# AN INVESTIGATION INTO THE PROBLEMS OF TEACHING AND LEARNING IN MATHEMATICS AT THE MIDDLE SCHOOL LEVEL

Lay Lay Hlaing[1], Htay Win[2]

## Abstract

The main purpose of this study is to investigate into the problems of teaching and learning in mathematics at the middle school level. Specifically, this study aims at identifying the problems of teaching in mathematics and proffering solution to them for teachers and the problems of learning in mathematics for students. The design adopted for this study was a descriptive research design. Four townships were randomly selected from four districts in Yangon Region. One high school and two middle schools from each township were selected by using a stratified random sampling technique. The participants in this study were (600) Grade Seven students and (63) mathematics teachers. The data were collected by means of two questionnaires administered to teachers and students. To get the reliability, a pilot test was administered. The internal consistency of questionnaire for teachers was (.646) and the questionnaire for students was (.614). In the analysis of data, descriptive statistics (percentage) was used. Some of the findings that emerged are: (1) the foundation of most mathematics teachers in mathematics is poor. (2) The students have poor foundation in mathematics. (3) The teaching and learning environment is not conducive. Based on the findings, it was suggested that (a) The state government should, as a matter of urgency, send mathematics teachers to attend training and seminars for effective teaching and learning. (b) The government should endeavor to provide the necessary infrastructures and facilities that will motivate teaching and learning of mathematics.

**Keywords**: problem, teaching, learning, mathematics

## Introduction

The teaching and learning of mathematics should be taken very seriously. Obodo (2000) averred that the problem of quality of mathematics instruction and learning are from diverse sources. The teacher has been accused to be responsible for the low quality of student performance in the current middle schools. Amazigbo (2000) has identified poor primary school

[1.] Tutor, Department of Physical Education, Bogalay Education College
[2.] Dr. Lecturer, Department of Methodology, Yangon University of Education

background in mathematics, lack of incentive for teachers, unqualified teachers in the system, lack of learner's interest, perception that mathematics is difficult, large classes and psychological fear of the subject as factors responsible for the dismal performance of students in the subject. Therefore, the researcher thought that it is essential to investigate the problems of teaching and learning in mathematics.

**Statement of the Problem**

The poor performance of students in mathematics has been a thing of concern to mathematics teacher and students themselves. At present most of mathematics teachers do not effort to identify the major problems associated with school mathematics. And then, the teachers rarely find the strategies that could solve the problems of teaching and learning mathematics. This is one of the real problems of the current mathematics classrooms.

**Purposes of the Study**

The main purpose of this study is to investigate the problems of teaching and learning in mathematics at the middle school level. The specific objectives are as follows.

1. To identify the problems of teachers in teaching mathematics.
2. To examine the strategies that could solve the problems of teaching and learning mathematics.
3. To identify the problems of students in learning mathematics.
4. To give suggestions for improving teaching and learning mathematics.

**Research Questions**

The research questions are as follows.

1. Which are the most serious problems of teaching in mathematics?
2. To what extent do the teachers respond to the strategies that could solve the problems of teaching mathematics at the middle school level?
3. Which are the most serious problems of learning in mathematics?

## Scope of the Study

This research has its own particular limitations. The first limitation is related to the fact that the participants of the study came from only twelve selected schools from Yangon Region. Four Basic Education High Schools and Eight Basic Education Middle Schools were included in this study. Participants in this study were (600) Grade Seven students and (63) middle school mathematics teachers from the twelve selected schools in the academic year (2016-2017). The second limitation is that this study is only concerned with the teachers' questionnaire in which the problems such as students' background knowledge, maintaining and arousing students' interest, anxiety, teaching aids, characteristics of mathematics teacher, students' problem solving skill, motivation, teachers' qualification, class size and teacher's over workload were consisted. Besides, researcher seeks to identify the strategies that could be adapted to solve the problems of teaching mathematics in which the characteristics of the effective mathematics teachers and creating quality learning environments were consisted. The third limitation is the questionnaire for students in which the general problems of students' learning in mathematics were consisted.

## Definition of Key Terms

**Problem** : A matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome (English Oxford Living Dictionary, 2016).

**Teaching** : Teaching is a form of interpersonal influence aimed at changing the behavior potential of another person (Gage, 1962).

