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# Exploration of the Low Arithmetic Achievement on Primary Students: Teacher's Perspectives

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**Abstract.** According to the Trends in International Mathematics and Science Study (TIMSS), the level of Mathematics achievement in Malaysia for primary levels has seemed to be steadily decreased from 2003 to 2007. Although there are many efforts done by the government, NGOs, societies and parents in order to increase students' performance in mathematics, it is still decreasing significantly and unfortunately the same problems carry until when it comes to secondary level. Therefore, the purpose of this study was to identify the causes of weaknesses of students' achievement from the teachers' perspectives. In addition, this paper aims to determine the effective strategies approaches for low achievement in mathematics and lastly to improvise the teaching and learning process for the future. An exclusive interview with the experienced mathematics teachers from a public and private school was conducted.

**Keywords:** low performance, mathematics education, TIMSS, primary mathematics students

## 1. Background of the Study

On 28<sup>th</sup> Feb 1991, our former Prime Minister, Tun Dr. Mahathir Mohamad had introduced Wawasan 2020 in the "Mesyuarat Majlis Perdagangan Malaysia". One of the missions he emphasized was "Global World Trends" that pointed out that science and technology is paramount importance for the country's development. As mathematics was major component of science and technology, it should not be neglected by our society. It is an essential companion to the study of both science and art subjects. Thus, mathematics becomes compulsory for all the primary and secondary students. It is also one of the core subjects for the tertiary level.

Furthermore, mathematics plays significant important in our lives. In the school context, almost all subjects involve mathematics such as physics, chemistry, science, accounting and geographic. Thus, it is vital to inculcate the positive perception toward mathematics. However, students' ignorance toward mathematics shows the declining in achievement of this subject. The Trends in International Mathematics and Science Study (TIMSS) report revealed a plummeting trend in the position of Malaysia in the Mathematics subject where the rank fell from 16th (1999) to 10th (2003), 20th (2007) and 26th (2011), [1]. In addition, TIMSS record shows that the average marks for the Mathematics subjects fell from 519 points (1999), to 508 points (2003), 474 points (2007) and 440 points (2011); dropping by 79 points. Therefore, the purpose of this study is to explore the mathematical development of arithmetic problem students in the primary school in Klang Valley, Selangor from the



teachers' perspective. Study is to explore the mathematical development of arithmetic problem students in the primary school in Klang Valley, Selangor from the teachers' perspective.

## 2. Statement of the Problem

Despite the intensive efforts that have taken by the government, non-government organisation (NGOs), teachers, and parents to increase students' performance in mathematics, the result from a survey entitled "Trends in International Mathematics and Science Study" shows that the level of mathematics achievement in Malaysia for secondary levels did not indicate a positive increase from 2007 to 2011,[1]. Dean, states that one of the major causes of the decrease in students' achievement is their failure to understand what they have been taught in schools [2]. Students have difficulties to understand when teachers introduce a new topic that requires them to learn a new concept.

Another major problem related to effective teaching method is due to the time constraint of the teachers. According to Sheppard, teachers have heavy workloads other than teaching [3]. Most of their time is spent in non-classroom duties, for instance, student counselling, grading students' work, extra-curricular activities, and communications with parents. This situation results in time limitation for teachers to prepare any teaching strategies. Therefore, due to these time constraints, teachers prefer to follow the textbooks not only in terms of the given methods but also the exercises in order to complete the syllabi in the specified time. Thus, they opt to use the textbook method. Obviously, it is easier to teach mathematics by using the textbook approach. However, it is uninspiring for some students because of its dull and passive learning style.

Textbook method is very straightforward without any visualisation of the concepts of mathematics. As a consequence, students who learn the concepts of mathematics without visual styles cannot learn at their maximum potential. Students who were not taught by the appropriate learning styles cannot grasp the information from the teacher effectively. When they have to sit for examination, they tend to memorise the concepts of mathematics in order to pass the examination. This is opposite with the objective of learning mathematics that aims to make logical connections between different facts and concepts, and transform them into new ideas. In contrast, memorising the formulas, definitions, or theorems would not help students understand mathematics, especially at the higher level of education. They may have difficulties when dealing with the complicated or lengthy questions. Therefore, teachers must look for the alternatives to dodge the students from memorising mathematical concepts.

In short, there are three major causes of the low students' performance in mathematics, which are failure to understand the mathematical concepts, teachers' time constraint, and the students' tendency to memorise subject contents. This study aimed to address these problems by identifying the problematic arithmetic students, recognizing the suitable activities, examining the effective strategies and approaches, identifying the challenges faced by the teacher in the classroom, and improvising the teaching and learning for the future.

## 3. Objective of the Study

This study aimed to meet the objective:

1. To identify the children with arithmetic problem in the school.

## 4. Research Questions

Based on the objectives, this study aimed to answer the research questions:

1. How do the teachers identify children with arithmetic problem in the school?

## 5. The Significance of the Study

This study attempted to assist the students become aware of the factors that affect their performance in mathematics. Knowing such factors can help them identify their strengths and weaknesses that constantly interfere their performance in mathematics. This will, in turn inspire the students to overcome their weaknesses and hence, results to a good performance of students toward Mathematics. In addition, this study also provides teachers teaching mathematics with a better understanding of, and

a deeper insight into the needs and problems of their students. Furthermore, it serve as springboard for administrators to revise the mathematics curriculum that may improve mathematics instruction. Lastly, it might help in providing more accurate approaches on assessing the students' ability, and information they need in order to properly address their students' academic problems.

