



Problems Associated with the Curriculum of Mathematics at Secondary Level

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Abstract: Curriculum is the guide that describes a learner's learning route and regulates the learning and teaching process. It recognizes critical learning and teaching areas, which describe in broad terms the information, attitudes, behaviours and abilities that all students and teachers must attain at a certain educational level. The objectives of this study were to discuss the problems of secondary school students in mathematics curriculum, to review curriculum of mathematics at secondary school (science group) and to measure the strengths and weaknesses of curriculum in implementation. A sample of 180 students from 3 different schools of district Dera Ghazi Khan was randomly selected by using sample random sampling technique. A questionnaire was developed to be used for the data collection from the students. The collected data was analyzed by using the SPSS-25. The findings of the study indicated that: most of the teachers did not use AV aids in teaching such as geometry boxes, only 5% of teachers solved examples before moving on to the exercise's questions, most of the teachers did not encourage students to ask questions, most students said that the curriculum matched their mental level, and the majority of respondents said that the curriculum in the book helped them to develop their critical thinking abilities. The results of this study may help teachers and scholars in resolving issues pertaining to mathematics curricula.

Key Words: Curriculum, Mathematics, Problems, Secondary Level

1. Introduction

The curriculum is a written document that contains an overarching education program as well as the experiences that each individual student has in the classroom. The curriculum serves as a road map with precise objectives and goals in mind. These are scheduled in accordance with a research paper or framework that presents a professional practice (Kelly, 2009). The study of mathematics is crucial at all educational levels. It is taught in first grade all the way up to the university level. The national level of government in Pakistan designs the mathematics curriculum (Government of Pakistan, 2006). Furthermore, as primary and secondary mathematics provide the groundwork for pupils' future performance, they have received increased attention. Since mathematics is used in all fields, it is regarded as the mother of all sciences. Pakistani students generally dislike mathematics because of its harsh, dry, and unforgiving character (Aijaz, 2001). Pupils find mathematics to be quite challenging. In Pakistan, two-digit addition and subtraction problems are beyond the ability of pupils attending public schools. The basic math issue is

only solved by 48% of children (Dubash, 2018; Pakistan, 2015). Conceptual comprehension is included in the mathematics curriculum and calls for both analytical and logical reasoning. The work that students put in is essential to their understanding of mathematics (Ellis, 2011). However, due to a lack of curricular understanding, instructors in both public and private schools were unable to teach pupils analytical skills (Gulzar & Mahmood, 2019).

Secondary school mathematics is sort of challenging and heavy-duty mathematics which includes the complexities and the introduction to the concepts of higher grade of studies. It should develop the HOTS (higher order of thinking) in students (Pia, 2015). The nature of this curriculum, the strengths and weaknesses in its development and its comparison with the old version of book it gives insight to the level of our secondary school curriculum in its review. How it fulfils the mental, social, physical, developmental needs of the students (Artigue, 2021). The learning difficulties at this level could paralyse the student to study the HSS (higher level) mathematics. The selective study is also becoming a trend at secondary school exams. The learning difficulties addressed the quality of education in its development if it makes balance in the nature of curriculum and implementation.

1.1 Objectives of Study

Following were the objectives of the study:

- i. To highlight the learning difficulties and behaviour of students in mathematics at secondary school.
- ii. To observe the factors on which the learning difficulties are based upon.

1.2 Research Questions

1. What are the obvious difficulties of students in study of mathematics at secondary school?
2. What are the confusions in student concepts occurs while doing mathematics?
3. What are the teaching strategies and methods applying on teaching secondary school mathematics and learning outcomes?

2. Literature Review

2.1 Concept of Curriculum

The curriculum is a set of prearranged, standards-based activities that help students hone their subject-matter and applied learning skills. Curriculum has to incorporate the fundamental objectives, methods, tools, and evaluations in order to properly support teaching and learning (Yurdakul, 2015). What is taught in a particular course or subject is referred to as the curriculum. A curriculum is an interactive educational system with predetermined objectives, subjects, strategies, evaluation criteria, and materials. The intended purpose of curriculum is the effective transfer and/or development of knowledge, abilities, and attitudes (Way et al., 2016).