**Learning** : Learning is a change in behavior (Pangborn, 2002).

**Mathematics** : The science of numbers and of shapes, including Algebra,

Geometry and Arithmetic (The Longman Company, 2009).

**Significance of the Study**

The teaching and learning of mathematics is a complex activity and many factors determine the success of this activity. The nature and quality of instructional material, the presentation of content, the pedagogic skills of the teacher, the learning environment, the motivation of the students are all important and must be kept in view in any effort to ensure quality in teaching-learning of mathematics.

Amazigbo (2000) identified poor primary school background in mathematics, lack of incentives for teachers, lack of learners' interest perception that mathematics is difficult as problems for the dismal performance of students in the subject. Osafehinti (1986) posits that if a student has a positive attitude towards mathematics, he will not only enjoy studying it but will also derive satisfaction from the knowledge of mathematical ideas he gains. Obodo (2002) explains further, if a student has a positive attitude towards mathematics, he will definitely interest in its teaching and learning.

Muhammad (2000) found that the students' anxiety about getting zero if they solved their problems in different way or through other method than those followed by teachers. Hossain (2000) found that the teachers used not at all teaching aids in the classroom except geometric tools sometimes in geometry class in similar way and their findings show that teachers make and execute that they cannot use teaching aids for the shortage of time to lesson plan.

Singh (as cited in Rathva, 2012) stated that mathematics is crucial not only for success in school, but in being an informed citizen, being productive in one's chosen carrier, and in personal fulfillment. Mathematical problem is used as not only to help students develop their thinking ability. Students can apply their knowledge and problem solving skill in daily life since the process of solving the mathematics problems are similar to the general problem solving in their lives.

Swan and Jones (as cited in Umameh, 2011) found that teachers should receive appropriate training in the subject matter area so that their classroom instruction could be above broad. For example, mathematics

teachers who have completed Ph.D. course work in mathematics and an advanced certificated course in education are more effective than poor teacher without such advanced training in education.

Carron and Chau (as cited in Ministry of Education, 2007) found that certain teachers have an insufficient mastery of the subject matter they teach, and lack the pedagogical knowledge - how required for good presentation of the materials. Many teachers identified this as a problem for themselves. Willims (as cited in Ministry of Education, 2007) found that children who were in classes of more than (25) students were (1.5) times more likely to demonstrate lower test scores and higher grade repetition increased. The number of students is so large in the class that it become hard to focus and teacher fails to pay attention to all the students, as a result the weakness and problems of mathematics remain unsolved. According to American international journal of contemporary research shows that (27.8%) of mathematics teachers teach more than (30) lessons in a weeks. According to the Ministry of Education (2007), a teacher in a secondary school is supposed to teach at most (30) lessons on a week. This indicates that (27.8%) of mathematics teachers are over work load. This percentage is high and many contribute to poor performance in mathematics.

According to the facts mentioned above, it is needed to identify the problems of teaching and learning of mathematics in Myanmar and mathematics teachers need to consider how to overcome these problems successfully.

## Theoretical Framework

### Importance of the Background Knowledge in Mathematics

A person's background knowledge is a collection of abstracted residue that has been formed from all of life's experiences. All person, whether as a toddler or a centenarian, bring diverse bits of background knowledge consciously or subconsciously to every subsequent experience, and ones use them to connect or glue new information to old. Background knowledge is an essential component in learning because it helps them to link sense of new ideas and experiences with the old one. If the students do not have enough

background knowledge in mathematics, it may be a problem for successful learning in mathematics.

**Arousing and Maintaining Interest in Mathematics**

To arouse and maintain the student's interest in mathematics is a major problem for the teacher. It is clear that loss of interest is one of the principle causes of student failure. A strong interest in mathematics would tend to produce a favorable attitude toward the subject, and such an attitude would in turn probably lead to or enhance the desire to study mathematics in a serious and productive way. Thus the development and stimulation of interest in mathematics becomes an important concern of the teacher. If the students do not have enough to arouse and maintain interest in mathematics, it may be a problem for successful learning in mathematics.