### *5.1 Low mathematics achievement*

Previous research was shown that many of primary students has difficulties in understanding mathematics. Haddad, conducted on sixth grade students is essential that the level of achievement in the units of measurement and calculations of the four geometric concepts and low level when compared to the level set by the judging committee [4]. In addition, in Al-Hayek, also shows the average of students in sixth grade basic skills in Jordan for sports in the collection of fractions, and put less than the acceptable level educationally [5]. A study of Abu Zeina, declared that there is a clear decline in student achievement in mathematics among the students of third grade and sixth primary [6].

Meanwhile, on Abdul Latif and Zechariah, research showed that the percentage of vulnerabilities are high in all subjects and in various grades from the fourth to the sixth primary, and also showed that the causes of weakness due to the teacher and incompetence, and the student, and put the family, social, and economic, to the automatic promotion, and the difficulty of the curriculum [7]. Therefore, it is proven by previous research which showed the decline achievement in mathematics among primary students due to several causes.

### *5.2 Family involvement*

Family involvement is the one of factor on students' successful [8]. They believe that families who are involved in their children's education, children earn higher grades and receive higher scores on tests, attend school more regularly, complete more homework, demonstrate more positive attitudes and behaviors, graduate from high school at higher rates, and are more likely to enroll in higher education than students with less involved families. For these reasons, increasing family involvement in the education of their children is an important goal for schools, particularly those serving low-income and other students at risk of failure. Scheffer, Mehlman and Howard, agreed that the trends of parental indifference towards the child, and family disintegration with a negative impact on student achievement at key stages [9].

In addition, Al-Sharkawi, believes that the importance of family status, and economic status of students in the process of academic achievement in primary schools in Kuwait, also highlighted the same study the impact of climate school on student achievement, where not taken into account preferences and students' attitudes, and abilities, as well as the inefficiency of teachers, and the adoption of decisions on the theoretical aspects [10].

### *5.3 Teaching methodology*

An effective teaching style engages students in the learning process and helps them develop critical thinking skills. Traditional teaching styles have evolved with the advent of differentiated instruction, prompting teachers to adjust their styles toward students' learning needs. Another weaknesses student in mathematics is due to the words problem. Understanding math is like understanding a foreign language. The students need to mastery and familiar with the mathematical terms so that they are able to understand the problems. Nile, pointed that there is a weakness among the students of the main stages in language skills, and confirms the reality of this weakness of students in key stages of the delay in the mastery of reading and writing skills, as well as weaknesses in the skills of writing the alphabet and calligraphy [11].

There are a number of studies that have been reviewed in this chapter that give various factors that may affect students' performance in mathematics. Some of the previous studies reviewed clearly state that several of methodology can be used in helping students to understand the mathematical concepts.

Therefore, understanding the students' capability and strength are important for teachers to develop the effective ways of approaching their students in teaching mathematics.

## 6. Methodology

This study was using phenomenology to understand how the problem occurred. According to Lester, "phenomenology is concerned with the study of experience from the perspective of the individual, 'bracketing' taken-for-granted assumptions and usual ways of perceiving" [12]. The best reason qualitative approach was used in this study is because it assists to obtain the information deeply from someone's experience. Marshall and Rossman, believed that one must try to understand the range of behaviour where people naturally engage [13]. Thus, Patton, affirms that by the using qualitative method, the researcher able to understand other's natural phenomenon and relate it in the real life [14]. An interview was conducted in order to find out the teachers' perception of the causes of poor achievement. It will focus on the teachers' perspective and understanding regarding this problem.

## 7. Data Collection and Analysis

The main goal of this study is to identify the teachers' perspective of poor achievement in mathematics. An interview was conducted for data collection. Face-to-face approach was been used. An interview was conducted to one of the mathematics teachers from a public and private schools at Klang Valley. The demographic questions were asked in order to get general view about the informant and a tape recorder was used to record the interview.

## 8. Results and Findings

The mathematics teachers' perception on low mathematical development in primary students has provide significant dimensions according to the research question.

### *Research Question 1: How does the teacher identify children with arithmetic problem in the school?*

#### *8.1. Disinclined to learn*

Mathematics needs more efforts while learning process. However, the students are lazy to think and make an effort. They prefer to obtain the explanation from the teacher rather than to think by themselves. The informant believes the students who are having arithmetic problem is disinclined to learn. He mentioned that:

*"Kids these days just had known by spoon feed. They don't want to think."*

Furthermore, the students also dislike reading long question:

*"They do not like to read a long question; in addition nowadays there are a lot of KBAT questions."*

These problem make the mathematics become more complicated because they are too dependent on the teacher while learning and do not try to overcome the laziness by themselves. In addition, the students already have a mind-setting that mathematics is difficult. The first informant said:

*"They had set in mind that mathematic is difficult"*

The students refuse to learn mathematics since they are not able to solve the mathematics problem. Besides, the second informant also agreed that the students already put the complexity of mathematics in their mind. She mentioned that:

*"Most of our friend said that mathematic is very difficult" (I2, 139)*

Therefore, it is difficult to instil the mathematics ideas since they already have a negative perception towards mathematics.

