JUNIOR SCHOOL TEACHERS' OPINIONS ON TEACHING TOPIC *"TRAPEZOID"* BY DISCOVERY LEARNING: THE INVESTIGATION IN DONG THAP PROVINCE, VIETNAM

Nguyen Phu Loc[1],
Nguyen Quoc Viet[2]
[1]School of Education,
Can Tho University, Vietnam
[2]Master student in Mathematics Education,
Dong Thap University, Vietnam

Abstract:

Discovery learning is a method of inquiry-based instruction, in discovery learning, learners have opportunities to discover facts and relationships for themselves. In Vietnam, this method was approached from many decades ago. The paper will present the results of the investigating mathematics teachers' opinions on the use of discovery learning in teaching geometry in junior schools of Vietnam in the case of instructing topic "trapezoid".

Keywords: discovery learning, teaching geometry, trapezoid, mathematics education

1. Background

1.1 Conception on discovery learning

Discovery learning, according to Bruner (1961), is an "*inquiry-based, constructivist learning that takes place in problem-solving situations where the learner draws on his or her own past experience and existing knowledge to discover facts and relationships and new truths to be learned*" As a result, students may be more likely to remember concepts and knowledge discovered on their own (Bruner, 2009)

1.2 Topic "Trapezoid" in Mathematics 8 – Vietnam

The content of topic "Trapezoid" in the textbook "Toán 8" (Mathematics 8) of Vietnam consists of the following contents (see Table 1).

Table 1: Contents of the topic "Trapezoid" in Mathematics 8 - Vietnam

Concepts	Theorems
Trapezoid A trapezoid is a quadrilateral with two sides parallel	Theorem 1: In an isosceles trapezoid, two legs are equal.
Right trapezoid A right trapezoid is a trapezoid with one right angle	Theorem 2: Two diagonals of an isosceles trapezoid are equal.
Isosceles trapezoid An isosceles trapezoid is a trapezoid in which two angles adjacent to a base are equal	Theorem 3: Trapezoid with two diagonals equal is isosceles.
	Theorem 4: The line through the midpoint of one leg of a trapezoid and parallel to its bases will pass through the midpoint of the second leg.
	Theorem 5: The mid-segment of a trapezoid is parallel to the two bases and equals half the sum of the bases.

The mathematics contents of the topic "trapezoid" as presented in Table 1 allow us to assert that it is not difficult for the teacher to guide his students to learn by discovery. The problem is that in practice of teaching, do teachers have used this method? How do they think about discovery learning? They are main reasons for our investigation.

1.3 The purpose of investigating teachers 'opinions
1. To know what teachers' perceptions on discovery learning are.
2. To find out whether teachers (and students) in secondary schools are interested in discovery learning.
3. To find out what difficulties of teachers have met in using discovery learning to teach topic "Trapezoid".

2. Methodology

- *Questionnaire*: In order to investigate mathematics teachers' opinions, we designed questionnaire of 8 closed questions with multi-choices.
- *Subjects:* 40 junior school teachers of mathematics who are teaching in Junior schools of Chau Thanh district, Dong Thap province, Vietnam.
- *Time:* from 8-2016 to 11-2016

3. Results and discussion

3.1. The questions to investigate and their answers

Question 1: During teaching, do you ever have use discovery learning to help your students explore the geometric contents? (The answers in Table 2).
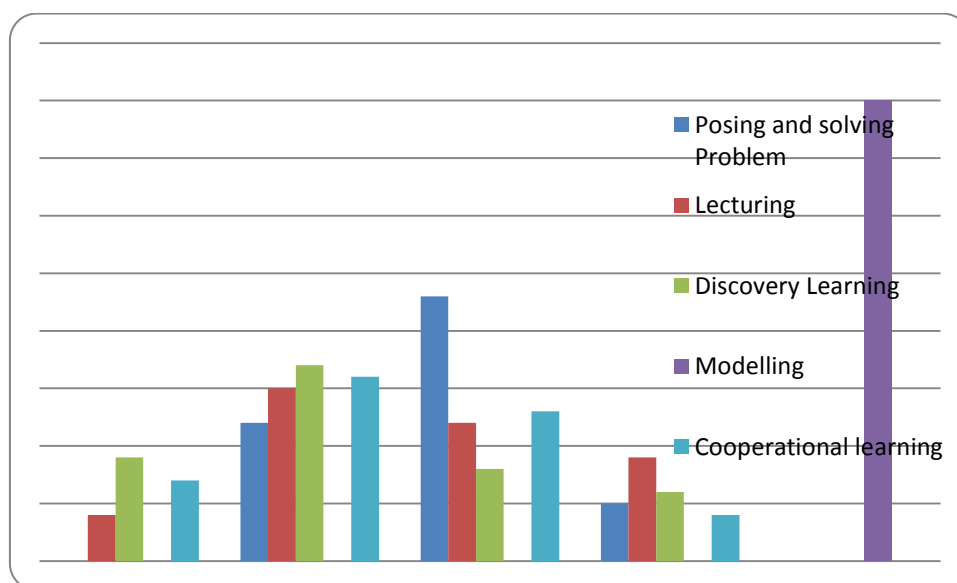
Table 2: Teachers' the levels of using discovery learning to teach Geometry

