

The Effects of George Poliya's Problem Solving and Brainstorm Active Methodologies on The Educational Progress of Fifth-Grade Male Students in the Social Training Course in Andimeshk

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ABSTRACT: The present study is to investigate the effects of the problem solving and the brainstorm active teaching methodologies on the educational progress of fifth-grade male students in the Social Training Course in Andimeshk in the academic year 2010-2011. The population included the male fifth graders studying at elementary schools in Andimeshk that year. In sampling, firstly, an elementary school with two working times was selected randomly through a two-step cluster sampling. In each working time, there were two classes of fifth graders one of which being selected on a random basis. Again, one of the two was selected randomly as the test group (the first group) and the other as the control group (the second group). After that, the first group received the brainstorm methodology and the second group received George poliya's Problem Solving. Then, a teacher-made test including 50 multiple-choice items was administered to both groups. Next, 20 instruction sessions were designed for geography (8 sessions), history (7 sessions), and civil law (5 sessions). The content was scrutinized by the researcher, then 20 lesson plans were written for each class with regards to the methodological, cognitive, psychomotor, and emotional considerations at all levels. The researcher performed the procedure through 2.5 months. The researchers used the SPSS software to analyze the data. The descriptive statistics included frequency, bar graphs, circle graphs, mean, and standard deviation. The inferential statistics consisted of independent t, Lon test, and dependent t to determine the level of significance. The results showed that there was a significant difference between the mean of educational progress among students receiving the brainstorm and the problem solving active of George Polio methodology, and the main theory is confirmed.

INTRODUCTION

In modern era, everyone needs training and almost all nations are more and less aware of its significance and its difficulties. Cant (cited in Shokouhi, 1991) wrote: among all the human inventions, two are the most difficult: the art of governing, and the art of education. Training can provide the individual progress and social warfare. So; it plays an important, determining role in human's life. Generally, the fostering of individual talents and progress, the strengthening the social life and the developing of mutual understanding are all supported by education.

However, it should be noted that today, some traditional methods have lost their appropriateness and usefulness, and that following them cannot make students ready to live in our dynamic world, and ready for future because nowadays, the students are involved in working with new material, technologies, computer, digital libraries, CDs, different software, satellite and videos. So, the traditional methods bombard the students with the information and materials that are not suitable for the students' present-day needs and attitudes. For this reason, they repeat all things through parrot learning and gradually they may feel disappointed. Perhaps, they give up educational activities.

Therefore, it is necessary to take immediate actions regarding the whole teaching-learning process, methodologies, curriculum planning, realia, use of new technologies and qualified teachers trained for this purpose. Also, governments and their affiliated institutions, especially the education ministries have to change their current attitude, adopt a new stand and try to implement it. So, every nation that longs after progress, welfare and development, has to develop the education on which all the progress is based.

Recommending using the most appropriate ways to have the best educational equipment to supply better, deeper and developed learning in the shortest possible time, the educationists oppose to the traditional definitions of teaching that regarded it as a process of transferring knowledge. They welcome the methodologies in which the responsibility is left to the learners. In these methodologies, the teachers are not only the source of information but also the creators and leaders of opportunities for students so that they can achieve more learning, and better understanding.

Emphasizing on students' active role and the stability of their learning, Rogers (cited in Adib Nia, 2004) has likened teaching to psychotherapy. Because, as in psychotherapy in which the psychologist attempts to help the patients to discover their own problems and how to overcome them, in teaching, students themselves learn the materials, and the teacher helps them get close to and acquire the educational goals.

Also, Makava (cited in Adib Nia, 1383) believes that the efficacy of education depends on the expansion of teacher-student communication to a large extent. This causes the students to get more and more involved in the teaching-learning process. Therefore, the teacher can act as a guide and director in the teaching-learning process help them. Thus, the teacher should try to engender the students' highest possible involvement in the class.

Basler (cited in Adib Nia, 2004), maintains that much of trivial misconduct by students result from the inactive presence of students in the class, and from making light of active teaching methodologies. Fouler and Hanuman (1989) and Walberg (1991) emphasized more on the key role of school and its circumstances than on the family effects in the Third World countries. It seems that in these countries, selecting a methodology by teacher, paying attention to learners' emotions, and success in establishing good human communications and mutual respect can have a significant role in the enhancement of effects learners' motivation. In the educational system of most of the Third World countries, learners don't have a positive attitude to the educational materials and programs, and do not consider them as in agreement with their interest and inner desire. But, when the teacher selects an appropriate methodology, they gradually begin to display interest. This shows the significant role of teacher in the education system of the Third World countries (Fathi Azar, 1993).

