

Problem-Posing Activities in Primary School Mathematics Textbooks in Russia and Azerbaijan

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Abstract: Textbooks are one of the learning mediums. The activities in mathematics textbooks and qualities of these activities are of paramount importance. Problem-posing is one of the activities in these textbooks. Many researchers emphasize that examination of textbooks is important in explaining student success. The purpose of this study was to examine the problem-posing activities in the primary school mathematics textbooks in Russia and Azerbaijan. To this end, these textbooks were analysed and compared by content analysis according to the aforementioned countries and years. It was found out that there were more problem-posing activities in Russian textbooks than Azerbaijani textbooks in terms of both number and variety. In addition, it is considered that the number of problem-posing activities in textbooks should be increased and these problem-posing activities should be diversified.

Keywords: Mathematics, primary school mathematic textbook, problem posing, Russia, Azerbaijan.

1. Introduction

Textbooks, which are one of the learning environments, are an important indicator of the learning opportunities provided to students, since the curriculum designed for students is reflected in the textbooks (Erbaş, Alacacı, & Bulut, 2012). Any curriculum content may be transferred to teachers and students by textbooks, thus, students can be guided in specified goals (Hatam, Zeinali, & Hatam, 2015). It is important to use books in a mathematic course as in other courses. Mathematics textbooks allow transferring mathematic curriculum to teachers and students (Johansson, 2003; Schmidt, McKnight, & Raizen, 1997). Previous studies show that there is a strong correlation between students' success in mathematics and textbooks used (Fan, Zhu & Miao, 2013; Tornroos, 2005; Xin, 2007).

1.1. Problem Statements

It is considered that if teachers examine the problem-posing activities in textbooks to improve and guide their teaching methods, this will contribute much to their classroom practices (Cai & Nie, 2007; Cai, Jiang, Hwang, Nie & Hu, 2016). In addition to problem-posing activities, examination of types of problem posing is also important (Cai, Jiang, Hwang, Nie & Hu, 2016; Christou, Mousoulides, Pittalis, Pitta-Pantazi, & Sriraman, 2005; Silver, 1995).

1.2. Related Research

In this regard, when examining the prior studies investigating the problem-posing activities in primary school textbooks, it was identified that the mathematics textbooks used in China and the USA (Cai, Jiang, Hwang, Nie, & Hu, 2016; Cai & Jiang, 2017; Jiang & Cai, 2014; Zhu & Fan, 2006; Zhu & Fan, 2006), Korea (Kim & Ryu, 2013; Ko, 2015; Park, Lee & Cho, 2019), Turkey (Deringöl, 2020; Kalaycı, 2014; Usta, 2018; Usta & İpek, 2019), Turkey and the USA (Kar & Yıldız, 2015) were examined. As is seen, there is no study conducted comparing the problem-posing

activities in Russia and Azerbaijan. Due to this gap in the literature, this study is considered to contribute to the literature. To this end, it was aimed whether there was any problem-posing activity in the mathematics textbooks used in the primary schools in Russia and Azerbaijan, and to examine and to compare present activities regarding their types and numbers.

1.3. Research Objectives

The sub-problems of the research are as follows:

1. How many types and numbers of problem-posing activities are there in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Russian primary school?
2. How many types and numbers of problem-posing activities are there in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Azerbaijani primary school?
3. What are the differences among the problem-posing activities in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Russian and Azerbaijan primary schools when compared regarding their types and numbers?

2. Theoretical Framework

For the development of mathematical thinking skills of primary school students, mathematical reasoning and problem-posing should be emphasized more as a skill in mathematics textbooks (Usta & İpek, 2019). Problem solution and posing are in the centre of mathematics teaching. Although problem-posing has a significant place in mathematics teaching research, in recent years, it has begun to increase problem-posing profiles in different educational levels in changes made in curricula in many countries (English, 1997; National Council of Teachers of Mathematics [NCTM], 2000). In line with this, it is suggested to include the activities allowing students to create their own problems, to mathematics teaching while students solve preformulated problems (English, 1997; Silver & Cai, 1996).

It is considered that problem-posing activities develops students' perceptions, motivations and excitements about any topic (English, 1998; Silver, 1994). The problem-posing develops students' conceptual learning, reasoning and mathematical communication. It also improves interest and curiosity of students (Cai, Hwang, Jiang, & Silber, 2015). The problem-posing develops students' problem-solving skills, attitudes and their trust and creativity related to mathematics. It also contributes to the broader understanding of mathematical concepts and mathematical thinking (Ayllón, Gómez, & Ballesta-Claver, 2016; Cai & Cifarelli, 2005; Christou, Mousoulides, Pittalis, Pitta-Pantazi, & Sriraman, 2005; English, 1998; Silver, 1994, 1997; Van Harpen & Sriraman, 2013). What is more, problem-solving and problem-posing are closely related (Cai, 1998; Cai & Hwang, 2002; Cai & Hwang, 2002; Silver & Cai, 1996). Success in any of these is correlated with the success in other (Cai & Hwang, 2002; Silver & Cai, 1996).

3. Method

3.1. Research Design

The research was designed as a qualitative study and content analysis. "The qualitative research is defined to be an investigation in which qualitative data collection methods, such as observation, interview and document analysis are used, a qualitative process is followed for providing perceptions and events in their natural environments in a realistic and holistic manner (Yıldırım & Şimşek, 2006, p.39). "The data summarised and interpreted by descriptive analysis are subjected to a deeper procedure in the content analysis, and the concepts and themes that cannot be identified by descriptive analysis are discovered by this analysis" (Yıldırım & Şimşek, 2006, p.227). As it is an analysis of unidentified concepts and themes, the content analysis is considered to be proper in examining the problem-posing activities in the primary school mathematics textbooks.

