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Study of Some Effective Factors on Teaching Mathematics, Causes of Non-Utilization of New Teaching Methods, and Consideration of the Effects of Active and Inactive Methods on Learning

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ABSTRACT

A classroom is similar to a boat, its crews are seeking a seaside,; therefore, all members traveling in the boat should turn on their moving motors. In this paper, firstly we consider active and inactive methods and declare that in individual and group active method, learner is the active party. If active method is established between teacher and a student, it will be called "individual active method" but if the active method is established between teacher and a group of students, the method will be called "group active method". In inactive method, students are passive and teachers are active. This method is teacher-based. Then, we briefly explained some active methods in mathematics teaching and expressed instructive media. At the end, we arranged a questionnaire during which, some hypotheses were considered and confirmed: 1- The effect of making instruction instruments is more identified in active mathematics teaching than other hypotheses. 2- The effect of active methods is more identified in learning than other hypotheses. 3- The effect of the factor of limited time is more identified in non-utilization of active teaching methods than other hypotheses.

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INTRODUCTION

Choosing a teaching method is one of the stages of instruction design. A teacher should select his or her appropriate procedure and teaching method usually after selection of content and before definition of instruction instruments because procedure and teaching method of teacher define the quality of activity of students to reach their instruction goals. In fact, "teaching method" is called to a series of regular measures to be taken to reach the goals according to circumstances and conditions(Bazargan, 1995). Teachers will be unable to select an appropriate teaching method if they do not know various methods. More familiar with different teaching methods, the teacher will be more capable to reach instruction goals in different situations. So, we explain active and inactive methods in mathematics teaching and describe their importance. We will also explain the effect of media and instruction instruments. At last, some hypotheses will be considered while using active and inactive methods and the role of these methods in effective learning will be assessed (Safavi, 2003).

2- Description of Subject:

2-1) Individual Active Method:

Some teaching methods activate the teacher and learners appropriately and create teaching – learning bilateral relations. In these methods, topics and concepts are discovered because of activities of teacher and students, and each selected method is defined as an axis of teaching. In addition, a method or a part may be used in teaching. These methods have various stages, and teaching begins within them regularly and continues up to taking concept. Inductive method, problem-solving method and role performance method are some of these methods(Fazlikhani, 2003).

2-2) Group Active Methods:

Group active methods are taken into account as active methods in the viewpoint of active instruction procedure. But cooperation and consultation of some students together to reach a goal is what distinguishes active methods of participatory methods. There is this possibility to establish an active method between teacher

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and student which is called “individual active method”. But group active methods are formed between groups, while group interests take a great importance. Cooperative learning is the result of participatory activities. Since the goals of participatory and individual methods are the same; hereinafter, these two methods are addressed under one title. We have tried to arrange the measures in which, the offered methods are representing a series of characteristics of two methods to be used by practitioners and teachers. So we use the term “active method” instead of “individual and group active methods” because it covers both methods (Bazargan,1995). Here, we briefly consider some methods in mathematics teaching:

1- Inquiry Method: The method in which, teacher leads the student to think about a new concept or to explain a new subject. Along this method, student tries to move from a known subject toward an unknown subject by means of mental efforts. This method is also called “Socratic Method”.

2- Problem-Solving Method: This method is a kind of comprehensive preparation for life, because life is confrontation with problems and trying to solve them (Shabani, 2006). A Chinese proverb says: “If you give a fish to somebody, you have provided a meal for him; but if you teach him how to fishing, you have provided a lifetime meal for him” (Hassani, 2000-2001).

2-3) Inactive Methods:

Some other traditional methods make passive students and active teachers because this information is provided as a strain and make a little interaction in teaching process. These methods are not heuristic and make learners lazy and reduce their self-confidence due to their boring and annoying nature (Yazd; 2008). Here we consider some traditional methods in teaching mathematics:

1- Memorization and repetition method: This is one of the oldest instruction methods. In this method, memorization, repetition and replication of subjects are the main tasks to do. This method may be suitable for some other courses, but it is not an appropriate method itself for mathematics teaching.

