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INVESTIGATION OF MATHEMATICS TEACHERS' VIEWS ABOUT IMPROVING PROBLEM SOLVING SKILLS

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ABSTRACT: Since problem solving skills play a central role in middle and secondary school mathematics curricula, this made mathematics educators give importance to this subject. Improving problem solving skills of students is one of the primary aims of education so it is very important to make students gain problem solving skills. Thus, the aim of this research is to investigate views of middle and secondary school mathematics teachers related to improvement of students' problem solving skills. Qualitative research method was used in this study. The research was done on fall term of 2015-2016 academic year. The study was conducted with 115 mathematics teachers (60 middle school and 55 secondary school) working at state schools. Data were gathered by a form consisted of open ended questions and analyzed by descriptive and content analysis techniques. At the end of the research, it is found that teachers had information about the importance of problem solving skills improvement in mathematics education. Also, it is determined that participants thought teachers should have a central role in improving problem solving skills and students should strive in problem solutions. In addition, it was found that teachers believed that mathematics and other lessons improved problem solving skills and improvement in problem solving skills had a positive effect on the achievement in mathematics and other lessons. Lastly, teachers thought that students whose problem solving skills had improved were more successful than the other students and had higher self-confidence than others. They also stated that since it had an impact on improvement in problem solving skills, it should be given importance to level of students when the textbooks were prepared.

Key words: Problem solving skills, mathematics education, middle school mathematics teacher, secondary school mathematics teacher

INTRODUCTION

John Dewey problem is defined as a situation which confuses people's mind, finds the strength to fight it and make it question all judgments that the mind believes in (Gelbal, 1991). Olkun and Toluk (2004), defines the problem as situations where the individual is enthusiastic about solving the problem, does not know the way to reach the solution, yet may solve it with knowledge and skills that he or she possesses. Mathematical problem is a problem which needs to be solved, yet ways to find the solution are not obvious and cannot be solved by the individual immediately (at first glance) (Grouws, 1996). Also, a problem is a cognitive and behavioural process which the individual encounters in everyday life under his or her specific conditions and the solution is managed by the individual himself or herself (D' Zurilla, Nezu, & Maydeu-Olivers, 2002; Kneeland, 2001).

Problem solving can be defined as "deciding what to be done in cases what to be done is not known" (Altun, 2015). Finding a solution, developing a strategy or deciding on a method for the solution when faced with a problem that is not understood is almost impossible (Altun, 2015). For this reason, it can be said that problem solving is of vital importance. One of the objectives of mathematics education is to improve problem solving skills (Karataş & Güven, 2004; Reusser & Stebler, 1997). National Council of Teachers of Mathematics (NCTM) published a document named Curriculum and Evaluation Standards for School Mathematics in 1989 (NCTM, 1989). NCTM (1989) described problem solving as "the central focal point of the mathematics curriculum".

The importance of improving problem solving skills is emphasized in updated mathematics curricula in Turkey as well (Ministry of National Education [MoNE], 2009, 2013a, 2013b). In this context, it is mentioned regarding improving elementary school students' problem solving skills in mathematics curriculum that "utilizing problem

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solving to teach mathematics, raising awareness regarding the contribution of problem solving to learning, teaching students to use problem solving skills in situations encountered during mathematics course, other courses and everyday life, teaching them to apply problem solving steps in a meaningful way, raising their confidence in relation to problem solving, giving them positive feelings and thoughts regarding problem solving” (MoNE, 2009, p.14). In the middle school mathematics curriculum, the importance of “giving place to problem solving activities, paying attention to improving students’ communication, mathematical connection, reasoning skills” is emphasized (MoNE, 2013a, p.VI). In the secondary school mathematics curriculum, it is suggested “to place students in problematic situations which they might face in their everyday life, teach them how to deal with these situations and give them reasoning skills” (MoNE, 2013b, p.53).

Considering that improving problem solving skills is one of the main objectives of NCTM (1989) standards and mathematics curricula of MoNE (MoNE, 2009, 2013a, 2013b), teachers should make it a priority to improve problem solving skills of students. Individuals encounter various problems in their everyday lives. They are expected to be able to solve these problems. This is only possible with improvement of problem solving skills. If problem solving is made a part of everyday life in school, problem solving skills can be improved easily (Henton, Marotz-Baden, & Kieren, 1979).