3.2. Research Tools

The sources used in the research are the textbooks used in the primary schools in Russia and Azerbaijan in the 2019-2020 school year.

3.3. Data Analysis

One of the researchers known Russian and Azerbaijani. In further explanation, the problem-posing activities in the textbooks were separately examined with other researcher, a mathematics teacher. In addition, the activities examined were also checked by another expert knowing Russian and Azerbaijani. The actions requested from students by the activities in these textbooks were: "posing problem/s", "creating problem/s" and "writing expression/s". As it is seen, students were sometimes asked to pose more than one problem. This number results in an uncertain situation as it is for "problems, expressions". Because students are expected to create multiple problems in the activities in which the expression of "problems" is used. What is more, there are more than one problem-posing activities in the activities with visuals. For this reason, it was determined to be appropriate that the researchers and a mathematics teacher would examine the number of problem-posing activities in the textbooks. In other words, in the cases where problem-posing/creation/writing situations were mentioned, numbered or multiple ambiguous problem statements were examined as 1 (one) problem-posing activity. To this end, the problem-posing activities in the textbooks were examined in terms of number and type and they were exemplified. Problem types were enriched and used by researchers based on Stoyanova (2003)'s problem posing types.

4. Findings

This section is divided into sub-problems.

4.1. Findings of the first sub-problem

The mathematic textbooks used in Russian and Azerbaijani primary schools were examined regarding the number and types of problem-posing activities. They were classified regarding grade levels and reported in the findings by examples. The findings related to the question "How many types and numbers of problem-posing activities are there in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Russian primary school?" are provided in Table 1-4.

Table 1. The Problem Posing Activities in Russian 1st Degree Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem by completing a problem in which some information is provided	18
Posing a problem in accordance with picture/pictures	9
Posing a problem by completing missing parts of a problem	9
Posing a problem in line with a solution	6
Posing a problem with 2 operations by changing the question statement	5
Posing a problem in accordance with pictures and the question statement given	4
Posing a problem in line with a short writing	3
Posing a problem in accordance with data and that can be solved by a subtraction	3
Posing a problem by using the answer of a previous problem	2
Posing a problem based on the information and the question statement provided	2
Posing a problem upon the information given and in order to be solved by a subtraction operation	1
Posing a problem upon the information given and in order to be completed according to desired order of operations	1
Posing a problem upon the information given and in order to be completed by two operations	1
Posing a problem upon the information given and by completing in accordance with a solution	1
Completing a problem by changing the question statement	1
Posing a problem by changing the question statement in order to be solved by a subtraction	1
The problem in which the question statement is given by changing the problem	1
Posing a problem by completing it in accordance with a diagram	1
Posing a problem that is solved by an addition operation in line with a picture	1

Posing a problem in accordance data	1
Posing a problem in line with a drawing	1
Total	72

When examining the problem-posing activities in Russian 1st-degree textbook regarding their types and numbers, it was observed that the most used problem type was "Posing a problem by completing a problem in which some information is provided (f: 18)". Other types of problem-posing activities are provided as follows: 'Posing a problem in accordance with picture/pictures (f: 9)', 'Posing a problem by completing missing parts of a problem (f: 9)', 'Posing a problem in line with a solution (f: 6)', 'Posing a problem with 2 operations by changing the question statement (f: 5)', 'Posing a problem in accordance with pictures and the question statement given (f: 4)', 'Posing a problem in line with a short writing (f: 3)', 'Posing a problem in accordance with data and that can be solved by a subtraction (f: 3)', 'Posing a problem by using the answer of a previous problem (f: 2)', 'Posing a problem based on the information and the question statement provided (f: 2)', 'Posing a problem upon the information given and in order to be solved by a subtraction operation (f: 1)', 'Posing a problem upon the information given and in order to be completed according to desired order of operations (f: 1)', 'Posing a problem upon the information given and in order to be completed by two operations (f: 1)', 'Posing a problem upon the information given and by completing in accordance with a solution (f: 1)', 'Completing a problem by changing the question statement (f:1)', 'Posing a problem by changing the question statement in order to be solved by a subtraction (f:1)', 'The problem in which the question statement is given by changing the problem (f:1)', 'Posing a problem that is solved by an addition operation in line with a picture (f: 1)', 'Posing a problem by completing it in accordance with a diagram (f:1)', 'Posing a problem in accordance data (f:1)', 'posing a problem in line with a drawing (f:1)'. In addition, there are 21 different problem-posing types and a total of 72 problem-posing activities in the 1st grade textbook (Table 1).