**Mathematics Anxiety**

Although mathematics' importance and applications in everyday life, it is often considered as a difficult subject. Research has demonstrated that many students have learning difficulties and show poor performance in mathematics. One of the attributed reasons is the anxiety that an individual may have towards mathematics. Mathematics anxiety is an important factor that affects students' achievement and attitude towards mathematics (Hembree, 1990). It may lead to poor performance and avoidance of mathematics. If the students have high anxious in mathematics, it may be a problem for successful learning in mathematics.

**The Use of Teaching Aids (Instructional Materials) in Mathematics**

The use of sensory aids in the teaching of mathematics is of recent origin. In fact, all teaching has always involved the communication of ideas through the sense either orally through the medium of a speech, or visually by the use of written or printed material, text-books, writing materials, geometrical instruments and the blackboard (all these are sensory aids) have long been regarded as indispensable equipment for mathematics classes. For many years resourceful teachers have used models, instruments, drawings, and other devices to stimulate interest and facilitate learning. But for a long time the potential values of these supplementary devices were fully realized only

by exceptional teachers. Only lately has there been a concerted effort among leaders in mathematics teaching at making all the teachers alive to these possibilities. Mathematics is essentially a subject, where doing is more prominent than reading. That is why a certain amount of equipment is indispensable in order to make even a start in this subject. Moreover, it is felt by a vast majority of people that mathematics is a dry and difficult subject, full of abstract things. The result is that students take very little interest in it. To create the necessary interest is a constant problem for the teacher. This subject demands the use of aids at every step.

**Characteristics of Effective Mathematics Teachers**

The effectiveness of a specific individual as a teacher depends on a mix of such factors as (1) personal and professional qualifications; (2) the nature of the student population to be taught; and (3) the workplace condition that foster effectiveness or inhibit it. Although these characteristics vary in the literature, Ralph and Fennessey (as cited in Joseph & Leonard, 1998) stated that they generally involve the presence of a combination of (1) strong leadership by administrators; (2) a school climate that is safe and orderly; (3) an emphasis on basic academic skills; (4) a high level of teacher expectation for all learners; and (5) a system for monitoring and assessing student performance. The qualified and competent teacher realizes that principles and techniques of teaching that have been found to be effective in one classroom are not always equally effective in a different classroom. Thus, the teacher must use of judgment in deciding when and how to apply these principles and practices. According to Brophy (1982), the following observations are presented as guidelines for effective teaching.

1. Effective teachers take their jobs seriously.
2. Effective teachers provide children with an opportunity to learn.
3. Effective teachers manage their classrooms efficiently.
4. Effective teachers pace instruction to ensure that learners will be involved in meaningful tasks.
5. Effective teachers are active teachers.
6. Effective teachers have learners master desired outcomes.

7. Effective teachers recognize grade-level differences that require different teacher behavior.
8. Effective teachers provide a supportive learning environment.

Every teacher should possess above characteristics for promoting students learning in mathematics.

**Students' Problem Solving Skill**

Life is full of problems and the successful man in life is he, who is fully equipped with adequate knowledge and reasoning power to tackle these problems successfully. Problem solving becomes the central activity of the teaching mathematics. Resenbloom (1966) asserts that problem solving is a basic mathematical activity. Teaching for problem solving and learning problem solving skills, therefore, become the primary and important concerns of the teacher and the learners. National council of Teachers of Mathematics (as cited in Taplin, n.d.) advocated that all of the students, starting from the pre-school, should be made to acquire the behavior of building mathematical knowledge, being able to solve problem not only in mathematics but in every field as well, applying the proper problem solving strategies, and evaluating the problem solving. Because problem solving makes it possible to structure knowledge and to bring into connection with the other knowledge, it is included in the center of mathematics programs. Practicing on mathematics problems makes it possible to be developed aimed at the rational solutions of problems and enables these strategies to be adapted to all kinds of problem to encounter in life by leading to mathematical thinking. Development of mathematical ideas through problem solving is a difficult part of teaching mathematics. Teachers play an important role in the development of students' problem solving dispositions by creating and monitoring classroom environment in which students are encouraged to explore, take risks, share failures and successes, and questions with one another. In such supportive environment, students develop confidence in their abilities and a willingness to engage in and explore problems, and they will be more likely to pose problems and to persist with challenging problems. If students do not possess problem solving skill, they will not overcome their daily life problems successfully.