2- Lecturing Method: This method has a long history in instruction system. Offering concepts orally by teacher and audio learning and note-taking by students are the foundation of this method. In this method, teacher is active and the sole-speaker and students are inactive acceptors of subjects. This method may be useful for other courses (Shabani, 2006).

2-4) Media and Instruction Instruments:

We explain media and instruction instruments because they are used in most active methods. The educational environment will be unfamiliar for the student who has been grown up in a technological society if no media or instrument is used in mathematics classes. Now this question arises that why should we use media and instruction instruments? Effective learning starts from first-hand and new experiences and goes into more abstract experiences, namely students, at least instead of oral learning, learn something by experiencing real things and visual representation.

3- Statistical Sample:

The statistical sample includes twenty mathematics teachers in schools of Yazd City, Iran.

4- The Purpose of Questionnaire:

1- Considering effective factors on active method.

2- Considering the effect of active and inactive methods on effective learning.

3- Learning resources to be used by teachers and students may be effective on teaching methods especially teaching mathematics.

Creative use of various media increases the probability of higher learning, longer memorization and better function in mathematics teaching. Of course, only using media in instruction activities will never guarantee the above-mentioned results, while other factors are involved in this field. Mathematics is not learnable only by hearing and watching, but it may be learnt through touching to convey a sense of tactility (Yazd; 2008).

5- Analysis:

We formed a questionnaire in which, the influence of some hypotheses on active teaching or active methods of mathematics teaching are considered. The second part is related to effective learning and here, we offer some hypotheses about their effects on learning. The third part is related to hypotheses, their effects on non-utilization of active teaching methods are considered. The fourth part of questionnaire is related to hypotheses, their effects on utilization of inactive teaching methods are considered.

6- The effect of factors for no-utilization of teacher from active methods

Following is the text of questionnaire. This questionnaire considers some hypothesis in order to use active and inactive methods and their effects on learning. we hope to take an effective step to improve mathematics teaching under effective collaboration with you.

Description:

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Active method: Asking questions, problem-solving, demonstrative, constructivism, planned instruction, team members,

Inactive method: Lecturing, memorization, repetition, …

The effect of following hypotheses on mathematics teaching:

Hypothesis 1: Making instruction instruments by student

Hypothesis 2: Getting help of other students to teach mathematics

Hypothesis 3: Using instruction instruments

Hypothesis 4: Using instruction media in mathematics teaching

The effect of teaching method on effective learning:

Hypothesis 1: Using new and active methods

Hypothesis 2: Using traditional and inactive methods

The relationship between non-utilization of active methods by teacher and following items:

Hypothesis 1: Unfamiliarity of teacher of active teaching method

Hypothesis 2: Time

Hypothesis 3: Dependence on traditional methods

Hypothesis 4: Non-accessibility to facilities

Hypothesis 5: Indolence of teacher

Hypothesis 6: High proficiency of teacher in traditional methods

6-1) The effect of following hypotheses on active mathematics teaching:

Table 1: of hypothesis

	Frequency	Percentage
High	16	80%
Average	3	15%
Low	1	5%

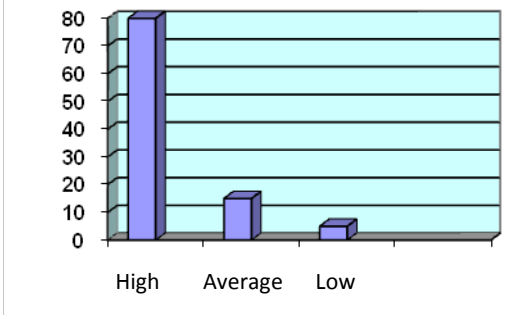

Fig. 1: Chart of hypothesis

Table 2: of hypothesis

	Frequency	Percentage
High	15	75%
Average	4	20%
Low	1	5%

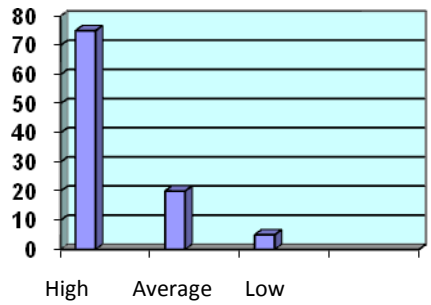

Fig. 2: Chart of hypothesis

Table 3: of hypothesis

	Frequency	Percentage
High	14	70%
Average	6	30%
Low	0	0%

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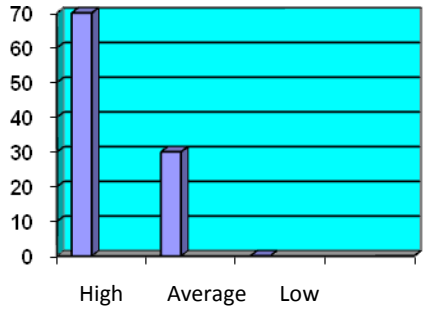