With regards to the above discussion, it follows that one of the most important factors to determine students' progress is the teacher's methodology and performance. Selecting methods based on students' active involvement and their needs will result in educational progress.

Today, everyone should be equipped with the required knowledge in science and technology which is referred to as scientific- technological literacy

The scientific- technological literacy refers to a set of information, knowledge and skills in science technology needed by everyone. In fact, it is the ability to act in a scientific way to solve the problems faced by the present human community. Everyone may have a positive or negative contribution in this regard.

The main goal of all scientific educational programs is to develop the scientific- technological literacy. One of the factors that directly affects the level of scientific- technological literacy is the attitudes and policies governing the education system of any society. There is a two-sided, systematic relationship between the science qualities in general education courses and the level of scientific- technological literacy

The education system is considered as one of the critical human needs which is as old as the existence of human beings. In meeting this basic need, everyone has a unique goal and method dependent on to his/her characteristics, norms, and cultural and social status. For this, with the passage of time, an institution was established to facilitate the arrangements to achieve this complicated goal and to meet this crying need. As the societies become more sophisticated, the educational content, methodologies, and programs get more complicated. Based on the structure of the society and culture, the education system of a nation has to follow special principles and goals. In fact, the activities within the education system of any society are provided to help achieve the goals and train the future generation of that society.

In all the world, teachers, economists, experts, and politicians express their opinions on how to learn, how to teach, and what the school and educational content should be like. That's because today's children will become the active members of society in future constituting its driving force. Thus, it is now incumbent on us to make appropriate decisions for their education to make aware and responsible individuals out of these children.

Statement of the Problem

In the present age, a new civilization is being engendered. Such a civilization will bring with itself new information and awareness. It is really difficult to describe the depth and broadness of this extraordinary change. Some speak of the Space Age, the Electronic Age, or the global village. We are designing a new, wonderful civilization from which we have no clear understanding. This is what we mean by the Third Wave (Toffler, 1970)

Asubel (cited in Seif, 2001) states that effective teaching plays a key role in students' motivation. Because learning comes through effective teaching, and the satisfaction may motivate students more. The extraordinary great changes which are about to happen will change our conceptions about the educational

standards. So, it is obvious that it is so wrong if individuals rely on the old methodology and prejudice in applying the traditional methods especially in educational system and training students. The inefficiency of traditional, obsolete, passive education systems in modern circumstances has been revealed first in developed, and then in developing nations. So, there is no way to respond adequately to the economic and social needs in developing nations except making major change in educational methods.

Nowadays, the methods are based on students' activities and their cooperation is considered as a necessary need. Those trainings accompanied by contemplation and reflection, and the involvement of the learners result in in-depth learning. And those trainings which fail to provoke the learners' thinking will lead the students to insularity and superficiality.

Students must experience in person, manipulate things, and understand directly, so that they can get clear concepts (Piaget, cited in Shokouhi, 1984). Although this can be time consuming, spend more time in the first steps of teaching, provided that it leads to the students' deep understanding, will guarantee the higher pace of teaching in next steps. Therefore, providing an appropriate circumstance to get experience, do activities, make efforts and understand the facts is a necessity. Making a two-sided communication in the educational atmosphere will help cause to remove the students' indifference.

In the present study, the researcher tries to introduce a methodological model based on students' activities. The aim is to investigate the efficiency of two active methodologies- the brainstorm and George Polya's problem solving methodologies- in students' progress. The researchers believes that although the students' educational progress is influenced by intelligence, talent, family status, and parents' level of education, the active teaching methods can play an important role in educational progress.

Learning based on problem solving begins with the involvement of students in a problem and individual or team working with respect to the teaching goal. The teacher acts as a facilitator, not as a primary source of information (Kar et al. 2008). Students try their solutions and make conclusions. There are different models to present the problem-solving methodology. The most important one is presented by Dewey and George Polya. The present research is based on George Polya's model as follows:

The first step: understanding

The second step: planning

The third step: implementation

The fourth step: control and revision (Adib Nia, 2010).