Very Frequently	Frequently	Occasionally	Rarely	Very Rarely
2	11	20	5	2
(5%)	(27.5%)	(50%)	(12.5%)	(5%)

Question 2: When teaching the topic of trapezoid, which teaching method do you have used to transfer knowledge to students? (The answers in Table 3 and Figure 1).

Table 3: Teachers' the levels of using discovery learning to teach trapezoid in comparison with the others

Teaching method	Level of application				
	Very Frequently	Frequently	Occasionally	Rarely	Very Rarely
Posing and solving problem	0	12	23	5	0
	(0%)	(30%)	(57.5%)	(12.5%)	(0%)
Lecturing	4	15	12	9	0
	(10%)	(37.5%)	(30%)	(22.5%)	(0%)
Discovery learning	9	17	8	6	0
	(22.5%)	(42.5%)	(20%)	(15%)	(0%)
Modelling	0	0	0	0	40
	(0%)	(0%)	(0%)	(0%)	(100%)
Co-operative learning	7	16	13	4	0
	(17.5%)	(40%)	(32.5%)	(10%)	**(0%)**

Figure 1: Teachers' the levels of using discovery learning to teach trapezoid in comparison with the others

Question 3: In your opinion, is discovery learning suitable for teaching the topic of trapezoid? (The answers in Table 4).

Table 4: The appropriate levels of discovery learning in teaching trapezoid

Absolutely appropriate	Appropriate	Neutral	Inappropriate	Absolutely inappropriate
6	19	13	2	0
(15%)	(47.5%)	(32.5%)	(5%)	(0%)

Question 4: When applying discovery learning to your instruction, do you have used visual tools (learning cards, projectors, math software) to support in the lesson? (The answers in Table 5).

Table 5: The use visual tools to support discovery learning

Very Frequently	Frequently	Occasionally	Rarely	Very Rarely
3	17	11	8	1
(7.5%)	(42.5%)	(27.5%)	(20%)	(2.5%)

Question 5: When using discovery learning, what difficulties did you meet? (The answers in Table 6 and Figure 2).

Table 6: Teachers' difficulties when using discovery learning

Items	The number of teachers (N = 40)	
Lacking teaching equipments	7	17.5 %
Taking much time for preparation	32	80%
Being less effective than traditional teaching methods	11	27.5%
IT skills are limited	9	22.5%
Other difficulties	0	0%
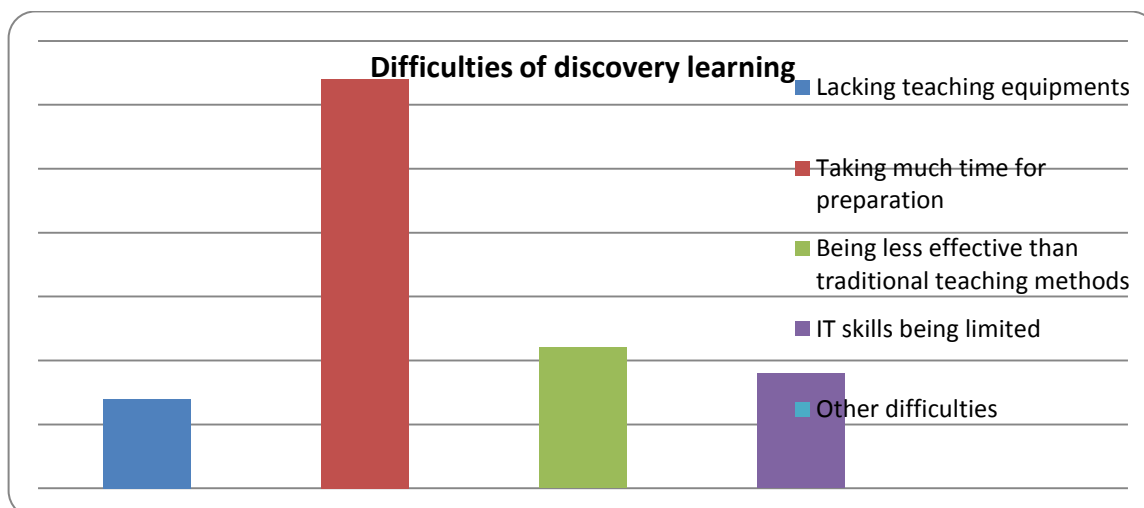
Figure 2: Teachers' difficulties when using discovery learning

Question 6: In your opinion, does discovery learning make students interesting in learning? (The answers in Table 7).