Fig. 3: Chart of hypothesis

Table 4: of hypothesis

	Frequency	Percentage
High	11	55%
Average	9	45%
Low	0	0%

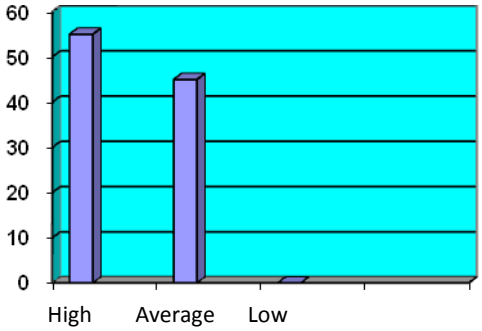

Fig. 4: Chart of hypothesis

6-2) The effect of active and traditional methods on learning

Table 1: of hypothesis

	Frequency	Percentage
High	15	75%
Average	5	25%
Low	0	0%

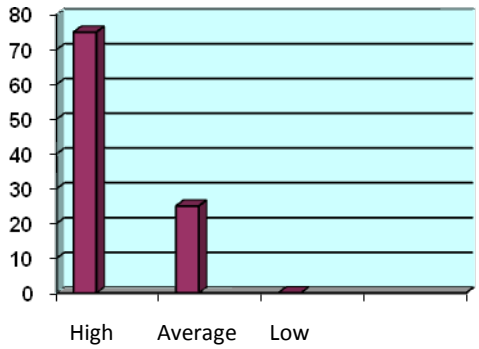

Fig. 1: Chart of hypothesis

Table 2: of hypothesis

	Frequency	Percentage
High	9	45%
Average	10	50%
Low	1	5%

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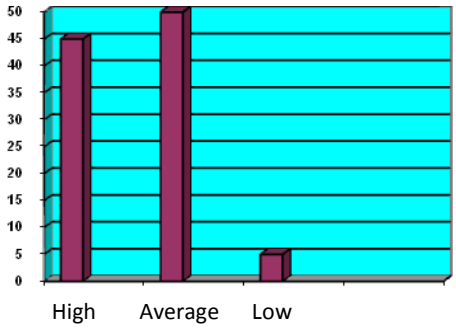

Fig. 2: Chart of hypothesis

6-3) The relationship between non-utilization of active teaching methods with following items:

Table 1: of hypothesis

	Frequency	Percentage
High	8	40%
Average	7	35%
Low	5	25%

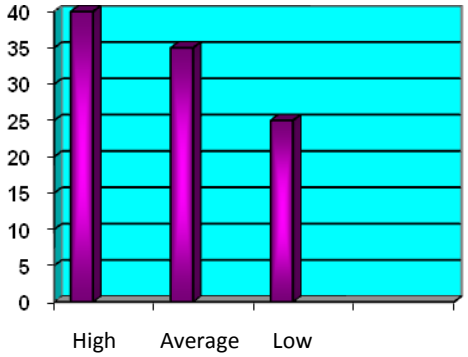

Fig. 1: Chart of hypothesis

Table 2: of hypothesis

	Frequency	Percentage
High	10	50%
Average	8	40%
Low	2	10%

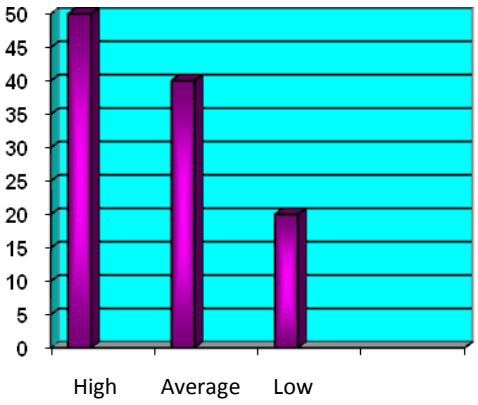

Fig. 2: Chart of hypothesis

Table 3: of hypothesis

	Frequency	Percentage
High	8	40%
Average	8	40%
Low	4	20%

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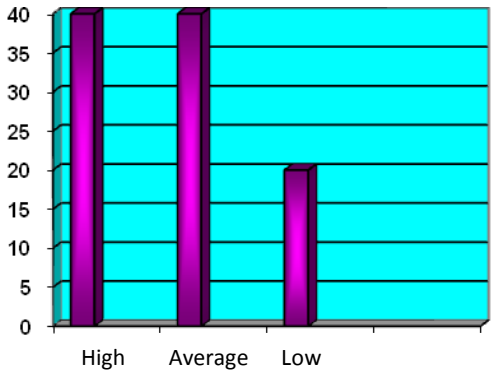

Fig. 3: Chart of hypothesis

Table 4: of hypothesis

	Frequency	Percentage
High	4	20%
Average	13	65%
Low	3	15%

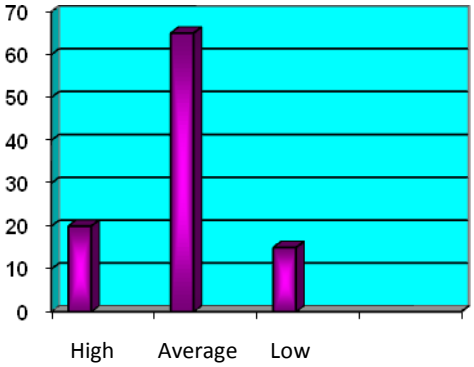

Fig. 4: Chart of hypothesis

Table 5: of hypothesis

	Frequency	Percentage
High	4	20%
Average	12	60%
Low	4	20%

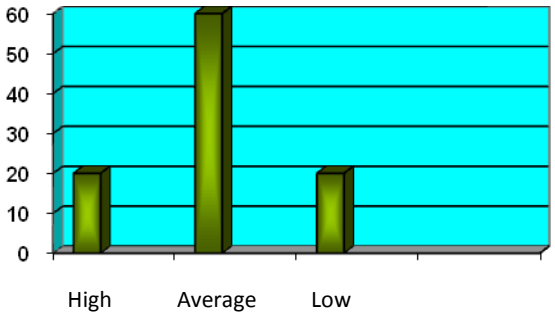

Fig. 5: Chart of hypothesis

Table 6: of hypothesis

	Frequency	Percentage
High	7	35%
Average	8	40%
Low	4	20%
Ineffective	1	5%

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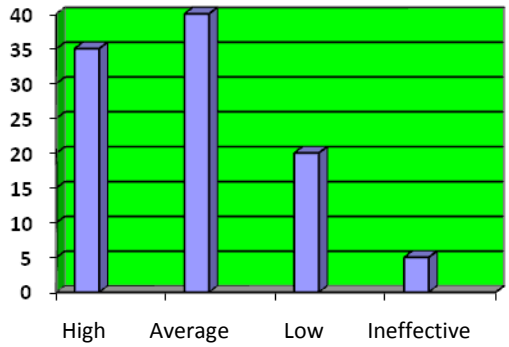

Fig. 6: Chart of hypothesis

Conclusion:

1- Making instruction instrument by students, getting help of students to teach mathematics, using training equipments and instruction media are effective in mathematics teaching.

2- Using modern methods is effective in learning.

3- Unfamiliarity of teacher with active methods, time, dependency to traditional methods, non-accessibility to facilities, indolence of teacher and high proficiency of teacher in inactive methods are effective to non-utilization of active methods by teachers. Time has the highest effect.

Suggestions:

1- Holding regular meetings among teachers to assess, improve, design and perform courses.

2- The factor of "time" may be argued by educational planners of Ministry of Education to offer necessary solutions to teachers.

3- Sometimes, students should be in an environment except for their regular classes.

4- It may be possible to engage students while teaching them.

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