

A STUDY OF TEACHING MATHEMATICS WORD PROBLEMS IN PRIMARY SCHOOLS OF VIETNAM

By

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Abstract

In mathematics curriculum of primary education of Vietnam, students solve word problems from Grade 1 to Grade 5 – the final Grade in primary schools. The questions are that “How do students of Grades 1 begin to learn this type of problems?”, and “What are teachers’ opinions on teaching mathematics word problems?. The results of our study presented educators’ the conceptions on the type of problems in primary education, also showed that how textbook “TOÁN 1” (Mathematics 1) introduced word problems to students, what difficulties students often encountered and how interesting students were in solving mathematics word problems.

Key words: *Word problem, mathematics education, problem solving, primary education, mathematics textbook.*

1. What mathematics word problems are: Conceptions of Vietnamese educators

Word problems of mathematics have very important position in the mathematics curriculum in primary schools of Vietnam. In the Vietnamese primary school, students get acquainted with word problems of mathematics from Grade 1 to Grade 5 - the final Grade of the primary school. Vietnamese educators had different conceptions on the type of these problems as follows:

Hoàng Thị Mẫn (2014) argued that contents of the mathematics word problems are stated in words about the relationships, correlations related to real world. The difficulty of the problem is that we omit elements of the text concealing the nature of the problem to find the answer to that problem.

On mathematics word problem solving, according to Đỗ Trung Hiệu *et al* (2004), in word problem solving there are two main points which the solver should pay attention to as follows: (1) to establish the connections among data, between what was given and what is to look for in the given problem; (2) to choose the appropriate calculations for the problem.

The author Vũ Quốc Chung *et al* (2007) argued that mathematics word problems are understood as "problematic situations" which contain data, certain variables described by the language situations. To be solved, the language situations must be analyzed to identify strategies for solving the problem. However, also according to these authors, the problem is only a problematic situation when students meet it at first time. Once students have become familiar with the type of this problem, solving such a problem is not difficult for them anymore.

Hồ Văn Phúc Trần (*from website*) stated that mathematics word problems often are the problems relating to real world; therefore, they bridges the gap between mathematical knowledge and real life. Therefore, teaching word problem solving is to help students learn how to apply knowledge of mathematics to real situations. Through solving word problems, students have opportunities to develop their thinking and language.

About the instruction of word problems, according to Trần Ngọc Lan (2009), teaching mathematics word problem consists of the following activities:

Activity 1: State a problem and help students analyze and identify the structure of the problem, and students look for how to solve the problem by themselves.

Activity 2: Teachers introduce the strategy for solving the problem and write the solution of the problem. Students observe steps of the solution of the problem and draw notions on the solution.

Activity 3: Generalize how to solve the problem, and students do some applications relating to the type of the above problem.

2. Purpose of the problem

In this study, we wanted to find out the answers to below *two research questions*:

1. How do primary – school students of Vietnam begin to learn the concept of mathematics word problem?

2. What do the mathematics teachers in Vietnamese primary schools think about mathematics word problems?

3. Methodology

- *Content analysis*: We analyzed Vietnamese textbook “TOÁN 1” (Mathematics 1) of Đỗ Đình Hoan *et al* to understand how primary – school students begin to learn mathematics word problems (in Vietnam, only one textbook “TOÁN 1” of the above authors was used for teaching mathematics in primary schools).

- *Questionnaire:* We used a questionnaire to get primary education teachers' opinions on teaching and learning mathematics word problems.
- *Subjects:* 150 primary school teachers who have been teaching in primary schools of province "Hậu Giang", Vietnam.
The survey was carried out in 2014.

4. Results and discussion

4.1. How students in primary schools begin to be introduced the type of mathematics word problem (the answer to research question 1)

In Vietnam, students begin to be familiar with mathematics word problems while they study at Grade 1 (aged: 6). The textbook "TOÁN 1" (Mathematics 1) introduces what a mathematics word problem is to students according to four - task process as follows:

Task 1: Give a problem with a picture to illustrate and one question to be given, but assumptions of the problem lack numerical data. Ask students for supplementary (see *Illustration 1*).

Illustration 1:

"Fill suitable numbers in the blanks to have a problem:

Problem: There are....., there isHow many boys are there in all?" (See Figure 1)



Figure 1 (cited from TOÁN 1, p.115)

Task 2: Give a problem with a picture to illustrate with assumptions of the problem given. Ask students for write the question of the problem (see *Illustration 2*).

Illustration 2:

“**Problem:** There are 1 mother chicken and 7 young chickens.

Ask.....?” (see Figure 2)



Figure 2 (cited from TOÁN 1, p.116)

Task 3: Give a mathematics word problem with full of what to be given and what to find, and introduce a sample of how to solve the problem (see Illustration 3).

Illustration 3:

“An’s the house has 5 chickens, the mother of An bought 4 chickens more. How many chickens are there in An’s the house in all?”