Table 7: The interesting level of students towards learning by discovery

Very interesting	Interesting	Normal	Not interesting	Absolutely not interesting
5	16	11	8	0
(12.5%)	(40%)	(27.5%)	(20%)	(0%)

Question 7: According to your opinion, does learning by discovery help students to be easy to remember mathematical knowledge? (The answers in Table 8 and Figure 3).

Table 8: Students' levels to remember mathematics when learning by discovery

Very easy to remember	Easy to remember	Normal	Difficult to remember	Very difficult to remember
5	23	8	4	0
(12.5%)	(57.5%)	(20%)	(10%)	(0%)
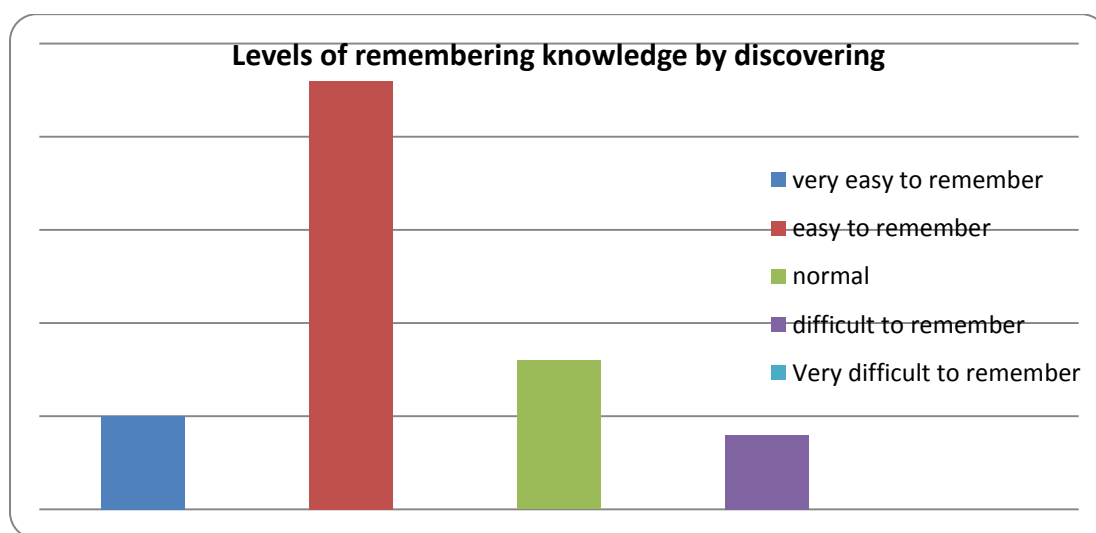
Figure 3: Students' levels to remember mathematics when learning by discovery

Question 8: During teaching mathematics by discovery, are you associated with the other teaching methods? (The answers in Table 9).

Table 9: Associating discovery learning with other teaching methods

Very Frequently	Frequently	Occasionally	Rarely	Very Rarely
2	19	11	8	0
(5%)	(47.5%)	(27.5%)	(20%)	(0%)

4.2. Discussion

Through Table 2, 50% teachers occasionally used discovery learning to teach geometry content. However, for topic of trapezoid, there are 47.5% teachers applied this method for teaching frequently. Figure 1 shows us that learning by discovering was used by the most teachers; this results coincide with the results in Table 3 in which many teachers (47.5%) stated that discover learning is an appropriate for teaching topic of trapezoid.

Table 7 and Table 8 indicated that learning by discovering is an effective teaching method because it makes students interesting and easy to remember mathematical knowledge (see Figure 3). In addition to these advantages, we should note that it take much time for preparing the lesson with discovery learning (see Table 6 and Figure 2), and should associate the other teaching methods to increase the quality of instruction (see Table 9).

5. Conclusion

Discovery learning is an active teaching method. It provides learners with opportunities to carry out discovering actions such as: analyzing, making hypothesis, generalizing,.. However, in order to use this method in an effective way, the teacher takes much time to prepare the lesson and know how to guide his students to re-invent knowledge if not, the teaching process will not produce results as expected.

References

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