A MYSTERIOUS TEACHING TECHNIQUE: INTERACTIVE BULLETIN BOARD

Gülhan Can[1]

Bilkent University

M. Sencer Corlu

Bilkent University

Abstract

In this paper, I explained the developmental process of creating an interactive bulletin board (IBB); the preparation part, interaction part, and the reflection part. After constructing my IBB, which is named *The King's Treasure*, I had a chance to observe its applicability while the sixth grade students were playing with it. I added some figures of this process and shared my observations in this article.

Key Words: interactive bulletin board, the king's treasure, activities in mathematics.

[1]Correspondence concerning this article should be addressed to gulhan.can@bilkent.edu.tr

Introduction

The purpose of this article was to explain the process of my preparation, interaction, and learning about interactive bulletin board (IBB). I shared my own IBB's details such as what I thought as its grade level, aim and objectives; which materials I used; and which questions/activities I prepared as a whole. After that I had a chance to observe its interaction process while students were playing with it. At the end of this process, I got the idea of my mentor about the IBB and by adding my own observations, I reflected on it in this paper.

The Details of Interactive Bulletin Board: The King's Treasure

Title: The King's Treasure

Grade Level: 6-7-8

Objective(s) (learner outcomes):

- Students will increase their fluency on the operations with integers, fractions, and percentages.

- Students will be able to make connections of a fraction amongst its forms.

- Students will represent the idea of a variable as an unknown quantity using a letter or a symbol.

- Students will construct the equation by using a symbol for one unknown.

- Students will solve the equations including one unknown.

NCTM Content and Process Standards:

- work flexibly with fractions, decimals, and percents to solve problems;

- develop meaning for percents greater than 100 and less than 1;

- understand and use ratios and proportions to represent quantitative relationships;

- use models, benchmarks, and equivalent forms to judge the size of fractions;

- recognize and generate equivalent forms of commonly used fractions, decimals, and percents;

- identify and use relationships between operations, such as division as the inverse of

  multiplication, to solve problems;

- develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30 × 50;

- develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.

- represent the idea of a variable as an unknown quantity using a letter or a symbol;

- express mathematical relationships using equations.

MoNE Objectives:

- Kesirlerle işlemler yapmayı gerektiren problemleri çözer ve kurar.

- Kesirlerle yüzde arasındaki ilişkiyi açıklar.

- Yüzde ile ilgili problemleri çözer ve kurar.

- Nicelikleri karşılaştırmada oran kullanır ve oranı farklı biçimlerde gösterir.

- Belirli durumlara uygun cebirsel ifadeyi yazar.

- Denklemi açıklar, problemlere uygun denklemleri kurar.

- Birinci dereceden bir bilinmeyenli denklemleri çözer.

Materials Needed:

- A cardboard for the main body (50x70)

- Coloured cardboards one for the ground and one (or more) for the box, number cards.

- One or two acetate paper to construct the place on the number cards (for the agents)

- Printed pictures (from the internet)

