



## The Use of Textbooks in Teaching Mathematics in Secondary Schools: An Investigation of Teachers

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**Abstract:** In Vietnamese schools, textbooks used in schools were compiled by authors whom were chosen by the Ministry of Education and Training; both teachers and students used the same textbooks in process of teaching and learning. Particularly in mathematics education of Vietnam, textbooks of mathematics always are main materials which each school student was equipped to support the process of learning both at home and at classroom. In order to know how the mathematics teachers in schools have used textbooks in their teaching, we carried out an investigation of secondary school teachers of mathematics with two research questions as follows: (1) How have the secondary teachers of mathematics used textbooks in their teaching? (2) Are there any differences between junior school teachers of mathematics and senior school teachers of mathematics in their use of textbook? The results show that all stages of a process of teaching a mathematics content such as making lesson plan, designing learning activities of students in the classroom, giving exercises to students, all teachers based on textbooks.

**Keywords:** Textbook; mathematics education; theory of activities; the use of textbook; secondary education

### I. Conceptions of a textbook

#### Definitions

Textbook is an educational tool and it has become popular after print technology was invented in 15<sup>th</sup> century. In order to understand what a textbook is, we consider the following definitions:

*Definition 1:* "A textbook is a book containing facts about a particular subject that is used by people studying that subject". [1]

*Definition 2:* A textbook is "a book about a particular subject that is used in the study of that subject especially in a school". [9]

*Definition 3:* "A textbook or coursebook (UK English) is a manual of instruction in any branch of study". [10]

*Definition 4:* "A textbook is a book used by students as a standard work for a particular branch of study". [6].

*Definition 5:* A textbook is "a book which was compiled according to the curriculum in schools". [7]

From the above definitions, we could recognize that a textbook is a kind of book designed to provide a pedagogical and legal version for a field of knowledge (Stray, 1994) [5]. Therefore, the textbooks are the bridge between intended curriculum and implemented curriculum; they are the main documents for both teachers and students in teaching – learning process.

#### The usage of textbooks: Considerations under the theory of activity

According to Vygotsky's theory of activity [2], an activity consists of three components: subject of the activity, tool for the activity and object of the activity (see Figure 1), from which we might point out the roles of

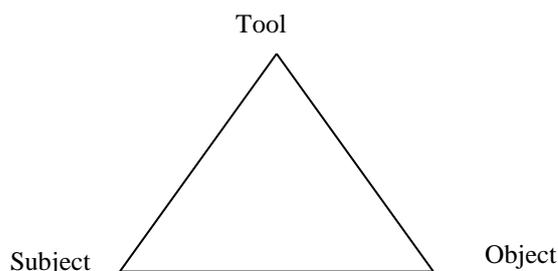
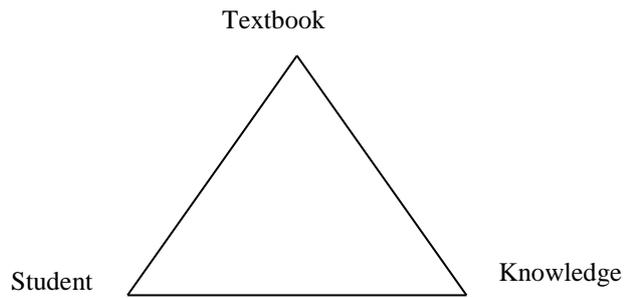


Figure 1: Vygotsky's model of an activity

textbooks in the process of teaching and learning in schools according to the following three models.

**Model 1:** Student (Subject) - Textbook (Tool) - Knowledge (Object)

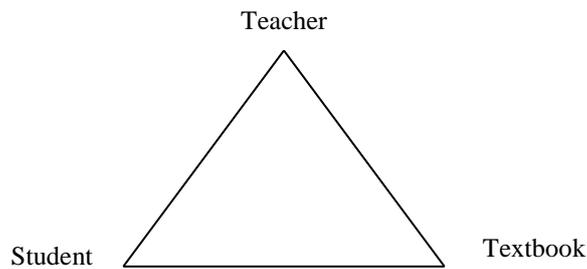
Students can use the textbook as a means to learn knowledge. The purpose of activity of the students is to understand the concepts and rules presented in the book. In this case, textbooks should indicate the objectives of



**Figure 2: Textbook as a learning tool of student**

each chapter, each lesson (learning outcomes); and the textbook should involve system of examples and figures illustrating the concepts and provide also the exercises for testing and evaluating (see Figure 2)

**Model 2: Student (Subject)- Teacher (Tool) - Textbook (Object)**

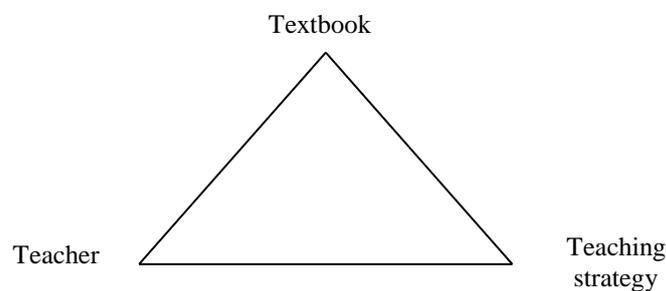


**Figure 3: Textbook as a learning object of student**

In this model, the teacher plays a supporting role (intermediate role). Students' task is to implement the learning activities mentioned in textbooks, whereby they acquire knowledge. In this case, the textbooks should set out the highly pedagogical activities which help students achieve learning objectives (see Figure 3)

**Model 3: Teacher (Subject) – Textbook (Tool) – Teaching strategy (Object)**

In the model 3, the teacher uses the textbook as a teaching tool, the object of the teacher's activity is to find out pedagogical strategies (teaching strategies) to help his students achieve the learning objectives (see Figure 4).