Table 2. The Problem Posing Activities in Russian 2nd Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem contrary to that problem	27
Posing a problem by completing a problem in which some information is provided	23
The problem in line with solution	13
The problem in line with short writing	13
Posing a problem in line with a solution	10
Posing a problem by completing missing parts of a problem	9
Posing a problem in accordance with a diagram	4
Posing a problem in accordance with data	3
Posing a similar problem	3
Posing a problem with a multiplication in line with a picture	3
Posing a problem in accordance with picture/s	2
Posing a problem in accordance with a picture and a solution	2
Posing a problem with a division in line with a picture	2
Problem posing according to drawing	2
Posing a problem by completing a problem to be solved by 2 operations	2
Posing a problem upon the information given and in order to be completed by two operations	2
Posing a problem to be solved by a subtraction operation by changing data	2
Posing a problem by changing the question statement in order to be solved by a subtraction operation	2
Completing a problem so that it can be solved by addition operation	1
Posing a problem by changing a problem in order to be solved by a subtraction operation	1
Posing a problem by changing the question statement in order to be solved by a single operation	1

Completing a problem so that it can be solved by subtraction operation	1
Posing a problem upon the information given and by completing in accordance with a solution	1
Posing a problem by completing a problem in line with a diagram and a solution	1
Posing a problem in accordance with pictures and the question statement provided	1
Posing a problem in accordance with pictures and a table	1
Posing a problem in accordance with a picture and a short writing	1
Posing a problem in accordance with a diagram and a solution	1
Total	134

When examining the problem-posing activities in Russian 2nd degree textbook regarding their types and numbers, it was seen that the problem type identified most was 'Posing a problem contrary to that problem (f: 27)'. As to the types and numbers of other types of activities, they are ranked as follows: 'Posing a problem by completing a problem in which some information is provided (f: 23)', 'The problem in line with solution (f:13)', 'The problem in line with short writing (f:13)', 'Posing a problem in line with a solution (f: 10)', 'Posing a problem by completing missing parts of a problem (f: 9)', 'Posing a problem in accordance with a diagram Posing a problem in accordance with a diagram (f: 4)', 'Posing a problem in accordance with data (f:3)', 'Posing a similar problem (f: 3)', 'Posing a problem with a multiplication in line with a picture (f: 3)', 'Posing a problem in accordance with picture/s (f:2)', 'Posing a problem in accordance with a picture and a solution (f:2)', 'Posing a problem with a division in line with a picture (f: 2)', 'Posing a problem in line with a drawing (f:2)', 'Posing a problem by completing a problem to be solved by 2 operations (f: 2)', 'Posing a problem upon the information given and in order to be completed by two operations (f:2)', 'posing a problem to be solved by a subtraction operation by changing data (f:2)', 'Posing a problem by changing the question statement in order to be solved by a subtraction operation (f:2)', 'Completing a problem so that it can be solved by addition operation (f:1)', 'Posing a problem by changing a problem in order to be solved by a subtraction operation (f:1)', 'Posing a problem by changing the question statement in order to be solved by a single operation (f:1)', 'Completing a problem so that it can be solved by subtraction operation (f:1)', 'Posing a problem upon the information given and by completing in accordance with a solution (f:1)', 'Posing a problem by completing a problem in line with a diagram and a solution (f: 1)', 'Posing a problem in accordance with pictures and the question statement provided (f:1)', 'Posing a problem in accordance with pictures and a table (f:1)', 'Posing a problem in accordance with a picture and a short writing (f:1)', 'Posing a problem in accordance with a diagram and a solution (f:1)'. There were 28 types of problem-posing activities along with a total of 134 problem-posing activities (Table 2).

Posing an inverse problem can be considered as a didactic tool for systematizing educational materials. The inverse (opposite) problem method is one of the main tools for expanding the assimilation unit. This method indicates that it is not appropriate to complete the question by answering: New, inverse problems must be prepared for the original problem. Thus, additional information should be provided, consisting of new relationships between the values of the original problem. What is more, inverse (opposite) problems are considered appropriate to be used as increasingly difficult problems starting from basic tasks to test intelligence (Басангова, 2012).

Table 3. The Problem Posing Activities in Russian 3rd Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem by completing a problem in which some information is provided	18
Posing a problem contrary to that problem	14
Completing a problem in line with a solution	13
Posing a problem in line with a solution	13
Completing the missing parts of a problem	11
Posing a problem in accordance with a table	7
Posing a problem based on the question statement provided	6
Posing a similar problem	3
Posing a problem by completing missing data in order to be solved by 2 operations	2
Posing a problem by changing the question statement in order to be solved by a subtraction	2
Posing a problem in line with a short writing	2
Posing a problem solved by a multiplication operation in line with a picture	1
Posing a problem solved by a division operation in line with a picture	1
Posing a problem upon the information given and in order to be solved by two operations	1
Posing a problem by completing a problem in accordance with the given information and diagram	1
Posing a problem in accordance data	1
Total	96

When examining the problem-posing activities in Russian 3rd degree textbook regarding their types and numbers, it was seen that the problem type identified most was 'Posing a problem by completing a problem in which some information is provided (f: 18)'. Other types of problem posing activities are provided as follows: 'Posing a problem contrary to that problem (f: 14)', 'Completing a problem in line with a solution (f: 13)', 'Posing a problem in line with a solution (f: 13)', 'Completing the missing parts of a problem (f: 11)', 'Posing a problem in accordance with a table (f: 7)', 'Posing a problem based on the question statement provided (f: 6)', 'Posing a similar problem (f: 3)', 'Posing a problem by completing missing data in order to be solved by 2 operations (f: 2)', 'Posing a problem in line with a short writing (f: 2)', 'Posing a problem solved by a multiplication operation in line with a picture (f: 1)', 'Posing a problem solved by a division operation in line with a picture (f: 1)', 'Posing a problem upon the information given and in order to be solved by two operations (f: 1)', 'Posing a problem by completing a problem in accordance with the given information and diagram (f: 1)', 'Posing a problem in accordance data (f: 1)'. There were 13 types of problem-posing activities along with a total of 96 problem-posing activities (Table 3).