- Scissors

- Straightforward

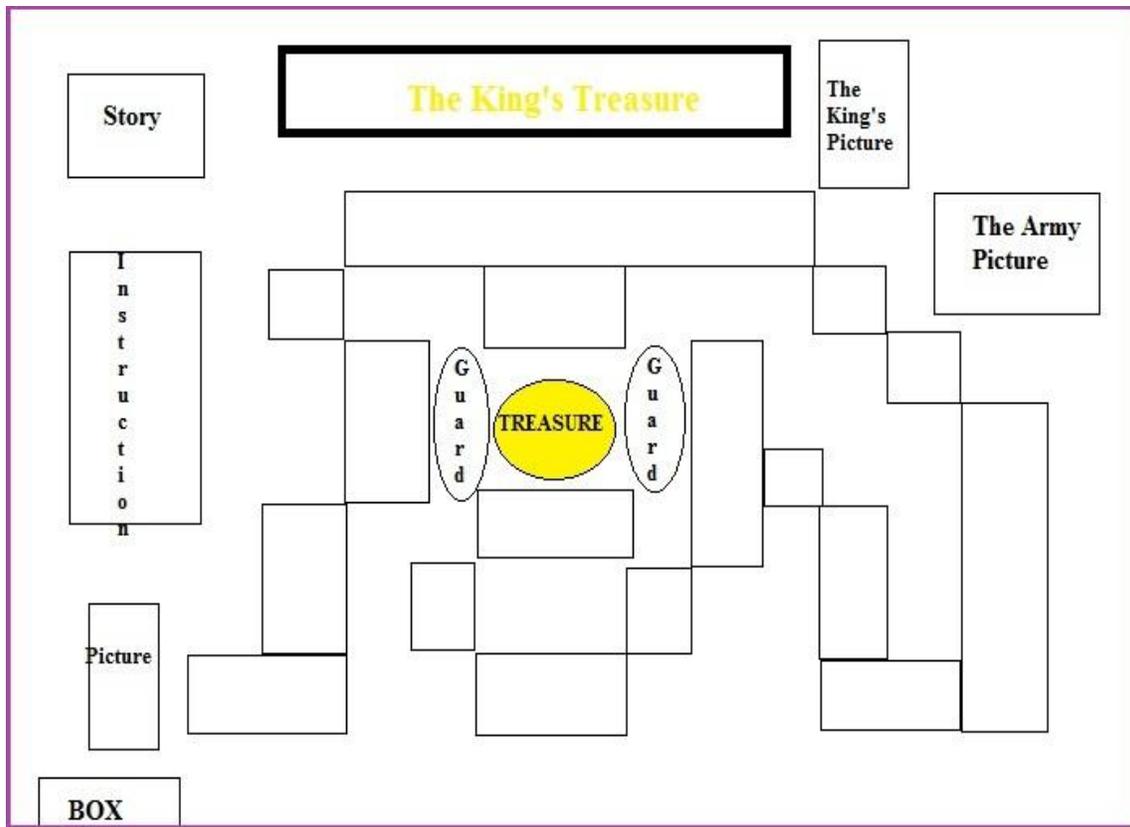- Colourful pens

- Glue and an adhesive tape

- Pins

Figure 1. The draft of the interactive bulletin board: The King's Treasure.

Description of the interactive bulletin board with its activities and problems/questions

At a first look to the IBB, it is written a story (that I kept it) about the mystery of ancient Egypt to be able to gain students' attention. Additionally I tried to design its appearance to make seem it more mysterious with the images, colors, and so on. Once managed to attract the attention of the students, there is an explanation part which is named *How to Play It?* To be able to reach the treasure before than the other(s), the running is like that:

Firstly, each of the explorers must choose their own agent from the left bottom box (purple box: choose your treasure hunter). To understand that who will be the first, (if there are more than two explorers, it will be decided on the same way) each explorer rolls the dice and the one who rolls the biggest number begins first. It means also each explorer has the right to take the number of step(s) that is seen on his/her own dice.

To be able to go on, the explorer must choose one of the question cards (which the wise of the king puzzled) and must answer it correctly in the given time (for 6th graders I decided on two minutes for each question). It is stated "*Remember, calculators will not be able to work in the pyramids!*" so, students will do it in their minds or use paper and pencil only. It is also reminded in the *how to play* part that explorers must give the simplest form of a fraction, if the answer is a fraction indeed. Each explorer has only one right of reply in the given time. So, they must check their answer before answering. To learn the answer is correct or not, I designed a table which is matching a question number to its answer as an answer key (it is called *the right answers of the wise* in the IBB). As it is seen in the figure2, I designed it as replaceable whereby for different questions it can be changed easily. Additionally it has a front page which makes the answers secret for the big part of the game.
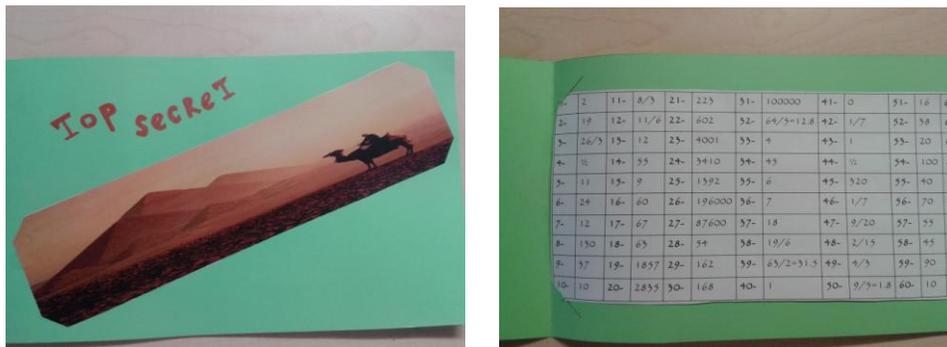

Figure 2. The image of the answer key.

