A STUDY OF THE RELATIONSHIP BETWEEN THE MIDDLE SCHOOL STUDENTS' MATHEMATICS-RELATED BELIEF SYSTEMS AND THEIR PROBLEM SOLVING ABILITY

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Abstract

The main purpose of this research is to study the relationship between the middle school students' mathematics-related belief systems and their problem solving ability. A quantitative research method and descriptive research design were used to study students' mathematics-related belief systems and their problem solving ability. This study was conducted in Yangon Region. The sample schools for this study were randomly selected. Two high schools and one middle school were selected from each district, Yangon Region. Therefore, eight high schools and four middle schools were included in this study. The (600) Grade Eight students were participated in this study. A Mathematics-Related Beliefs Questionnaire (MRBQ) and a problem solving ability test were used as instruments. To measure the reliability of the instrument, a pilot test was conducted to (50) Grade Eight students. The internal consistency (Cronbach's Alpha) of the students' Mathematics-Related Beliefs Questionnaire (MRBQ) was (.736) and students' problem solving ability test was (.733). This means that these instruments have the reliability. The copies of modified instrument were distributed to all the participants of the twelve selected schools with the help of the headmaster/headmistress and teachers from those schools. The data were analyzed by using the descriptive analysis techniques and Person product moment correlation in this study. The research finding revealed that there were positively moderate relationships between the students' beliefs about mathematics education and their problem solving ability ($r = .615$, $p < .01$), the students' beliefs about the self and their problem solving ability ($r = .635$, $p < .01$), the students' beliefs about the social context and their problem solving ability ($r = .606$, $p < .01$). Furthermore, the relationship between the students' mathematics-related belief systems and their problem solving ability was positively high relationship ($r = .790$, $p < .01$). Findings pointed out that the students' mathematics-related belief systems influence on the students' problem solving ability, so there is a relationship between students' mathematics-related belief systems and their problem solving ability.

Keywords: Students' Mathematics-related Belief Systems, Problem Solving, Problem SolvingAbility

Introduction

Education is essential for everyone. It enables an individual to make his life better both as an individual and as a member of his society. Mathematics education also plays a vital role in the present day scientific and technological world. One cannot also do without the use of fundamental processes of mathematics in daily life. It can be visualized as the vehicle to train a person to think, reason, analyze, and to articulate logically. So, mathematics is very important for everyone. Moreover, mathematics is a subject that is filled with problems. According to Branca (1980, cited in Rahayu & Kartono, 2012), the ability of problem solving is the heart of mathematics. Op'tEynde and De Corte (2004) explained that in order for students to become competent problem solvers they must develop a mathematical disposition, where affect plays a major role. More specifically, student's mathematics-related belief systems form a central component of a mathematical disposition and have a strong impact on learning and problem solving (Op'tEynde & De Corte, 2004).

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Statement of the Problem

Mathematics is very important subject. It is a compulsory subject from the primary school level to high school level in Myanmar. However, over four years of the teaching career of the researcher, it was found that many students have the hateful notion in mathematics learning. They may think that learning mathematics and calculating mathematical problems are unattainable tasksand these are not related real life situation. This hateful notion seems to be undermined their mathematics achievement and problem solving ability. A large number of teachers hope that students will be able to improve the mathematics achievement and problem solving ability.

Schoenfeld(1989) pointed out that students' ability to solveproblems is often undermined by their beliefs about mathematics. So, it is important thing that students must possess positive beliefs about mathematics to do mathematical tasks unreservedly. But, the researcher thinks that most students do not have beliefs about mathematics. This is undoubted aspect that beliefs play great role in mathematics learning and teaching.

Schoenfeld (1989) claimed that the learning outcomes of students are strongly related to their beliefs about mathematics. By his claim, how students' mathematics-related beliefs influence on their learning and problem solving of this subject has attracted to the researcher. Therefore, the researcher would like to study the middle school students' mathematics-related belief systems and the relationship between these systems and students' problem solving ability.