2.2 Concept of Mathematics Curriculum

Attempts to understand the universe and ourselves, as well as human cognition and reasoning, require an understanding of mathematics. Logic, mental rigor, and mental discipline may all be fostered and developed with the help of mathematics. Additionally, understanding the subjects covered in other academic fields like physics, social studies, and even music and art requires a solid foundation in mathematics (März & Kelchtermans, 2013). The goal of a mathematics curriculum is to assist students achieve certain mathematical objectives by planning both the experiences they will have and the ones they actually do have (Remillard & Heck, 2014).

2.3 Curriculum of Mathematics and Associated Problems

Mathematics curriculum, weight, and teaching procedure, as well as high-level mental talents and creativity, to create a favourable direction, gains, and profits between the pattern (Hu et al., 2014). To that positive direction, and innovation, in the pattern between gains to delta measurement and evaluation activities in terms of problem-solving skills deficiencies, it was stated that there could be problems due to crowded classes, a positive relationship

between, teachers' work load, using technology, the class of problems due to physical conditions, and teachers' lack of knowledge in the implementation of the curriculum (Verzosa et al., 2019). Teaching mathematics with applications is frequently seen as a gateway to paradise in mathematics education. Students' interest and motivation in mathematics will be boosted via application-oriented mathematics instruction and real-world examples. It fosters students' favourable attitudes toward mathematics and ensures their long-term retention (Atit et al., 2020). Motivating by means of useful applications, working on modelling, solving problems, this is the ideal way, we consider for our mathematics teaching at all level (Giorgio-Doherty et al., 2021). While some believe that applying mathematics to real-world issues outside of the classroom is the key to knowing mathematics, others believe that applying mathematics to real-world problems is the key to understanding mathematics (Cleary et al., 2017). Mathematical problems, which are posed in an applied form in the actual world, are an important and inescapable part of mathematics study. Students are more motivated and engaged when they have a purpose and context for utilising, learning, or performing mathematics (Namkung et al., 2019). Real-life applications, particularly visual and hands-on demonstrations, boost students' learning of the content, fulfil the requirements of students with diverse learning styles, and provide additional incentive for learning a discipline, according to Lotz et al. (2018). The use of context in mathematics instruction is exemplified through real-life applied scenario problems in mathematics. The term "context" refers to an imagined or real-world setting of mathematical problems that demonstrates the application of mathematics through the use of various activities in mathematics education.

3. Methodology

3.1 Research Design

It was a quantitative type of research; this research included quantitative data to analyse and evaluate on the basis of instruments used in the research procedure. The research procedure included questionnaires, in its assessment the observed strengths and weaknesses of curriculum measured with respect to the current situation.

3.2 Population

In this research the population was selected from girl's public and private schools of Dera Ghazi Khan including GGHS Mullah Quaid Shah and GGHS No.1 and Little Scholar School. The population was contained 200 students.

3.3 Sample and Sampling Technique

A sample of 180 students was taken by using the simple random sampling technique.

3.4 Data Collection

Data were collected through the distribution of questionnaire among the students of secondary schools.

4. Data Analysis

The data collected by questionnaire were analysed by using the Statistical Package for Social Sciences (SPSS-25). The results of data analysed were presented in the form of frequency distribution.

4.1 Results

The following results were obtained by analysing the data collected by the questionnaire.

Table 1: Teacher use AV aids to make you better understanding the concept in math

Responses	Always	To Some extent	Never	Max
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Frequency	0	87	93	93
Percentage	0%	48.33%	51.66%	48.33%

In response to the statement that Teacher use AV aids to make you better understanding the concept in math, 48.33% student said to some extent and 51.66% said never.

Table 2: Teacher solve the examples given in book before starting the exercise

Responses	Always	To Some extent	Never	ax
Frequency	12	128	40	8
Percentage	7%	71%	22%	%

In response to the statement that Teacher solve the examples given in book before starting the exercise, 71% student responded that their teachers solve the examples given in book before starting the exercise, 22% responded never and only 7% responded always.

Table 3: You solve the examples given in start of exercise by your own

Responses	Always	To Some extent	Never	ax
Frequency	3	7	170	0
Percentage	2%	4%	94%	%

In respond to the statement that you solve the examples given in start of exercise by your own, 94% students responded that they never solve the examples before going to start exercise, only 2% responded always and 4% to some extent.

Table 4: Teacher help you to make your missing concepts

Responses	Always	To Some extent	Never	ax
Frequency	26	42	112	2
Percentage	14%	23%	62%	%

In response to the statement that Teachers help you to make your missing concepts, 62% responded stated that their teachers never help to make missing concepts, 23% responded to some extent and only 14% responded to always.