Table 4. The Problem Posing Activities in Russian 4th Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem by completing a problem in which some information is provided	21
Completing a problem in line with a solution	18
Posing a problem contrary to that problem	12
Posing a problem in line with a table	11
Completing the missing parts of a problem	7
Posing a problem in accordance with a diagram	6
Posing a problem in line with a solution	5
Posing a similar problem	4
Posing a problem with a question statement	4
Posing a problem by changing the question statement	3
Posing a problem in line with a short writing	1
Posing a problem that is solved in two different ways by changing data	1
Posing a problem in line with a given diagram by completing the data	1
Posing a problem in accordance with a solution given by changing the question statement	1
Posing a problem in line with a statement with letters	1
Posing a problem in accordance with data	1
Completing a problem in accordance with a diagram and a solution	1
Posing a problem in accordance with a table and a solution	1
Posing a problem in line with a picture and data	1
Posing a problem with a question statement in line with a table	1
Posing a problem by information and question statement provided	1
Completing a problem by finding surplus data	1
Total	103

When examining the problem-posing activities in Russian 4th degree textbook regarding their types and numbers, it was identified that the problem type specified most was 'Posing a problem by completing a problem in which some information is provided (f: 21)'. Other types of problem posing activities are provided as follows: 'Completing a problem in line with a solution (f: 18)', 'Posing a problem contrary to that problem (f: 12)', 'Posing a problem in line with a table (f: 11)', 'Completing the missing parts of a problem (f: 7)', 'Posing a problem in accordance with a diagram (f: 6)', 'Posing a problem in line with a solution (f: 5)', 'Posing a similar problem (f: 4)', 'Posing a problem with a question statement (f: 4)', 'Posing a problem by changing the question statement (f: 3)', 'Posing a problem in line with a short writing (f:1)', 'Posing a problem that is solved in two different ways by changing data (f:1)', 'Posing a problem in line with a given diagram by completing the data (f: 1)', 'Posing a problem in accordance with a solution given by changing the question statement (f: 1)', 'Posing a problem in line with a statement with letters (f:1)', 'Posing a problem in accordance with data (f:1)', 'Completing a problem in accordance with a diagram and a solution (f: 1)', 'Posing a problem in accordance with a table and a solution (f:1)', 'Posing a problem in line with a picture and data (f:1)', 'Posing a problem with a question statement in line with a table (f: 1)', 'Posing a problem by information and question statement provided (f: 1)', 'Completing a problem by finding surplus data (f:1)'. There were 22 types of problem-posing activities along with a total of 103 problem-posing activities (Table 4). You can see below the examples of the problem-posing activities from the Russian 4th grade mathematics textbook (See. Figure 7-8).

4.2. Findings of the second sub-problem

The findings related to the question "How many types and numbers of problem-posing activities are there in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Azerbaijani primary school? are provided below.

Table 5. The Problem Posing Activities in Azerbaijani 1st Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem in accordance with picture/s	13
Posing a problem in accordance with a picture and a question statement	4
Completing a problem text in line with a picture	3
Posing a problem in accordance with a model	2
Posing a problem in accordance with a table	2
Posing a problem in accordance with data	2
Posing a problem by completing missing data	1
Posing a problem with 3 components in line with pictures	1
Posing a problem by completing what has been provided	1
Total	29

When examining the problem posing activities in Azerbaijani 1st grade textbook regarding their types and numbers, it was seen that the problem type identified most was 'Posing a problem in accordance with picture/s (f: 13)'. Other types of problem-posing activities are provided as follows: 'Posing a problem in accordance with a picture and a question statement (f: 4)', 'Completing a problem text in line with a picture (f: 3)', 'Posing a problem in accordance with a model (f:2)', 'Posing a problem in accordance with a table (f:2)', 'Posing a problem in accordance with data (f:2)', 'Posing a problem by completing missing data (f:1)', 'Posing a problem with 3 components in line with pictures (f:1)', 'Posing a problem by completing what has been provided (f:1)' (Table 5). There were 9 types of problem-posing activities along with a total of 29 problem-posing activities in this textbook (Table 4).

Table 6. The Problem Posing Activities in Azerbaijani 2nd Grade Textbook

Problem Type	Number of Problem Posing (f)
Completing a problem by changing the question statement	6
Posing a problem by completing missing data	3
Posing a problem in accordance with a given solution by changing the question statement	2
Posing a problem in accordance with a table	2
Posing a similar problem	2
Posing a problem in accordance with a solution	2
Posing a problem in accordance with data	2
Posing a problem in line with pictures and a question statement provided	1
Posing a problem with a parentheses operation in line with data	1
Posing a problem by changing data	1
Posing a problem in line with a diagram	1
Total	23

In the Azerbaijani 2nd Grade Mathematic Textbook, the problem-posing type identified most was 'Completing a problem by changing the question statement (f: 6)'. Other types of problem-posing activities are provided as follows: 'Posing a problem by completing missing data (f: 3)', 'Posing a problem in accordance with a given solution by changing the question statement (f: 2)', 'Posing a problem in accordance with a table (f:2)', 'Posing a similar problem (f:2)', 'Posing a problem in accordance with a solution (f:2)', 'Posing a problem in accordance with data (f:2)', 'Posing a problem in line with pictures and a question statement provided (f:1)', 'Posing a problem with a parentheses operation in line with data (f: 1)', 'Posing a problem by changing data (f: 1)', 'Posing a problem in line with a diagram (f: 1)'. There were 11 types of problem-posing activities along with a total of 23 problem-posing activities in the 2nd grade textbook (Table 6).

