

LANGUAGE IN INDIA
Strength for Today and Bright Hope for Tomorrow
Volume 12 : 5 May 2012
ISSN 1930-2940

Managing Editor: M. S. Thirumalai, Ph.D.
Editors: B. Mallikarjun, Ph.D.
Sam Mohanlal, Ph.D.
B. A. Sharada, Ph.D.
A. R. Fatihi, Ph.D.
Lakhan Gusain, Ph.D.
Jennifer Marie Bayer, Ph.D.
S. M. Ravichandran, Ph.D.
G. Baskaran, Ph.D.
L. Ramamoorthy, Ph.D.
Assistant Managing Editor: Swarna Thirumalai, M.A.

**Teaching of Mathematics in Pakistan -
Problems and Suggestions**

Muhammad Nisar Ul Haq Kiani, Ph.D.
Samina Malik, Ph.D.
Saira Ijaz Ahmad, Ph.D. Scholar

=====

ABSTRACT

There is no doubt that the present era is the era of science and technology. Modern advancements have changed the entire life style of man. Mathematics is the queen of sciences. Mathematics education plays a vital and strategic role in the process of adopting education to the needs of rapid social and economic changes. Therefore teaching of mathematics is of great concern to every nation.

This study followed descriptive method involving survey approach to investigate the problems of teaching mathematics at elementary level. The main objectives of the study were to find out the problems faced by teachers during teaching mathematics and to give suggestions to develop strategy for the improvement of teaching mathematics at elementary level. This study was delimited to five male and five female secondary schools of Rawalpindi city. Twenty teachers were included in the sample. For data collection, a questionnaire was developed and administered after pilot testing to the mathematics teacher of the selected schools. The data was analyzed and interpreted. Major findings of the study include a)

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

teachers were well qualified in their academic as well as professional qualifications, b) majority of Mathematics teachers had teaching experience of more than 11 years, c) hundred percent teachers used A.V. aids, d) twenty percent teachers introduced self-made activities in their classroom frequently, e) fifty percent of the teachers had never attended any refresher course of teaching mathematics, f) majority of teachers reported that the Arithmetic was the easiest area of mathematics teaching, g) majority of teachers declared the time allocation sufficient for the coverage of the course, and h) most of teachers declared that the major causes of failure in Mathematic were lack of practice and lower comprehension level of the students.

Keywords: *Mathematics, Teaching, Science, Problems*

1. INTRODUCTION

There are various stages of education in Pakistan. First one is called elementary education, i.e., from class I to VIII. Mathematics is taught in the elementary classes as a compulsory subject. Mathematics occupies an important place in today's society due to its significance and demand. The rapid progress in science has increased the body of mathematical knowledge and had led to more extensive use of mathematics in daily life and technology. These developments demand to improve and upgrade the mathematics curriculum.

Mathematics has always held a key position in the school curriculum because it has been considered indispensable to the educated persons.

In the elementary school, mathematical knowledge consists in large measure of computational arithmetic. This aspect of mathematics has an important role in the education of the society, and today it is more important to basic education than ever before in the past. Following are some of the factors that seem to guide the teaching of mathematics.

- Explosion in mathematical knowledge
- New ways of conceiving of even the elementary ideas in mathematics
- Increasing dependence of scientific thought and
- Almost a requirement in every profession, skill to learn basic mathematics.

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

Now in the twenty-first century, we have entered a period of modernization and improvement in every field of life especially in the teaching of mathematics at the elementary level.

Three Types of Goals at the Elementary School Level

According to Howard F. Fehr and Philips J. Mckeeby (1967), there are three types of goals at elementary school level.

1. First goal deals basically with the knowledge of the content of elementary school mathematics. It can be succinctly referred to by the single descriptive word “information”. The first goal of mathematics instruction is that children learn to read mathematics, to learn fundamental concepts that are basic to the understanding of the subject. They must learn to express these concepts in words and in symbols.
2. Second goal of mathematics at elementary level is that the student be able to do with the information he/she has gained. A popular phrase is that “to learn mathematics, a person must do mathematics”. Information gained is of little value until it can be used. A student should be able to develop skill in handling mathematical symbols and concepts so as to obtain mature performance. These skills are indeed a tool, but a tool in which must be thoroughly understood so as to free the mind of routine work and permit it to concentrate on new learning.
3. First two goals lead to the third goal of mathematical instruction. Third goal is to develop the ability to solve problems. All new learning can be conceived of as problem solving. A problem is a situation in which a desired outcome is sensed or known, but the intellectual means to the goals unknown to the child.

