



Effects of formulating math problems on primary students` performance.

Auyesbay Bagzada and Abdilazim Assel
(mbagzada97@gmail.com , assel.abdulazim@gmail.com)
Suleyman Demirel University, Kazakhstan

Abstract

In maths classrooms at every level in all countries of the world, students can be observed solving problems. The quality and genuineness of these maths problems has been the theme of many arguments and debates in recent years. In this article we are going to show and compare the performance of primary school students using our experiment. We collected 20 second-grade students and conducted a lesson with traditional way of teaching. At next lesson we had took an examination to check if our students have comprehended the material and got the results. The next lesson they were given tasks to pose problems related to the same topic we had learned last time and took another exam with the same level of difficulty and a slight change of numbers and got the results as well. The change and progress of students impressed us.

Keywords: problem posing, constructing math problems, cognitive activity, activation of thinking.

Effects of formulating math problems on primary students' performance.

When students use the problem-posing method they will learn how to build social activity, and it helps to improve experience in the field of science. In the process of teaching this method, they will have a responsibility, and it helps to generate potential for the public. This process begins with the concept of "problematization" (Freire, 1985, pp. 52, 56). It means teachers interpret the problem that occurs in everyday life. As a result, the student will begin to reveal a problem that is not visible at all and are hiding.

The tasks teachers construct in their classrooms deserve important consideration because they open or close the students' opportunity for important mathematics learning. In mathematics classrooms at all levels in all countries of the world, students can be seen solving problems. The quality of these math problems has been the topic of many discussions and debates in recent years. Where did such problems come from? When such problems arise, what measures should be taken? The impression we get in much of schooling is that they come from books or from teachers, and that the task of the student is to solve them. Generally, all Mathematical Curriculums are agreed that the goal of teaching math is to extend the students' ways of learning and to develop the students' abilities in problem solving and provide suitable mathematical knowledge, expertise and skills for needs in future. Pupils must fully understand the world in which they live. In the process, they need an existing knowledge base and new knowledge that they learn in the real world. Otherwise, it is impossible and difficult to solve the upcoming problem with the traditional method. And they cannot find a common relationship between the real world and the type of training. Because in the modern world, learning often and quickly changes. And this approach is new in mathematical education. Scientists have noticed that focusing on the course of the solution in mathematics is very important. Even in the decision process, some points may be missed. We put the emphasis precisely on elementary school on goal setting and as a result, there are several differences from the traditional method of how to achieve great positive results and formulate tasks.

Another goal of this work is to find an identical solution to the causes of difficulties in the process of setting the problem.

This study also investigated teachers' perspectives on why the ability to pose problems is important for students and teachers in primary schools.

Literature view

Problem-posing is an imperative component of the science educational modules, and is considered to be an basic portion of numerical doing (Brown, I. S. and Walter, I. M., 2005). Problem-posing involves generating of new problems and questions aimed at exploring a given situation as well as the reformulation of a problem during the process of solving it (Silver, E. A., 1994).

Giving understudies with openings to posture their possess issues can cultivate more assorted and adaptable considering, improve students' issue tackling aptitudes, broaden their discernment of science and improve and solidify fundamental concepts (English, L. D., 1998). In expansion, Problem-posing might offer assistance in diminishing the reliance of understudies on their instructors and reading material, and provide the understudies the feeling of getting to be more locked in in their instruction. The term "problem-posing" in the literature usually refers to an activity in

which the problem posing itself is the focus of attention and not a problem solving tool (Lavy, I. and Bershadsky, I.,2003). Problem-posing by students can be used to provide a window through which teachers may assess students' conceptual understanding (Silver, E. A. On mathematical problem posing, 1994). Problem-posing is an imperative perspective of both immaculate and connected arithmetic and an necessarily portion of modeling cycles which require the numerical idealization of genuine world marvel. Amid the problem-posing understudies get it the contrast between great and critical questions and insignificant questions, which is frequently troublesome action. Students who are engaged in problem-posing activities become enterprising, creative from the problem solving context are applied to new situations.

