The Correlation between Metacognitive Knowledge with Mathematics Anxiety in the First Grade High School Female Students

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Abstract

The aim of this study was to investigate the relationship between control source and role-personality conflict the purpose of this study is to investigate the correlation between met cognitive knowledge and math anxiety. The population of the study consists of 1950 female students in the first grade of high school in Tehran 8th district. 323 female students were selected using cluster sampling. The instrument consisted of two standardized questionnaires designed by Swanson to assess problem-solving met cognitive knowledge and Math Anxiety Scale constructed by Chiu and Henry. Using factor analysis and Cranach's alpha, both validity and reliability of the questionnaires were attained. Analyzing the data in the descriptive statistics area was conducted by frequency and percentage and in inferential statistics with the Pearson correlation showed that the relationship between met cognitive knowledge and problem solving with math anxiety is negatively significant at 99% confidence level (r=-0.454). The relationship between the components of met cognitive knowledge (person, task and strategy) with math anxiety is significantly negative. In other words, the more the learner informed and aware of the cognitive system, task, and strategy, the less he/she will feel math anxiety. The index of knowledge of strategies demonstrates the most significant negative relationship with students' math anxiety while the two other indexes, knowledge of self and task, are in the next levels respectively. The results generally indicate that more students are aware of problem-solving met cognitive knowledge, less they suffer from math anxiety.

Keywords: Math Anxiety, Met cognitive knowledge, The first grade high school.

Introduction

One of the goals of education in any society is to raise the intellectual and cognitive abilities of students so that one can think independently about various issues and lead his/her cognitive processes to optimal use and in the desired direction. The met cognitive skills have been of great importance in human life.

In the age of information technology and unpredictable virtual learning, learners need to internalize skills to enter the world of knowledge to control their own learning and as self-regulated learners, exploit their capabilities in planning and evaluating their performance [1]. Various concepts have tried to define the term met cognition. Flavell [2] is regarded as the first person conceptualizing the term and founder researcher in met cognition. He uses the term to define personal knowledge about cognitive processes and products or anything associated with it. According to Flavell [2] met cognition is one of the mind's higher processes that divided into two basic categories, including the knowledge of one's own cognitive knowledge, and regulation of cognition and cognitive activities.

considers that educational psychologists have confirmed specific learning strategies to teach students over the past several decades. Lefrancois [5] asserts that the main issue of cognitive psychology and educational psychology is to emphasis on "how to learn" which is one of the broad goals of learning and teaching.

Asserts that the met cognition is a part of such executive control processes as attention, review and exercise, organize and Processes information. The extent of using the executive Processes results in dissimilarity of learning processes among Learners. In other words, the stronger the executive control processes are, better information processing performance in memory is.

Met cognition refers to individual knowledge of one's own learning processes [6]. Downing, believe that met cognition includes the cognition on how to analyze the thinking, extract results from analysis and how to interpret and covert the learned information into action Students require understanding the mental function to solve problems more effectively, as well as appreciating vital cognitive tasks such as memorization, learning and problem solving [7].

One of the imperative components of met cognition is met cognitive knowledge. Met cognitive knowledge is what a person acquires about the human mind and its activities. Like any other forms of information, this knowledge may be in the form of language, rhetoric or action. Flavell further divides met cognitive knowledge into three categories: knowledge of person variables, task variables and strategy variables [8-9] introduced three types of met cognitive knowledge as follows: Content or Declarative knowledge, Task or Procedural Knowledge and Conditional Knowledge.

Declarative knowledge consists of the quiddity of learning, memory skills, strategies and resources. Procedural knowledge deals with how to use learning strategies and Conditional Knowledge deals with why and when to use learning strategies and actions. The application of declarative, procedural and conditional knowledge strategies shapes meta-cognition.

Met cognitive knowledge monitors a part of the acquisition of knowledge concerned with cognitive affairs. It refers to parts of the knowledge and beliefs that accumulate in long-term memory through the experiences and help us in applying the objectives, actions and ranges of experiences leading to processing various types of information. Met cognitive knowledge refers to knowledge and beliefs about one's own cognitive resources in a specific field and deals with how he acts well in this field, what are the strategies and heuristic approaches that he can use and how a particular field of knowledge is defined [10].