Summary

Have: 5 chickens

Add: 4 chickens

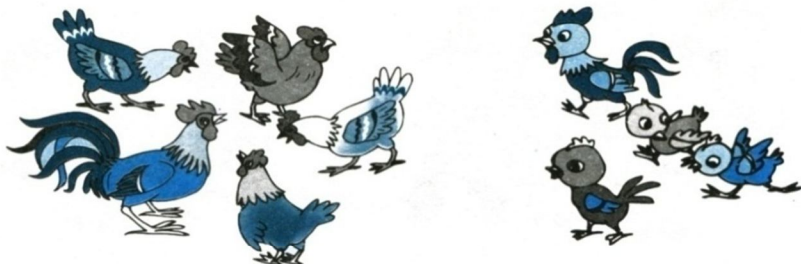
All :...chickens?

Solution

All of chickens in An’s the house are:

$$5 + 4 = 9 \text{ (chickens)}$$

Answer: 9 chickens” (see Figure 3)



Bài toán : Nhà An có 5 con gà, mẹ mua thêm 4 con gà. Hỏi nhà An có tất cả mấy con gà ?

Tóm tắt
 Có : 5 con gà
 Thêm : 4 con gà
 Có tất cả : ... con gà ?

Bài giải
 Nhà An có tất cả là :
 $5 + 4 = 9$ (con gà)
 Đáp số : 9 con gà.

Figure 3 (cited from TOÁN 1, p. 117)

Task 4: Give a mathematics word problem with full of what to be given and what to find, and guide students to solve the problem ((see Illustration 4).

Illustration 4:

“At first time, your team had 6 boys, then had 3 boys more. How many boys were there in your team in all?”

Summary

Had: 6 boys

Add: 3 boys

All :.....boys


Solution

.....

.....


Answer:boys”

(see Figure 4)




2

Lúc đầu tổ em có 6 bạn, sau đó có thêm 3 bạn nữa. Hỏi tổ em có tất cả mấy bạn ?



Tóm tắt

Có : ... bạn
 Thêm : ... bạn
 Có tất cả : ... bạn ?



Bài giải

.....

Đáp số : ... bạn.

Figure 4 (cited from TOÁN 1, p.118)

Comments

Based on the above stages, it is easy to recognize that textbook “TOAN 1” introduced concept “mathematics word problem” to students through 2 main phases:

Phase 1: Introduce the components of a mathematics word problem

Use examples to show students two components of a mathematics word problem: what are given (Task 1) and what required to find out (Task 2).

Phase 2: Introduce what the solution of a mathematics word problem is. This phase includes the following contents:

- Analyse the the problem (or understand the problem): What are given? What is required to find out?; and
- Show how to write the solution of a word problem (Task 3, Task 4)

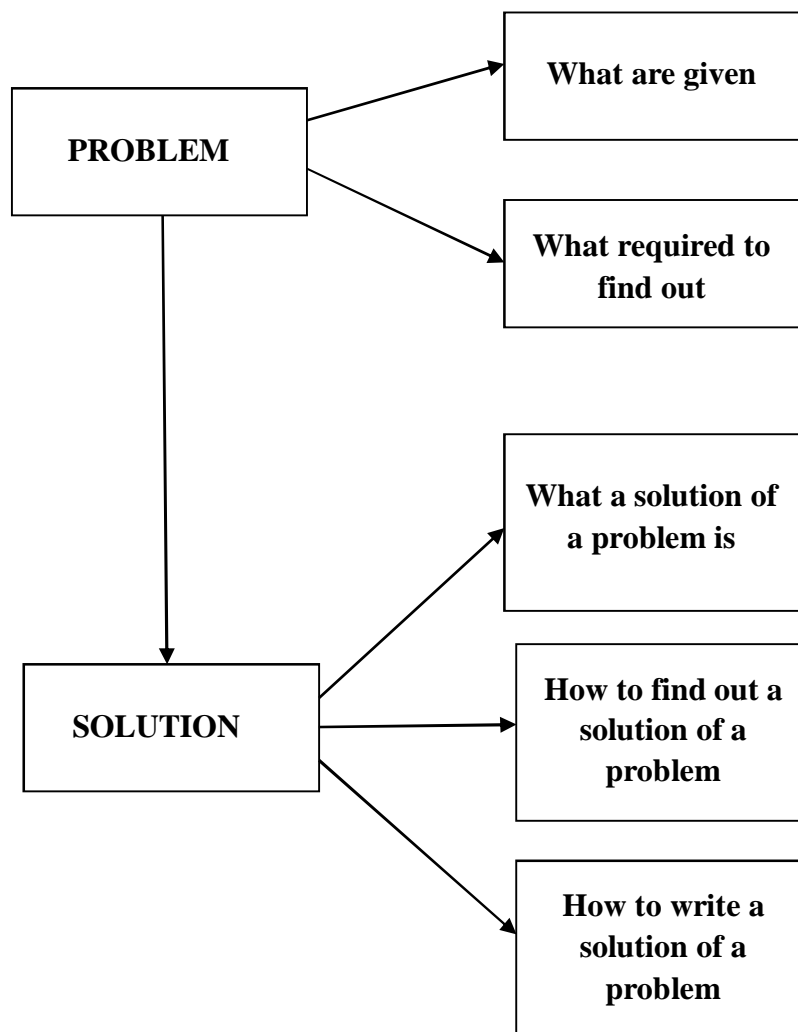


Figure 5: How to introduce what a mathematics word problem is to primary - school students in the Vietnamese textbook “TOÁN 1”

In summary, how to introduce what a mathematics word problem to primary – school students in textbook “TOAN 1” of Vietnam can be represented by Figure 5. Accordingly, students know “what is a word problem?”, “how many parts are there in the texture of a word problem?”. As a result, students can understand the meanings of a word problem and know how analyze the content of a word problem, from which they can seek a solution of the problem (Nguyen Áng *et al*, 2005).