## Incentive to Motivate Teachers

Motivation comes from many sources. Some teachers are motivated by their love of children and of teaching, some by more external factors such as a stable or the advantages of having more leave time. Most teachers are motivated by a complex combination of internal and external factors. Incentives used to motivate some teachers may antagonize others. Incentives are sometimes used by government and education leaders to encourage teachers to behave differently, presumably in ways that promote the ends desired by those giving the incentives. Indirect incentives include all the other financial resources offered to teachers. These might include: (a) professional support such as initial and ongoing training, teacher guides, resource books, instructional supervision; and (b) personal support such as free and subsidized housing, food and transportation. To the extent that incentives do work, research suggests that financial incentives appear to be more effective than other types of inputs. Vegas and Umansky (2005) suggest nine types of action that can operate as incentives in attracting teachers, retaining teachers, or in encouraging more effective teaching. These include intrinsic motivation, recognition and prestige, salary differentials, job stability, pension and benefits, professional growth, adequate infrastructure and teaching materials, subject master, and responding to stakeholders.

## Teachers' Qualification

A poor teacher can only produce poor results. Sizer (as cited in Umameh, 2011) stated that a competent mathematics teacher will be a teacher with good academic and pedagogical backgrounds, who is not easily worn out by the system. As in the case of other teachers, many things are expected of the teacher of mathematics. His obligations not only are confined to the classroom but extend in many other directions also. It must not be forgotten, that his first and foremost obligation is to teach his subject effectively. Teaching mathematics is a task which, if sincerely undertaken, will challenge the best efforts of the best teacher. No teacher can do a thoroughly good job of teaching aspects of any true profession viz., significant knowledge and effective techniques. One cannot be efficiently professional if there is any serious weakness in either of the two. The beginning teacher will need to speed most of his time in improving his knowledge of his field and techniques

of teaching, and becoming familiar with the traditions and administrative policies of the school. According to Sidhu (1995), the teachers of mathematics need to possess in general qualities and qualifications. Some of these are stated as follows.

1. Thorough knowledge of the subject
2. Interest in the subject
3. Knowledge of the child psychology
4. Enthusiasm for the subject
5. Capacity to inspire confidence in the students
6. Full knowledge of the objectives of the teaching of the subject
7. Up-to-date knowledge of the subject
8. Capacity of analysis and comprehensive description
9. Originality

Every teacher should possess above general qualities and qualifications for promoting students learning mathematics.

**Class Size**

According to Sidhu (1995), large class is general defect. No individual attention can be paid. It becomes difficult for the teacher to establish close contacts with the students. He cannot easily judge the capacities of the individuals. For education to be effective, teaching staff strength has to be adequate. A student-teacher ratio of (40:1) may be considered adequate but the situation is far from this in many schools. Card and Krueger (cited in Umameh, 2011) showed that both low pupil-teacher ratios and high quality school systems lead to higher future earnings for students. Finn (1998) concluded that no doubt that small classes have an advantage over larger classes in school performance and Krueger (1998), in a similar study confirms the original findings that students in small classes scored higher on standardized test than students in regular classes. Many studies indicate that reduced class size have a great impact in the progress of student achievement. The students are expected to do class works, home works and assignments

frequently and the teacher is expected to correct these assignments and give feedback to the students, but when the number of students in a class is very big it makes this task impossible and it affects the progress of each child because of not getting the correct feedback timely. The large class size has also other impacts such as suffocated classrooms, hinder active participation of all students in class discussions, inconvenience in assessing each child, uncomfortable sitting and writing conditions etc. Therefore, large class is also a problem of teaching and learning mathematics.

### Teachers' Over Work Load

Teachers are hugely committed professionals who work hard to put the needs of their pupils first. Their role is very rewarding but demanding and teachers want to spend their time on the things that will make the biggest difference to pupils' learning and progress. School leaders have a direct influence on the staff in their schools. No head-teacher wants to cause unnecessary and unproductive work for their teachers. As in the case of other teachers, many things are expected of the teacher of mathematics. So, the teacher is over work load on all sides and to follow the way of least resistance, he emphasizes cram work. He cannot adopt, and prepare for effective methods, as he has no spare time. His over work load does not allow him, time to remove individual difficulties (Sidhu, 1995).