The brainstorm refers to the process of collecting different ideas from the learners for solving or tackling a problem (Adib Nia, 2010). The main goal of brainstorm is to separate the process of response production from the evaluation process, because evaluation often represses the production of various responses and creativity (Seif, 2001). The brainstorm method consists of following steps:

The first step: making thought and creativity

The second step: Decision making and evaluation

The aim of the implementation of these methods is to internalize creative thinking and behaviors in students, and to help the students utilize them in their everyday lives (Adib Nia, 2010).

Significance of the Study

Nowadays, almost all those who advocate development and change, begin their activities with education. Paying attention to education and training increases development pace and coordinates it with the global trend. The new perspectives coming from the technology age such as self-learning, thinking on one's learning (metacognition), process-oriented learning and independent learning have led to a gradual revolution in considering the main educational concepts. Literacy, knowledge, teacher, student, curriculum and school all are gaining new definitions (Adib Nia, 2010).

In the present era, the aim of education system is not to transfer knowledge, and the role of school is different from that in the past. The education system is responsible for taking into consideration the whole individual and all the aspects of his/her life. In fact, the teacher is a guide to train students, not to a source to transfer information. The present world is immensely dependent on technology, while a few people know what technology actually is. The ability to understand the technology is called scientific literacy. And the main aim of all science education systems is to foster scientific literacy. It enables people to collect information in related technology and make right decisions.

The education systems and the activities governing them are subject to changes occurring in the society. The education change is dependent on the social and technological changes, .Simple societies have simple needs and simple needs to meet them. These societies require limited knowledge and a member may be right to claim that I learnt whatever I need. But in developed nations, the changes take place so fast that the education systems experience a great revolution in a relatively short time. Even some people speak of school less society. Owing to the great progress of the modern time, it is impossible to acquire the whole knowledge, and not everyone can be suitable as a teacher (Shabani, 2007).

With the progress and sophistication of societies and science, the individual and social needs become more complicated. Sophisticated technologies are needed to satisfy these complicated needs. Sophisticated technologies needed great, new and active educational methods. So, the education system and teacher's responsibilities become so complicated. Now, it is impossible to lead individuals and societies toward a sophisticated, great change with the help of traditional methods since various equipment and new technologies are required (Shabani, 2007).

The teacher in the present world cannot make light of his responsibilities by being indifferent and non-challant. If he/she is not familiar with the educational principles and concepts, the students' characteristics, the active methods and other educational skills, can never provide the students with the adequate progress.

Individuals have to come up with the belief that their responsibility of teaching process is not to transfer the scientific facts, and that the education system has to provide an ideal learning state. The teachers have to teach how to think and how to learn. If the teacher tries to teach the adequate, required teaching method, students will learn better. If we are able to state educational goals clearly, and provide the grounds for gaining new experiences and performing educational tasks by organizing the environment in right ways and using right teaching methodology, learning will take place automatically (Shabani, 1991).

Training creative, thoughtful persons calls for its own right ways. The traditional structures cannot provide the suitable grounds for such a thing. Unfortunately, in many educational systems, wrong habits have become predominant on teaching process due to the rapid development of schools and use of non-expert, untrained personnel, especially those wrong habits that have replaced consultation collaboration and communication among students. Also, in any freedom of thought in the acquisition of educational goals and the training of valued humans, various factors, including curriculum are important, and in this regards, the social studies course has a distinct role. The social study training is considered as a main subject matter in the curriculum which continues from the first grade to the last grade of high school in some countries. The goals of social studies are extracted from the general needs, the learning nature, social science and needs. The content is related to history, demography, economics, anthropology, and politics, in some cases in humanities, science and sometimes in demographic training, consumption, training and technology.

The methodology of social studies reflects the individual, environmental, social and cultural awareness. So, the acquisition of practical and mental skills is made possible, learning levels are facilitated and appropriate attitudes and evaluations are engendered in the learner through the social studies training.

Research Question

Is there any significant difference between the efficacy of active brainstorm and George poliya's problem solving methods in the elementary fifth graders progress in social studies in Andimeshk in the academic yea 2010-2011?

Research Hypothesis

There is a significant difference between students' progress due to active brainstorm and George poliya's problem solving methods.

Literature Review

Hossein Zadeh (1991, cited in Zahedi Yazdi, 1999) conducted a study entitled A Comparative Study of Effectiveness in Active and Passive Methods in Junior and Senior High Schools. The research population included 83 second-grade male students in science course, and females in geography, and the first graders in Persian literature. He selected the test and control groups based on IQ test of R.B. Cattle, and created equal consistent situations for the two groups except the methodology. After training, he administered a test to both groups, and concluded that the efficiency of active method was so higher than that of the passive one.