Purposes of the Study

The main purpose of this research is to study the relationship between the middle school students' mathematics-related belief systems and their problem solving ability.

The specific objectives are as follows.

- To investigate the middle school students' mathematics-related beliefs
- To examine students' problem solving ability
- To identify the relationship between the middle school students' mathematics-related belief systems and their problem solving ability

Research Questions

Q_1: To what extent do the students possess mathematics-related beliefs?

Q_2: To what extent do the students possess problem solving ability?

Q_3: Is there a relationship between the middle school students' mathematics-related belief systems and their problem solving ability?

Scope of the Study

This research has its own particular limitations. The first limitation is related to the participants of the study. The (600) Grade Eight students from selected eight Basic Education High Schools and four Basic Education Middle Schools, the total twelve schools in Yangon Region are included in this study. The second limitation is that this study is only concerned with the categories and subcategories of students' mathematics-related belief systems which are identified by Op'tEynde, De Corte, and Verschaffel (2002). The three main categories are (1) beliefs about mathematics education, (2) beliefs about the self and (3) beliefs about the social

context, i.e., the classroom context. To investigate these beliefs, Mathematics-Related Beliefs Questionnaire (MRBQ) will be used. The third limitation is the content areas of the subject that is mathematics. The content areas are limited to fourteen chapters from Grade Eight mathematics textbook volume I and four chapters from mathematics textbook volume II to construct problem solving ability test that is used to measure students' problem solving ability.

Definition of Key Terms

Students' Mathematics-Related Belief Systems

Students' mathematics-related belief systems can be defined as the implicitly or explicitly held subjective conceptions students hold to be true about mathematics education, about themselves as mathematicians, and about the mathematics class context.

(De Corte & Op'tEynde, 2002)

Problem Solving

Problem solving is the process of working detail of problem to reach a solution. Problem solving may include mathematical or systematic operations and can be a gauge of an individual's critical thinking skills. (Longman Company, 2009)

Problem Solving Ability

In this study, problem solving ability is referred to an essential ability in which includes reading skill to comprehend or understand the statement, process skill to identify the mathematical operations and quantities needed to solve the problem, and computational skill to carry out the computation accurately.

Significance of the Study

With new developments in cognitive science in the 1970s, attention to beliefs and belief systems re-emerged. Students hold certain beliefs about mathematics and about themselves that play an important role in the development of their affective responses to mathematical situations (Mcleod, 1992). More specially, studies on students' value and expectancy beliefs in the context of mathematical learning and problem solving clearly show how these beliefs relate to students' motivation and the way they engage in mathematical learning and problem solving. Beliefs about the self strongly determine students' emotions during problem solving (Op'tEynde et al., 2002). Students' belief about teaching and the practices characterizing their specific classroom context have been found important factors to be taken into account if the academic behaviors in the classroom want to be understood fully.

And also several studies have conducted about the mathematics-related belief systems. The researcher thinks that the results of the current study may raise students' awareness of their probable belief systems and how they influence their learning, problem solving and achievement in mathematics.According to the reasons mentioned above, it is clear that it is necessary to study students' mathematics-related belief systems and how these belief systems impact students' problem solving.

Theoretical Framework

Problem Solving

Polya (1985) proposed that problem solving was a major theme of doing mathematics and teaching students to think was of primary importance. How to thinkis a theme that underlies much of genuine inquiry and problem solving in mathematics. Problem solving has come to be viewed as a process involving the highest faculties – visualization, association, abstraction, comprehension, manipulation, reasoning, analysis, synthesis, generalization – to be managed and all ending to be coordinated.

For a learner to effectively solve a mathematical problem, he/she should clearly identify four components at the initial or approach stage of problem solving.

1. The goal or goals (The thing or things wanted to do in a situation).
2. The givens (The facts and factors that are available to start in a problem situation).
3. The obstacles (The elements or factors that get in the way of a solution).
4. The methods or operations (The procedures that may be used to solve the problem).

