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INVESTIGATION OF MATHEMATICS TEACHERS' OPINIONS ABOUT PROBLEM POSING

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Abstract

Problem posing in mathematics education is one of the most important skills. Since mathematics teachers are one of the most important parts of mathematics education and teaching, this research was conducted to evaluate their views on this important skill and the implementation process. The research was carried out by 56 mathematics teachers working at different schools with different seniority times. We evaluated the teachers' opinions by applying content analysis. The importance of problem posing skills in mathematics education has come from knowledge and practice that teachers have.

Keywords: Mathematics education, Problem posing, Teachers' opinion

Abstrak

Problem posing merupakan salah satu keterampilan yang penting dalam pendidikan matematika. Guru matematika juga dipandang sebagai bagian yang penting dalam pendidikan dan pengajaran matematika. Oleh karena itu, penelitian ini dilaksanakan untuk mengevaluasi pandangan para guru matematika terhadap keterampilan *problem posing* dan proses implementasinya. Subjek penelitian ini adalah 56 guru matematika yang mengajar di berbagai sekolah yang berbeda dengan tingkat senioritas yang berbeda pula. Pandangan dari para guru tersebut dievaluasi dengan menerapkan analisis konten. Pentingnya keterampilan *problem posing* dalam pendidikan matematika bersumber dari pengetahuan dan pengalaman yang dimiliki guru.

Kata kunci: Pandangan guru, Pendidikan matematika, *Problem posing*

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Problem posing is seen as an important component of mathematics programs and is at the center of mathematical activities (NCTM, 2000; Mose, Bjork, & Goldenberg, 1990; Silver, 1994). Some mathematics education researchers have stated that problem-solving provides important opportunities for students to improve their mathematics education (Nakano, Murakami, Hirashima, & Takeuchi, 2000). Problems teachers set up to provide opportunities for students and contribute to their understanding of mathematics (Knott, 2010). According to Gonzales (1998), the inclusion of problem posing activities in lectures depends on the guidance that teachers will make in establishing problems for their students. It is important to analyze the pedagogical knowledge of teacher or teacher candidates for problem posing from different dimensions whether the teachers' knowledge influence the process of teaching and students' success (Fennema & Franke, 2006; Kulm, 2008; Rizvi & Lawson, 2007).

It is possible to come across different definitions of problem posing in field writing (Kılıç, 2014). Posing a problem is a necessary process to fulfil a series of mental activities. Some of the definitions of problem posing in the literature are mathematical concepts (English, 1998; English, 2003; Pirie, 2002; Shuk-kwan, 1997) and the transitions between representations to contribute to the establishment of the relationship between processes and everyday life (Dickerson, 1999), as well as the center of

mathematics education and mathematical thinking with problem-solving (Silver, 1997). By these, problem posing allows students to form a deep thinking structure. The problem has been proven by the research that has contributed to the thinking organization.

The quality and suitability of mathematical problems have been the subject of many studies in recent years. Many mathematics educators or researchers emphasize that problem-posing processes are important and useful in terms of providing students with knowledge (Cai & Hwang, 2002). We provide some studies conducted in terms of providing students with problem posing in Table 1.

Table 1. Examples from the findings of studies in providing students with problem posing

Problem posing contribution to students	Studies
To establish the relationship between mathematical concepts, operations, and everyday life context	(El Sayed, 2002; Dickerson, 1999; Rizvi, 2007)
Transitions between representations	(English, 1998; Ticha & Hošpesová, 2009; Işık, Kar, Işık, & Guler, 2012)
To your success and attitude	(Silver, 1994)
Critical thinking skills	(Nixon-Ponder, 1995; Nardone & Lee, 2010)
their creativity	(Cankoy & Darbaz, 2010; Silver, 1997)
Problem-solving	(Cankoy & Darbaz, 2010)
Interest and participation	(Brown & Walter, 1993; Nardone & Lee, 2010)
Mathematical reasoning	(Akay, 2006; Crespo & Sinclair, 2008)
To discover mathematical situations	(Akay, 2006; Yuan & Sriraman, 2011)
They can express	(Akay, 2006)
As an evaluation tool	(Lin, 2004; Lin & Leng, 2008; Silver & Cai, 2005)
The relationship between concepts and numbers	(Bonotto, 2006; Nakano *et al.*, 2000)
Reducing dependence on textbooks	(Toluk-Uçar, 2009)
Conceptual meaning	(Silver & Cai, 2005)

In the context of learning and teaching perspectives, problem-posing has an important place. From a learning perspective, students build problem-posing and creativity skills that students contribute to the development of reasoning skills, and strengthen and enrich basic concepts (Brown & Walter, 1983; Richards, 1990; Silver, 1994). From a teaching perspective, problem-posing gives teachers an idea of the skills, attitudes and conceptual learning of a given situation (Lavy & Shriki, 2007).