Table 7. The Problem Posing Activities in Azerbaijani 3rd Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem in line with a solution	5
Posing a problem in line with a table	3
Posing a problem in accordance with data	3
Posing a problem by completing missing data	2
Completing a problem by finding missing or surplus data	1
Posing a problem with a question statement according to a	1
A problem posing activity solved by summation by changing the question statement	1
A problem posing activity solved by subtraction by changing the question statement	1
A problem posing activity obtained by changing the problem statement	1
Posing a problem with a parentheses operation in line with a table	1
Completing a problem in line with a solution	1
Posing a similar problem	1
Total	21

In the Azerbaijani 3rd Grade Mathematica Textbook, while the problem posing activity type identified most was 'Posing a problem in line with a solution (f:5)', other activity types are as follows: 'Posing a problem in line with a table (f:3)', 'Posing a problem in accordance with data (f:3)', 'Posing a problem by completing missing data (f:2)', 'Completing a problem by finding missing or surplus data (f: 1)', 'Posing a problem with a question statement according to a table (f:1)', 'A problem posing activity solved by summation by changing the question statement (f: 1)', 'A problem posing activity solved by subtraction by changing the question statement (f: 1)', 'A problem posing activity obtained by changing the problem statement (f: 1)', 'Posing a problem with a parentheses operation in line with a table (f: 1)', 'Completing a problem in line with a solution (f: 1)', 'Posing a similar problem (f:1)'. There were 12 types of problem-posing activities along with a total of 21 problem-posing activities in the 3rd grade textbook (Table 7).

Table 8. The Problem Posing Activities in Azerbaijani 4th Grade Textbook

Problem Type	Number of Problem Posing (f)
Posing a problem in line with data	2
Posing a problem in line with a model	2
Posing a problem by completing the information provided	2
Completing a problem by dividing a three-digit number by a one-digit number	1
Posing a problem in accordance with a table	1
Posing a problem in line with a solution	1
Total	9

The problem-posing activities in Azerbaijani 4th grade mathematics textbook are as follows: 'Posing a problem in line with data (f:2)', 'Posing a problem in line with a model (f:2)', 'Posing a problem by completing the information provided (f:2)', 'Completing a problem by dividing a three-digit number by a one-digit number (f:1)', 'Posing a problem in accordance with a table (f:1)', 'Posing a problem in line with a solution (f:1). There were 6 types of problem-posing activities along with a total of 9 problem-posing activities in the 4th grade textbook (Table 8).

4.3. Findings of the third sub-problem

The findings related to the question 'What are the differences among the problem-posing activities in the mathematics textbooks of the 1st, 2nd, 3rd and 4th grade in Russian and Azerbaijan primary schools when compared regarding their types and numbers?' are provided as follows:

Table 9. Number of Problem Posing Types in Russian and Azerbaijan Textbooks

	1 st Grade book	2 nd Grade book	Russia 3 rd Grade book	4 th Grade book	Total
Russia	21	28	13	22	53
Azerbaijan	9	11	12	6	24

When an analysis was carried out according to the problem-posing types in the mathematic books in Russia and Azerbaijan, it was found that there were 21 types of problem-posing activities in the Russia 1st Grade book, 28 in the Russia 2nd Grade book, 13 in the Russia 3rd Grade book, and 22 in the Russia 4th Grade book. As to the Azerbaijan textbooks, there were 9 types of problem-posing activities in the 1st Grade book, 11 in the 2nd Grade book, 12 in the 3rd Grade book, and 6 in the 4th Grade book. When examining how many types of problem activities were in all textbooks, it was identified that there were 53 different problem posing types in the Russian textbooks while this number was 24 for Azerbaijan textbooks (Table 9).

Table 10. Problem Posing Number in Russia and Azerbaijan Textbooks

	1 st Grade book	2 nd Grade book	3 rd Grade book	4 th Grade book	Total
Russia	72	134	96	103	406
Azerbaijan	29	23	21	9	82

When looking at the total number of the problem-posing activities in the mathematics textbooks in Russia and Azerbaijan, it was determined that there was a total of 406 problem-posing activities, 72 problem-posing activities in the Russia 1st Grade book, 134 in the Russia 2nd Grade book, 96 in the Russia 3rd Grade book, and 103 in the Russia 4th Grade book. As to the Azerbaijan textbooks, there were 29 problem-posing activities in the 1st Grade book, 23 in the 2nd Grade book, 21 in the 3rd Grade book, and 9 in the 4th Grade book (Table 10).

Table 11. The Most Common Problem-Posing Types in Russia and Azerbaijan Textbooks

	Problem-Posing Types	1 st Grade book	2 nd Grade book	3 rd Grade book	4 th Grade book	Total
Russia	Posing a problem by completing a problem with given data	18	23	18	21	80
	Posing a problem contrary to that problem	-	27	14	12	53
	Posing a problem in accordance with a solution	6	13	13	-	32
	Completing a problem in line with a solution	-	-	13	18	31
Azerbaijan	Posing a problem in accordance with picture/s	13	-	-	-	13
	Posing a problem activity in accordance with data	2	2	3	2	9
	Posing a problem in line with a table	2	2	3	-	7
	Posing a problem in accordance with a solution	-	2	5	-	7

The problem-posing activities observed most in the Russia mathematic textbooks are: 'Posing a problem by completing a problem with given data (f: 80)', 'Posing a problem contrary to that problem (f: 53)', 'Posing a problem in accordance with a solution (f: 32)', 'Completing a problem in line with a solution (f: 31). The most common problem-posing activities in the Azerbaijan textbooks are as follows: 'Posing a problem in accordance with picture/s (f: 13)', 'Posing a problem activity in accordance with data (f:9)' 'Posing a problem in line with a table (f: 7)' and 'Posing a problem in accordance with a solution (f: 7)'.

