). *Educational research*. (7th ed.).Harlow: Prentice Hall.

George, T.K.(1994). *World Education Encyclopedia*.(Vol.II,pp.350-353),India: Jaico Publishing House.

Goswami, U. (2000). *Cognition in Children*. UK: Psychology Press.

Hoodbhoy, P. (1998).*Education and the State Fifty years of Pakistan*. New York: Oxford University Press.

Hunt, R., & Ellis ,H. (2004).*Fundamentals of Cognitive Psychology*.(7th ed.).New York: Steve Rutter.

Hussain, I. (1992). *Pakistan educational & cultural perspective.* Lahore: Nadeem book house.

Iqbal, M.A. (1997). *A study on the effectiveness of intervention methodology on the cognitive development of science students.*(PhD thesis, University of the Punjab, Pakistan).Retrieved on 24-10-2010 from http://eprints.hec.gov.pk/1524/1/1406.HTM.

Kurian. T.G. (n. d). *World Educational Encyclopedia*: Vol II. Bombay: Jacio publishing house.

Li-Fang, Z., & David. (2001). Cognitive development and student approaches to learning: An investigation of Perry's theory with Chinese and U.S. university students. *ERIC, 41*, p. 239-261.

Lohman, F. D., & Lakin, J. M, (2009). *Reasoning and Intelligence.* New York: Cambridge University Press.

Lohman, F. D., Hagen, E. P., & Thorndike, L. R. (n.d). *CAT - Cognitive Abilities Test.* Retrieved on 22-10-2010 from (http://shop.gl-assessment.co.uk/home.php?cat=310.

Lohman,F.D, & Hagen, E. P.(2001).*Cognitive Abilities Test: Cog At Form 6.*retirieved on 22-10-2010 from http://www.riversidepublishing.com/products/cogAt/details.html

Louis, D. H. (1987). *The crisis of Education in Pakistan.* Lahore: Vanguard Books.

Lumsdaine, E., & M. (1995). *Creative Problem Solving: thinking skills for a changing world.* London: McGraw Hill.

Madrassah.(1995).*Oxford Encyclopedia of the Modern Islamic World.* New York: Oxford University Press.

Maj, R. (2006).*Pakistan Education system and the Radical Islamic.* (Unpublished Master Thesis).University of Colorado,Kansas,USA.

Margaret, W. (1989).*Cognition.*(2nd ed.). USA: Harcourt Brace Jovannovich.

McClure, R.K. (2009). Madrasas and Pakistan's education agenda: Western media Misrepresentation and Policy Recommendations. *International Journal of Educational Development, 29* (2009), 334–341.

McCormack, L., (2009). *Cognitive Acceleration across the primary-second level transition.*(Unpublished master's thesis). Dublin City University.

Mehmood, A. (2008). *Deeni Madaris ke Nizam-e-Teleem ki Khoobian aur Khamian: Aik Tehqeeki aur tanqeedi jaiza* (unpublished M.Phil thesis, National University of Modern Languages, Islamabad).

Muchinsky, P.M. (2000).*Psychology Applied to Work: An introduction to industrial and organization psychology.* (6th ed.). Canada: Wodsworth Thomson Learning.

Naglieri, A. J,& Bardos, N. A.(n.d). *GAMA Test of General Ability Measure for Adults* Retrievedon10-10-2010 from http://www.pearsonassessments.com/HAIWEB/ Cultures/en-us/Productdetail.htm?Pid=PAg118

Naglieri, A. J. (2007). *Naglieri Nonverbal Ability Test-Second Edition (NNAT–2)* (Retrieved on 25-10-2010 from, http://www.pearsonassessments.com/haiweb/cultures/enus/productdetail.htm?pid=PAg118&Community=CA_Psych_AI_Ability.

Oakley, J., & McDougall, A.(2010). *Educational Environments for Research on Cognitive Development through Programming*. London : Routledge Publisher.

Ormrod, J. E. (2000). *Educational Psychology: developing Learners*. .(3rd ed.). New Jersey: Prentice-Hall.

Pandya. A., & Laipson. E.(2009). *Islam and Politics: Renewal and Resistance in the Muslim World*: Washington DC, The Henry Stimson.