Kilpatrick (1985) notes that the success of a student in problem solving depends on his or her improvement in skills related to problem solving process. In teaching programs, the importance of raising students who are able to associate everyday life with mathematics, solve the problem step by step, discuss reasons behind solutions, work in groups, and have positive attitudes toward mathematics (MoNE, 2009). In addition, considering that one of the main reasons behind negative attitudes toward mathematics is students’ lack of confidence in their problem solving skills, the significance of improving problem solving skills in mathematics course can be seen more clearly (Yıldızlar, 2001). It should be remembered that understanding the problem, planning the solution, carrying out the plan, checking the correctness and validity of the solution, generalizing the solution, and creating similar/original problems, which are Polya’s stages of problem solving, must be observed in efforts to improve students’ problem solving skills (MoNE, 2013a, p.IV).

A literature review shows that problem solving skills are increasingly emphasized in mathematics education. (Baker & Shaw, 1987; Blissett & McGrath, 1996; Farrel, Meyer, & White, 2001; Karahan, Sardoğan, Güven, Özkamalı, & Dicle, 2006; Karataş & Güven, 2004; Korkut, 2002; Mandin, Jones, Woloschuck, & Harasym, 1997; Nelson, Golding, Drews, & Blazina, 1995; Sawyer, MacMullin, Graetz, Said, Clark, & Baghurst, 1997; Soylu & Soylu, 2006; Taşkın, Yıldız, Kanbolat, & Baki, 2013; Yıldız & Baltacı, 2014; Yıldız, Baltacı, & Güven, 2011). Also, it is mentioned in teaching programs that problem solving process should be aimed at topics handled in each class (MoNE, 2009, 2013a, 2013b). In order for teachers to give problem solving skills to their students, they need to know about the importance of improving problem solving skills in mathematics education. For this reason, it has become important to investigate teachers’ opinions and suggestions regarding improvement of problem solving skills. Therefore, it is an important topic of research to find out opinions of teachers regarding improvement of students’ problem solving skills.

The Purpose of the Study

The main objective of education is to teach individuals to think, use their logical power, and become better problem solvers (Shin, Jonassen, & McGee, 2003). Therefore, this study aims to reveal opinions of middle and secondary school mathematics teachers regarding improvement of students’ problem solving skills.

METHOD

This section contains information about the research method, study group, data collection tool, and data analysis.

Research Method

Therefore, this study aims to reveal opinions of middle and secondary school mathematics teachers regarding improvement of students’ problem solving skills and utilizes the qualitative research approach to this end. Qualitative studies aim to investigate and understand social phenomena in their environment (Yıldırım & Şimşek, 2008).

Study Group

The participants of the study consists of 115 (60 middle school and 55 secondary school) teachers serving in middle schools and secondary schools located in the provinces of Trabzon, Giresun, and Manisa during the fall semester of 2015-2016 academic year. Purposive sampling method is usually preferred in qualitative studies (Meriam, 1998). The maximum diversity sampling is one of the purposive sampling methods (Yıldırım, Atila,

Özmen, & Sözbilir, 2013). This study utilizes the maximum diversity sampling to determine common or different aspects in a variety of situations, thus describe the problem in a wider framework (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2009). This study consists of voluntary teachers serving in high-end schools who stated that they were knowledgeable about improving students' problem solving skills. Demographic characteristics of teachers are given in Table 1.

Table 1. Certain Demographic Characteristics of Teachers

Characteristics	Categories	Middle School		Secondary School		Total	
		f	%	f	%	f	%
Gender	Male	24	20.9	26	22.6	50	43.5
	Female	36	31.3	29	25.2	65	56.5
Age	20-25	4	3.5	7	6.1	11	9.6
	26-30	19	16.5	10	8.7	29	25.2
	31-35	14	12.2	20	17.4	34	29.6
	36 and above	23	20.0	18	15.7	41	35.7
Years of service	0-5	22	19.1	15	13.0	37	32.2
	6-10	20	17.4	18	15.7	38	33.0
	11-15	7	6.1	10	8.7	17	14.8
	16-20	10	8.7	9	7.8	19	16.5
	21 and above	1	0.9	3	2.6	4	3.5
Educational status	3 years of educational institute	1	0.9	3	2.6	4	3.5
	Faculty of education	47	40.9	30	26.1	77	67.0
	Faculty of arts and sciences	7	6.1	20	17.4	27	23.5
	Master's degree	5	4.3	2	1.7	7	6.1