These three goals are necessary and sufficient for the purpose of mathematical education. Each is as important as others. To neglect one in favor of the others would result in an inadequate education. Therefore correct and meaningful concepts

organized into a structure of knowledge, skill in operating in these concepts through an appropriate symbolism and processes, and the ability to apply this knowledge to solve problems (one type of problem is to learn more mathematics) should be in the mind of teacher as he instructs each lesson in mathematics.

There are a number of problems, which seriously affect the teaching of mathematics at the elementary level. Some problems are listed below. Yadav (2001) has identified some of the problem such as Problems of Planning and Management, Over Crowded Classes, Boring Syllabus, Teacher Centered Approach, Examination System and the Problem of Motivation in Mathematics Teaching.

FACTORS AFFECTING THE PERFORMANCE OF STUDENTS

Yaqoob (1998) states following factors affecting the performance of the students

Factors Regarding Teachers

- a. Shortage of teachers
- b. Defective teaching methodology
- c. Low salary of teachers
- d. Load of work
- e. Lack of interest
- f. Ignoring the objectives of teaching
- g. Ignoring individual differences of children

Administrative Factors

- a. Irrelevant Curriculum
- b. Rapid Changes in Syllabus
- c. Defective Evaluation

Factors Regarding Students

- a. Over Crowded Classes
- b. Shortage of Educational Facilities
- c. Lack of Suitable Guidance
- d. Lack of Communication
- e. Physical Punishment

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

- f. Unjustified Promotion in the Lower Classes

Environmental Factors

- a. Illiterate parents
- b. Pressure to learn science subjects
- c. Lack of coordination between parents and teachers (Yaqoob, 1998)

2. METHODS AND PROCEDURE OF RESEARCH

There were 19 boys and 23 girls' secondary schools in Rawalpindi city. All the male and female mathematics teachers of these schools, teaching at secondary level constitute its population. Ten boys and ten girls' schools were selected randomly. Total one hundred mathematics teachers (50 males and 50 females) of these selected schools were included in the sample of the study. A questionnaire was developed to collect the data form sample teachers.

2.1 PILOT STUDY

Pilot study was conducted on a representative group of teachers to ensure the tool reliability and the observed degree of reliability was 0.79. The validity of the tool was ensured through experts' opinion. Tool was modified and amended according to the suggestions received.

2.2 DATA COLLECTION

The researchers personally visited the target sample. The objectives of the study were explained to the respondents. Questionnaires were delivered to all those respondents included in the study and requested to fill the questionnaires as soon as possible.

3. DATA ANALYSIS

In order to make study meaningful, the collected data were presented in the tabular form. Percentages were used as statistical tool to analyze the data. The discussion has been made part wise and item wise.

Table 1: Academic Qualification, Professional Qualifications, Total Teaching Experience and Teaching Experience Particular to the Subject of Mathematics

Academic Qualification	No. / Percentage of Teachers
-------------------------------	-------------------------------------

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

Matric	10
F.A./F.SC	10
B.A./B.Sc	40
M.A./M.Sc	40
M.Phil	00
Total	100
Professional Qualification	No. / Percentage of Teachers
P.T.C	00
C.T./S.V.	30
B.Ed	45
M.Ed	25
Total	100
Total Teaching Experience in Years.	No. / Percentage of Teachers
1 – 5 Years	20
6 – 10 Years	15
11 – 15 Years	15
16 – 20 Years	10
Above 20 Years	40
Total	100
Teaching Experience of Mathematics in Years	No. / Percentage of Teachers
1-5 Years	25
6-10 Years	20
11-15 Years	15
16-20 Years	15
Above 20 Years	25
Total	100

The data in the table 1 shows that majority of the teachers were well educated as 40 percent teachers had Masters Degree, 40 percent Bachelor and 10 percent teachers' qualification was intermediate.

Most of the teachers (45 percent) had the professional qualification of B.Ed. and 30 percent of teachers had the qualification of S.V or C.T, 25 percent teachers have high professional qualification of M.Ed. No P.T.C teacher was teaching at elementary level in government schools. It is observed that qualified teachers are teaching mathematics at elementary school level.

40 percent teachers had total teaching service experience of more than twenty years, 20 percent teachers have teaching experience of 1-5 years, 15 percent had teaching experience of 6-15 years and 10 percent teachers had teaching experience of 16-20 years. It is, therefore, concluded that teachers in government schools had handsome teaching experience.