The problem posing types used commonly in both countries' textbooks are as follows: 'Completion of a problem by changing the question statement', 'Posing a problem in line with

a given solution by changing the question statement', 'Posing a problem in line with a picture and a question statement provided', 'Posing a problem in accordance with pictures and a question statement provided', 'Problem posing activity solved by subtraction by changing question statement', 'Posing a problem activity by completing the information provided in a problem', 'Posing a problem activity by completing a problem in line with a solution', 'Completing a problem by the information provided', 'Posing a problem activity according to a table providing a question statement', 'Posing a problem activity in line with picture/s', 'Posing a problem activity in accordance with data', 'Posing a problem similar to that problem', 'Posing a problem activity in accordance with a diagram', 'Posing a problem activity in line with a table', 'Posing a problem activity in accordance with a solution' and 'Posing a problem activity in line with a model'. As it is seen, 15 types of problem-posing activities are included in the mathematic textbooks of both countries.

5. Discussion

As explained earlier, this study conducted a comparative analysis of the problem-posing activities in the primary school mathematic textbooks in Rusia and Azerbaijan. According to this, the activity titled 'posing a problem activity by completing a problem upon provided information' has been used most by 18 times in the 1st grade. Looking at the problem-posing activities from the one used least and to the one used most, the activities named 'posing problem activities in accordance with picture/s and posing problem activities by completing missing parts of a problem' have been used for 9 times. In addition, other posing problem activities and numbers of their uses are as follows: 'posing a problem in accordance with a solution (6)', 'posing a problem by 2 operations by changing question statements (5)', 'posing a problem in accordance with pictures and provided question statement (4)', 'posing a problem in accordance with a short writing, data (3)', 'posing a problem that can be solved by subtraction (3)', 'posing a problem by using the responses of prior problems (2)', 'posing a problem upon what provided information (2)', 'posing a problem by providing questions statements'. The problem-posing activities used only once are provided as follows: 'posing a problem based on provided information', 'completing a problem so that it can be solved by subtraction', 'completion of a given problem in accordance with requested order of operations', 'completion of a given problem in order to be solved by 2 operations', 'completion of a problem in accordance with data and solutions', 'completion of a problem by changing a question statement', 'posing a problem by changing the question statement in order to be solved by a subtraction operation', 'posing a problem by changing the problem based on the question statement provided', 'completing a problem according to a diagram', 'posing a problem that is solved by an addition operation in line with a picture', 'posing a problem in accordance with data', 'posing a problem in line with a drawing'.

The most used problem-posing activity found in the Russia 2nd grade mathematic textbook is posing a contrary problem. It was found 27 times, on the other hand problem-posing activities used are as follows: 'posing a problem by completing a problem upon provided information (23)', 'posing a problem in accordance with a solution and a short writing (13)', 'posing a problem by completing a problem in line with a solution (10)', 'posing a problem by completing the missing parts of a problem (9)', 'posing a problem in accordance with a diagram (4)', 'posing a problem in accordance with provided information (3)', 'posing similar a problem (3)', 'posing a problem by a multiplication in accordance with a picture (3)', 'posing a problem in accordance with pictures (2)', 'posing a problem in accordance with a picture and solution (2)', 'posing a problem with a division operation in line with a picture (2)', 'Completion of a problem to be solved with 2 operations (2)', 'Completing a problem in order to be solved with 2 operations by provided information (2)', 'posing a problem to be solved by a subtraction operation by changing data (2)'.

The problem-posing activities used least are as follows: 'posing a problem solved by an addition operation by completing the problem', 'posing a problem solved by a subtraction operation by changing the problem', 'posing a problem solved by an addition operation', 'posing a problem solved by a single operation by changing the question statement', 'posing a problem solved by a subtraction operation by completing the problem', 'completing a problem in

accordance with provided information and a solution', 'completing a problem in line with a diagram and a solution', 'posing a problem in accordance with a picture, a question statement, a picture and a table, a short writing and picture, a diagram and a solution'.

The problem-posing activity used most in the Russia 3rd grade mathematic textbook is 'posing a problem by completing a problem upon provided information (18)'. Other activities used in the book are as follows: 'Posing a problem contrary to that problem (14)', 'Completing a problem in accordance with a solution (13)', 'posing a problem in line with a solution (13)', 'Completing the missing parts of a problem (11)', 'posing a problem in accordance with a table (7)', 'posing a problem with a question statement (6)', 'posing a similar problem (3)', 'posing a problem solved by two operations by completing missing data (2)', 'posing a problem solved by a subtraction operation by changing the question statement (2)', 'posing a problem in line with a short writing (2)'. It has been found that the least used problem-posing activities are: 'posing a problem solved by a multiplication operation in line with a picture', 'posing a problem solved by a division operation in line with a picture', 'posing a problem solved by 2 operations upon provided information, 'posing a problem activity upon what has been given and by completing the in accordance with a diagram', 'the problem-posing activity created by data'.

