Conference Paper
UDC: 159.953.5:51]303.62

THE APPLICABILITY OF MULTILATERAL STRATEGIES IN THE FUNCTION OF MOTIVATION AND PERCEPTION OF TEXTUAL TASKS FROM THE MATHEMATICAL SUBJECT

Merita Ajdini

Corresponding Author e-mail: merita.ajdini@yahoo.com

Abstract

In recent years, educational policy makers have show us the need of linking the cognitive development of children and their achievements in math. Cambridge programs, caused insecurity, starting from teachers, parents, and all the way to the students, making them feel unprepared and without prior knowledge to achieve broader goals. On the other hand, there still exists the belief that learning math should be automatic and that it is an abstract process.

Looking from a different angle, the teachers are the ones that to a large extent should give the students greater help, by using multiple strategies in order to motivate them to solve different mathematical problems and especially textual tasks.

The subject of the research: Researching the use of the concept map technique and its role in improving the choice of textual tasks in mathematics.

Research sample: 52 third-grade students.

Research Methods**:** Descriptive, Comparative, and Analytical-Interpretative Methods.

Instruments: Test of knowledge, surveys, and interviews.

Statistical Data Processing: We have two measurements, before and after the changes (action). Data was processed on Excel.

This action research will serve as an indicator of how we should help students to achieve greater results during the selection of textual tasks.

Keywords: math, textual assignment, student, lesson.

Introduction

Conceptual mapping is a technique for visualizing relationships between different notions, and conceptual maps are graphic tools for organizing and presenting knowledge. The terms are written in text boxes, and are associated with arrows and signs. In the teaching practice this technique can be used in the process of learning new contents, in repetition, systematization of a topic, but also for checking what has been learned.

The textual task in mathematics, however, is a problematic situation in which more information and data are given, where the connections between them should be found, that is, understanding the concept of the task itself. According to Mayer, R. E. (1998), "Resolving textual tasks requires representation of the problem, elaboration of a plan for solving and execution of that plan. Apart from having to master basic arithmetic and algebraic skills, students must also learn how to use those skills in order to successfully solve mathematical problems."

In fact, in solving textual tasks in mathematics, students need to learn to approach the task and read it with understanding, to analyze it, to create a work plan, to present the task mathematically, to use appropriate procedures for solving it and to give a final solution. For understanding and analyzing the task, it is important for the student to perceive: what is required in the task, what is given, what is unknown, and what are the connections between known and unknown.

Goals and tasks of the research

The subject of the research: Researching the use of the concept map technique and its role in improving the choice of textual tasks by mathematics.

- **The purpose of this action research** is to explore the application of the technique for visual presentation's use (conceptual map) and its role in improving the solving of textual math tasks.
- **The research tasks are:**

- confirmation that the results in solving textual tasks in mathematics have improved through the use of the technique for visual presentation (conceptual map)
- confirmation that the use of the visual presentation technique motivates students in their intellectual engagement.

Work methods

Research methods

- **The descriptive method** – this method is used to analyze, explain, and compare the issues during the research.
- **The comparative method** – is used to compare the classes in which conceptual maps are used- (classes before and after the changes - action).
- **The analytical – interpretative method** – covers the analysis and interpretation of the materials, results, and conclusions.

The sample of the research covers:
52 third-grade students dhe 2 class teachers in the school year 2018/2019
The data are processed using Excel.

Description of activities:
Initial measurement - Worksheet with four textual tasks
Introduction to exercises –

Workshop - Construction of the conceptual maps.
- Key words for which he/she should be careful when solving the textual tasks
- What is the organization of data through conceptual maps
- How are the data organized with the conceptual maps?
- Solving textual task

Activity-Exercises
- **Example:** Textual task solution with a certain level through conceptual mapping.
- **Exercises:** Solving textual tasks with the help of conceptual maps.

Activity-Exercises
- Reminding example
- Review of the task that was solved the previous day, discussion about the way of solving it.
- **Exercises -** Solution of the textual tasks through conceptual maps.

Measurement at the end of the exercises - Worksheet with four textual tasks
Collecting the data before, during, and at the end of the action

Initial measurement	Measurement during the action time	Measurement at the end of the action
Survey for students	Discussion with students	Survey for students
Interview with teachers	Analysis of tasks that we solve with students	Interview with teachers
Worksheet with four textual tasks	Monitoring of the way of solving tasks after solving the textual tasks	Worksheet with four textual tasks

Results and discussion

Table 1. Students' answers to questions posed by the survey

What do you find the easiest in math?				
	Before the change		After the change	
Adding	10	19.23%	10	19.23%
Subtraction	7	13.46%	6	11.53%
Multiplication	6	11.53%	6	11.53%
Division	5	9.61%	5	9.61%
Textual task	4	7.69%	10	19.23%
2D and 3D forms	11	21.15%	8	15.38%
Measurements	9	17.30%	7	13.46%

From the table we see that before the change or action, the lowest number of students is found on the category of textual tasks, with only 4 students or 7.69%. But after the change or action, by usingconceptual maps, the number increases to 10 students with 19.23 %.