Various studies have been conducted on the effectiveness of teaching methodologies. The findings are considered important to improve the methodologies. Depending on the research type, some studies indicate the higher efficacy of certain methodologies compared to other methodologies. Some of these studies are presented as follows.

Kazem pour performed a comparative analysis between the active brainstorms with the lecture-based traditional method with regard to the effectiveness of teachers' attitudes on the students' progress in the social studies course among the female fourth-graders in elementary schools in Ray in the school year 2007-2008. The research method was of semi-experimental type in both groups receiving pre-test and post-test. A school was selected randomly among 34 girls' schools in the Jurisdiction II of the Education Office of Ray. 40 students were selected randomly among all the fourth-graders placed into two groups- the test and control ones. So, the sampling method and sample distribution were random in nature. The allocated time to implement the methods were: 5 weeks, and each week included 3 sessions, so the active brainstorm group received 15 sessions, 45 minutes each session. A teacher-made questionnaire was designed to evaluate the teachers' attitudes. The questionnaire consisted of 30 items. The teachers were selected randomly. She concluded that there was a

significantly greater difference in the fourth graders' educational progress of the fourth graders who received the active brainstorm methodology compared to those who received the traditional lecture-based method, and that there was a significant difference in the brainstorm and lecture group teachers' attitudes.

Mirzaiyan investigated the efficacy of the active brainstorm and direct discovery methodologies in the enhancement of junior high school third graders' creativity in Boroujen in the school year 2002-2003. The results showed:

The creativity training through brainstorm caused the students who received such training to show higher creativity than the control group.

The directed discovery training led to the students receiving it to display a higher control of creativity.

The creativity training through directed discovery leads the students to display higher creativity indicated than students who received the brainstorm method.

In this research, the researcher used pre-test and post-test in several groups. The population included all male third graders in Boroujen. The sampling was random. Each group consisted of 24 students in three groups; brainstorm, discovery and control.

Also, Anjefi conducted a comparative study on the effectiveness of synaptic and brainstorm methodologies in fostering creative thinking among the elementary fourth graders in the Jurisdiction II of Education Office of Tehran in the school year 2008-2009. The researcher found that:

Instruction in synaptic resulted in an increase in the students' creativity in the all five dimensions.

The active brainstorm method was able to increase the students' creativity, but this result was not confirmed in the two dimensions of the abstract and resistance against premature closing.

Statistically, there was no significant difference between synaptic and brainstorm in the enhancement of the students' creativity.

Gig (1963) summarized the results of studies on the relative effectiveness of the lecture-based and group discussion methods as follows: Due to the quick learning of real information, most researches didn't show significant difference between the two methods, but a few researches preferred lecturing to group discussion. Also, with regard to the information saved in long-term, the studies indicated the superiority of group discussion to lecturing, but this wasn't so significant.

Dobbin and Tavjia (1968) considered the findings of 100 studies which had been conducted within a 40-year-long period on the effectiveness of the group discussion and lecturing on the students, learning. In this study, the mean of students' scores in two methods were compared in final exams. The results showed that the mean difference was zero; it means that there was no significant difference between students in two methods.

M.C. Ki chi and Kulich (1975, as cited in Gig and Berliner, 1992) compared lecturing and group discussion in three different criteria, namely, the real information test, the measure of remembering and high-level thinking, and the measure of the attitude and motivation. The findings showed that in 21 comparisons made with the criterion of real information test, lecturing was better than group discussion in 12 cases. In 7 comparisons made with the criterion of remembering and high-level thinking, group discussion showed better results than lecturing. Out of 9 comparisons made with the criterion of attitude and motivation, in 7 cases, group discussion was better than lecturing, in one case, both were the same, and in the other one, group discussion was weaker than lecturing.

Regarding the above studies, Gig and Berliner (1992) hold that there is a psychological problem in the most of these studies. The problem was that students who know that they have to take a test of what they have learned whether through lecturing or group discussion, they will try to compensate the shortcomings of each method, so this compensation leads to a decrease in the difference of their scores. Therefore, there was no significant difference in effectiveness of methods in studies which neglected this point. In spite of probable differences of the various teaching methods, those activities students used to compensate the shortcomings, made their success extent closer. So, the future studies must pay more attention in this regard.