It can be seen from Table 1 that 56.5% of the teachers were female, 65.3% were over the age of 30, 34.8% had a professional experience of 11 years and above, and 67.0% were faculty of education graduates.

Data Collection Tool

A form consisting of eight open-ended questions was used for data collection. The questions in the form were created by the researcher examining the literature related to problem solving skills. The help of two Turkish language teachers was taken and opinions of two experts in the field of mathematics education were taken for the content validity of the questions. Necessary corrections were made based on the feedback supplied by experts and teachers. The comprehensibility of the questions was checked via the pilot study performed with 15 mathematics teachers. Forms were filled by the teachers in a time and place where they could express their opinions conveniently.

Data Analysis

Descriptive data analysis and content analysis techniques were used together for data analysis. The data were firstly analyzed with descriptive analysis. Then, the data were analyzed at a deeper level with content analysis and codes and categories were created. After the determination of codes and categories by the researcher, the frequency and percentage of codes were calculated. Since some teachers gave answers to a single questions that could be considered in multiple codes, the sum of code frequency may be more than the number of mathematics teachers participated in the study. The data are presented for the reader in tables and sample sentences from answers of the teachers can be found below tables.

The data collected via forms were transcribed by the researcher and three randomly selected data were coded by two researchers independently. The consistency between the codes was calculated using the formula $[\text{Agreement} / (\text{Agreement} + \text{Disagreement})]$ and the conformity among researchers was found to be 0.86. Also, abbreviations such as S1, S2, ... , S115 were used instead of real names of the teachers.

FINDINGS

The frequency and percentage values related to codes created from opinions of teachers regarding the importance of improving students' problem solving skills in mathematics education can be found in Table 2.

Table 2. The Importance of Improving Problem Solving Skills in Mathematics Education

Category	Codes	f	%
The Importance of Problem Solving Skills in Mathematics Education	1. Helps solve problems in everyday life.	84	73.0
	2. Gives different perspectives.	29	25.2
	3. Teaches different ways to solve a problem.	25	21.7
	4. Facilitates to understand the problem.	14	12.2
	5. Allows for finding practical solutions.	13	11.3
	6. Contributes to mental development.	13	11.3
	7. Improves self-confidence.	12	10.4
	8. Improves the success in mathematics course.	11	9.6
	9. Improves the ability to read and understand.	9	7.8
	10. Improves the ability to perform operations.	7	6.1
	11. Improves the ability to interpret.	6	5.2
	12. Improves critical thinking.	6	5.2
	13. Makes it possible to focus on the problem.	5	4.3
	14. Improves decision-making.	5	4.3
	15. Improves analytical thinking.	5	4.3
	16. Makes individuals more successful in everyday life.	4	3.5
	17. Makes students enjoy mathematics.	3	2.6
	18. Raises solution-focused individuals.	2	1.7
	19. Encourage students to think.	2	1.7
	20. Provide connecting subjects to each other.	2	1.7
	21. Improves creative thinking.	1	0.9

As seen in Table 2, the teachers mostly mentioned that improving students' problem solving skills helped them solve everyday life problems, gave them different perspectives, allowed them to find different ways to solve the problem, and facilitated to understand the problem. Some answers given by the teachers to first four codes are given below:

"A student with an improved problem solving skill can handle problems in everyday life. (S11)"

"Problem solving skill allows for seeing problems from different perspectives... (S11)"

"Problem solving teaches students to find alternative solutions to problems that they encounter in their everyday lives and try routes which will make their lives easier, thus it is beneficial for them. (S34)"

"When these skills are improved, students will understand problems more easily and reach solutions more efficiently and rapidly. (S15)"

The frequency and percentage values related to codes created from opinions of teachers regarding responsibilities of teachers related to improving students' problem solving skills can be found in Table 3.