Parsons, R.D., Hinson, S. L., & Brown, D.(2001). *Educational Psychology: A Practitioner research Model of teaching*. Canada: Wadsworth Thomson Learning.

Peter, B. (1994). *Pakistan Education: A Country Study: GPO for the Library of Congress*. Retrieved on 1 -04-2010 from http://countrystudies.us/pakistan/42.htm.

Quddus, N.(1990). *Problems of Education in Pakistan*. Karachi: Royal book company.

Rao, N.P. (1996). *Education and human resource Management*. New Delhi: APH Publishing Corporation.

Rao, V.K. (2003). *Education System*. India: A.P.H. Publishing Corporation.

Reed, S.K. (1982). *Cognition: Theory and applications*. California: Brooks Cole.

Rehman, A. (2001). *A study of relationship of self concept with classroom environment, gender role, cognitive development and academic achievement of the students at*

secondary school level.(PhD thesis, Allama Iqbal Open University, Department of Teacher Education, Islamabad).Retrieved on 12-10-2010 from http://eprints.hec.gov.pk/273/2/3.htm.

Sami, P. A., & Hussain, K. S.(2005). *Basic Education in Pakistan.* Islamabad: Academy of Educational Planning and Management.

Schraw, G., Crippen, K. J., & Hartley, K.(2006). Promoting Self regulation in science education: Meta-cognition as part of a broader perspective on learning. *Research in Science Education, 36*,111-139.

Shah, D. (2003).*Country Report on Decentralization in the Education System of Pakistan Policies and Strategies.* Islamabad: Academy of Educational Planning and Management.

Shakil,S.(2002). *An Overview of Early Childhood Care and Education in Pakistan: An Initial Survey and Situational Analysis*. Islamabad: Agha Khan Foundation. Retrieved on 20-06- 2010 from http://www.ecdpak.com/publications/Sofia-Shakil.pdf

Shami, P.A., & Hussain, K.S.(2005). *Development of education in Pakistan.* Islamabad: Academy of Educational Planning and Management.

Sharma, P. L. (2006).*The Psychology of Teaching and Learning*. New Dehli: Saurb & Sons.

Siraj, M. (2010). *Increasing Education Expenditure to 7 percent of GDP in Pakistan: Eyes on the Miracle:* Islamabad.

Srivastava, N. (2006). *Educational Psychology.* New Delhi: Pragun Publications, p-159-161.

Stephen, D.B. (1993).*Developing critical Thinkers: Challenging Adults to explore Alternative Ways of Thinking and Acting.* USA: Jossey-Base Publisher.

Stephen, K.R. (2000).*Cognition: Theory and Applications.* USA: Wadsworth Thomson Learning.

Tudge, J. (2000). Theory, Method, and Analysis in Research on the Relations Between Peer Collaboration and Cognitive. *Journal of Experimental Education, 69*(1), 98-112.

UNESCO, (2000). *Report of the education for all* .Islamabad: Ministry of education Government of Pakistan.

Weaver, M.A. (1995). *Children of the Jihad.* New York: Prentice-Hall.

William, E. G. (2000). *Approaches to Psychology.* (3rd ed.), Philadelphia: Open University Press.

William, T. D. (2004). *Cognitive Ability, Senior Fellow the Brookings Institution.* Retrieved on 22-12-2010 from http://www.google.com.

Zohar, A., & Dori, J. Y.(2003). Higher Order Thinking Skills and Low-Achieving Students: Are They Mutually Exclusive? *The Journal of the Learning Science.12* (2), 145-181.