Met cognitive knowledge can be divided into three categories: knowledge about the self (person), knowledge about task and knowledge about strategies. Knowledge about the self refers to the one's knowledge regarding what he should know about learning and processing information and includes information such as the abilities of memory, the memory stages, kinds of memory and its capacity, strategies to check the contents and controlling processes. Knowledge about task refers to one's knowledge about the nature of the task, task kinds and quality and task that one is supposed to be involved with. Knowledge about strategies indicates awareness of cognitive and met cognitive strategies and how, when and where the person can use the strategies [11].

The important issue in the learning process is to provide learner with conditions situation for the learning so that the best results can be achieved. This is further required in the case of such basic courses as mathematics. Mathematics has always played a major role in the history of philosophy and the development of science, as well as the development of industrial and technological evolution. Math is considered as one of the very primary personal skills in sustaining everyday life in modern societies [12].

Math comprises several challenging issues and because of broad and all-inclusive nature of it, math anxiety is responsible factors that can undesirably affect the process of learning mathematics and its positive aspects [13]. Anxiety is one of the most serious cognitive and inspiring variables which significantly affect learners’ academic achievement,
learning and performance, as well as attention, concentration and retrieving information [14]. In fact, anxiety is a natural part of life, and most of us experience it from time to time. Anxiety is a prevalent, often ambiguous, and very unpleasant feeling of uneasiness and worry conveyed along with one or more physical sensations [15].

Math anxiety is often experienced as a general feeling of apprehension, or fear impeding a person who deals with math performance. It is also defined as a feeling of tension, helplessness and mental confusion that a person experience when working with numbers [16]. The so-called math anxiety was introduced in late 1950. “Mathematical anxiety” is referred to the mental situation that people involve with when confront with math contents either in learning situation or when a learner solves math problems or mathematical behavior is assessed.

This state is usually concerned with increasing anxiety, disorder and confusion of thought, imposed opinion, stress and thus “thinking stop.” Consequences of math anxiety are: hopelessness, depression, distraction and invasion of irrelevant thoughts and disturbance in information processing [17] stoppage in reasoning ability, and avoiding math. It might impact on selecting the high school courses to continue the studies [18].

The researchers found out that math anxiety begins in the meantime of elementary school and continues afterwards. Several researchers have offered optimistic solutions to reduce this anxiety at the university level [19].

In recent decades, the study of met cognition and its impact on doing school Courses and different assignments, especially mathematics, is of interest to researchers. Students’ mathematical behavior can be effectively shaped by adopting appropriate educational approaches as an exterior factor. Since developing and dynamic mathematical behavior is a result of effective interaction between internal and external factors, this method of instructing mathematical concepts and skills regardless of internal factors, particularly individual differences of learners, seems impossible or unscientific; therefore, optimal efficiency in learning mathematics wouldn’t be achieved.

Accordingly, math teachers or instructors’ insight regarding emotional and mental states of students or learners is prominent. They can attain appropriate educational methods and classroom activities to provide a more favorable situation for the participation of learners [17]. Studies have shown that academic achievement in math is determined by not only one’s basic knowledge, but also depends on such other factors as awareness of different learning strategies and how to use this knowledge in doing homework [20].

Yilmaz [21] studied met cognitive factors associated with symptoms of anxiety and depression. The results showed that increasing the levels of negative met cognition is associated with math anxiety and depression and symptoms of math anxiety and depression is related to the met cognitive factors.

Believe that there is a significant relationship between the negative met cognitive beliefs and anxiety. Based on these findings and in accordance with the self-regulatory executive function model introduced by Wells [22], people with anxiety disorder compared with patients without anxiety disorder show higher levels of maladaptive met cognitive beliefs. Legg and Locker [23] examined the impact of met cognition on math anxiety, math performance, reaction time and confident in doing the math problems.

The results show that people with modest met cognitive skills experience more math anxiety and their performance is reduced influencing with math anxiety; although, those who have higher levels of met cognition show less anxiety. Correspondingly, Alizadeh, Bahrainian and Naziri [24] showed that there is a significant correlation between the four dimensions of met cognitive beliefs (cognitive trust, cognitive self-awareness, positive beliefs and beliefs about the uncontrollability of thought) and psychological consequences (stress, anxiety and depression).

Gharghani [13] showed that there is a significant correlation between met cognition
and math anxiety among students studying in talented schools. The strongest predictor of anxiety embraces negative beliefs about the uncontrollability of thoughts and danger.