## Research Method

### Research Design and Procedure

A quantitative research method was used in this study. The research design used in this study was a descriptive research design. First of all, the researcher explored the relevant literature concerning with the research. Secondly, in order to get the required data, the researcher constructed the instruments. Content validity was determined by expert judgment. After getting the validity of these instruments, a pilot testing was conducted. The modified instruments were distributed to all participants of the twelve sample schools and a test was administered with the help of the teachers of those schools in January 2017. After three weeks, all the instruments were returned,

and then the data were entered into the computer data file and were analyzed using the Statistical Package for the Social Science (SPSS 22).

**Instruments**

**(i) Questionnaire for Teacher**

This questionnaire was used to investigate the problems of teaching mathematics. This consisted of two main parts: the problems of teaching mathematics and the strategies that could solve the problems of teaching mathematics. The second part was based on two areas: creating quality learning environment and the performance of effective mathematics teachers. Items (1, 2, 3 and 4) were concerned with creating quality learning environment and items (5, 6, 7, 8, 9 and 10) with the performance of effective mathematics teachers. The items were constructed based on a five point Likert-type scale from (1) to (5). For each item, the score closer to (1) indicated 'Strongly Disagree' and 'Strongly Agree' was indicated by the score closer to (5). The total scores of agree and strongly agree will define the level of the problems. It means that if the total scores of agree and strongly agree is high, the level of the problems will be high and the total scores of agree and strongly agree is low, the level of problems solving skill will be low. An expert review was conducted by (10) expert teachers. According to the pilot study, the internal consistency (Cronbach's Alpha) was (.646).

**(ii) Questionnaire for Student**

This questionnaire was used to investigate the problems of learning mathematics. There are ten items dealt with background knowledge of students, lack of interest, motivation, anxiety, students' problem solving skill, lack of instructional materials, inadequate mathematics teachers in terms of number and quality, support of parents, support of family and lack of mathematical instrument in this questionnaire. The items were constructed based on a five point Likert-type scale from (1) to (5). For each item, the score closer to (1) indicated 'Strongly Disagree' and 'Strongly Agree' was indicated by the score closer to (5). The total scores of agree and strongly agree will define the level of the problems. It means that if the total scores of agree and strongly agree is high, the level of the problems will be high and the total scores of agree and strongly agree is low, the level of problems will be low.

An expert review was conducted by (10) expert teachers. According to the pilot study, the internal consistency (Cronbach's Alpha) was (.614).

## Population and Sample Size

The sample schools for the study were selected by using a stratified random sampling technique. One high school and two middle schools from each township were selected as the sample schools. Therefore, twelve schools (four high schools and eight middle schools) are included in this study. All mathematics teachers and Grade Seven students from the selected schools were selected as the sample of the study. The number of students and teachers were (600) and (63) respectively. Participants in this study were selected randomly. Table (1) shows the number of population and the sample size in the selected schools.

**Table 1 Population and Sample Size**

| No. | Townships | School | No. of Teacher | Population | No. of Student | | |
|---|---|---|---|---|---|---|---|
| | | | | | Male | Female | Total |
| 1 | Yankin | BEHS 2 | 6 | 267 | 29 | 21 | 50 |
| 2 | Yankin | BEMS 2 | 5 | 84 | 22 | 28 | 50 |
| 3 | Yankin | BEMS 4 | 4 | 76 | 26 | 24 | 50 |
| 4 | Mayangone | BEHS 1 | 8 | 402 | 23 | 27 | 50 |
| 5 | Mayangone | BEMS 3 | 4 | 113 | 26 | 24 | 50 |
| 6 | Mayangone | BEMS 5 | 4 | 182 | 23 | 27 | 50 |
| 7 | Dala | BEHS 1 | 7 | 340 | 25 | 25 | 50 |
| 8 | Dala | BEMS 2 | 3 | 62 | 22 | 28 | 50 |
| 9 | Dala | BEMS 3 | 4 | 97 | 23 | 27 | 50 |
| 10 | Insein | BEHS 6 | 6 | 204 | 26 | 24 | 50 |
| 11 | Insein | BEMS 3 | 6 | 153 | 21 | 29 | 50 |
| 12 | Insein | BEMS 10 | 6 | 175 | 24 | 26 | 50 |
| **Total** | | | **63** | **2155** | **290** | **310** | **600** |

**Note**: BEHS = Basic Education High School
BEMS= Basic Education Middle School

## Data Collection

The modified instrument were distributed to all participants of the twelve sample schools with the help of the headmaster/headmistress of those schools.