The studies conducted on the effectiveness of mastery learning method generally showed that this method had positive effect on the students' progress especially in weak students. Anderson and Arlin (1973, cited in Bloom, 1982, translated by Seif, 1363) showed that this methodology has positive effects on the students' progress and brings positive emotional outcomes.

METHODOLOGY

Selecting the research method is dependent on the subject, goals, hypotheses, moral and human considerations, and equipment (Ahmad Pour, 1377). In the present study, since we intend to measure the effectiveness of two teaching methodologies (independent variable) on the students' progress (dependent variable) the semi-experimental research type is adopted.

Participants

The population consisted of all the male fifth graders in elementary schools of Andimeshk in the school year of 2011-2012.

Sampling

In the current study, 24 students were placed in two experimental groups.

SAMPLING METHOD

The researcher used a two-step cluster random sampling. This method is common in schools. In this study, first, a school was selected randomly among all elementary schools in Andimeshk. The school included 4 classes of fifth graders in two working times. Each working time included two classes of fifth graders. In each time, a class was selected randomly as the test groups 1 and 2, also the test group 1 received the brainstorm and the other test group received the George problem solving method on a randomized basis.

Instrumentation

The data was collected through a researcher-made test of the social studies coursing the fifth grade of elementary school. The test contained 50 multiple-choice items which consisted of first 8 lessons in geography, first 7 lessons in history, and first 5 lessons in civil law.

Procedure

Firstly, the researcher selected a school that had 4 classes of fifth graders in two working times. After that, he selected a class in each working time randomly; next he administered a pre-test to the two classes. Then, he both two classes received the brainstorm method (first group), and problem-solving method (second group), and 20 minutes was allocated to teach each group a session. After teaching, they received a post-test.

Research Design

The research design is dependent on the research goals, the variables to manipulate, and limitations and conditions of the study. In other words, selecting the research design is dependent on the examinees' selection, manipulation of the variables, control of the undesired variables, and data analysis (Naderi and Seif Naraghi, 1999).

RESULTS

The main hypothesis: There is a significant difference between the mean of students' progress in the brainstorm and George poliya's problem-solving methodologies.

Table 1. The descriptive statistics of students' progress in two methods

Group	N	Pre-test		Post-test	
		Mean	Std.	Mean	Std.
Brainstorm	24	26.20	6.45	42.70	4.12
Problem soling	24	24.20	7.02	45.50	4.25

As the table showed, there is no difference between the means of brainstorm method group and problem-solving method (26.20 vs. 24.20). But, there is a significant difference between the post-test mean in two groups (42.70 vs. 45.50), and the difference is due to the higher scores in problem-solving method. This indicates the higher effectiveness of problem-solving than the brainstorm method.

Graph 4.1

According to the results, there is no significant difference in the means of brainstorm and problem-solving methods (25.41 vs. 25.64). However, there is a difference in the means of two methods in the post-test (41.64 vs. 46.64). This shows the higher level of intermediate students' progress through the problem-solving method.

Table 2. The Leven's and t-test to analyze variances of Scores in two methods

Education progress	Leven-test F	Sig.	T-test	df	Sig.	T results
Total students	0.093	0.7	1.02	46	0.3	consistent
Weak	1.42	0.2	1.005	9	0.3	consistent
Average	0.558	0.4	0.154	29	0.8	consistent
Advanced	35.03	0.004	0.831	4	0.4	consistent

As the table 4.2 shows, the Level test (Variances equity) is not significant in the level of 0.05 in all variables except advanced students, so the variances homogeneity is in two groups. But, according to t independent test, there is no significant difference in the mean of students' progress in pre-test in two groups; therefore, the homogeneity of two groups is accepted.

Table 3. The results of dependent t-test to consider mean difference of students' progress in pre-test and post-test of the brainstorm method

Group		N	Mean	Std.	Mean Difference	df	t	Sig.
Total	Pre-test	24	26.20	6.4	16.5	23	12.80	0.001
	Post-test	24	42.70	4.1				
Weak	Pre-test	3	17.0	2.0	27.33	2	16.40	0.004
	Post-test	3	44.33	1.5				
Average	Pre-test	17	25.41	3.9	16.23	16	15.74	0.001
	Post-test	17	41.64	4.2				
Advanced	Pre-test	4	36.50	1.7	9.50	3	4.21	0.02
	Post-test	4	46.0	2.9				

The results of table 4.6 indicates the significance of the measured t in total mean differences of students-advanced, intermediate and under intermediate- in pre-test and post-test in the brainstorm method. So, the null hypothesis is refused.