Table 3. Responsibilities of Teachers in Improving Problem Solving Skills

Category	Codes	f	%
Responsibilities of Teachers	1. Guides students.	37	32.2
	2. Teaches problem solving strategies to students.	19	16.5
	3. Makes students like mathematics.	7	6.1
	4. Provides students with problems of different kinds.	6	5.2
	5. Encourages students.	6	5.2
	6. Arouses a sense of wonder in students.	5	4.3
	7. Associates topics with everyday life.	4	3.5
	8. Gets down to students' level.	4	3.5
	9. Provides solutions of problems clearly and understandably.	2	1.7
	10. Improves students' creativity.	2	1.7
	11. Explains problem solving steps.	2	1.7
	12. Prepares problems suitable for students' level.	2	1.7
	13. Knows his or her students well.	2	1.7
	14. Makes students like reading.	1	0.9
	15. Gives students opportunities to prove themselves.	1	0.9
	16. Gives the course using materials.	1	0.9
	17. Gives the course in a student-centered manner.	1	0.9

As can be seen in Table 3, the teachers believed that their responsibilities in improving problem solving skills mostly included guiding students, teaching problem solving strategies, and making students like the mathematics. Some answers given by the teachers to first three codes are given below:

“The teacher must be an example and guide the student. (S29)”

“I believe teachers should ... teach appropriate strategies to improve students’ problem solving skills. (S30)”

“The teacher should make it possible for students to like the course and students should make an effort. (S5)”

The frequency and percentage values related to codes created from opinions of teachers regarding responsibilities of students related to improving their problem solving skills can be found in Table 4.

Table 4. Responsibilities of Students in Improving Problem Solving Skills

Category	Codes	f	%
Responsibilities of Students	1. Making an effort to solve problems.	34	29.6
	2. Trying to apply what he or she learned in school in everyday life.	21	18.3
	3. Being determined.	16	13.9
	4. Reading books.	12	10.4
	5. Being curious.	5	4.3
	6. Exchanging knowledge with the teacher.	5	4.3
	7. Studying hard.	3	2.6
	8. Being active during classes.	3	2.6
	9. Fulfilling his or her responsibilities.	2	1.7
	10. Trying to improve his or her self-confidence.	1	0.9
	11. Trying to improve his or her communication skills.	1	0.9
	12. Making comments.	1	0.9
	13. Not being biased toward the course.	1	0.9
	14. Solving problems.	1	0.9

As can be seen in Table 4, the teachers believed that students’ responsibilities in improving problem solving skills mostly included making an effort to solve problems, trying to apply what they learned in school in everyday life, being determined, and reading books. Some answers given by the teachers to first four codes are given below:

“...Students must make an effort to solve problems that they encounter. (S2)”

“...Students should try to apply what they learned in everyday life. (S31)”

“...The responsibility of students ... is to be determined to study. (S34)”

“...I believe that having a different perspective and producing creating ideas are related to reading books avidly... (S36)”

The frequency and percentage values related to codes created from opinions of teachers regarding whether mathematics and other courses have any contribution to improving students’ problem solving skills can be found in Table 5.

Table 5. Effects of Mathematics and Other Courses on Improving Problem Solving Skills

Category	Codes	f	%
Contribution of Courses to Improving Problem Solving Skills	1. Mathematics and other courses positively affect the improvement of problem solving skills.	100	87.0
	2. Mathematics course positively affects the improvement of problem solving skills.	6	5.2
	3. Mathematics and other courses have no effect on the improvement of problem solving skills.	4	3.5
	4. Turkish course positively affects the improvement of problem solving skills.	3	2.6
	5. Mathematics and Turkish courses positively affect the improvement of problem solving skills.	1	0.9
	6. Mathematics course has no effect on the improvement of problem solving skills.	1	0.9

As can be seen from Table 5, the teachers mostly believed that mathematics and other courses positively affected the improvement of problem solving skills. The answer given by one of the teachers related to the first code can be found below.

“All courses; mathematics, life sciences, and Turkish courses in particular, are very important in the improvement of problem solving skills. (S23)”

The frequency and percentage values related to codes created from opinions of teachers regarding whether improving students' problem solving skills have any contribution to their success in mathematics and other courses can be found in Table 6.