When we look at recent studies on problem posing, it is seen that studies about teachers (Toluk-Uçar, 2009; Isik *et al.*, 2012) and students (English, 1998; Cankoy & Darbaz, 2010; Barlow & Cates, 2006). Primary school mathematics teachers place the most problem posing activities in the fractional learning area within the numerical learning area. Fractions also found that all of the teachers involved in problem posing activities in the sub-learning field expressed opinions that problem-solving contributed to the conceptual understanding of students and the establishment of the relationship between symbolic expression and everyday life. According to Akay (2006), researches that examine students' cognitive processes in problem posing do not have definite results. At the same time, problem posing has been a subject that has been ignored by teachers and mathematics educators in response to

the importance of teaching programs. There were only small number of studies focused on this subject. Therefore, we considered to examine this issue in Turkey versatile. The problem is that teachers are positively involved in thinking about mathematics teaching (Barlow & Cates, 2006), teachers are experiencing problems with problem posing exercises, and self-efficacy perceptions affect teachers' productive passivity. It is necessary to reveal self-efficacy perceptions related to Lin (2004) states that mathematics education should have a strong understanding of problem posing activities in the natural process and teachers should have a strong understanding of problem posing activities. Primary school mathematics teachers included in problem posing activities in the classroom, and that they contributed to the establishment of the relationship between a conceptual understanding of problem-solving and symbolic expression and everyday life.

This study aims to examine the opinions of mathematics teachers about problem building. Given this goal, we asked the teachers whether they were ready to use the problems they had settled or not, their difficulties in setting up the problem, and their recommendations. We considered that the research teachers' opinions are important thought to contribute to pedagogical field knowledge.

METHOD

Research Pattern

We used phenomenology from qualitative research design to see the teachers' opinions. Events, objects, and experiences have different meanings to different people (Johnson & Christensen, 2008). They see the world as a spectator of the participants, conceives the meaning of their experiences (Lodico, Spaulding, & Voegtle, 2010), and the concept of self (McMillan, 2008). In the study, we used the interview as the data collection technique.

Participants

We reached the mathematics teachers who worked in the urban schools. We did not take the rural schools into the survey. Because the working conditions of the rural schools are different, these schools should be examined separately. The characteristic of participation in the study is voluntary. We reached 56 mathematics teachers in the research. These teachers are 20 female and 36 male. We described the service and age status of the participants in Table 2.

Table 2. Information of the participant group

Age	Year of service				Total
	0-5	6-10	11-15	16 and over	
20-30	13	5	-	-	18
31-40	-	14	13	1	28
41-50	-	-	2	5	7
51 and over	-	-	-	3	3
Total	13	19	15	9	56

Data Collection Technique

We used the interview form developed by the researcher as a result of field survey as the data collection tool. While the interview form was developed, the opinions of two experts working in the field of mathematics teaching were taken and applied to 5 mathematics teachers. In line with the feedback received, the final form was given to the interview form. The ten open-ended questions about mathematics teachers' views on problem-solving, the way they were structured, the criteria they followed, the content of multiple solutions, stages, student level, multiple representations, mathematical and pedagogical situation of problems, and difficulties teachers encountered in problem writing.

Mathematics teachers' opinions about writing problems have been taken in writing. In this context, the interview form was applied by the researcher to the mathematics teachers working in public schools. The reason why the data should be collected in writing is that the participants should be more comfortable writing. Also, the face-to-face interviewer is the weakest point, and the presence of the interviewer can influence the responses of participants (Leeuw, 2008). According to Johnson & Christensen (2008), participation interviews can be conducted face-to-face in participatory research, and experience can be taken in writing from participants.

Validity and Reliability

Long-term interaction, deep-focus data collection, expert analysis and detailed descriptions were used to increase the validity of the study. The teacher's answers were first read by the investigator, and these responses were written down, on separate files of each question. The data were analyzed using Nvivo 8 and the obtained analysis were reviewed several times. During the examination, the raw materials were returned and checked. Besides, there is a direct citation in the finds section without any comment. A scorer association (Creswell, 2009; Miles & Huberman, 1994) was used to confirm the reliability of the study. For this purpose, the level of compliance between the interview forms, which were filled in by the teachers in writing, and the coding, which was coded by another expert experienced in qualitative data analysis, was determined (92%).

Data Analysis

In the analysis of the data, a content analysis method was used. One of the main features of the content analysis method is digitization (Bilgin, 2006). In this study, frequency analysis technique which is one of the content analysis techniques is used. Frequency analysis refers to the frequency with which the unit or objects are viewed numerically. This analysis makes sense of the density and importance of a particular pillar (Bilgin, 2006). Responses to interview questions were read before grouping (Patton, 1987). Responses given by classroom teachers are recorded in the word file for each question. In the analysis of the data, Nvivo's support was obtained. Data were analyzed with Nvivo. Then a table containing the themes, frequencies and the codes in the specified theme was prepared with Nvivo. The data analyzed with raw data were again compared, and inappropriate themes were removed, the themes

merged or new themes were created. It is useful to work on the classification of data by multiple evaluators in content analysis (Patton, 1987). Raw data were sent to a specialist at a different university. As a result of the comparison of the opinions of the researcher and the expert, "Interview group", and "Interview group" between the experts were determined by marking. If the researcher and the expert have pointed out the different theme in the relevant question, the "opinion separation" has been accepted, taking the marking that the researcher has done as a reference. Reliability was calculated using Miles & Huberman's (1994) formula as stated in Equation (1).

$$Reliability = \frac{Vision\ Union}{(Vision\ Union + Vision\ Separation)} \quad (1)$$

As a result of applying the formula, a confidence percentage of 94% was obtained.

RESULTS AND DISCUSSION

In this section, the themes of the opinions of the mathematics teachers on the problem posing, the problem-posing criteria, the steps and difficulties are given.