Table 5: You enjoy while doing mathematics in the class

Responses	Always	To Some extent	Never	ax
Frequency	17	67	96	
Percentage	9%	37%	53%	%

In respond to the statement that you enjoy while doing mathematics in the class, 53% student responded that they never enjoy doing mathematics in the class, 37% responded to some extent and only 9% responded always.

Table 6: You like to help your friends in math

Responses	Always	To Some extent	Never	ax
Frequency	22	113	45	3
Percentage	12%	62%	25%	%

In respond to the statement that you like to help your friends in math, 62% responded that they like to help their friends, 25% responded never and only 12% responded always. It shows the positive attitude of students towards learning mathematics.

Table 7: You feel freedom to raise question in the class

Responses	Always	To Some extent	Never	ax
Frequency	21	136	23	6
Percentage	12%	75%	13%	%

In response to the statement that you feel freedom to raise question in the class, 75% responded that they feel freedom to raise question in the class, 13% responded never and only 12% responded always.

Table 8: You think this math book is according to your mental level

Responses	Always	To Some Extent	Never	ax
Frequency	9	144	27	
Percentage	5%	80%	15%	%

In response to the statement that you think this math book is according to your mental level, 80% students responded to some extent, 15% responded never and only 5% responded to always.

Table 9: This book is making your competitive skills in mathematics

Responses	Always	To Some extent	Never	ax
Frequency	17	67	96	
Percentage	9%	37%	53%	%

In response to the statement that This book is making your competitive skills in mathematics, 53% student responded to never, 37% responded to some extent and only 9% responded to always.

Table 10: Some of the part of book is beyond your understanding

Responses	Always	To some extent	Never	ax
Frequency	152	22	6	2
Percentage	84%	12%	4%	%

In response to the statement that some of the part of book is beyond your understanding, 84% students responded to always, 12% to some extent and only 4% responded to never.

Table 11: You think this book doesn't match to your mental level or it is complex

Responses	Always	To Some extent	Never	ax
Frequency	47	112	21	
Percentage	12%	80%	8%	%

In response to the statement that you think this book doesn't match to your mental level or it is complex, 80% students responded that they think that this book does not match their mental level, 12% students responded to always and only 8% responded to never.

Table 12: You like to know the application of the math you practicing in future

Responses	Always	To Some extent	Never	ax
Frequency	26	146	8	6
Percentage	14%	81%	5%	%

In response to the statement that you like to know the application of the math you practicing in future, 81% students responded to some extent, 14% responded to always and only 5% responded to never.

Table 13: Teacher give examples related to math and its application in other subjects

Responses	Always	To Some extent	Never	ax
Frequency	6	21	153	3
Percentage	4%	11%	85%	%

In response to the statement that Teacher give examples related to math and its application in other subjects, 85% students responded to never, 11% responded to some extent and only 4% responded to always.

Table 14: You think you improving your skills of mathematics

Responses	Always	To Some extent	Never	ax
Frequency	16	137	27	7
Percentage	80%	9%	11%	.90%

In response to the statement that you think you improving your skills of mathematics, 80% students responded to always, 11% responded to never and only 9% responded to some extent.

Table 15: You think the math you are studying is beyond your understanding

Responses	Always	To Some extent	Never	ax
Frequency	167	11	2	7
Percentage	92%	6%	2%	%

In response to the statement that you think the math you are studying is beyond your understanding, 92% students responded to always, 6% responded to some extent and only 2% responded to never.

Table 16: You are taught all the theorems in class given in the book

Responses	Always	To Some extent	Never	ax
Frequency	146	9	25	6
Percentage	81%	5%	14%	%

In response to the statement that you are taught all the theorems in class given in the book, 81% students responded to always, 14% responded to never and only 5% responded to some extent.

Table 17: You understand concepts of geometry

Responses	Always	To Some extent	Never	ax
Frequency	24	115	41	5
Percentage	13%	65%	22%	%

In response to the statement that you understand concepts of geometry, 65% students responded to some extent, 22% responded to never and only 13% responded to always.

Table 18: You like solving geometry in class

Responses	Always	To Some extent	Never	ax
Frequency	75	94	11	
Percentage	41%	52%	7%	%

In response to the statement that you like solving geometry in class, 52% students responded to some extent, 41% responded to always and only 7% to never.