Table 6. Effect of Improving Problem Solving Skills in Student Success in Mathematics and Other Courses

Category	Codes	f	%
Effect of Problem Solving Skills in Student Success	1. Positively affects success in mathematics and other courses.	111	96.5
	2. Positively affects success in science courses.	1	0.9
	3. Sometimes increases success in mathematics course.	1	0.9
	4. Positively affects success in mathematics course.	1	0.9
	5. Has no effect on success in mathematics and other courses.	1	0.9

As can be seen in Table 6, the teachers mostly believed that improving students' problem solving skills positively affected their success in mathematics and other courses. The answer given by one of the teachers related to the first code can be found below.

“Improving students’ problem solving skills has a positive effect on their success in mathematics and other courses. (S42)”

The frequency and percentage values related to codes created from opinions of teachers regarding characteristics of students with improved problem solving skills can be found in Table 7.

Table 7. Characteristics of Students with Improved Problem Solving Skills

Category	Codes	f	%
Characteristics of Students with High Problem Solving Skills	1. Is more successful in classes.	47	40.9
	2. Has higher self-confidence.	31	27.0
	3. Solves problems more easily.	19	16.5
	4. Understands problems more easily.	8	7.0
	5. Shows a solution-oriented approach.	8	7.0
	6. Has a broader perspective to life.	8	7.0
	7. Has higher critical thinking ability.	6	5.2
	8. Has more leadership qualities.	5	4.3
	9. Gives more accurate decisions.	5	4.3
	10. Is more curious.	4	3.5
	11. Is more active.	3	2.6
	12. Has higher analytical thinking ability.	3	2.6
	13. Is smarter.	2	1.7
	14. Likes reading more than others.	2	1.7
	15. Is more interested in classes.	1	0.9
	16. Has higher motivation.	1	0.9
	17. Associates subjects with each other more easily.	1	0.9
	18. Questions more frequently.	1	0.9
	19. Is more careful.	1	0.9
	20. Has a higher readiness level.	1	0.9
	21. Asks more questions.	1	0.9

As can be seen in Table 7, the teachers mostly believed that students with improved problem solving skills were more successful, had higher self-confidence, and solved problems more easily. Some answers given by the teachers to first three codes are given below:

“Students with high problem solving skills understand problems that they encounter more easily. They are more successful. (S52)”

“Students with high problem solving skills become self-confident individuals... (S23)”

“Students with high problem solving skills cope with issues more easily...Students with low problem solving skills struggle in the face of adversity. They have a hard time. (S2)”

The frequency and percentage values related to codes created from opinions of teachers regarding characteristics of students with low problem solving skills can be found in Table 8.

Table 8.Characteristics of Students with Low Problem Solving Skills

Category	Codes	f	%
Characteristics of Students with Low Problem Solving Skills	1. Has lower self-confidence.	20	17.4
	2. Has a harder time solving problems.	15	13.0
	3. Is not successful in classes.	15	13.0
	4. Has more difficulties understanding problems.	8	7.0
	5. Has a tendency toward rote learning.	4	3.5
	6. Cannot think multi-dimensionally.	3	2.6
	7. Has weaker critical thinking ability.	3	2.6
	8. Has little interest in classes.	2	1.7
	9. Has lower motivation.	2	1.7
	10. Is more nervous.	2	1.7
	11. Has difficulties in associating subjects with each other.	1	0.9
	12. Dislikes reading.	1	0.9
	13. Has difficulties in decision-making.	1	0.9

As can be seen in Table 8, the teachers mostly believed that students with low problem solving skills had lower self-confidence, had a hard time solving problems, and were relatively less successful in classes. Some answers given by the teachers to first three codes are given below:

“Students with low problem solving skills demonstrate ... lack of self-confidence. (S50)”

“Students with low problem ... avoid problems and issues as much as possible and continue their lives without solving any problems or solving any issues. (S22)”

“Students with low problem solving skills are not really successful in classes. (S48)”

The frequency and percentage values related to codes created from opinions of teachers regarding to what particularities textbook authors should pay attention in order to improve students’ problem solving skills can be found in Table 9.