### 8.2. *Mathematical abstract concept*

Mathematics is prominent by its abstract concept. It has become one of the obstacles during learning mathematics. The informant believes that students feel difficult to understand the mathematical concepts due to the nonconcrete problem. The first informant stated that the students prefer to have direct problems rather than long question:

*“We are more preferred to answer direct question for example  $2+5$  compared to a problem solving question which very hard to explain”*

The second informant agreed with the first informant that the students unable to understand the problems although she already taught them that particular topic:

*“Students had been given mathematic exercise in class and they have to submit when they are done. For those who can do it means they are understands what they learn in class but, who cannot answer correctly means they are not understood at all and have to teach them again.”*

Another factor that makes the students feel that mathematics is difficult because they do not remember the formula and concept that they learn before. The first informant said that the students do not remember the formula, thus they cannot solve the mathematical problem:

*“...they do not remember the formula.”*

The second informant also said that her students are unable to understand the concept and recall the restored information. She said that:

*“He has a problem with writing numbers, for example 5, 2, 3 and he did it in inverted. If we teach a descending order of descent, the number would be decrease from a large number to a small number. Same goes with ascending small numbers to large numbers. When I was teaching him about descending and ascending he understood so well plus can do an exercise. But the next day, he will forget about everything that had been taught yesterday.”*

Moreover, in order to develop students' understanding in mathematics, the curriculum developers will set up the question which able to stimulate students' potentiality. However, the students having the difficulties in understanding the mathematical concept due to the lack of mathematical term. The informant believed that the students feel difficult to answer the question properly because they lack of understanding on the mathematical words:

*“There is one thing about mathematics which we do not understand the term.”*

In addition, the poor understanding students also easily getting confused of the mathematical concept. They students are unable to make sense of mathematics concept, thus, they are unable to identify the real ideas.

### 8.3. *Dispassionate*

The informant also realized that the students who have difficulties in understanding the mathematical concept due to lack of interest in mathematics.

*“...teacher, I do not like mathematics, if I am seeing mathematic question then I can become dizziness.”*

The second informant also agreed that her students having difficulties in understanding mathematics due to lack of interest in that subject. Furthermore, complication of mathematics is due to the teachers who failed to attract the students' attention. She said that:

*"She is actually does not have any interested in mathematics because of her past history. Her previous teacher taught mathematics syllabus too fast when she was in standard 1."*

She further explained that teachers give huge influence to attract students' interest in mathematics.

*"Interest. Teachers have to play an important role in making kids interested in math."*

Since the previous teachers failed to inculcate students' interest in mathematics, it leads to the reason why the students do not able to make an effort to understand the present knowledge. They already miss a lot of information during mathematics classes. It makes the students having lack of curiosity on new knowledge since they are unable to relate to the previous.

#### *8.4. Need individual learning*

Direct coaching or personal teaching of students is one of the methods to recognize students' problem. In a big class size, it is not easy to find the problematic students in math. Students also need individual coaching so that they are able to ask question directly. The informant believed that teacher must go to the particular students so that they are able to identify the problem. She said that:

*"I had explained to student that they can do it but when it came to Qayyum for example, absolutely I have to teach him personally."*

Furthermore, she also agreed that some students are not able to receive optimum information when they learn in a group. They prefer to have personal coaching rather than learning in groups.

*"They have to be coach by personally compared doing a group work. Personal coach is more effective to them and they can do it well when."*

Therefore, the informants realized that their students have difficulties to understand mathematical concept due to disinclined in learning, mathematical abstract concept, dispassionate and need individual learning. Findings from this study have provided various implication for educational practice. Teaching mathematics is not easy task. It requires higher order of thinking and imagination. However, the current students dealing with many influences. Therefore, teachers need to attract students' attention so that the teachers are able to recognize their students' strengths and weaknesses. In addition, teachers need to familiar with the different types of student. Family involvement also encourages the low achievement students in mathematics to increase their performance. Family encouragement is important to ensure that the teachers are capable to recognize the students' talents and weaknesses.

### **9. Conclusion**

As a conclusion, the causes of weaknesses of students' achievement are disinclined to learn, mathematical abstract concept, dispassionate and the need of individual learning. This causes help identify what type of teaching and learning strategies should teacher used in the class. This study shows several strategies and approaches to make the lesson interesting and meaningful which are interesting set of induction, schematic learning, classroom management, direct assessment, visualization and reinforcement. These approaches assist in develop and boost up students' curiosity towards mathematics. This study also provided the suggestion which mainly concern on the reviewing the present curriculum so it will emphasize more on particular subject rather than learning many things without strong foundation. Therefore, all parties including teachers, students, parents and

communities play important roles to ensure that every student will obtain their own chance to understand mathematics and they can learn in a significant environment.

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