Twenty five percent of teachers had 1-5 years of the experience of teaching mathematics; twenty percent teachers had 6-10 years experience of teaching this subject. On the basis of above table, it is concluded that the teachers in government schools were experienced in teaching mathematics.

Table 2: Work Load of Mathematics' Teacher

Subjects	No. / Percentage of Teachers
English	45
Urdu	15
Math	100
Science	35
S. Studies	15
Classes	
6 Th	10
7 Th	10
8 Th	80

Table 2 shows that most of the teachers (45 percent) teach English along with mathematics. It is also observed that 35 percent teachers also teaching science in their schools. It is therefore concluded that majority of teachers teach English and Mathematics. Most of the teachers (80 percent) teaching in class eight whereas 10

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

percent teachers in classes VI and VII. It is, therefore, concluded that majority of the teachers teach in class VIII.

Table 3: Use of A V aids, Accuracy of books and time allocation for teaching of Mathematics

	Percentage	
Use of A.V. Aids	Yes	100
	No	00
Textbooks According to the Objectives Set at National Level	Yes	50
	No	50
Time Allocation for Teaching Mathematics Per Week is Sufficient	Yes	60
	No	40

Table 3 indicates that all of mathematics teachers use A.V. aids during their teaching. It is, therefore, concluded that 100 percent of the Mathematics teachers use A.V. aids in their teaching. Fifty percent teachers consider their books of mathematics at elementary stage are according to the objectives set at national level and 50 percent do not compare the content with the objectives. Majority of teachers (60 percent) declare the time allocation sufficient for the coverage of the course. 40 percent teachers are not satisfied with the weekly time allocation. Therefore it is concluded that most of the teachers are satisfied with the time allocated for the teaching of the mathematics.

Table 4: Assigning the Homework to the Students.

Assign of homework	Daily	Sometimes	Never
Percentage	100	00	00

Table 4 indicates that all teachers of Mathematics assign homework to their students. It can be concluded that 100 percent of mathematics teachers assign homework to their students.

Table 5: Introduction of Self-Made Activities in the Classroom.

Item	Percentage
Mostly	20
Sometimes	80
Never	00
**	100

Table 5 shows that 20 percent teachers introduce self-made activities in classroom frequently and most (80 percent) of the teachers introduce self-made activities only sometimes.

Table 6: The number of teachers who attended In-service Refresher Courses

No of Courses Attended	Percentage
0	50
1	25
2	20
3	05

Table 6 shows that the fifty percent of the teachers had never attended any refresher course of teaching mathematics. Twenty five percent teachers had attended only one course during their entire service whereas 20 percent of the teachers had attended two refresher courses in the teaching of mathematics.

It is therefore, concluded that fifty percent of the teachers had never attended refresher course of teaching mathematics.

Table 7: The level of different portions of Mathematics

Area	Easy Percentage	Difficult Percentage	Neglected Percentage
Arithmetic	80	20	00
Algebra	65	35	00
Geometry	35	30	35

Trigonometry	25	55	25
Graph	65	15	20

Table 7 shows that the Arithmetic was the easiest area (80 percent) of mathematics teachings whereas sixty five percent teachers also indicated Algebra as easiest area. It is observed that the neglected areas of the teaching mathematics were Geometry (35 percent), Trigonometry (25 percent) and Graph (20 percent). It is also observed that teachers felt difficulty in making the students understand Trigonometry (55 percent), Algebra (35 percent) and Geometry (30 percent).

Therefore it is concluded that the easiest areas of mathematics was Arithmetic and Algebra whereas difficult area was Trigonometry, and the neglected areas were Trigonometry, Geometry and Graph.

Table 8: The Strength of Classes

Strength of Class	No of Responses	Percentage
Less than 30	01	05
30 to 45	07	35
More than 45	12	60

This table represents the size of classes in government schools. According to this study there are only 5 percent classes where strength of students is below thirty. 35 percent classes have 30-45 students. Most the classes (60 percent) have more than 45 students.

Therefore it is concluded that most of the classes are overcrowded.

Table 9: Preparing of Lesson Plan

Item	Percentage
Mostly	25
Some time	60

Never	15
-------	----

Table 9 shows that majority of teachers (60%) some time prepared lesson plan. 25 percent teacher prepared lesson plan frequently and 15 percent of the teachers never prepared lesson plan for their teaching.

It is therefore concluded that most of teachers sometimes prepare lesson plan.

List of Proposed Arrangement for the Content

1. Contents should be relevant with the previous knowledge of the students
2. The content should be prepared according to the needs of the country
3. Some basic concepts of Computer and Statistics should be included
4. More solved examples should be added
5. Objective questions should be developed at the end of each chapter.