Table 9.Particularities to Which Textbook Authors Should Pay Attention in order to Improve Students’ Problem Solving Skills

Category	Codes	f	%
Particularities to Which Textbook Authors Should Pay Attention in order to Improve Students’ Problem Solving Skills	1. Level of students should be taken into account when preparing problems.	42	36.5
	2. Problems should be taken from daily life.	13	11.3
	3. Number of problems should be high in textbooks.	13	11.3
	4. A comprehensible language should be used for problems.	6	5.2
	5. Problems should be attention-grabbing.	6	5.2
	6. Problems should be ordered from easy to difficult.	5	4.3
	7. Problems should be suitable for students’ readiness.	5	4.3
	8. Social environment of students should be taken into account when preparing problems.	4	3.5
	9. Solutions of problems should be given in textbooks.	3	2.6
	10. Problems should include visual elements.	3	2.6
	11. Information given in problems should conform to the reality.	2	1.7
	12. Problems should be ordered from simple to complex.	2	1.7
	13. Textbooks should include problems that will encourage students to research.	2	1.7
	14. Textbooks should include open-ended problems.	1	0.9
	15. Textbooks should include up-to-date problems.	1	0.9

As can be seen in Table 9, the teachers mostly believed that, when preparing textbooks, level of students should be taken into account, problems should be taken from daily life, and the number of problems should be high. Some answers given by the teachers to first three codes are given below:

“Preparing understandable textbooks which are appropriate for level of students should be paid attention. (S17)”

“Textbooks should include problems from everyday life. (S13)”

“Textbooks ... should include a high number of problems. (S56)”

DISCUSSION and CONCLUSION

This study aims to find out opinions of mathematics teachers regarding improvement of students’ problem solving skills.

Teachers expressed the importance of problem solving skills in mathematics education in that they help students solve problems of everyday life, provide different perspectives, allows students to find different ways to solve a problem, and facilitate to understand the problem. Thus, it seems that teachers have an awareness regarding the improvement of problem solving skills. Emphasizing the importance of problem solving skills in teaching programs seems to have created an awareness in teachers. With regard to mathematics education, improving students' problem solving skills will help them solve mathematical problems and mathematics courses in their academic lives, cope with and overcome problems that they encounter in their everyday lives.

The teachers believed that their responsibilities in improving problem solving skills mostly included guiding students, teaching problem solving strategies, and making students like the mathematics. It seems that teachers are informed about their responsibilities in improving problem solving skills, although partially. It is pleasing that teachers assume such responsibilities. Because improving students' problem solving skills is only possible with the use of appropriate teaching methods, techniques, and strategies (Tertemiz, Çelik, & Doğan, 2014; Yazgan & Bintaş, 2005). These roles are also consistent with the teacher as a guide, adopted in the constructivist approach. Also, teachers who have the understanding that "each child can learn mathematics (MoNE, 2009)" are expected to adopt the approach that "student values mathematics". If students believe mathematics is valuable, they may recognize it as worthy of dealing with, protect it and thus enjoy it. It should be remembered that this love will take them to success.

The teachers believed that students' responsibilities in improving problem solving skills mostly included making an effort to solve problems, trying to apply what they learned in school in everyday life, being determined, and reading books. It should be remembered that teachers should motivate students to fulfill these responsibilities, draw their attention to the course, give them opportunities to apply what they learned, and encourage them. Also, for reading comprehension activities, which is a very important issue in understanding the problem, teachers should emphasize the importance of reading and try to help students perceive reading as a positive habit rather than a task. To this end, teachers may hold reading hours as an in-class activity to encourage students read.

The teachers mostly believed that mathematics and other courses positively affected the improvement of problem solving skills. It is highlighted that understanding the problem, devising the solution, carrying out the plan, checking the correctness and validity of the solution, generalizing the solution and creating similar/original problems, which are Polya's stages of problem solving, must be observed in efforts to improve students' problem solving skills (MoNE, 2013a, p.IV). In this context, Özsoy (2005) reported that students with low mathematical success also had low problem solving skills, although these students were successful in the stage of understanding the problem, they were relatively less successful compared to other students in stages of planning, carrying out the plan, and checking solution. In the same study, it was mentioned that there was a significant relationship between mathematical success and problem solving skill and problem solving skill positively affected mathematical success. These finding supports the results of our study.