After that, if the answer is correct, the explorer can go on his/her way. It means the explorer will move his/her agent to its new position. As long as the explorer gives the correct answer, he/she can go on. The process is same: Choose a question, roll the dice, if the answer is correct, the number on the dice says you to move the agent to its new position. Otherwise, if the answer is incorrect, it is the time for the other explorer. By the way, all explorers must put the answered questions into the pink bucket in terms of its correctness. If the explorer gave true answer, the question paper will be put into the first section; otherwise if the answer is incorrect,

it will be put into the second one. I thought it to help the teacher to assess the missing points of the topic(s) when he/she looked to the bucket's sections.

Now, it is the part that I most enjoyed. There are some special numbers on the way of getting the treasure. If an explorer comes across the 11th and 12th numbers, then he/she lose his/her right to go on. Because these numbers indicate the blind alleys! So it will be good for other explorer(s). For the number #5, 6, 28, and 29, the guards of the treasure will try to stop the explorers. To dodge them, the explorer must answer one more question correctly. One correct answer will not be enough for this time. The same procedure applies for #16, 17, 18, and 19 since this time the king's ancient army will try to stop the explorers. However if an explorer comes across # 3, 14, 18, and 25, lucky day for him/her since if the explorer answers correctly he/she moves twice as much as the number on the dice.

Finally, if an explorer comes across #35 or 36, then of course provided to answer the question correctly, he/she can get the treasure if any of the explorers have not got it yet. Here, for these last questions I thought it can be placed brain teasers by considering the students' interests and grade level. I did not apply it for this time, I thought it as optional for the teacher whether to ask brain teaser, or any challenging question related with the current topic and so on. Choices can be increased by the teacher.

Figure 3. The image of the interactive bulletin board: The King's Treasure.

Reflection on the IBB

When I was pondering about the concept of my IBB, I thought that *the first thing to do* must be to *gain students' attention*. And to be able to cover this, it must be entertaining and also sometimes challenging for the students. The chance factor is very important here. It brings fun to any game. I also remembered the games that I most enjoyed in my childhood and asked myself if I was the child who plays such a game, then what would make me eager to play with it for many times. By considering all these I prepared this IBB.

For the topic and questions, I decided on the *equations* first. But then I realized that many middle school grade students experience some similar difficulties to understand what questions ask for. Even they understand the problem; they usually had some difficulties to transform the

words into the equation. So, I decided to prepare an IBB based on the process mostly. By doing these, I also intended to promote their operation skills. The questions ranges from the basic ones such as: *what happens if it is subtracted three from the half of ten? What is 4 more than 3 times 5?* to more challenging ones such as *when the number is multiplied by four and six is subtracted from the result, the new result would be 62.what is that number?* I added the seventy of them at the end of this paper. Since the school's education language is Turkish for mathematics, I designed it in Turkish (Particularly I had observed and experienced the Turkish students' problems with the issue).

I had a chance to observe how my IBB really interacts with the 6th grade students in OBO. I can say that first the appearance of the IBB attracted the attention of the students. The students, who even did not play with it, came and read the story part and had a glance to it. The students who played with it enjoyed the IBB mostly when the chance factor is actively in the game. They were interested to hear the other's answer whether it was correct or not. And they were also excited when they came up the special points (x2, blind alley, guards, and army).