## Data Analysis

After three weeks, all the participants' answer sheets were gathered and their answer sheets were scored. In order to know the teachers' problems and students' problems questionnaires, descriptive statistics (percentage) was used.

## Research Findings

### Findings of the Problems of Teaching Mathematics

In order to find out the problems of teaching in mathematics, a questionnaire for teachers was used. According to the results, the teachers strongly agree to the facts that the poor foundation of students, teachers' qualification, over work load of teachers and incentives to motivate teachers are the most serious problems of teaching mathematics. This result shows that the first three serious problems are the background knowledge of the students, the characteristics of effective teachers, and students have problems even when similar examples are given (students' problem solving skill) (see Table 2).

**Table 2:** Percentage of Teachers Response to each Problem

| No | Problem | Percentage of Teachers' Response | | | | |
|---|---|---|---|---|---|---|
| | | SDA | DA | N | A | SA |
| 1 | Background knowledge of students | 0 | 5 | 2 | 46 | 47 |
| 2 | Lack of interest | 6 | 36 | 18 | 37 | 3 |
| 3 | Anxiety | 5 | 25 | 9 | 48 | 13 |
| 4 | Use of instructional materials | 2 | 20 | 2 | 65 | 11 |
| 5 | Characteristics of effective teachers | 0 | 3 | 5 | 71 | 21 |
| 6 | Students' problem solving skill | 0 | 16 | 2 | 66 | 16 |
| 7 | Incentive to motivate teachers | 2 | 17 | 10 | 46 | 25 |
| 8 | Teachers' qualification | 6 | 16 | 5 | 46 | 27 |
| 9 | Class size | 6 | 21 | 10 | 49 | 14 |
| 10 | Over work load of teachers | 3 | 16 | 2 | 53 | 26 |

**Note:** SDA = Strongly Disagree, N = Neutral, SA = Strongly Agree
DA = Disagree A = Agree

## Findings of Strategies that could Solve the Problems of Teaching in Mathematics

In order to find out the strategies that could solve the problems of teaching in mathematics, a questionnaire for teachers was used. About (49%) of the teachers strongly agree to the fact that the teachers should use appropriate method to be able to work their homework lessons smoothly. According to the results, the teachers strongly agree to the facts that using relevant teaching methods, motivation, managing class size and giving feedback are the best strategies that could solve the problems of teaching mathematics. This result shows that the highest percentage of strategies that could solve the problems of teaching in mathematics are the using relevant teaching methods, motivation for students, giving feedback, caring for individual differences, relating real life situation, creating positive learning environment (see Table 3).

**Table 3:** Percentage of Teachers Response to each Strategy

| No | Strategy | Percentage of Teachers' Response | | | | |
|---|---|---|---|---|---|---|
| | | SDA | DA | N | A | SA |
| 1 | Using relevant teaching aids | 0 | 2 | 0 | 81 | 17 |
| 2 | Making available for school facilities | 0 | 3 | 0 | 70 | 27 |
| 3 | Creating positive learning environment | 0 | 0 | 0 | 64 | 36 |
| 4 | Managing class size | 0 | 0 | 2 | 57 | 41 |
| 5 | Motivation | 0 | 0 | 0 | 52 | 48 |
| 6 | Relating real life situation | 0 | 0 | 0 | 63 | 37 |
| 7 | Using relevant teaching methods | 0 | 0 | 0 | 51 | 49 |
| 8 | Caring for individual differences | 0 | 0 | 0 | 62 | 38 |
| 9 | Using practical work | 0 | 3 | 3 | 65 | 29 |
| 10 | Giving feedback | 0 | 0 | 0 | 60 | 40 |

Note: SDA = Strongly Disagree, N = Neutral, SA = Strongly Agree
DA = Disagree A = Agree

**Findings of Problems for Students**

In order to find out the problems of students' learning mathematics in general, a questionnaire for students was used. According to the results, the students strongly agree the fact that background knowledge of the students, lack of mathematical instruments, lack of instructional aids and inadequate mathematics teachers are the most serious problems of learning mathematics. This result shows that the first three serious problems of learning mathematics are the poor foundation of the students (background knowledge), lack of instructional aids, and lack of mathematical instruments (see Table 4).