Strategies in solving mathematics problems are essential in mathematics education. Problem solving procedure is a plan made as to how question can be solved, and a perspective and pattern in the events. The most commonly used problem solving model is Polya's four-step model including understand the problem, devise a plan, carry out the plan, and look back to check the results (Polya, 1985).

Problem Solving Ability

The efficiency and ability in solving problems is the basis of success in learning mathematics. The learner must have adequate knowledge of such essential information as number facts, relationships of commonly used measures, arithmetical symbols, formulas, the technical vocabulary of arithmetic, and the use of graphs and tables. Problem solving ability depends on not only problem solving intelligence but also the relationship between problemsolving and arithmetical understanding. In addition, an interest in mathematics and in learning to solve problems plays a significant role in problem solving ability.

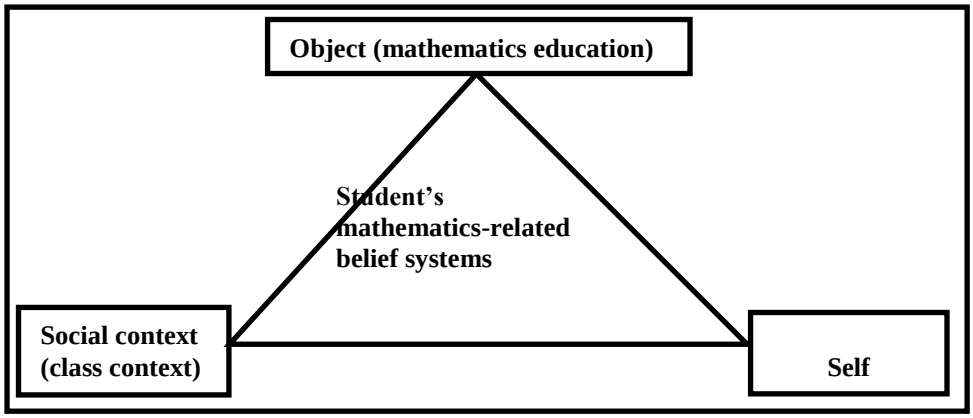
Problem Solving and Beliefs

The ability to solve mathematics problems develops slowly over a very long period of time because it requires much more than merely the direct application of some mathematical content knowledge. Problemsolving performance seems to be a function of at least five broad, interdependent categories of factors: knowledge acquisition and utilization, control, beliefs, affects and socio-cultural contexts (Charles & Lester, 1982, cited in Ozturk&Guven, 2016).

Cognitive skill is needed but itself is not sufficient to support problemsolving behavior. In addition to possessing affectivedomain, problem solvers need to be able to manage their ability and skills. According to Sriraman (2003), it is currentlyaccepted that the cognitive processes involved in problem solving are susceptible to the influence oftheaffective domain in its three fundamental areas: beliefs, attitudes, and emotions.

Students' Mathematics-Related Belief Systems

An analysis of the nature and the structure of beliefs and belief systems show that the social context, the self, and the object in the world that the beliefs relate to, are constitutive for the development and the functioning of these systems. The constitutive dimensions of students' mathematics-related belief systems can then be represented as a triangle (see Figure 1).



Source: From Op't Eynde, De Corte, and Verschaffel (2002), P. 27.

Figure 1 Constitutive Dimensions of Students' Mathematics-Related Belief Systems

Students' mathematics-related beliefs are constituted by theirbeliefs about mathematics education,beliefs about the self, andbeliefs about the social context (i.e. class context). A framework of students' mathematics-related beliefs in which the major components of the modelspresented above were tried to integrate was developed. The different categories and subcategories of the framework are presented in the Table 1.