Problem posing activity should be added in elementary teachers programs to let them to pose their problems in pre-service courses. Hence, when they will become a good teacher, they can help their students to generate a mathematics problem.(Majid Haghverdi, 2014).

Methodology

What is the difference between problem posing learning and “unproblematic”, traditional? In traditional teaching, the teacher informs students of the finished knowledge: explains new material, shows new provisions, reinforces them with examples, illustrations, experiments, experiments, seeks understanding of the new material, connects it with the already studied, checks the degree of assimilation. The teacher's activities are explanatory and illustrative, and the teacher himself becomes a translator of knowledge, accumulated by humanity. Students perceive the message, comprehend, remember, memorize, reproduce, train, exercise, etc. Their activities are reproductive. This is a consumption activity in which a student is likened to a receiver perceiving information transmitted through a translator. It's good or bad? Neither one nor the other - reproductive activity is inevitable for any type of training: otherwise, the younger generation would have to independently acquire the knowledge, skills accumulated by mankind in the entire history of its existence. At the same time, the traditional educational system does not ensure the development of the creative abilities of the personality, which were mentioned above, or develops them spontaneously, unproductively, “by chance”. In case of problem posing training, the teacher either does not provide ready-made knowledge, or gives them only on special subject content - new knowledge, skills and students acquire skills on their own when solving a special sort of tasks and issues called problematic. In traditional teaching, emphasis is placed on the motives of direct motivation (teacher interestingly tells, shows, etc.), with problematic training the leading motives of cognitive activity are intellectual (students independently seek knowledge, experiencing satisfaction from the process of intellectual labor, from overcoming difficulties and solutions found, conjectures, insights).

Primary school students are generally in their stage of life where they have a high level of curiosity, which makes them often ask many questions repeatedly. The question-asking process is not only motivated by their lack of understanding, but also by the desire to be sure about their knowledge. For this reason, the students need adults to help them be sure about their knowledge. On another note, the students' high level of curiosity can still always grow should they be facilitated in their learning process. In any case, in reality, the more seasoned the understudies get, the more hesitant they ended up to inquire questions. This comes about within the debilitating of their issue posing skill. Problem posturing

could be a prepare of making scientific issues through substantial cases based on one's numerical encounters. Issue posturing incorporates making unused issues or creating issues based on an existing information or data. Issue posturing exercises permit more opportunity for understudies in learning freely by defining and understanding their possess issues. In conclusion, issue posturing ability can be characterized as students' capacity to posture issues from given circumstances. The capacity of essential school understudies to posture issues is accepted to be moo. In spite of their nature of having a tall level of interest, there are numerous things that make the understudies hesitant to inquire questions. They, among other reasons, feel shy, are afraid to be made fun, do not want to be perceived as unintelligent, do not know exactly what to ask, and could not focus on the subject being discussed.

In our experiment primary schoolchildren are considered objects. We selected one group of schoolchildren which consist 20 people. At the beginning of the experiment we conducted a lesson on a new topic in the traditional style, where the teacher explains the topic and the students listen, learn, memorize, the teacher gives homework. Schoolchildren do their home tasks unless of course they understand them. If they are not interested in the topic, they do not fully understand the material, they simply can ditch on their homework. And in the next lesson we took an exam of 10 questions, the results of which you can see below on Table 1.

	ID numbers of students	Results out of 10	Percentage
	001201	5	50%
	001202	6	60%
	001203	7	70%
	001204	7	70%
	001205	7	70%
	001206	7	70%
	001207	8	80%
	001208	4	40%
	001209	5	50%
0	001210	6	60%
1	001211	5	50%
2	001212	5	50%
3	001213	5	50%
4	001214	8	80%
5	001215	6	60%
	001216	8	80%

6			
7	001217	9	90%
8	001218	3	30%
9	001219	4	40%
0	001220	4	40%

Table 1. Results after Traditional Education

Mean	Standard Deviation	N
5.95	1,637553	20

Table 3.

In the next lesson, we explained the construction of tasks and gave them the task of creating problems themselves and they can give each other their work and check their friends and play like that way. After that we took an exam from them, the complexity of which was almost the same as the previous one. You can also see the results of the second exam on Table 3.