Appendix-A

List of F.G Boys Schools of Islamabad

S. No	Name of Schools	Address
1	F.G. Boys Model School	F- 8/3
2	F.G. Boys Model School	G-8/4
3	F.G. Boys Model School	G-9/4
4	F.G. Boys Model School, NO 6	G-6/4
5	F.G. Boys Higher Secondary School	G-6/2
6	F.G. Boys Model School	G-7/4
7	F.G. Boys High School NO 3	G-7/3
8	F.G. Boys Model School	G-10/3
9	F.G. Boys Model High School No 7	I-10/2
10	F.G. Boys High School No 8	F- 6/2
11	F.G. Boys High School No 13	G-8/1
12	F.G. Boys high School No 14	G- 9/1
13	F.G. Boys Higher Secondary School No 16	I-10/1
14	F.G. Boys Model School,	I-9/4
15	F.G. Boys Secondary School,	I-14

Appendix-B

List of GECs Registered Schools of Islamabad

S. No	Name of the Schools	Address
1	Khaldunia Public School	F-8/2
2	The City School	H-8
3	Bahria College	E-8
4	Headstart School (Girls)	Mauve Area , G-8/1
5	Alta Vista College	F-8/4
6	The Capital High School	F-8/4
7	Beaconhouse School	H-8/4
8	University College of Islamabad	F-8/2
9	Burhan College	F-8/3
10	Lahore Grammer School Islamabad	G-6/3
11	Global System of Integrated Studies	H-8/1
12	Preparatory School Islamabad	G-5
13	Brookfield School	F-11/4
14	Pak-Turk International School	F-10/4
15	Fountainhead School	F-7/3
16	Islamabad School of Art & Sciences	F-8/3
17	Bahria Foundation College	F-11/3
18	Islamabad College of Art & Sciences	F-8/2
19	OPF College for Girls	F-8/2
20	Froebel's International School	F-7/2
21	Islamabad Convent School	H-8/4
22	OPF College for Boys	H-8/4
23	International Grammar School	F-11/4
24	Schola Nova	F-8/3
25	Roots Montessory & High School	F-7/1

26	Westminster School & College	F-8/3
27	ASAS International School	F-8/3
28	Shaheen School System	F-10/3
29	Imperial International School	F-10/3

1	جامعہ فریدیہ (لال مسجد)	E-7	مولانا عبدالعزیز صاحب
2	معہد الدراسات الاسلامیہ	F-6/3	مولانا اسداللہ عباسی صاحب
3	جامعہ محمدیہ	F-6/4	مولانا ظہور احمد علوی صاحب
4	تعلیم القرآن باب الاسلام	F-7 مرکز	مولانا عبیداللہ شاہ صاحب
5	جامعہ قاسمیہ	F-7/4	مولانا عبدالکریم صاحب
6	دارالعلوم اسلامیہ تحفیظ القرآن	F-8/1	مولانا سعیداللہ صاحب
7	اسلامیہ تحفیظ القرآن	F-8/2	مولانا عبدالقادر صاحب
8	معہد القرآن	F-8/3	مولانا عبدالحمید صابری صاحب
9	ادارہ معارف اسلامیہ وعصریہ	F-8/3	قاری بشیر احمد صاحب
10	ایوان قرآن ایمز ایجوکیشن سسٹم	F-8/4	مولانا الماس ایوب صابر صاحب
11	جامعہ عمر انوار القرآن	F-10 مرکز	مولانا عبدالحلیم قاسمی صاحب
12	مدرسہ عثمانیہ	F-11/1	مولانا لیاقت علی ترابی
13	مدرسہ رحمانیہ	بلیو ایریا	مولانا محمد طیب صاحب
14	مدرسہ عبداللہ بن عباس	G-6 آبپارہ	قاری غلام رسول حامد صاحب
15	مدرسہ سیدۃ حفصہؓ	G-6/2	مولانا عبدالعزیز صاحب
16	جامعہ فاطمۃ الزہراء	G-6/2	مولانا شریف ہزاروی
17	دارلعلوم اسلام آباد	G-6/4	مولانا ضیاءاللہ خان صاحب
18	جواہر القرآن	G-7/1	مولانا حفیظ الرحمان صاحب
19	تعلیم الاسلام	G-7/2	مولانا پیر برکت اللہ ربانی صاحب
20	ام القریٰ	G-8/4	مولانا محمد ادریس صاحب
21	تعلیم الدین	G-8 کمپلکس	قاری عبدالواحد علوی مرحوم