The teachers mostly believed that improving students' problem solving skills positively affected their success in mathematics and other courses. This result suggests that teachers are able to establish interdisciplinary associations. Similarly, Yıldırım et al. (2013) found that the majority of prospective science teachers believed that courses other than the science course contributed to improvement of their scientific process skills and they were able to establish interdisciplinary connections. The improvement of students' problem solving skills will positively affect all courses included in the teaching program. Because this skill should not be perceived as a skill specific to mathematics and it should be remembered that it helps individuals offer solutions to all problems encountered in everyday life, and solve these problems step by step.

The teachers were found to believe that students with improved problem solving skills were more successful in classes, had higher self-confidence, and solved problems more easily. This result is parallel with the objective of "allowing students to have confidence in their problem solving skills, giving them positive feelings and thoughts regarding problem solving (MoNE, 2009)", which is one of the objectives of elementary school mathematics curriculum. Based on this emphasis in the curriculum, it can be said that "the student who can solve problems or the student with improved problem solving skills becomes more successful in classes and this success makes the teacher, the family, and the student happy". In this context; solving, research, review, exploration, and experiencing activities in the problem solving process allow students to find the strength to cope with adversities, increase their self-respect, and thus deem themselves adequate socially and emotionally (Britz & Richard, 1992). The teachers were found to believe that students with low problem solving skills had lower self-confidence, had a hard time solving problems, and were relatively less successful in classes. This may lead students with low problem solving skills to have difficulties in their everyday lives in future and fail in school.

The teachers mostly believed that, when preparing textbooks, level of students should be taken into account, problems should be taken from daily life, and the number of problems should be high. Foong and Koay (1997)

found that teachers mostly chose verbal problems involving everyday life situations in textbooks when determining mathematical problem types to use, which supports our findings. In the study conducted by Gökçek and Hacısalıhoğlu Karadeniz (2013), the fact that the question type in MoNE's mathematics textbooks was insufficient to prepare for national university exam was found to lead students to use alternative sources containing different question types and their solutions. Therefore, in addition to the updated curriculum, reviewing textbooks might be a good step toward improving students' problem solving skills.

RECOMMENDATIONS

The following recommendations are presented considering the outcomes of the study:

1. In-service trainings (seminars, courses, etc.) may be held to further enhance teachers' knowledge and abilities related to improving problem solving skills.
2. Efforts may be made to increase teachers' determination to improve problem solving skills, allow them to see themselves as a part of the process and encourage them to overcome their deficiencies if any.
3. In order to improve their problem solving skills, students may be supported in terms of mathematics, given more access to mind games, encouraged to see relations, check the accuracy of the solution, make use of concrete models or materials, establish rich models in the stage of understanding the problem, and utilize the paper folding method (MoNE, 2009, p.14).
4. Teachers may be more careful about relating problems used in class to everyday life. This way, students will be more interested in solving the problem and become more successful in classes.
5. It may be useful to add an elective course such as "Improvement of Problem Solving Skills" to mathematics curricula.
6. Prospective teachers may perform problem solving activities outside the mathematics course as well, which will enhance interdisciplinary connections.
7. Performing studies related to improving problem solving skills in "Special Teaching Methods I and II" classes included in the 3rd year course schedule of the mathematics teacher education program is believed to be helpful in reducing possible issues in future. Increasing the prospective teachers' level of knowledge and eliminating their shortcomings regarding improving problem solving skills may be useful. Thus, prospective teachers will feel sufficient when they start service.
8. It may be useful to pay attention to whether problems in mathematics textbooks prepared in accordance with the updated curricula are practice-based. The number and quality of problems and solutions in mathematics textbooks prepared in accordance with the updated curricula may be increased.
9. This study was conducted with teachers only. Opinions of prospective teachers and students in primary school, middle school, and secondary school may be taken for a more comprehensive study.
10. Observations may be made to investigate how teachers and students behave during the problem solving process and what sort of difficulties they encounter.

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