Causes of Failure of Students in Mathematics

1. Lack of practice and understanding of concepts by the students
2. Lack of student's interest
3. Lack of parent's interest
4. Uneducated parents
5. Contents are difficult with respect to the mental level of students.

List of the Topics / Concepts Which Are Difficult For the Students

1. Trigonometry
2. Algebra
3. Geometry

List of Topics / Concepts Which Are Difficult For the Teachers

1. Trigonometry
2. Geometry

Topics, Which Are Usually Left by the Teachers

1. Complements of Sets
2. Surface area of volume of cone
3. Trigonometry

Topics, Which Are Usually Left by Students

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

1. Sets
2. Trigonometry
3. Some part of Geometry

Topics / Concepts That You Like to Add In Textbook of 8th Class

Trigonometry is widely used in 9th and 10th class. Therefore its basics should be more briefly introduced in 8th class.

Topics / Concepts That You Like to Delete From The Textbook of 8th Class.

The chapter on Set should be deleted from the text because the advanced countries have already deleted the concepts of sets from elementary classes.

Suggestions and Area Requiring More Emphasis in Textbooks of Mathematics

1. Textbooks should be according to the needs and requirements.
2. Trigonometry, practical geometry, logarithm (basic concepts) and graphs should be more emphasized along with solved 'examples.
3. A Chapter on Computer should also be added in the book.

Problems in Teaching Mathematics Other Than Mentioned in the Questionnaire

In the institutions, there is no check on entry level of the students. Especially teacher of mathematics is not consulted at the time of admission. He should be involved in the process of giving admission to the students in the school.

4. RECOMMENDATIONS

Following are the recommendations of the study.

1. In order to improve the quality of education, it is recommended that class strength may not be more than 30 students.
2. Physical facilities and A.V. aids for teaching Mathematics may be provided in the schools.
3. Keeping in view the changes in curricula, the in-service refresher courses may be arranged.
4. For the periods teaching Mathematics may be increased in the school timetable and extra time may be allotted for the purpose of practice.
5. Although most of the teachers have the professional qualifications of B. Ed, and M.Ed., it is recommended that curriculum and training programs may be revised time to time for the teachers.

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions

6. Teachers-parents meetings to discuss various educational matters of students may be arranged regularly.
7. Textbooks of mathematics may be revised time to time according to the needs of society and according to the mental abilities of the students.
8. Textbooks should be written according to the learning principles and keeping in view the psychology of students.
9. At the time of admission of the students, the Mathematics teacher should be consulted.

=====

References

1. Freitage, H.T.; Freitage, A.H. (1960), The Number Story, National Council of Teachers of Mathematics, Washington, USA p.76
2. James, Glenn; James, Robert C. (1976), The Mathematics Dictionary, John Wiley & Sons, USA p.244
3. Gregory R. Baur; Linda Olsen George (1976), Helping Children Learn Mathematics, Cummings Publishing Company, California
4. Howard F. Fehr; Philips J. Mckeeby (1967), Teaching Modern Mathematics in The Elementary School, Addison-Wesley Publishing Company, U.S.A.
5. Smith, D.E. (1933), Text and Tests in Plane Geometry, Boston
6. Yadav, M.S. (1992) Teaching of Science, Anmol Publications, New Delhi, India.
7. Yaqoob, M. (1998) Student's Performance Vs. Teacher's Qualification in physics Subject at Secondary Level in District Chakwal, Unpublished Thesis, University of Arid & Agriculture, Rawalpindi

=====

Muhammad Nisar Ul Haq Kiani, Ph.D.
Visiting Lecturer
Faculty of Social Sciences
International Islamic University, H-10, Islamabad
Pakistan

Samina Malik, Ph.D.
Assistant Professor
Language in India www.languageinindia.com
12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar
Teaching of Mathematics in Pakistan - Problems and Suggestions

Department of Education
International Islamic University, H-10, Islamabad
Pakistan

Saira Ijaz Ahmad, Ph.D. Scholar
Department of Education
International Islamic University, H-10, Islamabad
Pakistan
sairaijaz@ymail.com

Language in India www.languageinindia.com

12 : 5 May 2012

Muhammad Nisar Ul Haq Kiani, Ph.D., Samina Malik, Ph.D. and
Saira Ijaz Ahmad, Ph.D. Scholar

Teaching of Mathematics in Pakistan - Problems and Suggestions