It can be claimed that there is a significant difference between the total mean of students-advanced, intermediate and under intermediate-, in pre-test and post-test. The significant difference of scores in pre-test and post-test in the brainstorm reveal the effectiveness of this method to bring higher progress.

Table 4. The results of dependent t-test to consider mean difference of students' progress in pre-test and post-test of the problem-solving method

Group		N	Mean	Std.	Mean Difference	df	t	Sig.
Total	Pre-test	24	24.20	7.02	21.29	23	15.10	0.001
	Post-test	24	45.50	4.2				
Weak	Pre-test	8	17.87	0.9	25.12	7	12.82	0.001
	Post-test	8	43.0	5.6				
Average	Pre-test	14	25.64	4.3	21.00	13	15.41	0.001
	Post-test	14	46.64	2.9				
Advanced	Pre-test	2	39.50	7.7	8.00	1	1.33	0.4
	Post-test	2	47.50	0.70				

The findings of the table 4.7 show that measured t is significant for the total mean difference of intermediate and under-intermediate students in pre-test and post-test in problem-solving method in the level of 0.05. So, the null hypothesis is refused.

It can be inferred that there is a significant difference between the total score mean of the intermediate and under-intermediate students in pre-test and post-test in problem-solving method; therefore, the effect of problem-solving method is trivial in the students' progress. But, the t dependent test is not significant between the pre-test and post-test in problem-solving for advanced students.

Table5. The results of independent t-test to see the mean difference of students' progress in brainstorm and problem-solving methods

	Leven-test		N	Mean	Std.	Mean difference	df	t	Sig.
	F	Level of Sig.							
Brainstorm	0.028	0.8	24	42.70	4.12	2.79	46	2.30	0.02
Problem-solving	0.8		24	45.50	4.25				

According the results of Leven test, F is not significant in the level of 0.05, so the homogeneity of variances is out of question. The table shows that, since the t measured in students' progress (2.79) is smaller than 0.05 (0.02), the null hypothesis is refused.

It can be concluded that a significant difference is seen between the scores mean of students' progress in two methods. It means that, the mean of students' progress in problem-solving method is better than brainstorm method. It indicates the effectiveness of problem-solving method than brainstorm in the students' progress.

CONCLUSION

The main hypothesis suggested that there is a significant difference between the mean of students' progress in brainstorm and problem-solving methods. The hypothesis is confirmed. In other words, the analyzed data showed that the mean of students' scores in George poliya's problem-solving was better than in

brainstorm. In fact, the more effectiveness is observed in the problem-solving method in the elementary fifth graders.

The results of present study are consistent with the studies conducted before; Rahimi (2003), Eibari (2011), Nazari Sarem (1995), Sirfi (1997), Kanaani (1999), Zahedi Yazdi (2008), Khosravi (2004), and John Dewey (1942), Beroufi (2005), Dinisiew (2010), Spalding (1981), Ellis ad Wallen (1976), Peterson and John kit (1979), Foul and Limen (1988), Joana (1983), Millis (1993), Cooper (1990), Jonson et al. (1981), Slav in (1990). All the studies indicated that the effectiveness of active methods was more than that of the passive ones, and that there was an interrelationship between the active learning, students' cooperation and progress. In fact, the student-oriented method is more effective than teacher-oriented one. However, the results of the study are not in line with some studies; Asubel (1963), Myer (1979), Hamilton (1985), Layton (1980), Joes (1986), Novak (1978), Ferryman (1992) and Bell Jerald (1986). Because these researchers believe that there is no significant difference between the students' progress and the active methods such as brainstorm and problem-solving. Asubel (1963) stated that the problem-solving was the best method to learn. Such results may be due to the research sampling, lack of consistency and validity, in homogeneity of testees in groups and lack of inappropriateness of material in active methodologies.

Limitations of the study

The generalizability of the results is limited, because the research is allocated to a certain course, class and method.

As classes had been organized before, the researcher couldn't select examinees and place them in different groups.

It was impossible to control all the variables affecting the students' progress such as teacher-student relationship, individual differences, intelligence, motivation, the teacher's competence.

Lack of teachers' familiarity with the active teaching methodologies and their procedure.

Small size of the classroom to implement the active methodologies.

Lack of adequate equipment to implement the active teaching methodologies.

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