Table 1 A Framework of Students' Mathematics-Related Beliefs

Beliefs about Mathematics Education	Beliefs about the Self	Beliefs about the Social Context
(a) Beliefs about mathematics as a subject (b) Beliefs about mathematical learning andproblem solving (c) Beliefs about mathematics teaching	(a) Goal orientation beliefs (b) Task value beliefs (c) Control beliefs (d) Self-efficacy beliefs	(a) Beliefs about social norms in their own class -the role and the functioning of the teacher -the role and the functioning of the students (b) Beliefs about socio-mathematical norms in their own class

Source: Adapted from Op't Eynde, De Corte, and Verschaffel (2002), P. 28.

Previous Related Researh

Lerch (2004) conducted a study with the title "Control decision and personal beliefs their effect on solving mathematical problems." He found that belief affected students' approach to problem solving. Specifically, students' personal belief systems provided confidence that would be able to solve the problem. Chirove (2014) conducted the research on "The relationship

between learners' mathematics-related belief systems and their approaches to non-routine mathematical problem solving: A case study of three high schools in Tshwane north district (D3), Sourth Africa." He found that a weak positive linear relationship between them.

Research Methodology

Research Design

The research design used for this study was a descriptive research design.

Procedure for the Study

The students' result in mathematics achievement and problem solving ability is still under unsatisfactory condition. One assumption for this may be imperfectly students' beliefs about mathematical context. To what degree the students possess beliefs about mathematical context and are there really influences beliefs on students' mathematics achievement and problem solving ability should be investigated. So the researcher sought out the literature related to this study through books and Internet sources. After that, a Mathematics-Related Beliefs Questionnaire and a problem solving ability test were constructed for this study. To find the reliability of the instruments a pilot test with (50) Grade Eight students was conducted.Then, eight high schools and four middle schoolsfrom Yangon Region were selected by using a random sampling method. Six hundred Grade Eight Students were also selected as participants.The required data are collected with the help of the headmaster/headmistress of those schools and the test was administered 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

In this study, a Mathematics-Related Beliefs Questionnaire(MRBQ) and a problem solving ability test for Grade Eight students were used as instruments.

(a) Mathematics-Related Beliefs Questionnaire

Mathematics-Related Beliefs Questionnaire (MRBQ) developed by Op'tEynde and De Corte (2004, cited in Physick, 2010 &Chirove, 2014) was adapted.The total items were (50) on five point Likert-type scale from (1) to (5). For positive items, the score closer to (1) indicated "Never/Strongly Disagree" and "Always/ Strongly Agree" was indicated by the score closer to (5). For negative items, the score closer to (1) indicated "Always/ Strongly Agree" and (5) indicated "Never/Strongly Disagree". To measure the reliability of the questionnaire, the Cronbach's Alpha was used. According to the pilot study, the internal consistency (Cronbach's Alpha) of the questionnaire for all mathematics-related belief systems was (.736).

(b) Problem Solving Ability Test

In order to measure the problem solving ability of the students, a problem solving ability test was constructed .This test covered (18) chapters: (14) chapter (Chapter 1 to 14) from Grade Eight mathematics textbook volume I and (4) chapters (Chapter 1 to 4) from mathematics textbooks volume II. In this test, there are (10) multiple choice items for the score (10) marks of the test and (4) seen and (4) unseen problems for the score (40) marks of the test and the total score was (50) marks. Its internal consistency is (.733).

Population and Sample Size

All the participants in the sample were Grade Eight students. This study was conducted in Yangon Region. There are four districts in Yangon Region. One township from each district was randomly selected for this study.The sample schools for the study were selected by using a stratified random sampling technique. Two high schools and one middle school from each township were selected as the sample. Therefore, twelve schools (eight high school and four middle schools) are included in this study. The total number of students participated in this study were (600). The students in this study were selected by an equal-size (non-proportional) random sampling technique.Table 2 shows the number of population and the sample size in the selected schools.