	ID numbers of students	Results out of 10	Percentage
	001201	7	70%
	001202	9	90%
	001203	9	90%
	001204	10	100%
	001205	8	80%
	001206	8	80%
	001207	8	80%
	001208	8	80%
	001209	7	70%
0	001210	7	70%
1	001211	7	70%
2	001212	8	80%
3	001213	6	60%
4	001214	10	100%
5	001215	8	80%
6	001216	8	80%

7	001217	10	100%
8	001218	6	60%
9	001219	6	60%
0	001220	5	50%

Table 4.

Schoolchildren noticeably showed progress and I must say that the students appeared self-confident in their abilities and they liked this way of understanding the material.

Mean	Standard Deviation	N
7,75	1,409554	20

Table 5.

	N. of Questions	Test time	Test marks
First Test	10	50 minutes	20
Second Test	10	50 minutes	20

Table 6.

Table 6 shows that each question takes 2 marks.

At Table 3 and Table 5 we see a big difference of mean and standard deviation. After traditional education mean was 5.95 and after experiment it has improved to 7,75. And respectively standard deviations from 1,637553 to 1,409554 was changed. After traditional education there were four results less than 50%. After experiment we can notice that all results are more than 50%. Only one student's result didn't change. All others had an improvement.

Conclusion

In conclusion, the comes about of this consider are empowering and propose that the generally impacts of issue posturing intercessions on educating and learning of science

are positive and significant. Teachers ought to see this body of prove when choosing on directions techniques to actualize in classrooms for progressing students': a) information, b) issue fathoming abilities, c) capacities to posture issues, and d) state of mind toward science at all levels. In expansion, the comes about may fortify future analysts to create precise thinks about on issue posturing mediations. Still, numerous questions are unanswered related to the greatness of impacts of issue posturing mediations on the learning of science. Hence, more broad and compelling investigate should be conducted in this region to improve understandings for science educators.

The members centered on self-awareness in portraying their learning. They got to be mindful of what they may or seem not make sense of, were dubious of, and needed to memorize more around with respect to issue posturing and the mathematical concepts they experienced within the handle. They created mindfulness of the significance of setting in issue posturing. They realized that issue posturing can be challenging and created a diverse understanding of it and appreciation of its significance in learning science. As one member clarified: I learned how troublesome it is to type in math questions that are open-ended and require considering instead of memorization... I learned the contrasts between mindful questions and questions that I experienced that can make math unpleasant and boring for students.... I learned that math isn't fair memorizing duplication tables and including at the rudimentary level. It can be inventive and have problem solving at an awfully youthful age.... I learned that by composing questions appropriately, understudies can be given the opportunity to share their possess great thoughts on how to bargain with problems.... I learned how issue tackling can be presented as more almost memorization of aptitudes, just like the way I learned it, than almost making problem-posing capacities.

Members too picked up self-understanding of restrictions of critical perspectives of their arithmetic information for instructing. The assignments required understanding of distinctive science concepts and incited distinctive ways of considering almost and reflecting on issue posturing which permitted them to lock in in scientific considering in a assortment of ways.

References

- Freire, P. (1985). *The politics of education*. South Hadley, MA: Bergin & Garvey.
- Freire, P. (2000). *Pedagogy of the oppressed*. (30th Anniversary Edition). New York: Continuum.
- Geisel, T. S. (1958). *Yertle the turtle, and other stories*, by Dr. Seuss. New York: Random House
- Silver, E. A. (1994). *On mathematical problem posing. For The Learning of Mathematics*.1, 19-28.

Brown, I. S. and Walter, I. M. (2005). *The art of problem posing, Third Edition*. Lawrence Erlbaum Associates, Publishers Mahwah ,New jersey. 116-126.

Civil, M. (2007). *Building on community knowledge: An average to equity in mathematics education*. In N. Nasir and P. Cobb (Eds) improving access to mathematics: *Diversity and equity in the classroom*. 105-117. Teachers College Press.