It can be played with two students or student groups as ideal. But it is also possible to play it with more than two students or alone. In these conditions there are some disadvantages. For just one student it would be boring in my opinion. But yet, some students may want to play it on their own, for example during one of the break times, and then maybe play it with her friends for the other break times. The second option, more than two students can play with it. But this time when one of them failed, it can be confusing to control who comes next (even they roll the dice). Besides, it may be boring to wait for more than one person. So, in such a condition, I suggest to become two groups and solve the questions as a group, in a shorter time. Here is an image from the interaction part, and another image for my mentor's evaluation:

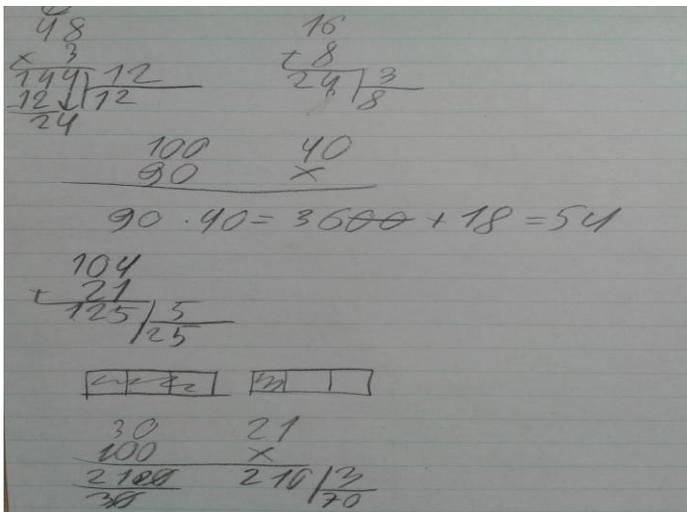*Figure 4*. The image of the interaction part with different numbers of students.

Figure 5. The image of one of the student's paper-pencil work.

Figure 6. The image of the mentor evaluation form.

One of the reasons that I designed my IBB such in this form is to increase its feasibility. Since the question box is apart from the main body of the IBB, different questions can be replaced for other topics and also for other grades. Additionally, it is also used colorful pins to attach the story and instructions part whereby it gives a chance to replace them with the new ones. But still, for high school grade students, I would need to choose another concept to gain attention and participation of them.

Conclusion

The purpose of this article was to explain the developmental process of constructing and using an interactive bulletin board. I learned to think from the eyes of a student to be able to make an activity/exercise/problem more worthwhile. Once you learned about it and had an appropriate decision on the issue, it will be very useful to transform the drill exercises to such a funny game. But the main thing that I learned is it is really a hard work from the beginning to its end. For each part, it requires a good concentration. The idea, its applicability, what kind of main body, instructions, explanations, questions and its assessment for students' self direction,

pictures, colors and many other things must be constructed neatly. But after constructing such a

thing it is inevitable to be proud of it.

_____

Gülhan Can

The questions and answer key of my IBB:

1-   10'un ½' sinin 3 eksiği kaçtır?

2-   5'in 3 katının 4 fazlası kaçtır?

3-   8'in 1/3'ünün 6 fazlası kaçtır?

4-   3'ün 50/100'ünün 1 eksiği kaçtır?

5-   21'in 3/7'sinin 2 fazlası kaçtır?

6-   32'nin 2/8'inin 3 katı kaçtır?

7-   55'in 4/11'inin 8 eksiği kaçtır?

8-   13'ün 7 katının 39 fazlası kaçtır?

9-   96'nın ¾'ünün 35 eksiği kaçtır?

10-   9'un 2/9'unun 5 katı kaçtır?

11-   12'nin 4/9'unun 8/3 eksiği kaçtır?

12-   15'in 1/6'sının 2/3 eksiği kaçtır?

13-   48'in 3 katının 1/12'si kaçtır?

14-   64'ün 1/16'sının 51 fazlası kaçtır?

15-   75'in 4/15'inin 11 eksiği kaçtır?

16-   85'in 3/17'sinin 4 katı kaçtır?

17-   121'in 10/11'inin 43 eksiği kaçtır?

18-   210'un 30/100'ü kaçtır?

19-   2476'nın 75/100'ü kaçtır?

20-   5103'ün 5/9'u kaçtır?

21-   18'in 12 katının 7 fazlası kaçtır?

22-   57'nin 11 katının 25 eksiği kaçtır?

23-   170'in 24 katının 79 eksiği kaçtır?

24- 314'ün 11 katının 44 eksiği kaçtır?

25- 91'in 15 katının 27 fazlası kaçtır?