**Research Methodology**

Since this study examines the relationship between met cognitive knowledge and students' math anxiety, the co-relational research method was applied to conduct the study. Statistical population of this research includes all the first grade female high school students studying in academic year 2014-2015 in Tehran 8th district. The population of the study consists of 1950 people. The sample size is proportional to the population and Morgan table was used to determine the sample size calculating 323 students. Also, the simple stratified sampling method was used for sampling.

**Data Collection Tools**

Data gathering tool was Swanson’s met cognition knowledge questionnaire and mathematics anxiety scale. Met cognitive knowledge questionnaire for problem solving has been prepared by Swanson [11]. This questionnaire contains 22 questions testing three qualifications as person, task and strategy. Questions 1 to 5 test one’s awareness of his cognitive system. Questions 6 to 14 and question number 22 test one’s awareness of the task and questions 15 to 21 deals with awareness of strategy. The lowest score for every question is 0 while the highest score is 5.

This questionnaire conceives favorable psychometric indices. Various analyzes has been carried out to test the validity of this questionnaire by Karimi [8] containing criterion and construct validity (convergent and divergent validity, internal coherence and age and group differentiation). Using Cronbach's alpha, Karimi [8], also calculated coefficient reliability and test-retest and reliability of the Inter rater. The reliability coefficient for the entire sample group equals \( r = 0.37 \). Test-retest correlation equals \( r_{12} = 0.96 \) and reliability of the Inter rater equals \( r_{11} = 0.99 \). Generally, Karimi’s [8] findings showed that the problem-solving met cognitive knowledge questionnaire is both valid and reliable which can be used with questionnaire to assess met cognitive knowledge. For Scoring of this questionnaire, Karimi [8] presented a wide-ranging classification and scoring system which is a completed version of the 6 point scale survey. The difference is that coding system is more consistent with Iranian teenagers. In fact, Swanson's problem-solving met cognitive knowledge questionnaire was entirely reformed and domesticated for national use by Karimi [8]. In this study, reliability of the met cognitive questionnaire using Cranach's alpha equals \( (\alpha = 0.72) \), which is considered as a good indicator.

**Mathematics Anxiety Scale**

Mathematics Anxiety Scale for Children (MASC) was constructed by Chiu & Henry (1990). This scale consists of 22 short phrases describing math-related activities such as preparation of new math books, listening method to solving mathematical problems in cooperation with other students or attending at the math class, to name a few. Then, the testee is asked to rate their anxiety on a scale of four degrees in each test. The marks are as follows: \( 4 = \) very high, \( 3 = \) high, \( 2 = \) moderate, \( 1 = \) no anxiety). The minimum score in this test is 22 while the maximum score would be 88. Accordingly, the overall obtained score by the testee echoes that person's degree of anxiety in association with the mathematical experiences [25] used various tools like S-MARS to calculate the validity correlation of the scale. The results indicate that this scale shows a high correlation with the short form of MARS math anxiety rating scale \( (r=0.97) \).

Furthermore, Chiu and Henry used Cranach’s alpha to calculate the reliability coefficient of the scale and declared that the index for students in seventh grade equals to \( \alpha = 0.93 \) [26].Validation and reliability of the questionnaire have been assessed and approved in various studies. Ahmadi [25] has calculated the questionnaire’s reliability based on Cronbach’s alpha coefficient which is declared as follows: \( \alpha = 0.88 \). In this study, Cronbach’s alpha calculated for the test is equivalent to \( \alpha = 0.94 \) indicating that the reliability of the questionnaire is appropriate.

**Results**

The main hypothesis of this research is that problem-solving met cognitive knowledge has a negative relationship with mathematical anxiety.
As it can be seen in table 1, there is a significant negative relationship between met cognitive knowledge and problem-solving math anxiety with a 99% degree of confidence ($r = 0.454$). To be precise, the more students know about problem-solving met cognitive knowledge, the less math anxiety they experience.

Table 1: Pearson correlation results for the relationship between problem-solving metacognitive knowledge and math anxiety

<table>
<thead>
<tr>
<th>problem-solving metacognitive knowledge</th>
<th>math anxiety</th>
<th>The correlation coefficient</th>
<th>The significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>mean</td>
<td>Standard deviation</td>
<td>mean</td>
</tr>
<tr>
<td>17.42</td>
<td>61.44</td>
<td>14.64</td>
<td>43.74</td>
</tr>
</tbody>
</table>

The first sub-hypothesis is that there is a no significant correlation between knowledge of one's own cognitive system (met cognitive knowledge about the self) and math anxiety. According to the results in table 2, the significant level is close to zero ($P = 0.000$) and the null hypothesis is rejected at the 99% interval of confidence. That is, there is a significant negative relationship between the knowledge of one's own cognitive (met cognitive knowledge about the self) and math anxiety with 99% confidence interval ($r=0.32$), which means that students, who know more about their own knowledge of cognitive system, experience lower degree of math anxiety.