22	مدرسہ عائشہ صدیقہ للبنات	G-9/1	مولانا ممتاز الحق صدیقی صاحب
23	ریاض العلوم	G-9/1	قاری ساجد محمود صاحب
24	جامعہ معارف القرآن	G-9/2	مولانا نذیر فاروقی صاحب
25	المرکز اسلامی	G-10/1	مولانا ظہور الٰہی صاحب
26	ادارہ المرکز الاسلامی	G-10/1	مولانا غلام اکبر
27	مسجد توحید	G-10/2	مولانا اکرام اللہ جان صاحب
28	مدرسہ محمودیہ تحفیظ القرآن	G-10/3	مولانا تاج الدین مدنی صاحب
29	صدیقہ للبنات	G-10/3	مولانا عبدالرشید صدیقی صاحب
30	مدرسہ مدنیہ تحفیظ القرآن	G-10/4	قاری عبدالعزیز صاحب
31	جامعہ نعمانیہ	G-10/4	
32	مدرسہ تحفیظ القرآن	G-10/4	
33	ترتیل القرآن	G-11	زاھد صمد مارگیلین صاحب
34	جامعہ اصلاح البنات	G-11/1	مولانا محمد احمد شفیع صاحب
35	جامعہ تحسین القرآن	G-11/1	مولانا وجیہ الدین صاحب
36	مسجد غفوریہ	G-11/2	مفتی محمد عبداللہ صاحب
37	جامعہ ترتیل القرآن للبنات	G-11/2	
38	مدرسہ رحیمیہ فیض عام	G-12	قاری اسحاق
39	تحفیظ القرآن	I-8/1	قاری ہارون الرشید صاحب
40	معھد القرآن	I-8/3	مولانا عبدالحمید صابری صاحب
41	جامعہ زینب	I-8/4	ڈاکٹر محمد مرسل صاحب
42	حکیم الامت	I-8/4	مفتی دوست محمد مزاری صاحب
43	اسلامیہ کالج للبنات	I-9/1	
44	سبیل الھدیٰ	I-9/1	مولانا محمد ادریس صاحب
45	جامعہ اسلامیہ مدنیہ	I-9/4	قاری عبدالحفیظ قادری صاحب
46	اشاعت القرآن	I-9/4	مولانا عبدالمجید عابد صاحب
47	مسجد اویس قرنی فاطمۃ الزھراء	I-10/1	مولانا طاہر محمود عباسی صاحب

48	فاطمۃ الزہراء	I-10/1	مولانا طاہر محمود عباسی
49	سراج العلوم	I-10/2	مولانا عزیز الرحمان صاحب
50	معارف الاسلام	I-10/2	مولانا عبدالخالق صاحب

Appendix-D

وفاق المدارس العربیہ پاکستان کا نصاب تعلیم درجہ ابتدائیہ

جماعت	مضامین	تفصیل
اول	قرآن مجید	قاعدہ نورانی الیسرنا القرآن
	دینیات	کلمہ طیبہ وکلمہ شہادت، شمائم ترجمہ
	اردو۔ لکھائی	قاعدہ اردو، کتاب اردو جماعت
	حساب	اولاً مفردات نویسی ہندسہ نویسی 100 تک
دوم	قرآن مجید	آخری پارہ ناظرہ ۔آخری دس
	دینیات	سورتیں حفظ۔نماز
	اردو۔ لکھائی	کتاب اردو جماعت دوم
	حساب	مرکبات نویسی۔ریاضی جماعت دوم
سوم	قرآن مجید	۵ پارے اول ناظرہ
	دینیات	نماز حنفی ماسواء خطبات واشعار ا۔وضو نماز کی عملی تعلیم
	اردو۔ لکھائی	کتاب اردو جماعت سوم۔املاء مرکبات
	حساب	ریاضی جماعت سوم
چہارم	قرآن مجید	از پارہ ۶ تا پارہ ۱۵ ناظرہ
	دینیات	تعلیم الاسلام حصہ اول
	اردو۔ لکھائی	کتاب اردو جماعت چہارم، عبادت نویسی
	حساب	ریاضی جماعت چہارم
پنجم	قرآن مجید	از پارہ ۱۶ تا آخر ناظرہ
	دینیات	تعلیم الاسلام حصہ دوم
	اردو۔ لکھائی	کتاب اردو جماعت پنجم، املاء زبانی
	حساب	ریاضی جماعت پنجم