Setting up problems yourself or using ready-made problems

Mathematics teachers in mathematics-geometry courses while describing the problems they have set out by themselves or using ready-made problems are given information. Twenty-five per cent of the teachers said they used ready-made problems, 19% said they had problems, and 26% said they were both ready and they had established themselves. When teacher opinions are examined, it is seen that there are six sub-themes in the ready to use problems category, five sub-themes in their problem posing category, and four sub-themes in both.

There were 35% of the teachers who use ready-made problems prefer to be informed due to lack of knowledge, 22% due to need, 13% due to the problem, 13% due to student level, 3% insufficient situation and 7 %. They stated that 27% of the teachers who set up the problems themselves were doing at the student level, 18% at the exam format, 18% at the question level, 18% at the original level and 18% at the appropriate level. Teachers who use both expressed that they make 50% of them according to the subject, 21% according to the situation, 21% according to the student level and 8% for the convenience of making meaning. The mapping is illustrated in Figure 1.

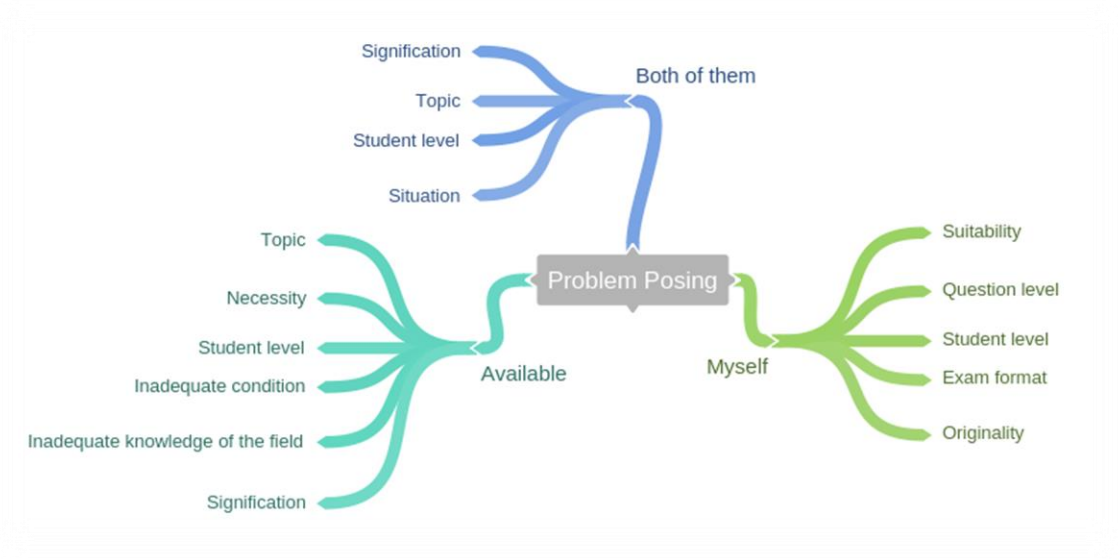

Figure 1. Sub-topics of teachers' views on the causes of problem formation

Some of the teachers' opinions participating in the survey on problem posing were recorded here.

T12 : I am preparing myself according to the success of the class (student-centered).
T36 : I am using prebuilt problems. Because I am not at a level where I can have problems. Setting up problems and generating questions is a serious business. Otherwise, students may lead to misconceptions in the concept.
T14 : I usually build myself. I'm simply adjusting the questions. Some narrative books I advise students.
T3 : I build myself according to the level of the class.
T21 : To make sure that it is understood during and after the narration of the subject, I build myself. I use ready-made problems at the end of the thread.
T48 : I am using ready-made problems. To avoid the problem of incorrect question preparation
T11 : I build myself. Because many ready-made problems are not heuristic-based.

Tracking down problem posing activities

The opinions of the teachers participating in the research on the path they followed in the problems they have established are the themes. They expressed opinions in the themes of using information, understanding, establishing relationships, question level, according to acquisition, daily life, experience, readiness, living by doing, student level, conformity, different representation, quality, attention, multiple solution, The most common ways of thinking are to include acquisition, student level, use of knowledge, daily life, different representation. The mapping is illustrated in Figure 1.

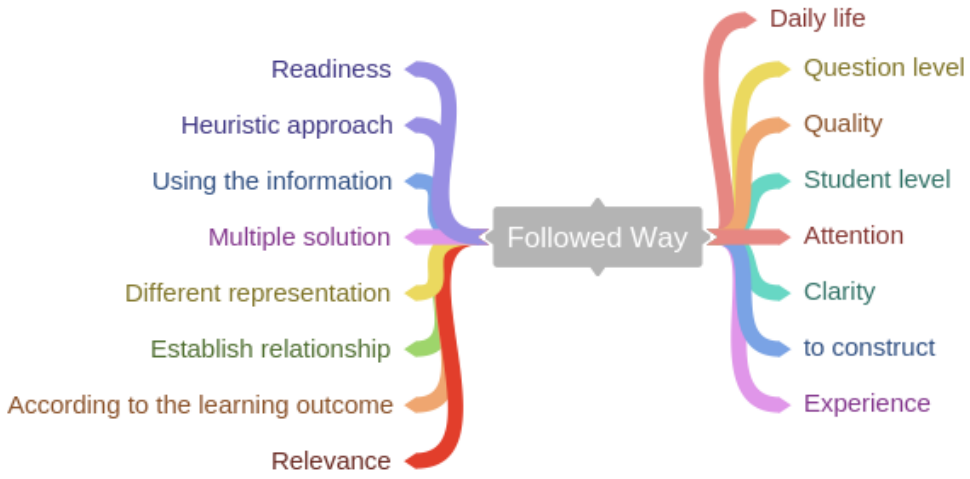

Figure 2. Themes related to the pathways of problem posing activities

Some of the teachers' opinions on the way of monitoring activities were recorded here..