Table 2: Pearson correlation results for the relationship between knowledge of one's own cognitive system and math anxiety

<table>
<thead>
<tr>
<th>knowledge of one's own cognitive system</th>
<th>math anxiety</th>
<th>The correlation coefficient</th>
<th>The significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>mean</td>
<td>Standard deviation</td>
<td>mean</td>
</tr>
<tr>
<td>3.87</td>
<td>18.12</td>
<td>14.64</td>
<td>43.74</td>
</tr>
</tbody>
</table>

The second sub-hypothesis is that there is no significant correlation between knowledge about task (met cognitive knowledge about the task) with math anxiety. The results of table 3 with the significant level of zero ($p=0.000$) and 99% confidence interval indicates that the null hypothesis is rejected. In other words, there is a negative significant relationship between knowledge of the task and the math anxiety ($r=0.313$). That means, if the students know more about task, the math anxiety which they experience is reduced.

Table 3: Pearson correlation results for the relationship between knowledge about task and math anxiety

<table>
<thead>
<tr>
<th>Task</th>
<th>Math anxiety</th>
<th>The correlation coefficient</th>
<th>The significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>mean</td>
<td>Standard deviation</td>
<td>mean</td>
</tr>
<tr>
<td>10.32</td>
<td>27.04</td>
<td>14.64</td>
<td>43.74</td>
</tr>
</tbody>
</table>

The third sub-hypothesis is that there is no significant correlation between knowledge about strategy (met cognitive knowledge about the strategy) with math anxiety. The results of table 4 with the significant level of zero ($p=0.000$) and 99% confidence interval indicates that the null hypothesis is rejected. In other words, there is negative significant relationship between knowledge about strategy and the math anxiety ($r=0.337$). That means, if the students know more about strategy, the math anxiety they experience is reduced.
Table 4: Pearson correlation results for the relationship between knowledge about strategies and math anxiety

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Math anxiety</th>
<th>The correlation coefficient</th>
<th>The significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>mean</td>
<td>Standard deviation</td>
<td>mean</td>
</tr>
<tr>
<td>8.9</td>
<td>16.73</td>
<td>14.64</td>
<td>43.74</td>
</tr>
</tbody>
</table>

Discussion and conclusion

The main hypothesis of this study indicates that there is a significant negative correlation between met cognitive knowledge and math anxiety. The results obtained from the main hypothesis of the research designate that the mean score of met cognitive knowledge is 61/14 (out of 110). On the other hand, the average scores obtained from the questionnaire of the math anxiety equals to 43.74 (out of 88). In other words, the mean score for met cognitive knowledge of the students is slightly above the average (50 %) while the mean score for the math anxiety is slightly less than the average (50%). Also, the data shows that there is a negative significant relationship between problem-solving met cognitive knowledge of student with 99% confidence interval (r=0.454) indicating that student who enjoy better met cognitive knowledge will experience less math anxiety.

The findings of this research are consistent with previous studies: Legg and Locker[23] showed that students with average met cognitive knowledge suffer further from math anxiety and performance is reduced in presence of math anxiety; whereas, students with higher met cognitive knowledge experience the math anxiety in lesser degree. Ozsoy [27] also, studied the relationship between met cognition and mathematical achievement.

He declared that there is a significant relationship between met cognition and mathematical achievement. Yilmaz [21] examined met cognitive factors associated with symptoms of anxiety and depression. The results showed that the increase in levels of negative met cognition is associated with math anxiety and depression. Furthermore, symptoms of math anxiety and depression are dependent on factors related to met cognition. Increasing in met cognitive knowledge (which is considered as a negative met cognition in Yilmaz study indicating knowledge about what someone doesn’t know and his awareness of the lack) test anxiety is felt more by the person. The results of Yilmaz’s study are consistent with findings of this research. Since someone has a negative met cognitive knowledge, he/she will experience more anxiety because he has a self-conscious about his lack of knowledge. The findings of Khodabalsh, Abbasi and Shahgian [28] are also consistent with results of this research. They identified that Wells (2000) met cognitive treatment (MCT) is effective in reducing positive met cognitive knowledge about obsessions and thus effectively reduces the symptoms of Obsessive-compulsive disorder (OCD).