**Table 4:** Percentage of Students Response to each Problem

| No | Problem | Percentage of Students' Response | | | | |
|---|---|---|---|---|---|---|
| | | SDA | DA | N | A | SA |
| 1 | Lack of Background knowledge of students | 2 | 2 | 3 | 27 | 66 |
| 2 | Lack of interest (motivation) | 19 | 22 | 13 | 34 | 12 |
| 3 | Lack of hard work | 27 | 37 | 16 | 16 | 4 |
| 4 | Anxiety | 14 | 21 | 15 | 35 | 15 |
| 5 | Problem solving skill | 25 | 34 | 14 | 19 | 8 |
| 6 | Lack of instructional aids | 8 | 10 | 7 | 37 | 38 |
| 7 | Inadequate mathematic teachers | 13 | 20 | 20 | 25 | 22 |
| 8 | Parental involvement | 29 | 28 | 8 | 24 | 11 |
| 9 | Support by family | 14 | 28 | 13 | 30 | 15 |
| 10 | Mathematical instruments | 12 | 11 | 5 | 30 | 42 |

**Note:** SDA = Strongly Disagree, N = Neutral, SA = Strongly Agree
DA = Disagree A = Agree

## Discussion, Suggestions, and Conclusion

### Discussion

The place of mathematics in the life of any nation is linked with the place of development in that nation. In this changing world, those who understand and can do mathematics well will have significantly enhanced opportunities and options for shaping their future. The knowledge of mathematics is an essential tool in one's society. One cannot lead his daily life activities very well without basic knowledge of mathematics. Therefore, it is necessary for everyone to have a good foundation of mathematics to lead his daily life activities properly. So, to develop the country, the teaching and learning of mathematics should be taken very seriously. The quality of mathematics that will pave way for the much needed pursuit in science and technology at the higher level is a matter of concern. Quality has to do with the attainment of standards and standards ensure accountability.

The teachers pointed out the problems of teaching in mathematics. Teachers' problems from highest to lowest are as follows.

1. Background knowledge of the students
2. Characteristics of effective teachers
3. Students' problem solving skill
4. Over work load of teachers
5. Use of instructional materials
6. Teachers' qualification
7. Incentives to motivate of teachers
8. Class size
9. Anxiety
10. Lack of interest

This result shows the most serious problems of teaching in mathematics. So, this finding reveals the answer of research question (1): Which are the most serious problems of teaching in mathematics?

The teachers pointed out the strategies that could solve the problems of teaching in mathematics. Teachers' strategies from highest to lowest are as follows.

1. Using relevant teaching methods
2. Motivation
3. Giving feedback
4. Providing for individual differences
5. Relating real life situation
6. Creating positive learning environment
7. Managing class size
8. Using relevant teaching aids
9. Making available for school facilities
10. Using practical work

This result shows the first highest percentage of strategies that could solve the problems of teaching in mathematics. So, this finding reveals the

answer of research question (2): To what extent do the teachers respond to the strategies that could solve the problems of teaching in mathematics at the middle school level?

The students pointed out the problems of learning in mathematics. Students' problems from highest to lowest are as follows.

1. Background knowledge of the students
2. Lack of instructional aids
3. Lack of mathematical instruments
4. Anxiety
5. Inadequate mathematics teachers
6. Lack of interest
7. Support by family
8. Parental involvement
9. Problem solving skill
10. Lack of hard work

This result shows the most serious problems of learning in mathematics. So, this finding reveals the answer of research question (3): Which are the most serious problems of learning in mathematics?

## Suggestions

On the basis of research findings and related literature, some suggestions are given under three headings: suggestions for teachers, suggestions for others and suggestions for further studies.

**Suggestions for Teachers:** A person's background knowledge is a collection abstracted residue that has been formed from all of life's experiences. So, it is an essential component in learning because it helps him make sense of new ideas and experience. To overcome the problem of lack of background knowledge of the students, the teachers should confront every new topic with four basic instructional problems; (1) teaching for understanding, (2) teaching for assimilation, (3) teaching for permanence, and (4) teaching for transfer. To

arouse and maintain the students' interest in mathematics is a major problem for the teacher.