Table 2Population and Sample Size

No.	District	Township	School	No. of Student	
				Population	Subject
1.	East	Tharkayta	B.E.H.S (4)	287	50
2.		Tharkayta	B.E.H.S (5)	367	50
3.		Tharkayta	B.E.M.S (7)	187	50
4.	West	Mayangone	B.E.H.S (2)	630	50
5.		Mayangone	B.E.H.S (3)	138	50
6.		Mayangone	B.E.M.S (3)	112	50
7.	South	Thongwa	B.E.H.S (1)	237	50
8.		Thongwa	B.E.H.S (2)	240	50
9.		Thongwa	B.E.M.S – Ye New	52	50
10.	North	Hlaingtharyar	B.E.H.S (2)	292	50
11.		Hlaingtharyar	B.E.H.S (3)	389	50
12.		Hlaingtharyar	B.E.M.S (5)	332	50
Total				**3263**	**600**

*Note.*B.E.H.S = Basic Education High School
B.E.M.S = Basic Education Middle School

Data Analysis

The data were analyzed by using descriptive statistics (mean and standard deviation). Moreover, the Pearson product-moment correlation was used to describe the relationships between the middle school students' mathematics-related belief systems and their problem solving ability.

Research Findings

Findings of Students' Mathematics-Related Belief Systems

In order to find out the students' mathematics-related belief systems, (50) items were used. The full score of students' Mathematics-Related Beliefs Questionnaire (MRBQ) was (250). In order to examine the percentage of students who possess mathematics-related belief systems of low, moderate, high levels a descriptive statistics (percentage) was used. The average mean score and the standard deviation by all the participants were (184.19) and (17.005) respectively. So based on these results, if the score was below (167), it would be defined as low level of mathematics-related belief systems. If the score was between (167) and (201), it would be defined asmoderate level of mathematics-related belief systems. If the score was above (201), it would be defined as high level of mathematics-related belief systems. From the total number of

participants, 11.3% (N =68) of the students possess low level, 72.5% (N = 435) of the students possess moderate level and 16.2% (N = 97) of the students possess high level of mathematics-related belief systems (see Table 3).

Table 3 Students' Level of Mathematics-Related Belief Systems

Level of Mathematics-Related Belief Systems	Score (x)	No. of Student	Percentage (%)
Low	$x < 167$	68	11.3
Moderate	$167 \leq x \leq 201$	435	72.5
High	$x > 201$	97	16.2
Total		**600**	**100%**

Comparison of the Three Categories ofStudents'Mathematics-Related Belief Systems

When the mean percentages of three categories of students' mathematics-related belief systems are compared, the mean percentage of beliefs about mathematics education was (71.01%), beliefs about the self was (73.44%), and beliefs about the social context was (76.65%) respectively (see Table 4). It indicates that the mean percentage of students' belief about mathematics education was the lowest and students'beliefs about the social context was the highest.It indicates that the mean percentage of students' belief about mathematics education which is the first category of students' mathematics related-belief systems was the lowest and the mean percentage of students'beliefs about the social context which is the third category of students' mathematics related-belief systems was the highest.

Table 4 TheComparison of the Mean Percentages of Three Categories of Students' Mathematics-Related Belief Systems

Students' Mathematics-Related Belief Systems	No. of Student	Mean	Mean Percent-age (%)	Standard Deviation	Mini-mum	Maxi-Mum
Beliefs about Mathematics Education	600	53.26	**71.01**	6.518	36	69
Beliefs about the Self	600	73.44	73.44	8.041	29	95
Beliefs about the Social Context	600	57.49	**76.65**	7.135	27	73

Findings of Students' Problem Solving Ability

In order to find out the students' problem solving ability, a problem solving ability test was administered.The full score of students'problem solving abilitywas (50). In order to access the students' problem solving ability level, it was necessary to examine the percentage of students whoseproblem solving abilitylevel is low, moderate and high in all the participants. The average mean and standard deviation by all the participants were (28.68) and (8.759) respectively. So based on these results, if the score was below (20), it would be defined as low problem solving ability level. If the score was between (20) and (37), it would be defined as moderate problem solving ability level. If the score was above (38), it would be defined as high problem solving ability level. The findings of students' problem solving abilitywere presented in Table 5 in terms of three levels.From the total number of participants, 17.5% (N = 105) of the students were at low level, 59.5%(N = 357) of the students were at moderate level and 23% (N = 138) of the students were at high level of problem solving ability.