In addition, it indirectly increases the emotional adjustment. It can be claimed that the obsessive thoughts is considered as one of mental disorders and upsurge in levels of meta-cognitive knowledge results in a smaller amount of disorder experience.

Showed that the meta-cognitive counseling is effective in decreasing the text anxiety in post-test period and afterwards. Moreover, the results of this study are consistent with those found by, which showed negative significant relationship between met cognition and perceived stress, as well as between self- efficacy and perceived stress.

Gharghani [13] showed that there is a significant correlation between met cognition aspects and math anxiety. The strongest predictor of anxiety among gifted students is uncontrollability of thoughts and danger that is consistent with the findings of this study. showed that students suffering from weak mathematical skill were significantly benefited from meta-cognitive training programs in comparison with students with superior math skills. Met cognitive training has positive effects on students’ problem-solving ability and it can positively influence on learning mathematics for high school students.

Accordingly, the results obtained from the first part of this research are consistent with findings declared by Khodabalsh, Abbasi and
Shahangian [28] Gharghani [13] and, Legg, and Locker [23], Ozsoy [27] and Yilmaz[21]. The first sub-hypothesis indicates there is a no significant correlation between met cognitive knowledge about the self and math anxiety. The mean score obtained from one's knowledge of the own cognitive system is 18.12 out of 25. Comparing this category with the knowledge of the task and strategy, this lies in the higher position in students group indicating that they have proper knowledge regarding cognitive system.

Data analysis showed that there is a significant negative correlation between one’s knowledge of cognitive system and math anxiety with 99% confidence interval (r=0.32). This suggests that the math anxiety will reduce if one’s knowledge of cognitive system increases. These results are consistent with findings of previous research. Mata [29] showed that consulting thinkers possess a met cognitive advantage over visual thinkers. The consulting thinkers, presumably, feel more confident and act accurately when assessing their own performance, as well as the others. We know that met cognitive behavior plays an important role in the success of problem-solving and subsequent academic achievement.

Because the person’s general knowledge about human learning and their capacity and how to check the contents and processes of the controller are variables of the knowledge of the self. Knowing about the abilities of memory and correct estimation of abilities can help acquiring, maintaining, and using what is learned. This can reduce such mental disorders as anxiety. also suggest that there is a positive relationship between met cognition and learning and students, who consider themselves more efficient, enjoy more cognitive and met cognitive strategies, experience less anxiety and they are more successful in solving the problem.

These results are consistent with findings of this research. believes that the difference between weak and strong students in math is not always associated with imperfections in the mathematical information but it is linked with how to control the use of information and cognitive processes effectively.

Mathews, Hillyard and Campbell [30] investigated the relationship between met cognitive beliefs with stress, worry, incongruent thinking and physical symptoms related to anxiety. The results showed that three categories of met cognition, cognitive self-awareness, positive beliefs about worry and negative beliefs about uncontrollability of thought are associated with test anxiety.

The results also showed that individuals with lower cognitive ability are more vulnerable towards test anxiety. Thus, we can say that the students who are aware of strengths and weaknesses, difficulty and simplicity of subjects and their interests suffer less from such mental disorders as anxiety and course-related stress because this awareness can control the internal and external resources necessary to achieve goals of learning.

The second sub-hypothesis: there is no significant correlation between met cognitive knowledge about the task with math anxiety. The mean score obtained from met cognitive knowledge about the task is 27.04 out of 50. This means that students’ awareness of tasks features they receive is higher than the average (50 percent). They are aware of their assignments and they know about the ways of dealing with it. In fact, data analysis shows that there is negative significant relationship between knowledge of the task and the math anxiety with 99% confidence interval significant (r=0.313). In other words, students with better awareness of knowledge of the task in turn suffer less from math anxiety. These findings are consistent with the results of previous studies.

Chi [20] revealed that academic achievement in math is determined not only by one’s basic knowledge, but also it depends on such other factors as awareness of this knowledge during task performance strategies and how to use this knowledge in doing homework. In other words, deficiency in met cognitive skills is one of the causes for the failure of learners in doing homework.