Genuine interest in mathematics probably depends basically upon the problem solving aspect of the subject. If mathematics is properly taught, the teacher should present the student with an abundance of problems, and also provide him with certain general modes of thought and a supply of techniques which enable him to attack these problems successfully. With each successful solution he receives a dividend of satisfaction he feels good when he gets the answer.

Posamentier and Stepelman (1986) expressed (13) ways to overcome mathematics anxiety. They are relax and enjoy, curb excessive competitiveness, no speed tests, praise a pupil's effort, never humiliate, develop a sense of humor, be a positive role model, do not use mathematics as a punishment, treat girls and boys equally, develop spatial relations, have pupils make up problems and humanize mathematics. Therefore, these ways should be used to overcome mathematics anxiety among the students.

One of the important components of the problem solving process is the problem solving procedures. The use of suitable problem solving procedures is significant in term of being successful in solving problems. Teacher should teach students how to solve problems by using appropriate problem solving procedures.

**Suggestions for Others:** There are inadequate number and quality of mathematics teachers. To overcome this problem, mathematics teachers' pre-service and in-service training must be encouraged and funded. Some innovative teaching methods and instructional strategies combined with new technologies in mathematics to enhance effective and efficient teaching and learning.

There are no incentives to motivate the teachers to be put in the best. To overcome this problem, the education and government decision makers should exhibit intense interest in identifying specific actions and benefits they might use as incentives to encourage valued teacher behaviors. They also should come up with packages that will motivate mathematics teachers and reward hardworking teachers and students.

Teachers' qualification is a common defect in educational set-up that most of the subject teachers are not adequately qualified in the subjects concerned. Without proper qualifications and proper training, they fail to do justice to the subject. A teacher may be able to show good examination results in spite of his low qualifications, but even that is not a sufficient criterion to allow him to continue with the teaching of his subject. An adequate, high qualification of the teacher develops self-confidence in him and serves as a source of inspiration to his students. The teacher must be master in his subject. Professional training should equip him to attain desirable standards in teaching. He must possess real knowledge of and insight into, the processes of mathematics and their effective teaching.

A large class size is a general problem. No individual attention can be paid in a large class. It becomes difficult for the teacher to establish close contact with the students. He cannot easily judge the capacities of the individuals. This problem, can be removed by limiting the number of students in each class up to a maximum of forty-five.

The teacher is over work loaded on all sides and, to follow the way of least resistance, he emphasizes cram work. He cannot adopt, and prepare for, effective methods, as he has no spare time. His work load does not allow him time to remove individual difficulties. It should be lightened to enable him to show his originality and initiative.

There is a serious lack of mathematical apparatus (such as compass, dividers, protractor, set square, etc.) in the schools. There should be an adequate provision of concrete materials in the classroom. Without them, the subject becomes abstract. The establishment of a mathematical laboratory will remove this problem. Though it is mainly the job of the management and higher authorities, the teachers' enthusiasm towards its establishment is also necessary. Thus, the government through the Ministry of Education should, as a matter of urgency, endeavor to provide necessary infrastructures and facilities that will motivate teaching and learning mathematics, and buy educational materials such as text books and other equipment as per requirements in the curriculum.

**Suggestions for Further Studies:** This study was dealt with the problems of teaching and learning in mathematics such as background knowledge of the students, maintaining and arousing students' interest, anxiety, teaching aids, characteristics of mathematics teacher, students' problem solving skill, incentive to motivate, teachers' qualification, class size and teacher over work load. Therefore, further studies should be conducted for other problems. This research is concerned with the problems of teaching and learning in mathematics of Grade Seven students. Further studies should be conducted to find out the problems of teaching and learning in mathematics at other Grade levels.

## Conclusion

Today's world largely depends on science, and science in turn depends on mathematics.

Although there is no fixed rule for good practices, examining existing problems of teaching and learning can be put forth towards creating better practices. As prerequisites for an effective mathematics lesson, teachers must be competent in the subject content knowledge, possess good pedagogical skills especially questioning, and have a good relationship with their students. Furthermore, as change in the real world is inevitable, it is therefore vital for mathematics teachers to constantly learn and update their instructional practices and find and solve the problems of teaching and learning mathematics so as to promote and equip students with the required mathematical understanding to meet the challenges of the 21$^{st}$ century.

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