Table 5 Students'Level of Problem Solving Ability

Level of Students' Problem Solving Ability	Score (x)	No. of Student	Percentage (%)
Low	$x < 20$	105	17.5
Moderate	$20 \leq x \leq 37$	357	59.5
High	$x > 37$	138	23
Total		**600**	**100%**

Findings of the Correlations between Students' Mathematics-Related Belief Systems and their Problem Solving Ability

The correlation analysis was performed between students' mathematics-related belief systems (overall belief systems, beliefs about mathematics education, beliefs about the self, and beliefs about the social context) and their problem solving ability using the Pearson product-moment correlation. Table 6 shows the correlation between students' problem solving ability and their mathematics-related belief systems in terms of beliefs about mathematics education, beliefs about the self, and beliefs about the social context.

Table 6 The Correlations between Students' Mathematics-Related Belief Systems and their Problem Solving Ability

Students' Mathematics-Related Belief Systems	Correlation (Problem Solving Ability)
Beliefs about Mathematics Education	**.615****
Beliefs about the Self	**.635****
Beliefs about the Social Context	**.606****
Over all Belief Systems	**.790****

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

Discussion, Suggestions, Conclusion

Discussion

This research finding supports the finding of Lerch (2004) and is similar to the finding of Chirove (2014) though a little different result had.

According to the research findings of students' mathematics-related belief systems, it was found that (11.3%) of the students possessed low level, (72.5%) of the students possessed moderate level, and (16.2%) of the students possessed high level. These findings revealed the answer to research question (1): To what extent do the students possess mathematics-related beliefs?Moreover, the fact that beliefs about mathematics education was lowest was found so students do not believe and cannot perform to apply their lesson in their daily life. The fact beliefs about the social context was highest indicated that most students depend on teachers and their peers. Positively, the warm relation, collaboration, accommodation, and adjusting between students and teacher and between peers were found.

Concerning with the students' problem solving ability, (17.5%) of the students possessed low level of problem solving ability, (59.5%) of the students possessed moderate level of problem solving ability and (23%) of the students possessed high level of problem solving ability. These findings revealed the answer to research question (2): To what extent do the

students possess problem solving ability? This result indicated students had difficulty in thinking unseen problems, formulating solutions from word problems and solving geometrical figures.

The correlation between the students' mathematics-related belief systems and their problem solving ability was found that the correlation (r (10) = .790, $p < .01$). This result showed that the direction of correlation was positive and it indicated that if the students' mathematics-related belief systems were high, the students' problem solving ability was also high and if the students' mathematics-related belief systems were low, the students' problem solving ability was also low. So, this finding revealed the answer to research question (3): Is there a relationship between the middle school students' mathematics-related belief systems and their problem solving ability?

Suggestions

Some suggestions for the improving of each mathematics-related belief systems and problem solving ability are as follows.

Suggestions for Improving the Students' Beliefs about Mathematics Education: Teachers should perform to gain knowledge for students to connect mathematics lessons to their daily life and other course. The facts that mathematics is continuously evolving and new thing are still being discovered should be demonstrated by giving unseen problem such as external problems and unusual problems. Moreover, teachers should never humiliate the students about mathematics learning and doing mathematical task and never use mathematics as a punishment.Teachers should try to make mathematics lessons interesting for students by asking to compete each other in solving problems, to discover own invention and to design a graph by using mathematical calculated data. In teaching mathematics, students' centered approach should be adopted and new lessons should be taught based on previous knowledge. Furthermore, teachers should keep in mind individual difference of the learner while teaching. Consequently, positive beliefs about mathematics education would increase.