Delclos and Harington [31] investigated problem-solving ability among the fifth and sixth grade elementary school students and classified their research population into the three groups: the first group received the special training in problem-solving. The
second group received both training in problem-solving and skills for monitoring cognitive activities. And, the third group did not receive any training. The results revealed that the second group could solve more complex problems. Also, they enjoy faster speed in solving problems. Domestic research are also supported the results revealed by Delclos and Harington. studied the role of met cognitive skills in solving math homework among male university students. The results indicated that there is a significant difference between met cognitive awareness of successful students in math problem solving and students who failed to solve the problem.

Madraki [32] suggested that instructing the met cognitive strategies results in improving students’ success in doing homework and academic achievement. Academic achievement is associated with reducing psychological problems, stress and anxiety since this factor can play an important role in improving students’ mental performance.

This means that if the nature and objectives of the assignment is clear for the student, it will help him/her to succeed in doing homework, as well as reducing the anxiety. Hence, we can claim that met cognition encompasses such issues as knowing how to analyze the thinking, how the results are derived from analysis and how the learned subjects can be put into practice.

Students need to appreciate the function of their mind so that they can solve problems effectively. In other words, it is necessary to understand how important cognitive tasks such as memorization, learning and problem solving are done. If a student is unaware of the consequence of the homework, he will experience more anxiety. So, it can be claimed that there is a significant relationship between knowledge of learning and cognitive tasks and decreasing math anxiety.

The third sub-hypothesis deals with negative significant correlation between met cognitive knowledge about the strategy with math anxiety. The average score for one’s knowledge about strategy is 16.73 out of 35. This means that students’ knowledge and awareness of the components of cognitive and met cognitive strategies, in comparison with the other two categories, is explicitly low. In other words, students do not have sufficient knowledge about strategies and its applications. Data analysis showed that there is a negative significant relationship between one's knowledge of strategies and math anxiety with 99% confidence (r=0.337). In other word, the math anxiety will decrease if one's knowledge about strategies develops.

The findings are consistent with previous results. Haberkorn, Lockle, Pohl, Ebert and Inert (2014) showed that met cognitive strategies are different from aspects of met cognitive knowledge. Also, this research is focused on practical understanding of met cognitive skills and theoretical understanding of met cognitive knowledge. The results of this research and those found by Haberkorn, etal [33] are consistent since findings in both studies assert that practical understanding is a result of using strategies.

That is because awareness of cognitive processes and success in solving the problem causes the cognitive activity gradually becomes more active and more effective which in turn assists the learner in problem-solving process. Then, searching the strategies, the learner uses the rules to achieve the goals. The end is to omit the wrong solutions and to concentrate on problems when the learner's use of these strategies can help reducing the anxiety and move forward towards achievement.

Yen-ju [34] revealed that increasing the met cognitive knowledge leads to better application of reading comprehension strategies among English language students. Eskandarian [35] also showed that teaching cognitive and met cognitive strategies will leave a positive impact on learning process and retention in math, Persian literature and sciences courses of the second grade students.

These results indicate that teaching strategies in elementary school requires special attention since successful people are those who are good at planning, spotting and introducing the specific objectives and designing strategies. The most important advantage of met cognitive knowledge is that it enables the learner to aware of learning activities from time to time and to identify
strengths and weaknesses. Using the organization, storage and mashing new knowledge, with the right solicitation of learning strategies and skills, makes studying easy. Teaching study skills, time management techniques, reading strategies and summarizing skills reduce math anxiety in students.

The findings suggest that met cognitive knowledge has a negative correlation with math anxiety. The findings suggest that there is a negative relationship between met cognitive knowledge of students with math anxiety. Students who have high cognitive knowledge suffer less from anxiety and students who appreciate strengths and weaknesses, complexity and easiness of subjects and recognize their interests are less likely to develop math anxiety since this information can provide students with both internal and external resources necessary to control and achieve their learning objectives.

As it was stated before, the awareness about the types of homework is an important issue that both teachers and students should consider. If students do not appreciate the consequences of the arbitrary assignment, they will experience more math anxiety. This training these elements of met cognition helps to lessen the mathematical anxiety. Using the organization, storage and mashing new Knowledge, with the correct use of learning strategies and skills, increase cognitive knowledge and thus reduce the anxiety, especially in mathematics. Thus, learning and the using the met cognitive strategies help learners to lessen the anxiety.

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