Finally, the problem-posing activity used most in the Russia 4th grade mathematic textbook is 'posing a problem by completing a problem by provided data (21)'. Other activities used are as follows: 'completing a problem in accordance with a solution (18)', 'posing a problem contrary to that problem (12)', 'posing a problem in line with a table (11)', 'completing the missing parts of a problem (7)', 'posing a problem in line with a diagram (6)', 'posing a problem in accordance with a solution (5)', 'posing a problem by creating similar problems (4)', 'posing a problem with a question statement (4)', 'posing a problem by writing appropriate problems in accordance with solutions by changing question statements (3)'. On the other hand, the least used problem-posing activities are identified to be as follows: 'posing a problem in accordance with a short writing', 'posing a problem solved by two ways by changing data', 'posing a problem in line with a diagram by changing data', 'posing a problem in line with a solution by changing question statement', 'posing a problem in line with an expression with letters', 'posing a problem by using data', 'posing a problem by completing a problem in line with a diagram and a solution', 'posing a problem in line with a solution and a table, 'posing a problem in accordance with a picture and provided information, 'posing a problem with a question statement provided in line with a table', 'posing a problem with a question statement', 'Completing a problem by finding surplus data'.

As it is seen in the 1st, 2nd and 3rd grade Russian textbooks, the most used problem-posing activity is the one created by completing the problem based on provided information. The most used problem-posing activity in the 4th grade is 'posing a problem by completing the problem in line with a solution'.

Regarding the second question of the research, Azerbaijan textbooks have been studied separately. In this respect, it has been achieved that the most used problem-posing activity in the 1st grade textbook is 'posing a problem in accordance with pictures (13)'. Other problem posing activities used in the textbook are: 'posing a problem in line with pictures and question statement (4)', 'posing a problem in which problem statement is completed according to a picture (3)', 'posing a problem in accordance with models, tables and data (2)', 'posing a problem by completing missing data (1)', 'posing a problem with 3 components in accordance with pictures', 'posing a problem by completing the given problem'.

The problem-posing activity used most in the 2nd grade mathematic textbook in Azerbaijan is 'completing the problem by changing the question statement'. In addition, other problem-posing activities used in this textbook are: 'posing a problem activity by completing missing data (3)', 'posing a problem activity in line with the solution given by changing the question statement (2)', 'posing a problem activity in line with a table (2)', 'posing a similar problem activity (2)', 'posing a problem activity in line with a solution, data (2)', 'posing a problem activity in accordance with pictures and the question statement given (1)', 'posing a problem

activity with a parentheses operation in accordance with data (1)', 'posing a problem activity by changing data (1)', 'posing a problem activity in line with a diagram (1)'.

In the 3rd grade textbook, the most used problem-posing activity is 'posing a problem activity in accordance with a solution (5)'. The problem-posing activities used for 3 times are: 'posing a problem in line with a table, data, by completing missing data'. The following problem-posing activities have been identified only for once: 'Completing a problem by finding missing or surplus data', 'posing a problem with a question statement according to a table', 'posing a problem by an addition operation by changing the question statement', 'posing a problem by a subtraction operation by changing the question statement', 'posing a problem in which desired is achieved by changing the problem statement', 'posing a problem with a parentheses solution in accordance with a table', 'posing a problem by completing in line with a solution', 'posing a similar problem.

In the 4th grade textbook of Azerbaijan, while there are 2 problem-posing activities in the following types: 'posing a problem activity in accordance with data, models, by completing a problem based on provided data, there is only one problem-posing activity in the following types: 'Completing a problem by dividing a three-digit number by a one-digit number, posing a problem activity in accordance with a table, solution'.

While posing a problem activity is drawn attention in the 1st grade by the statements: "Poses problem similar to any problem", "Poses various problems of addition and subtraction operations according to a picture and model" (p. 152), the following statements are used in the 2nd grade textbooks for indicating the significance of problem-posing: "Posing a mathematical text in line with a problem and posing a problem according to a text" (p. 160) (Qəhrəmanova, Əsgərova, Qurbanova, & Həsənova, 2016; Qəhrəmanova & Əsgərova, 2018).

The number and types of problem-posing activities in the mathematic textbooks of both countries have been compared under the last research question. When examining the number of problem-posing activity types in Russia textbooks regarding grades, it has been concluded that there are 21 problem-posing activities in the 1st Grade book, 28 in the 2nd Grade book, 13 in the 3rd Grade book, and 22 in the 4th Grade book. As to the Azerbaijani textbooks, there are 9 problem-posing activities in the 1st Grade book, 11 in the 2nd Grade book, 12 in the 3rd Grade book, and 6 in the 4th Grade book.

Regarding the different activities used in all textbooks, it has been achieved that while 53 different types of problem-posing activities have been used in Russian mathematic textbooks, this number is 24 in Azerbaijani mathematic textbooks. As it is seen, there are more problem-posing activities in the primary school mathematic textbooks in Russia compared to Azerbaijan. In a study investigating the mathematic textbooks in China and the USA, it has been reported that there are few problem types in these textbooks (Cai & Jiang, 2017). Zhu and Fan (2006) stated that an approximately 15% of the problems in American and Chinese textbooks are problem-posing activities.