4.2. *On mathematics word problems in primary schools: The teachers' an investigation (the answer to research question 2)*

1. *How important are mathematics word problems in the primary education?*

The results surveyed showed that most of the teachers agreed that mathematics word problems play an important role in the primary education (see Table 1).

Table 1: The importance of mathematics word problem in primary schools
(N = 150)

Important	Normal	Not important
144 teachers (96%)	6(4%)	0(0%)

2. *What have you done to teach mathematics word problem solving to your students?*

According to Table 2, over 2/3 teachers surveyed paid attention to developing students' basic skills for solving a word problem regularly. However, over 50% teacher sometimes extended the given problems and required their students to seek another strategy for solving a problem.

Table 2: Teaching *mathematics word problem solving* to the students of primary schools
(N=150)

Statements	Regularly	Sometimes	Rarely	Never
I guided students how to solve a problem by five – step process (understanding a problem, summarizing a problem, looking strategies for solving a problem, write the solution of a problem, checking the solution of a problem)	136 teachers (90.66%)	14 (9.34%)	0 (0%)	0 (0%)
I trained my students how to analyze of a problem	142 (94.66%)	8 (5.34%)	0 (0%)	0 (0%)
I trained my students how to summarize a problem	130 (86.66%)	20 (13.34%)	0 (0%)	0 (0%)
I trained my student how to find out strategies for solving a problem	142 (94.66%)	7 (4.66%)	1 (0.68%)	0 (0%)
I trained my students how to write the solution of a problem	134 (89.33%)	16 (10.67%)	0 (0%)	0 (0%)
I train my students how to check the solution of a problem	103 (68.66%)	42 (28%)	5 (3.34%)	0 (0%)

I taught my students skills of calculations	117 (78%)	32 (21.34%)	1 (0.68%)	0 (0%)
I required students to look for different methods of finding the solution of a problem	58 (38.66%)	87 (58.00%)	3 (2.00%)	2 (1.36%)
I extended or generalized given problems	24 (16.00%)	88 (58.66%)	33 (22.00%)	5 (3.34%)

3. According to you, what have students' the level of the difficulty been in solving a mathematics word problem?

Opinions the difficult level of students in mathematics word problem solving, about 45% teachers agreed that their students found difficult to distinguish types of problems and to find out a strategy for solving a problem; and about 70% teachers had the same view that it was not difficult for students to write the solution of a problem and to perform computations (see Table 3).

Table 3: Teachers' opinions on the difficult level of students in mathematics word problem solving

(N=150)

Elements of word problem solving	Difficult	Normal	Easy
Understand a problem	46 (30.66%)	74 (49.34%)	30 (20%)
Summarize a problem	36 (24.00%)	85 (56.66%)	29 (19.34%)
Distinguish types of problems	69 (46.00%)	74 (49.34%)	7 (4.66%)
Find out a strategy for solving a problem	66 (44.00%)	76 (50.66%)	8 (5.34%)
Write the solution of a problem	2 (19.33%)	104 (69.33%)	17 (11.34%)
Perform computations	16 (10.66%)	107 (71.34%)	27 (18.00%)

4 .What errors have your students made in mathematics word problem solving?

Table 4 presented the results of the teachers' opinions on errors which their students committed. Over 50% teachers agreed that their students often confused types of problems and misunderstood problems.

Table 4: Students' the errors in mathematics word problem solving

(N=150)	
Errors of students	Teachers agreed
Misunderstand problems	76 (50.66%)
Don't make use of all of what given to look for strategies for a problem	55 (36.66%)
Confuse types of problems	94 (62.66%)
Make mistakes in their calculations	62 (41.33%)
Make errors relating to measurement units	43 (28.66%)

4. How interesting have your students been to solve mathematics word problems

About students' attitude towards mathematics word problem solving, 100 out of 150 teachers surveyed believed that their students were interesting in solving word problems (see Table 5).

Table 5 : How interesting students have been to solve mathematics word problems
(N=150)

Interesting	Normal	Not interesting
100 (66.66%)	49 (32.66%)	1 (0.68%)

Conclusion

Mathematics word problems play important role in mathematics education in Vietnamese primary schools. Through solving word problems, students have opportunities to develop their abilities of problem solving, develop their thinking and to recognize the applications of mathematics to real world. The results of the study showed that students found it interesting to approach these problems. However, students often have committed errors in their process of problem solving. Therefore, the teacher should seek different strategies of teaching in order to help students to solve mathematics word problems in an effective way.

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