درجہ متوسط

جماعت	مضمون	تفصیل
ششم	مشق قرآن مجید و تجوید	حدر ۱۰ پارہ اول، تجوید مخارج حروف (حفظ)
	دینیات و عربی	تعلیم الاسلام حصہ سوم (مفتی کفایت اللہ) کتاب عربی جماعت ششم
	اردو لکھائی	کتاب اردو جماعت ششم۔ لکھائی از کتاب اردو بطور املاء
	فارسی	رہبر فارسی (مولانا مشتاق احمد) کریما شیخ سعدیؒ
	معاشرتی علوم (واقفیت عامہ)	معاشرتی علوم جماعت ششم
	ریاضی (حساب)	ریاضی جماعت ششم
ہفتم	مشق قرآن مجید و تجوید	حدر از پارہ ۱۱ تا پارہ ۲۰ تجوید صفات حروف (حفظ)
	دینیات و عربی	تعلیم الاسلام حصہ چہارم (مفتی کفایت اللہؒ) کتاب عربی جماعت ہفتم
	اردو لکھائی	کتاب اردو جماعت املاء از کتاب اردو
	فارسی	پندنامہ (شیخ فریدالدین عطارؒ) گلستان سعدی (باب ۷، ۸)
	معاشرتی علوم (واقفیت عامہ)	معاشرتی علوم جماعت ششم
	ریاضی (حساب)	ریاضی جماعت ہفتم
ہشتم	مشق قرآن مجید و تجوید	حدر از پارہ ۲۱ تا آخر۔ تجوید اظہار و اخفا وغیرہ حفظ
	دینیات و عربی	بہشتی گوہر (مولانا تھانویؒ) سیرۃ الرسول اردو (شاہ ولی اللہؒ) کتاب عربی جماعت ہشتم
	اردو لکھائی	کتاب اردو جاعت ہشتم۔ املا از کتاب اردو
	فارسی	گلستان سعدی (باب ۱ تا ۴) بوستان سعدی (باب اول)
	معاشرتی علوم (واقفیت عامہ)	معاشرتی علوم جاعت ہشتم
	ریاضی (حساب)	ریاضی جماعت ہشتم

درجہ ثانویہ عامہ

جماعت	مضمون	تفصیل) آ(کتاب معہ مصنف)
	تفسیر وتجوید	مفتاح القرآن جزا۔۲ (مولانا محفوظ الرحمٰن نامیؒ) جمال القرآن (حضرت تھانویؒ) مشق قرات پارہ عم
		(ربع آخر) جوامع الکلم (مفتی محمد شفیعؒ) تاریخ الاسلام حصہ سیرۃ (مولانا محمد میاں)
		جوامع الکلم (مفتی محمد شفیعؒ) تاریخ الملام سیرۃ (مولانا محمد میاںؒ)
	حدیث وسیرت	ارشاد الصرف (مولانا عبدالکریم) یا میزان الصرف (محمد بن مصطفیٰ) منشعب (ملاحمزہ)
الصف ا	صرف	صرف میر (میر سید شریف) یا علم الصرف حصص (مولانا چرتھاولیؒ)
تاسع	تمرین	تمرین صیغ وتعلیلات
(نہم)	نحو	نحو میر (میر سید شریف) یا علم النحو (مولانا مشتاق احمد چرتھاولی) بعد مائیہ عامل مظوم (عبد القاہر)
		وشرح مائیہ عالم ترکیب (مولانا عبدالرحمٰن جامیؒ)
		الطریقۃ العصریہ (ڈاکٹر عبدالرزاق سکندر) لطریقۃ الجدیدۃ حصہ دوم (محمد امین مصری)
	اللغۃ العربیۃ والانشاء	
	تفسیر وتجوید	ترجمہ پارہ عم معہ مختصر تفسیر۔ فوائد مکیہ (قاری عبدالرحمٰن مکی) مشق پارہ عم ربع
الصف ا	حدیث	ثالث زاد لطالبین کامل (مولانا محمد عاشق الٰہی برنی)
لعاشر	اللغۃ العربیہ ولانشاء	القراۃ الراشدہ جزء اول (سید ابوالحسن علی ندوی) معلم الانشاء جزاول) عبدالماجد ندوی
دہم	فقہ	قدوری کامل (ابوالحسن احمد بن محمد قدوریؒ)
	صرف	علم الصیغہ (مفتی عنایت احمد) خاصیات ابواب از فصول اکبری (علی اکبر الہ آبادی) یا علم الصرف حصہ
		چہارم (مولانا چرتھاولی)
	نحو	ہدایۃ النحو کامل، مصنفہ شیخ سراج دین عثمان المعروف باغی سراج
	منطق	تیسیر المنطق (عبداللہ گنگوہیؒ) ایساغوجی (اثیر الدین ابہری) المرقات (فضل امام خیرآبادی)