26- 14000'in 14 katı kaçtır?

27- 730'un 120 katı kaçtır?

28- 90'ın %40'ının 18 fazlası kaçtır?

29- 270'in %60'ı kaçtır?

30- 840'ın %20'si kaçtır?

31- 1 000 000'un %10'u kaçtır?

32- 128'in %10'u kaçtır?

33- 20'nin %20'si kaçtır?

34- 150'nin %10'unun 3 katı kaçtır?

35- 15'in %20'sinin 2 katı kaçtır?

36- 9/2'nin 1 eksiğinin 2 katı kaçtır?

37- **17/4'ün 2 eksiğinin 8 katı kaçtır?**

38- **4/3'ün 5 fazlasının yarısı kaçtır?**

39- **12/5'in ¾ fazlasının 10 katı kaçtır?**

40- **4/5'in 2/3 fazlasının 7/15 eksiği kaçtır?**

41- **5/14'ün 1/7 fazlasının ½ eksiği kaçtır?**

42- **2/7'nin 4 katının 1 eksiği kaçtır?**

43- **4/9'un 3 katının 1/3 eksiği kaçtır?**

44- **3/36'nın 1/6 fazlasının 2 katı kaçtır?**

45- **14/ 21'in 30 katının 300 fazlası kaçtır?**

46- **16/28'in %25'i kaçtır?**

47- **13/26'nın % 90'ı kaçtır?**

48- **9/54'ün %80'i kaçtır?**

49- **72/81'in 3/2'si kaçtır?**

50- **24/15'in yarısının 1 fazlası kaçtır?**

51- %25'i 4 olan sayı kaçtır?

52- %50'si 19 olan sayı kaçtır?

53- %75'i 15 olan sayı kaçtır?

54- %10'u 10 olan sayı kaçtır?

55- %20'si 8 olan sayı kaçtır?

56- %30'u 21 olan sayı kaçtır?

57- %40'ı 22 olan sayı kaçtır?

58- %60'ı 27 olan sayı kaçtır?

59- %70'i 63 olan sayı kaçtır?

60- %80'i 8 olan sayı kaçtır?

61- %90'ı 36 olan sayı kaçtır?

62- ½'sinin 5 fazlası 17 olan sayı kaçtır?

63- 1/3'ünün 8 eksiği 16 olan sayı kaçtır?

64- 2/5'inin 1 fazlası 25 olan sayı kaçtır?

65- 4 katının 6 eksiği 62 olan sayı kaçtır?

66- 7 katınn 2 fazlası 86 olan sayı kaçtır?

67- 5 katının 21 eksiği 104 olan sayı kaçtır?

68- 9 katının 79 eksiği 200 olan sayı kaçtır?

69- 3 katının 34 fazlası 119 olan sayı kaçtır?

70- 6 katının 6 fazlası 606 olan sayı kaçtır?

1~	2	1 1~	8/3	2 1~	223	3 1~	100000	4 1~	0	5 1~	16	6 1~	40		
2~	19	1 2~	11/6	2 2~	602	3 2~	64/5= 12.8	4 2~	1/7	5 2~	38	6 2~	24		
3~	26/3	1 3~	12	2 3~	4001	3 3~	4	4 3~	1	5 3~	20	6 3~	72		
4~	½	1 4~	55	2 4~	3410	3 4~	45	4 4~	½	5 4~	100	6 4~	60		
5~	11	1 5~	9	2 5~	1392	3 5~	6	4 5~	320	5 5~	40	6 5~	17		
6~	24	1 6~	60	2 6~	196000	3 6~	7	4 6~	1/7	5 6~	70	6 6~	12		
7~	12	1 7~	67	2 7~	87600	3 7~	18	4 7~	9/20	5 7~	55	6 7~	25		
8~	130	1 8~	63	2 8~	54	3 8~	19/6	4 8~	2/15	5 8~	45	6 8~	31		

9~	37	1 9~	18 57	2 9~	162	3 9~	63/2= 31.5	4 9~	4/3	5 9~	90	6 9~	51
1 O~	10	2 O~	28 35	3 O~	168	4 O~	1	5 O~	9/5= 1.8	6 O~	10	7 O~	10 0