T4 : If I have two problems, one is simple. On the other, I want additional information. For example, I am asking complex number information in the logarithm of the questions.
T32 : Understanding mathematical knowledge and creating a relationship between this knowledge. Creative and reflective the problems they will be able to use the skills of thinking analysis and synthesis.
T13 : The problem is firstly updated so that the student can understand that the acquisition is appropriate. I make sure that the daily life is appropriate.
T16 : We take care to prepare the questions understandably. According to the level of the students, I have questions ready.
T24 : By embodying, we can judge visually; I try to solve problems by taking advantage of it.
T9 : I am having problems with everyday life and with examples that students can take pictures of them.
T31 : According to the way it works, I am following a difficult path from my hand.
T16 : First, problems with the single acquisition (simpler level) and visual problems, here we go. At the level of analysis, after the problems are not understood, I want the children to set up their problems.

When Figure 2 and the opinions of some teachers were examined, they expressed the criteria that the mathematics teachers should be careful to understand the problems of the ways they see, to prepare the problems from the easy, current and daily life, students' preliminary knowledge and multiple solutions.

Criteria to establish the problem

Teachers who participated in the research stated that they consider some criticisms in the subject expressions and in the problems they have established at the end of the subject. Some teachers have specified more than one criterion. The themes created according to the views taken from the teachers are given in Figure 3.

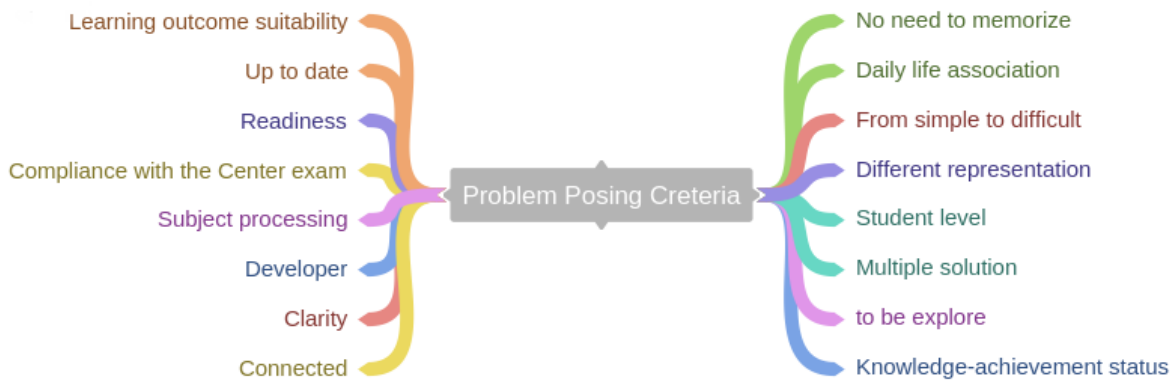

Figure 3. The criteria teachers use to solve problems

T5 : I do not solve problems that lead to learning based on memorization. I use canonical problems.
T15 : I take care to be up to date. I wish daily life is appropriate. Consider events that students may understand.
T23 : To be suitable for the level of the learner, to learn by exploring.
T19 : We take care to prepare the questions in a way that improves the students' minds from simple to complex.
T2 : I take into account the profitability. I pay attention to he questions that will enable them to establish relations between them are clear dictionaries and examples of daily life.
T33 : I pay attention to the fact that there are problems with the points that will direct the student to the goal. I'm careful not to be confused if it's clear and clear.

The most important aspect of the problem posing criteria

When the opinions of the teachers who participated in the research are examined regarding the most important in the problem building criteria, the sub-themes of the interviews are given in Figure 4 below. The importance of these criteria is mostly related to daily life, acquisition suitability, student level and the up to date problem.

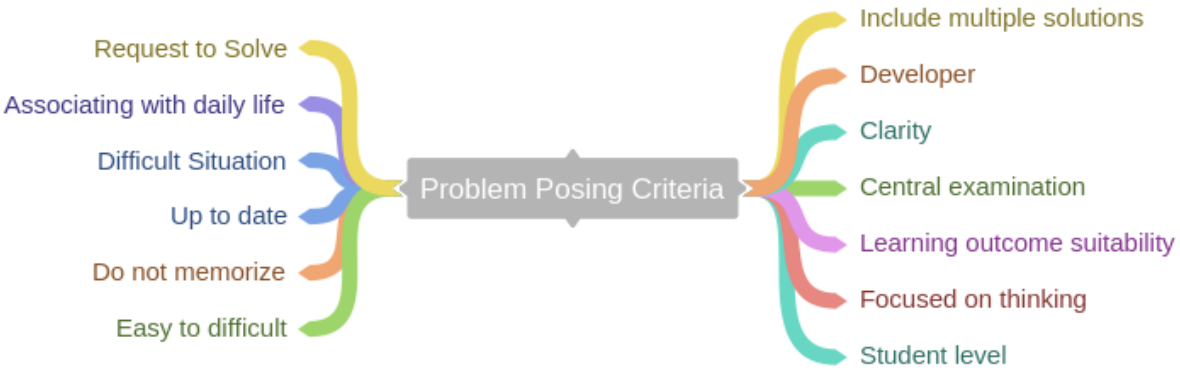

Figure 4. Situations where teachers are most important in problem posing criteria.