Suggestions for Improving the Students' Beliefs about the Self: Teachers should use instructional strategies to encourage the development of critical thinking skills such as think-pair-share, brain-storming, problem-based learning. Teachers should practice students to enjoy pondering mathematical exercise. So, thought-provoking problems should be provided to students. Problem-based learning should be used for active participation of the students. Classroom environment should be full of active activities to promote task value beliefs. Moreover, teachers should contribute students the opportunity to choose mathematical assignments that they can learn from even if they are not at all sure of getting a good grade. Students should be allowed to initiate their own strategies to solve problems and struggle with challenges. Sometime, unusual mathematical problems should be provided to sure the thought that the students could handle more difficult mathematical problems. Such the ways, the students' beliefs about the self will be able to promote.

Suggestions for Improving the Students' Beliefs about the Social Context: Teachers should upgrade not only students' skills but also their intrinsically competent by themselves. When students make mistakes in learning mathematics, the teachers should give explanation again instead of punishment. Students to be improved communication skill, the teaching strategies such as cooperation, collaboration, discussion, group investigation should be used.

Students should be made aware of their belief systems and the possible effects of their naive beliefs to mathematical problem solving. Teachers should incorporate students' belief systems in their teaching and learning process in an attempt to encourage the development of positive, health and enlightened mathematics-related belief systems. So, teachers should assess and be aware of students' active belief systems that adversely affect their mathematical problem solving. By doing so, the students' mathematics-related belief systems and problem solving ability can be promoted effectively.

Conclusion

Nowadays, most of the syllabuses are within ace of abstract in nature, the classroom teaching is likely to abstract and textual material is also abstract. So, it is needed that the students who are continuously trained in solving abstract mathematical problems are expected to prefer abstract problem situations. And, their beliefs appear to be for applying their mathematical knowledge in problem situations.

Certain beliefs affected the behaviors of the students and their decisions, as well as which behaviors they will perform in the process. The statement that students' beliefs affect their decisions was supported by the findings of this study. Students' beliefs have positive beliefs and negative beliefs. While some students' beliefs had a positive effect on the problem solving ability, others had a negative effect. The positive effects cause persistence in looking for a solution. Negative effects are giving up the missing problem solving process, failing to make an effort to solve the problem. Students' negative beliefs prevented them from the transition between the steps of problem solving and prevented their transition between the steps changed according to the tack of the problem.

Most of the participants who possessed positive beliefs thought that problem solving was an enjoyable activity as long as they were able to solve the problems they encountered. They believed that they needed to find solutions to the problems to increase their thinking for problem solving and thought the problem solving as gratifying. Therefore, it can be inferred that there was a direct positive relationship between the beliefs and the problem solving ability. It was also determined that students were motivated by their positive beliefs as long as they were successful.

Students' beliefs grow up along mathematics learning and it used to solve not only mathematics problem solving but also to solve daily life problem. If mathematical classroom practices can have detrimental effects on students' beliefs, it is plausible to hypothesize that alternative learning environments can be designed that foster positive mathematics-related beliefs in children. Students' mathematics-related beliefs are manifested in the classroom in whether and how they ask and answer questions, work on problems, and approach new mathematical tasks. The assessment of students' mathematics-related beliefs can help teachers plan instruction and structure the classroom environment so as to help students develop more enlightened beliefs about mathematics and mathematics learning. Furthermore, students' awareness of how beliefs develop, change over time and affect learning might assist them to develop a healthy relationship with mathematics. The information in this study can provide teachers with valuable information about the beliefs that influence their students' study of mathematics

Finally, the fact that the students' mathematics-related belief systems really impact on students' achievement and problem solving ability cannot deny according to the results of the current study. And, mathematics teachers will realize that their students need to improve

mathematics-related beliefs through this study. Although this study cannot fulfill all the aims of teaching mathematics in the middle school, it can be hoped that it can support, to some extent, to try for improving middle school students' mathematics-related belief systems and their problem solving ability in Myanmar.

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