Table 2. Comparing the results from the correctly solved tasks before and after the exercises

Tasks	Before the change		After the change		The difference
Task 1	36	69.23%	42	80.76%	11.53%
Task 2	31	59.61%	37	71.15%	11.54%
Task 3	29	55.76%	33	63.46%	7.70%
Task 4	18	34.61%	21	40.38%	5.77%

From the table we see that in all tasks we have an improvement in solving the textual tasks. More improvement in solving the tasks are noticed in the first and second categories, which are easier. But we have improvements also in the third and fourth task where the difference is smaller because they are more difficult.

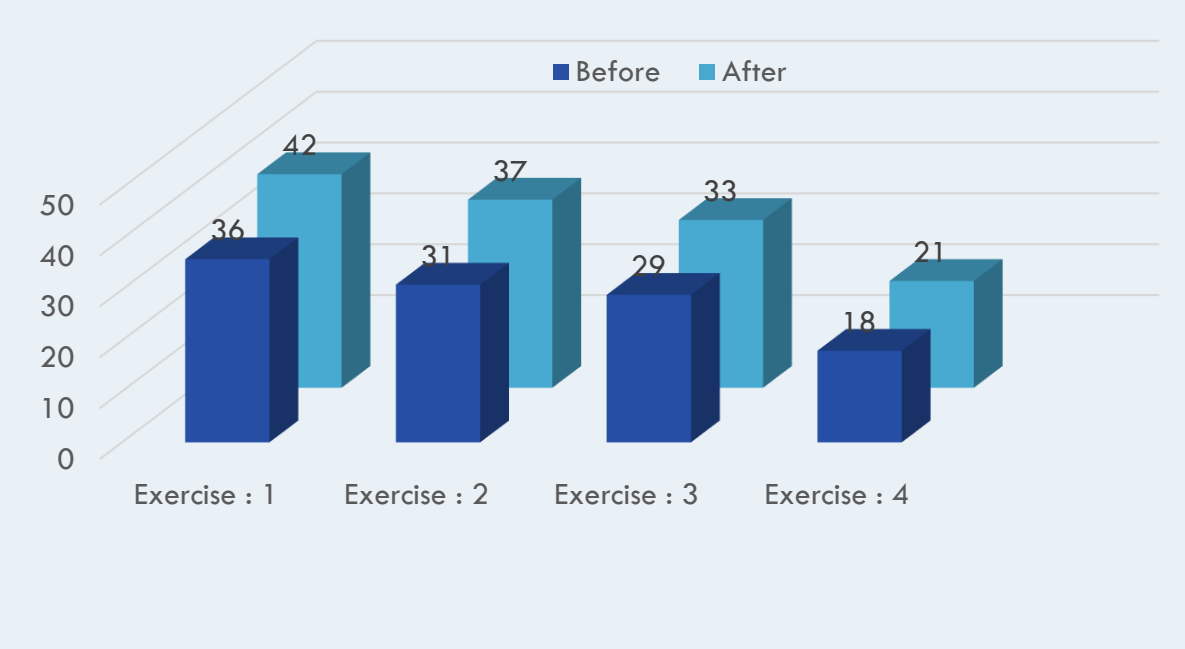

Figure 1. The results of the correctly solved tasks before and after exercises (action)

Conclusion

From the data received from the students as well as from the interviews with the teachers we have learned that in the subject of mathematics, students often have problems in solving the textual tasks. According to the students, difficulties arise because the tasks are unclear, complicated, they have a lot of data. While according to teachers, the difficulties appear because the students do not read carefully the tasks and do not take into account all the data in the task.

Because textual tasks are based on a concept that should be understood as action, we have applied exercises using the conceptual mapping techniques.

Results before and after the exercises show that the percentage of students who correctly solved the tasks is greater after the exercises. But more significant are the results and remarks from tracking the student's progress during the exercises, since, during it they talk about the learning process the students go through, and how they've become aware of their learning and progress.

The use of the visual presentation technique greatly motivates students in their intellectual engagement.

This action research will serve as an indicator of how to help students achieve greater results while they solve math-related textual tasks. It would be useful to research other strategies in function of motivating the students and enhancing their understanding of textual tasks.

References

[1]. Mayer, R. E. (1998): "*Cognitive, metacognitive, and motivational aspects of problem solving"*. Instructional Science 26: 49–63.
[2]. Mathematics Syllabi for Grades: *I, II and III. Bureau for Development of the Education* – Cambridge International Examination, Skopje, 2014.
[3]. Morison Karen, *Mathematics* 1, Manual for Teachers, Skopje, 2014
[4]. http://uwf.edu/jgould/ConceptMappingIntro.pdf - Introduction to Concept Mapping- Joseph D. Novak.
[5]. http://www.schrockguide.net/concept-mapping.html -concept mapping in the classroom
[6]. http://www.udel.edu/chem/white/teaching/ConceptMap.html -How to Construct a Concept Map