The opinions of some teachers participating in the research on the issues that are most important in problem posing criteria were recorded here.

T4 : I am setting the problems with incarnation principle (straight from the arm). According to the bell, last questions it's getting harder, and it's asking for additional information.
T17 : Class level and university exam questions
T32 : Students will be able to collect, analyze and reason data. Different thought problems they can solve.
T23 : I would like to be the situation that most students can meet or meet in their life. I make sure that there are as many current situations as possible.
T38 : Student level because if the student is (chalanged) at the above level, then the student cannot do the task; then mathematics becomes difficult, and the students will be bored.
T26 : Whether it is open to problem development. In case of trouble, can be created. Regarding how to solve problems by turning into a game frame and see whether all students participate. The place of this problem in my life is my priority.
T48 : Students can understand without difficulty. I attach importance to the difficulty of describing mathematics. So we pay attention to the fact that it is understandable when setting up the problems.

İncluding multiple solutions in the problem-posing process

The opinions of the teachers who participated in the research on the thinking of having multiple solutions in problems in problem posing process were examined. Teachers stated that they think and apply more than 85%, 1% do not think and do not use it, 7% sometimes use it partially.

Considering the explanations of the teachers who think that they have multiple solutions in their problems, it was seen that they were collected in 10 main headings. Reasons for using the multiple solutions most frequently are as follows: student perspective, conceptual learning, ensuring the development of creative ideas, attracting attention, linking issues, increasing differences in individual differences, increasing interpreting skills, choosing the right solution and achieving success in central exams. The reasons for those who do not reflect the problems with which they have created multiple solutions are that they are confused by the students' minds and the difficulty of preparing the problems. The sub-themes of these views are given in Figure 5.

Figure 5. Sub-themes for multi-solution in problem-solving

Some of the views of teachers participating in the survey on whether they have multiple solutions in the problems they have established are given below.

T8 : In the problem-posing process, the inclusion of more than one solution, the student's ability to solve the question negatively. Already the student does not adopt the solution much by the method of establishing the equation. When he finds the solution correct, he applies this solution to more than one question, and if he gets the same question, he finds his solution and adopts it.
T19 : Not always. Students are confused.
T54 : Partially finding the solutions when establishing problems according to the topic.
T50 : Yes, the student should understand the problem and make the appropriate solution (the solution that the student knows one of the ways)
T24 : Problems bring different solutions when students are given opportunities; opportunity should be given. They can interpret it in the problem they have not encountered before.
T33 : I think that finding different solutions will create creative ideas in the problem-solving.
T45 : I specifically use more than one solution. I think you have improved the perspective of the learner.
T5 : I definitely think. What kind of provision you make in comparing the solution of the behave with consciousness. Discuss the different solutions of the students. I identify with examples how some solutions are used in other problems.
T22 : Yes, absolutely. Especially due to the way of thinking at the end of the university exam, the solution is sensible.

Consider the problem-solving stages in the problem posing process

Whether or not the teachers involved in the research take into account the problem-solving stages and their reasons for the reason are examined. It has been seen that teachers take into account the problem-solving stages. Also, when the explanations were evaluated, five sub-themes emerged. The most important reason for considering the problem phases is that students in the sense of the problem point out that the convenience of students is useful in establishing relationships, sorting between given and desired, improving interpreting skills and facilitating central examinations. The sub-themes of the teachers' views are given in Figure 6.

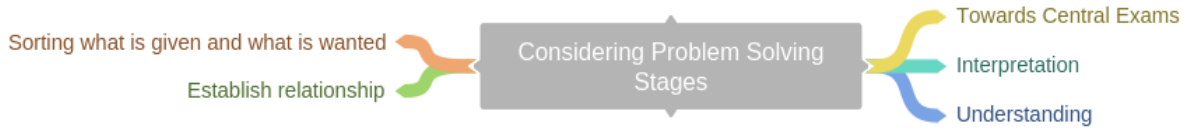

Figure 6. Sub-themes to consider opinions on problem-solving phases

The teachers's opinions on the problem-solving stages are recorded here.

T3 : Understanding and interpreting the problem. Establish the relationship among information.
T19 : We take it mandatory when it is directed to the examination.
T38 : The solution should be appropriate and understandable during the establishment of the problem. The data are given regarding information and logical order.
T9 : I buy it. I want a summary of what's given. I expect to establish a relationship between the given information and the desired information.
T53 : I buy it. A good reading comprehension and narrative can be expressed in their own words, the ability to express correctly in the words they say, the solution of the solution in the mind by rolling the solution, and the comparison of different solutions to compare different solutions to consider the possibility of preparing an appropriate activity and dancing problems.