**Figure 4: Textbook as a teaching tool of teacher**

## II. Purpose of the research

According to Monica Johansson (2006) [3], textbooks have great impact on the teaching process of teachers, he specifically noted as follows:

- (1) The mathematics topics stated in textbooks are most likely presented by teachers.
- (2) The mathematics topics not mentioned officially in textbook are not most likely presented by teachers.
- (3) The teaching strategies of teachers depend on pedagogical approaches of textbooks.
- (4) Teachers' the process of teaching is parallel with the process of textbook.

(5) Textbooks are a major source of information from which the teacher decides how to present content knowledge.

In Vietnamese schools, textbooks used in schools were compiled by authors whom were chosen by the Ministry of Education and Training; both teachers and students used the same textbooks in process of teaching and learning. Particularly in mathematics education of Vietnam, textbooks of mathematics always are main materials which each school student was equipped to support the process of learning both at home and at classroom. In order to know how the mathematics teachers in schools have used textbooks in their teaching, we carried out an investigation of secondary school teachers of mathematics with two research questions as follows:

1. *How have the secondary teachers of mathematics used textbooks in their teaching?*
2. *Are there any differences between junior school teachers of mathematics and senior school teachers of mathematics in their use of textbook?*

### III. Methodology

- *Teachers surveyed:*

- 48 senior secondary teachers of mathematics who are teaching at schools in Mekong Delta of Vietnam, and they also are studying Master program of mathematics education in Can Tho University - Vietnam

- 57 junior secondary teachers of mathematics who are teaching in schools in Mekong Delta of Vietnam, and they also continue university program of mathematics education in Can Tho University - Vietnam

- *Questionnaire:* The teachers surveyed were asked to answer a questionnaire with 9 items related to how to use textbook in their teaching according to Likert scale of five levels. (see Table 1)

- *Statistical analysis:* Chi – square test.

- *Time for the investigation:* Academic year 2014 -2015.

**Table 1: Items for investigating school teachers of mathematics**

Items	Never	Rarely	Sometimes	Regularly	Always
1. I use the textbook to make lesson plans					
2. The order of each my lecture content is the same as the one of the textbook					
3. The activities for students in each lesson, I comply with the activities outlined in the textbook					
4. In each lesson, I replace some activities in the textbook by activities which I created					
5. Homeworks for students are merely exercises in the textbook					
6. The textbook is used during my lessons.					
7. In each lesson, I recommend some exercises in the textbook					
8. For each lesson, I guide students to read content related in the textbook at home before					
9. After each lesson, I guide students to do exercises in the textbook					

### IV. Results and conclusion

**Table 2: Survey result of 1st item**

<b>1. I use the textbook to make lesson plans</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)		2		25	21
Junior teachers (n=57)				14	43
<i>Chi –square test</i>			<i>Chi-square</i>	<i>df</i>	<i>P</i>
			11.98	4	0.0175

**Table 3: Survey result of 2<sup>nd</sup> item**

<b>2. The order of each my lecture content is the same as the one of the textbook</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)	1	2	8	31	6
Junior teachers (n=57)			4	25	28
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			18.58	4	0.001

**Table 4: Survey result of 3<sup>rd</sup> item**

<b>3. The activities for students in each lesson, I comply with the activities outlined in the textbook</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)	1	3	25	15	4
Junior teachers (n=57)			12	32	13
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			18.85	4	0.0008

**Table 5: Survey result of 4<sup>th</sup> item**

<b>4. In each lesson, I replace some activities in the textbook by activities which I created</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)		1	21	22	4
Junior teachers (n=57)		5	45	5	2
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			22.16	4	0.0002

**Table 6: Survey result of 5<sup>th</sup> item**

<b>5. Homeworks for students are merely exercises in the textbook</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)	5	7	23	13	
Junior teachers (n=57)		3	12	36	6
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			26.27	4	<0.0001

**Table 7: Survey result of 6<sup>th</sup> item**

<b>6. The textbook is used during my lesson</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)	1	9	16	19	3
Junior teachers (n=57)			14	25	18
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			21.05	4	0.0003

**Table 8: Survey result of 7<sup>th</sup> item**

<b>7. In each lesson, I recommend some exercises in the textbook</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)			18	25	5
Junior teachers (n=57)			11	18	28
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			18.22	4	0.0011

**Table 9: Survey result of 8<sup>th</sup> item**

<b>8. For each lesson, I guide students to read content in the textbook at home before</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)		3	16	23	6
Junior teachers (n=57)			6	18	33
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			26.27	4	<0.0001

**Table 10: Survey result of 9<sup>th</sup> item**

<b>9. After each lesson, I guide students to do exercises in the textbook</b>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Regularly</i>	<i>Always</i>
Senior teachers (n=48)		1	19	25	3
Junior teachers (n=57)			3	26	28
<i>Chi –square test</i>			<i>Chi square</i>	<i>df</i>	<i>P</i>
			32.28	4	<0.0001

The opinions of teachers surveyed towards the use of textbooks in their teaching were reported in Tables from 2 to 10. The results of data analysis in these Tables show that almost teachers regularly or always used textbooks as main materials to give their lessons. In all stages of a process of teaching a mathematics content such as making lesson plan, designing learning activities of students in the classroom, giving exercises to students, all teachers based on textbooks. In addition, the result of chi-square analyzing indicates that the dependence of the teaching of junior secondary school teachers on textbooks was greater than that of senior secondary school teachers.

To sum up, the result of the investigation allows us to reach conclusion that the quality of teaching mathematics and sciences has been influenced much on textbooks used. In other words, the situation of mathematics education in Vietnam can be summarized: Textbooks. [8].

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