Considering the frequency of using problem-posing activities in the mathematics textbooks of the two countries, the problem-posing activities used most in Russia are as follows, respectively: 'posing a problem activity by completing a problem with data provided', 'posing a problem activity contrary that problem', 'posing a problem activity in accordance with a solution and by completing the problem in line with a solution'. The problem-posing activities used most in Azerbaijan are: 'posing a problem activity in accordance with picture/s', 'posing a problem activity in line with data', 'posing a problem activity in accordance with a table and a solution'. It has been revealed that the most common problem-posing activity used most in the textbooks books of the two countries is 'posing a problem in accordance with a solution'. Cai, Jiang, Hwang, Nie & Hu (2016) examined the textbooks used in America and China. They argued that while a problem is posed in line with an operation or a solution in the American textbooks as achieved in this study, Chinese books have included more problem-posing activities developed by a sample problem or information provided. It has been stated in a study on Chinese and American mathematic textbooks that while most of the problem-posing activities

in China are based on information provided or sample problems, American books include mostly the problem-posing activities created in line with a solution given (Cai & Jiang, 2017).

Regarding total numbers in the textbooks, while there are 72 problem-posing activities in Russian 1st Grade book, 134 in the 2nd Grade book, 96 in the 3rd Grade book, 103 in the 4th Grade book, this number is 29 in the Azerbaijan 1st Grade book, 23 in the 2nd Grade book, 21 in the 3rd Grade book, 9 in the 4th Grade book. Whereas a total of 406 problem-posing activities have been identified in Russian textbooks, 82 problem-posing activities have been found in Azerbaijani textbooks. As it is seen, when comparing the textbooks of the two compared in terms of number of problem-posing activities, it has been concluded that the number of Russian books is much higher than Azerbaijani textbooks. While most problem-posing activities are found in the 2nd grade in Russian textbooks, the 1st grade textbooks in Azerbaijan have most problem-posing activities compared to other grade textbooks. In the study carried out by Usta (2018) examining the problems related to multiplication and division operations in primary school textbooks in Turkey, it is seen that problem-posing activities are mostly included in third-grade textbooks. While there was not any problem related to the problem-posing skills in the 2nd grade textbooks, this rate was only 1% in the 4th grade textbooks. In his study investigating the problem-posing numbers and types in primary school mathematics textbooks in Turkey in 2018 and 2019, Deringöl (2019) has identified that the most problem-posing activities have been used in the 3rd grade textbooks. When examined by years, the number of activities is 184 and 70, respectively. Kar & Yıldız (2015) stated that problem-posing activities were included in American textbooks at a rate of 14.2%. This rate is only 3.1% in Turkish textbooks. Cai, Jiang, Hwang, Nie & Hu (2016) argue that they have not found a statistically significant difference in the problem-posing activities at all grade levels in Chinese and American books. The numbers were close to each other.

Finally, common types of problem posing in both countries' textbooks have been examined, and it has been identified that 15 types of problem-posing activities are used commonly in both countries' textbooks. These common activities are as follows: 'Completing a problem by changing the question statement', 'posing a problem activity in accordance with a solution provided by changing the question statement', 'posing a problem activity in accordance with pictures and the question statement given', 'posing a problem activity solved by a subtraction operation by changing the question statement', 'posing a problem activity by completing a problem with provided data', 'posing a problem activity by completing a problem in accordance with a solution', 'posing a problem activity by completing a problem by what has been given', 'posing a problem activity in which a question statement is given according to a table', 'posing a problem activity in accordance with pictures, provided information, diagrams, tables, solutions, models', 'posing a problem activity in which similar problems are developed'. In the investigation (Jiang & Cai, 2014) examining the mathematic textbooks in China and America, it is identified that while there are 131 problem-posing activities in the Chinese textbook, this number is 60 in the American textbook. When analysing these activities regarding their types, it has been achieved that whereas Chinese textbooks include activities urging to develop problems in accordance with data, American textbooks provide to pose problems in line with solutions. What is more, while approximately 80% of the problem-posing activities in Chinese textbooks include pictorial, graphical or tabulated representations, only 20% of American textbooks contain visual representations. 57% of the Chinese textbooks have a sample problem whereas only 15% of the Chinese textbooks include a sample problem before posing a problem.

Pursuant to article 47 of the Law on Education in the Russian Federation, "teachers are entitled to choose textbooks, teaching tools, materials and other educational and teaching materials in line with curriculum and educational legislation." (Artemov & Semenova, 1982, cited by Ayyvazyan, 2016). Therefore, primary school teachers can choose not only an educational program (system), but the textbooks allowing to create a suitable and comfortable learning environment instilling a love of knowledge in children from the first days in schools (Ayyvazyan, 2016). All activities in Russian textbooks are mostly provided for enabling teachers to perform different educational methods form each other. While the students with poor scores solve examples in the first two columns of the activity, the students better scores solve two-step

operations in other two columns. Whereas some students solve the problem from the textbook, others create and solve inverse problems. While some of them solve a problem by expressing, others solve a problem according to the solution steps. It is considered that it is beneficial to give activities with different difficulty levels so that students can choose the activity that they can do (Kanakina, Goretsky, et. al, 2014).

6. Conclusions

To conclude, it is considered that the number and types of problem-posing activities in primary school mathematics textbooks may affect students' problem-posing skills. Thus, it is very important that the number of activities in books should be much and varied. In this study, although the activities in Russian books are found high in terms of both number and variety, the activities in Azerbaijan books have not been identified to be adequate in number and variety. It is suggested to increase the number of activities in the books, especially not to repeat the same activities continuously.

Limitation

This research is limited to problem posing activities only found in Russian and Mathematics textbooks.

Recommendation

Teachers should prefer activities that will improve students' problem posing skills. In addition, teachers need to be more creative in order to increase the productivity of students by doing various activities that are not only in book activities.

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Conflict of Interest

The Author(s) declare(s) that there is no conflict of interest.

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