The most difficult situation in establishing the problem

The opinions of the mathematics teachers participating in the research on the difficult situations or situations in the problem-posing process have been examined. From the information obtained, the existence of the situation, the situation in which it exists and the solution proposal for these situations have emerged. Two teachers said that they do not have any difficulty in problem posing process. Other teachers expressed their suggestions describing the difficulties they experienced. The challenges and solution proposals have been put together, and the views have been combined under the themes as follows; Student level (problem posing, teacher manual, repeat, current example, information refresh, level classes), class status (level determination), problem diversity- quality (question variety, number change, teacher manual, (use of materials, daily life and reality), concretization (drama), measurement and evaluation (measurement evaluation criteria), and feedback (individual education, peer review)), levels of experience-social experiences (taken into account) and abstraction (material use). The mapping is given in Figure 7.

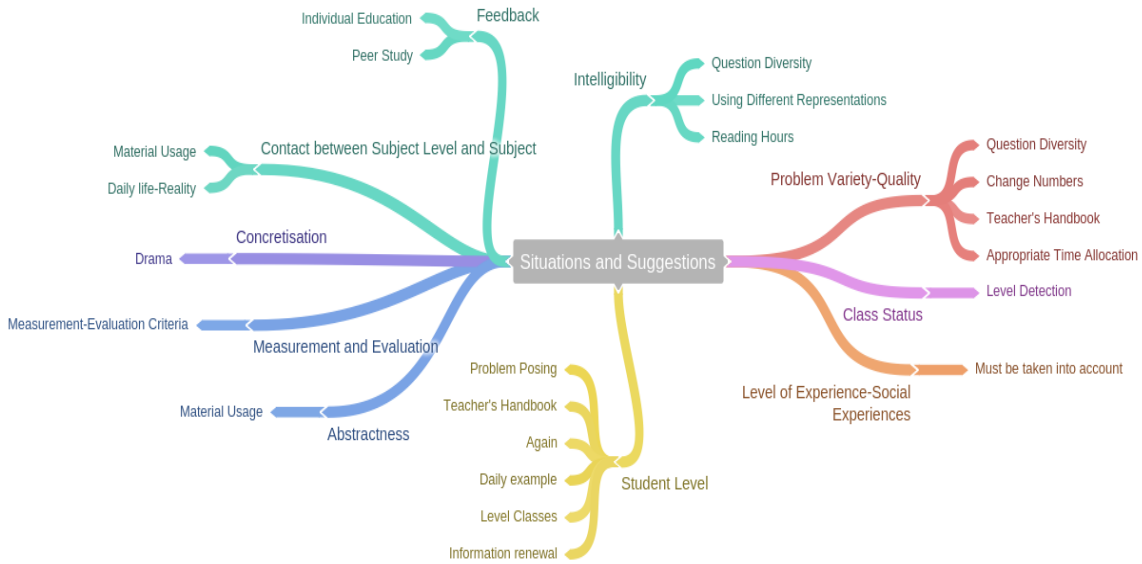

Figure 7. Challenges faced by teachers during the problem posing process and the proposed solution

Some of the opinions of mathematics teachers about the situations they have experienced in the problem posing process and the solutions they have expressed about these situations are recorded here.

T9 : Know the measurement evaluation criteria of the people who set the problem and know which question type is advantageous according to the situation. The purpose of some problems is not explicitly questioning the information, but problems that require special solutions.

T41 : Sometimes the problem we are having is not fully understood by the student. I try to make this situation more clear by using some explanation picture shape for this.

T13 : The level of confrontation is the most difficult situation for the level of the teacher. I'm trying to tell you this until you understand it.

T32 : I can face difficulties in determining the method of expression appropriate to the level of the learners. I use the method of generalization with simple examples in the case of Yada

when the student falls into concept confusion in the process of evaluation and equations.

T50 : The shortcomings in the basic mathematical knowledge (students) make it difficult to understand the abstractness of mathematics, and using more material may perhaps make sense easier.

Preparing the problem according to the level of the student's level

Mathematics teachers who participated in the research investigated the appropriateness of the problems in the process of problem posing and the opinions about how they made this appropriateness. They all stated that the problem was taken into account when setting up the student. Then, it concluded that this conformity is based on what they have done and they have done as follows: behaviour, observation, readiness, curiosity-willingness, pre and post evaluation, comprehension, performance, solving ability, perceiving ability, understanding ability.