درجہ ثانویہ خاصہ

جماعت	مضمون	تفصیل (نام کتاب معہ مصنف)
الصف الثالث عشر (سیزدہم ۱۳)	تفسیر وحدیث	ترجمہ وتفسیر از سورۃ فاتحہ تا سورۃ یونس آثار السنن (علامہ شوق نیموی)
	فقہ وفرائض	ہدایہ ج اول (برہان الدین ابوالحسن علی ابن ابی بکر مرغینانی) سراجی (سراج الدین سجاوندی)
	اصول فقہ	نورالانوار (باب القیاس) حسامی تا قیاس (ابوعبداللہ حسام الدین محمد بن محمد بن عمر)
	بلاغت	مختصر المعانی (سعد الدین مسعود بن عمر تفتازانی) دروس البلاغہ (حنفی بک ناصف)
	منطق وفلسفہ	سلم العلوم۔ تصورات (علامہ محب اللہ بہاری) ملاحسن تا مفہوم یا ہدیہ سعیدیہ (محمد فضل حق خیرآبادی) معہ رشیدیہ (الشیخ عبدالرشید جونپوری)
		سبعہ معلقہ (کامل) دیوان متنبی تا ختم کافیہ الحاء (ابوطیب احمد بن حسین)
الصف الرابع عشر (چہاردہم)	تفسیر	جلالین شریف کامل (علامہ جلال الدین المحلی وعلامہ جلال الدین عبدالرحمٰن سیوطی)
	حدیث	
	فقہ	کتاب الآثار (امام محمد ابن الحسن الشیبانی)
	اصول فقہ	ہدایہ (جلد ثانی)
		توضیح تا مقدمات اربعہ (صدرالشریعہ عبیداللہ بن مسعود)
	فلسفہ وعقائد	تلویح تا بحث خاص (سعد الدین تفتازانی)
	اللغۃ العربیۃ والعروض	میبذی (طبیعات میر حسین میبذی) وشرح عقائد کامل (سعد الدین تفتازانی)
		دیوان حماسہ (باب الحماسہ ابوتمام حبیب بن اوس۔ الانشاء علی الاسلوب الصحیح۔ محیط الدائرہ یا الکافی

درجہ تکمیل

پرچہ	مضمون	تفصیل
پہلا	منطق (الف)	حمداللہ (مولانا حمداللہ سندیلوی) قاضی (ملا قاضی مبارک)
دوسرا	منطق (ب)	میرزاہد۔ ملا جلالؒ۔ امور عامہ۔ رسالہ قبلہ
تیسرا	فلسفہ ابوقلیدس	صدرا۔ (صدرالدین الشیرازی) شمس بازغہ (محمد جونپوری) تحریر اوقلیدس (نصیرالدین طوسی)
چوتھا	حکمت	حجۃ اللہ بالغہ (شاہ ولی اللہ دہلویؒ) الذریعہ الی مکارم الشریعۃ
پانچواں	عقائد واصول فقہ	خیالی (احمد بن موسیٰ خیالی) مسلم الثبوت (محب اللہ بہاریؒ)
چھٹا	ردّ فرق باطلہ	مرزائیت۔ عیسائیت۔ صہونیت۔ اشتراکیت۔ رافضیت۔ ناصبیت۔ ردّ بدعات