Table 19: You like to solve math in your leisure time

Responses	Always	To Some extent	Never	ax
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Frequency	42	67	71	
Percentage	13%	38%	49%	%

In response to the statement that you like to solve math in your leisure time, 49% responded that they don't like to solve math in their leisure time, 38% responded to some extent and only 13% responded to always.

Table 20: Teachers give time individually for solving math problems

Responses	Always	To Some extent	Never	ax
Frequency	45	117	18	7
Percentage	25%	65%	10%	%

In response to the statement that teachers give time individually for solving math problems, 65% student responded to some extent that their teachers give time individually for solving math problems, 25% responded to always and only 10% students responded to never.

Table 21: You snatch geometry tools from your friend in math class

Responses	Always	To Some extent	Never	ax
Frequency	145	27	8	5
Percentage	80%	15%	5%	%

In response to the statement that you snatch geometry tools from your friend in math class, 80% students responded to always, 15% responded to some extent and only 5% responded to never.

Table 22: You enjoy doing math at home

Responses	Always	To Some extent	Never	ax
Frequency	18	86	76	
Percentage	11%	47%	42%	%

In response to the statement that you enjoy doing math at home, 47% student responded to some extent, 42% responded to never and only 11% responded to always.

Table 23: You have ever noticed the note boxes in your book

Responses	Always	To Some extent	Never	ax
Frequency	19	48	113	3
Percentage	11%	26%	63%	%

In response to the statement that you have ever noticed the note boxes in your book, 63% students responded to never, 26% responded to some extent and only 11% responded to always.

Table 24: You look at outline given in start of each unit

Responses	Always	To Some extent	Never	ax
Frequency	4	20	156	6
Percentage	3%	11%	86%	%

In response to the statement that you look at outline given in start of each unit, 86% students responded that they never look the outline given in start of each unit, 11% responded to some extent and only 3% responded to always.

Table 25: You use to memorize definitions from glossary given at end of the book

Responses	Always	To Some extent	Never	ax
Frequency	168	12	0	8
Percentage	93%	7%	0%	%

In response to the statement that you use to memorize definitions from glossary given at end of the book, 93% students responded that they always memorize definitions from glossary given at the end of the book, only 7% students responded to some extent and there were no such students that never see glossary.

Table 26: You experienced that your answers don't match to the answers of book

Responses	Always	To Some extent	Never	ax
Frequency	7	128	45	5
Percentage	4%	71%	25%	%

In response to the statement that you experienced that your answers don't match to the answers given in the book, 71% students responded to some extent, 25% responded to never and only 4% responded to always.

Table 27: You are known to those questions which have wrong answers in book

Responses	Always	To Some extent	Never	ax
Frequency	153	10	17	3
Percentage	5%	5%	90%	%

In response to the statement that you are known to those questions which have wrong answers in book, 90% students responded never, 5% responded to some extent and also 5% responded to always.

4.2 Discussion

Along with civilization, mathematics evolved as a field of study. In today's world, mathematics is an extremely vital topic for survival. This importance is reflected in the school curriculum and the emphasis placed on mathematical education. Mathematics has a special position in the school curriculum since it is essential for a person's well-being. However, it is well known that the majority of pupils see mathematics as difficult (Almanthari et al., 2020). Mathematical learning produces both cognitive and emotive consequences. Learning difficulties in mathematics are a widespread and major issue throughout the school years (Gafoor, 2015). Learning mathematics is like to building a complicated edifice; mastery of the fundamentals influences students' meaningful comprehension of mathematics (Acharya, 2017). The current study discussed the problems of secondary school students in mathematics curriculum. The results of the current study showed that the students found mathematics as difficult subject.

5 Conclusions

The research concluded that most of the teachers don't use AV aids for teaching geometry. A very few teachers solve examples related to the exercise. It is also concluded that most of the students help each other in study of mathematics by sharing the knowledge. Most of the students think that the book under curriculum match with their mental ability. Overall, the students show positive behaviour towards the learning of mathematics.

5.1 Recommendations

Student's concepts always need to be watched clearly and closely for that student should be motivated to ask question to raise question and to share their miss concepts. For this purpose, teacher need to build a friendly

behavior with the students. Teacher should also try to include the application and use of the mathematics in teaching to develop the power of logic and reasoning. This will also increase the student interest level.

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