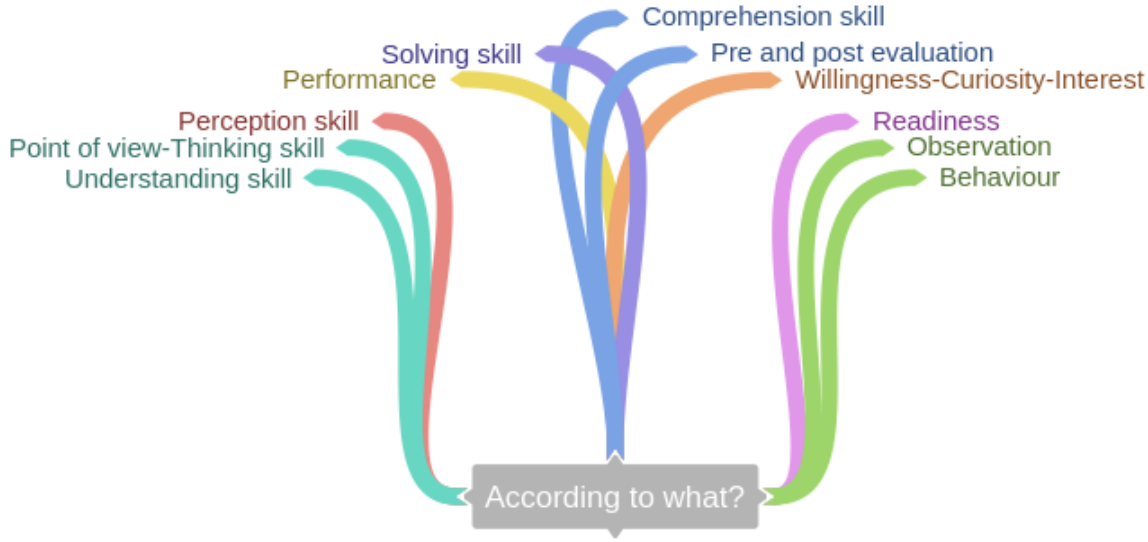

Figure 8. The theme of how teachers determine problems according to student level

The problems of the teachers in the process of forming the problem are recorded here.

T32 : I try to pay attention to the student level. In a non-homogeneous class, I choose appropriate problems according to each student's level. Try to determine according to students' understanding and solving capacities.

T19 : If you do not prepare the problem by observing the level of a group of students who do not have a basic mathematical thinking system like you are speaking English to people who do not speak English ... like taking oranges from your pharmacy. It should be appropriate for the student level.

T23 : It is preparing for students and class level. There are students I know over time in the classroom, probing students, different perspectives and sometimes with fewer questions.

T45 : I prepare according to the student's level. The student's level is determined by the questions themselves. Their levels come from simple to difficult, right or different ways of thinking and solving.

T54 : Yes, I am preparing for the level of the student. I also determine the level of the learners according to the positive or negative reaction given by the student.

T35 : I can observe the student's level with the leveling exam I applied at the beginning of the

year and the topic examination at the end of each topic. Partly because it is difficult for me to deal with the problems.

T40 : In the process of problem posing, the majority of times I prepare the problem according to the level of the student. It is necessary to prepare the problem according to the present situation of the learner, perception. Otherwise, the class disappears (in terms of teaching).

T6 : I prepare at the student level. I make use of in-class screening exams and in-class performances that I did before the actual exams.

Expressing the problem with multiple representations

The opinions of mathematics teachers participating in the research on whether the problems established in problem posing process are paying attention to the expressiveness of multiple representations have been examined. It has been seen that 11% (3 teachers) of the teachers do not pay attention to multiple representations and 89% of them pay attention. When the views of those who care are examined, the explanation they make is the theme. The opinions of teachers about why they pay attention to multiple solutions are as follows: student level, concrete-thinking, understanding-understandability, information use-transfer-activation, interest-motivation, connection-association. The mapping is given in Figure 9.

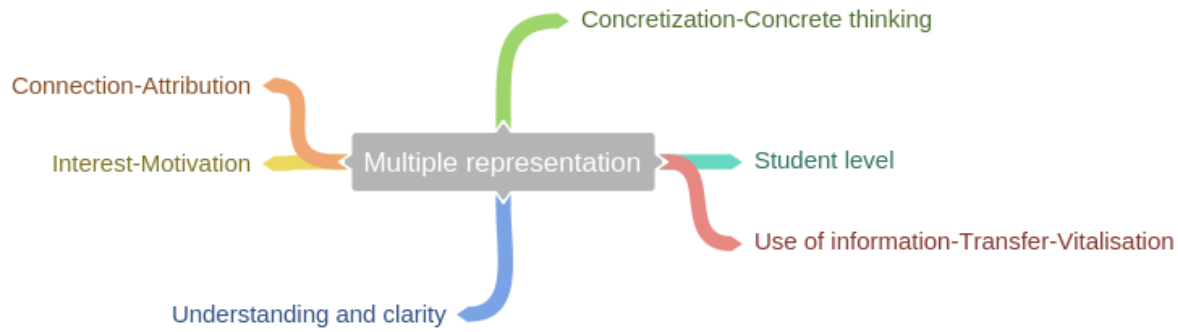

Figure 9. The ability of teachers to express the problem in multiple representations

Some of the opinions expressed by teachers about expressing problems with multiple representatives in the problem posing process are recorded here.

T2 : Yes, by writing intangible data with an abstract problem, we must ensure that the student has a good and complete understanding of the question.

T44 : Yes, I believe that the problem is very important for the rise of the student body.

T19 : Yes, I pay attention. I use multiple representations by linking to past issues.

T33 : In general, Osym uses this in 1-2 questions, but helping publishing houses do not give much to such questions. So I rarely use this type of question.

T24 : I pay attention. Too many variables can cause too many problems. The use of the least number of representations is important for the sake of legibility of the solution.

T39 : It depends on the topic. I support the visuals on topics that are available for table-graphics (drawing).

Do you think that the problems you set are mathematically and pedagogically satisfactory?

When the opinions of the mathematical teachers participating in the research are examined regarding their mathematical and pedagogical sufficiency, 70% of the teachers are not sufficient. Teachers believed to be competent have stated that mathematical competence is more than pedagogical competence. Some of the teachers' comments on the interview are recorded here.

T9 : It may be mathematically sufficient, but I do not think it is enough for pedagogical students. Because he does not work in a student with a memorizing education system, he goes to the way of solving it as an equation instead of thinking and researching thinking.
T47 : I see that it is difficult for the student to grasp because the knowledge of mathematics is an abstract science. I do not think it's enough.
T51 : I think it's enough for some time. The student is helping me with difficulties in understanding ready-made problems. Of course, I should be trained to learn about this topic in my mind.
T23 : I think that the problems in our framework are mathematical and pedagogical. But always good is better.
T35 : Yes, I think for the questions that have no basic teachings. But not for questions involving very specific rules in mathematics.
T22 : I think. I make every effort to produce mathematical love to produce new questions for the increase of the learning desire to improve the existence of agelessness from the difficulties of solving the problems and to raising those who are willing and willing to solve those produced.
T14 : I do not think it's enough. So I take care to build a problem by taking advantage of a source.
T42 : I think it is aimed mathematically at the desired goal. Pedagogically, I think that the high school curriculum can also be done by a medium-level student of intelligence. The problem is that the teacher does not update the teacher and the students do not evaluate the process well. I do not find a high note and correct chic finding pedagogically correct.

Discussion

It is considered that the problem formulation (NCTM, 2000; Silver, 1994), which is one of the most important skills in mathematics education with this research, will give more widespread and important to our country. Problem posing is as important as problem-solving. Nakano ver is an important opportunity for problem posing students to improve their mathematics education-related aspects, as it has been pointed out by others. Higher education institutions have lessons with problem-solving skills, but no special studies are conducted with problem posing. It is thought that teacher education will affect such incomplete mathematics teaching and learning. Also, the research aimed at evaluating the opinions of mathematics teachers by establishing problems and disseminating their results.

There were 55% of the mathematics teachers who participated in the survey stated that they had ready problems, 19% had problems themselves, and 26% were both ready, and they had established themselves. When the researches are examined, it is found out that many of the teachers have used ready-made problems and even mixed the concepts of problem and practice (Çömlekoğlu & Ersoy, 2002, Korkmaz & Gür, 2006, Özreçberoğlu & Çağanağa, 2018). When teachers' opinions are examined, they stated that using ready problems is due to insufficient knowledge of the field, due to necessity,

because of the subject, because of the student's level, inadequate situations and meaningfulness. They said that the teachers who set up the problems themselves were doing because of student level, exam form, question level, originality and suitability. Teachers who use both have expressed that they are doing things to enjoy convenience in subject, situation, student level and meaning.

Among how teachers see their problems is to use information, to understand, to establish a relationship, question level, according to the acquisition, daily life, experience, readiness, living by doing, student level, conformity, the inclusion of different representations, approach. The most common viewpoints are state of achievement, student level, use of knowledge, daily life, different representation. When the opinions of some teachers were examined, they stated that mathematics teachers in problem posing activities took care of the problems related to the ways they watched, prepared the problems forcibly from the easiest, daily and daily life.

They stated that teachers take into account certain criteria in their narratives or in the problems that they have established at the end of the topic. Some teachers have specified more than one criterion. When the opinions about the most important cases in the problem building criteria are examined, the correlation with daily life, acquisition suitability, student level and the problem are up to date.

Teachers think that they have multiple solutions to problems in problem posing process. Considering the explanations of the teachers in their problem, considering the explanations, the reasons for using the multiple solutions most are the student's point of view, the conceptual learning, the development of creative ideas, attracting attention, establishing the connection between the topics, increasing the skill of interpreting, and centralized examinations. The reasons for those who do not reflect the problems they have created are expressed as the confusion of the students' heads and the difficulty of preparing the problems. It has been seen that teachers take into account the problem-solving stages. It is important to note that students should be able to use the convenience of their lives, establish relationships, sorting between given and desired, improving interpreting skills, and facilitating centralized examinations.

It turns out that mathematics teachers are challenged in problem posing. The challenges and the solution proposal are as follows; level (problem determination, teacher handbook, repeat, current example, information renewal, level classes), class situation (level determination), problem diversity-quality (question variety, number change, teacher manual, (use of materials, daily life and reality), concretization (drama), measurement and evaluation (measurement evaluation criteria), and feedback (individual education, peer review)), levels of experience-social experiences (taken into account) and abstraction (material use).

In the problem posing process of mathematics teachers, the student level of the problems is among the most important ones. In this context, the problem is that the students stated that they determined the students' level in Kurdish by taking into consideration the behaviours of the students, observing them, observing readiness, curiosity-willingness, pre and post evaluation, comprehension ability, performance, solving ability, perceiving skill, It has also been found that mathematics teachers

take into account the expressiveness of problems created in the problem posing process by multiple representations. When the opinions of teachers about why they pay attention to multiple representations are examined, they pointed out that increasing the interest-motivations and linking-associating are beneficial also in descending to the multi-representative student level, in concrete-thinking, in understanding-understandability, in using and transferring information.

It turns out that the problems that mathematics teachers have established are not enough regarding mathematical and pedagogical aspects. Teachers believed to be competent have stated that mathematical competence is more than pedagogical competence.

CONCLUSION

This research has come up with the findings of researching how important problem-posing is regarding mathematics education. Mathematics teachers produce different problems from the problems in the books. Teachers should focus on problem posing, finding answers to established problems, and recording all thoughts about the problem. The transfer of the benefits to teachers regarding problem formulation and the students will be a great contribution to the teaching of mathematics. In this context, education faculties that develop mathematics education should include activities of mathematics teaching with problem solving-solving approach, and if necessary, a new and compulsory course should be added to the curriculum.

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